

# **Click-Less™ True-Bypass Universal Install Guide**

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## ABOUT THIS MANUAL

This manual covers Click-Less™ True-Bypass installation for a variety of effects circuits. Component reference numbers have been omitted as each circuit's unique component reference numbers will vary.

*It is recommended that you fully read this manual and become familiar with the installation procedure before beginning any work.*

The first section of this manual covers Click-Less™ installation for BOSS monophonic analog effects pedals.

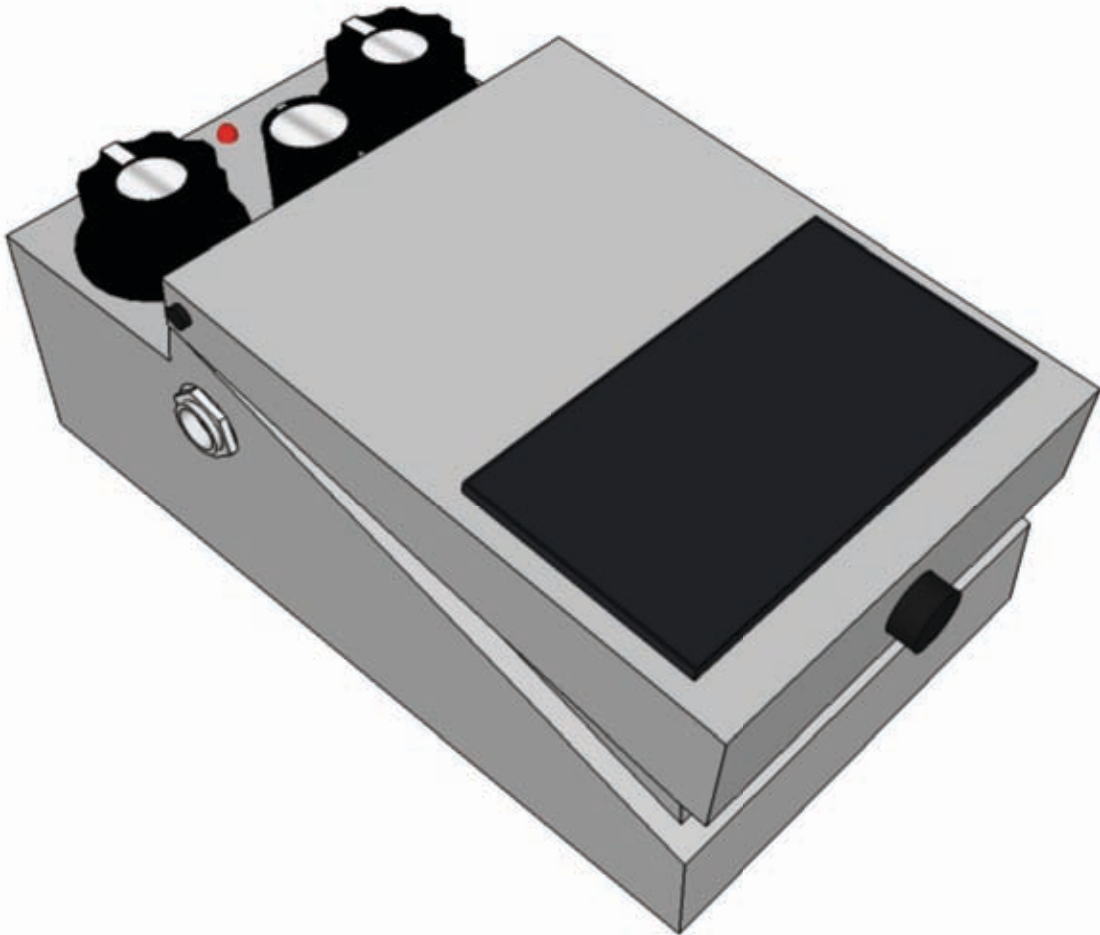
The second section of this manual covers Click-Less™ installation for Ibanez monophonic analog effects pedals.

The third section of this manual covers Click-Less™ installation for effects pedals using mechanical bypass schemes.

### RECOMMENDED TOOL AND SUPPLY LIST:

- Soldering station (with temperature control/regulation)
- Solder & Flux
- De-soldering braid or solder sucker
- Wire strippers
- Wire cutters
- Phillips head screwdriver
- Double-stick foam tape

# BOSS EFFECTS



## OVERVIEW

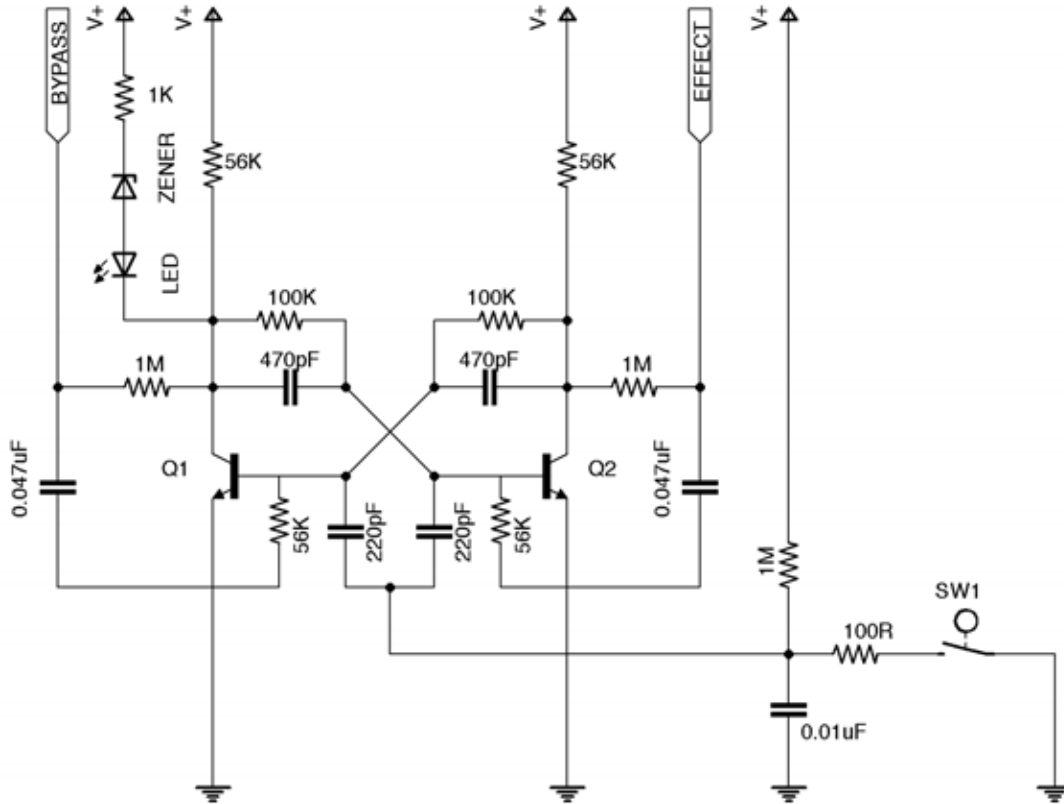
BOSS analog effects employ buffered electronic switching comprised of four main circuit elements:

- A buffer/driver circuit used to prevent loading of the signal path and to drive the electronic switching circuit
- Two FETs (field effect transistors) used to block/allow signal flow through the bypass and effect circuits
- A flip-flop circuit used to select which FET is on/off (BYPASS/EFFECT) and route the signal appropriately
- A mechanical momentary contact switch used to control the flip-flop circuit

Installing Click-Less™ True-Bypass requires circumvention of the electronic switching system and re-routing the signal path through the Click-Less™ PCB.

This manual will focus on the flip-flop circuit and signal routing.

## A TYPICAL BOSS FLIP-FLOP



### OPERATION:

- If Q1 is ON, Q2 is OFF and circuit is in EFFECT mode
- If Q2 is ON, Q1 is OFF and circuit is in BYPASS mode

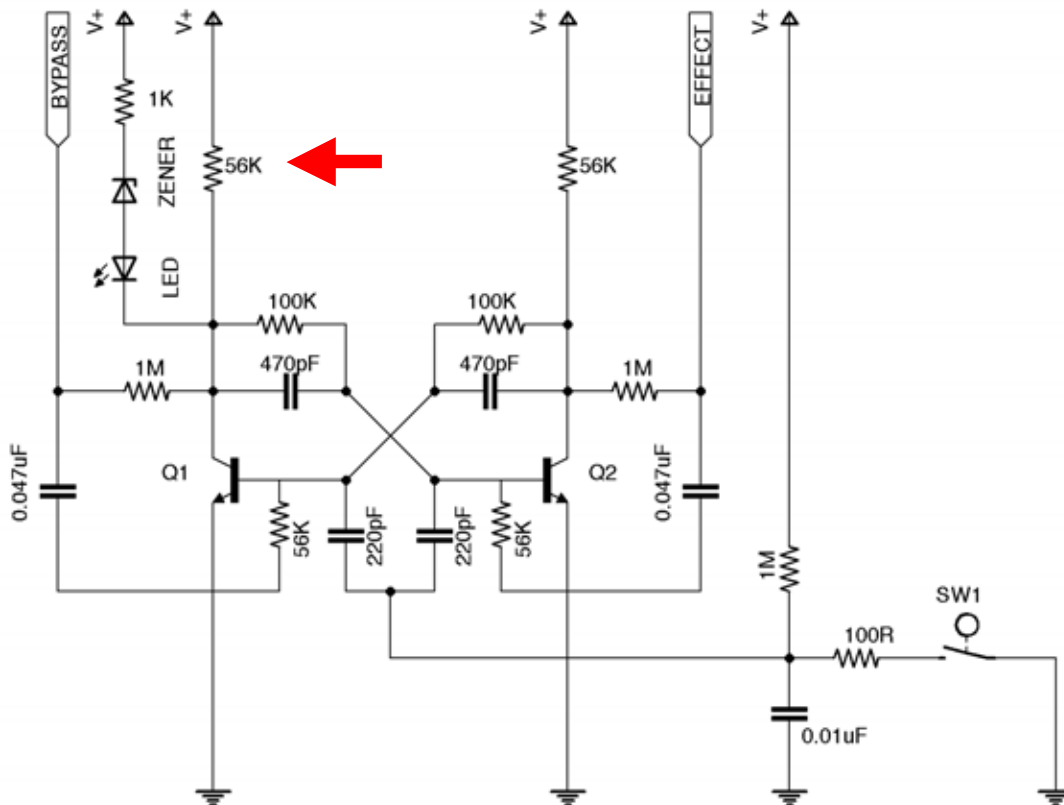
### ACTION:

When Q1 is ON its base is high and its collector is low. This forces Q2 to turn OFF because Q2's base is tied to Q1's collector via a 100K resistor. This simultaneously forces Q1's base to stay high because it is tied to Q2's collector, which is held high.

When Q2 is ON its base is high and its collector is low. This forces Q1 to turn OFF because Q1's base is tied to Q2's collector via a 100K resistor. This simultaneously forces Q2's base to stay high because it is tied to Q1's collector, which is held high.

## DEFEATING THE FLIP-FLOP

In order to install the Click-Less™ system, the flip-flop circuit must be forced into the EFFECT mode at all times so that signal is flowing through the effect circuit when the pedal is activated. This can be accomplished quickly and easily by simply removing one resistor:



Removing the 56K resistor indicated above (actual value may vary) insures Q2 will not turn on by preventing its base from ever receiving voltage. This forces the flip-flop circuit into permanently retaining the EFFECT mode state.

### TECHNICAL NOTE:

THE FLIP-FLOP RETAINS THE ABILITY TO TOGGLE STATES UNTIL THE LED NODE IS DISCONNECTED FROM THE CIRCUIT.

## RE-ROUTING SIGNAL FLOW

Now that the flip-flop circuit has been defeated the pedal is locked in EFFECT mode. Signal must now be re-routed from the input and output jacks to the Click-Less™ PCB to accomplish Click-Less™ True-Bypass switching. The Click-Less™ True-Bypass system has been designed to allow you to perform these actions quickly, easily and effectively.

There are a total of ten wires you will need to address in order to re-route signal flow through the Click-Less™ PCB:

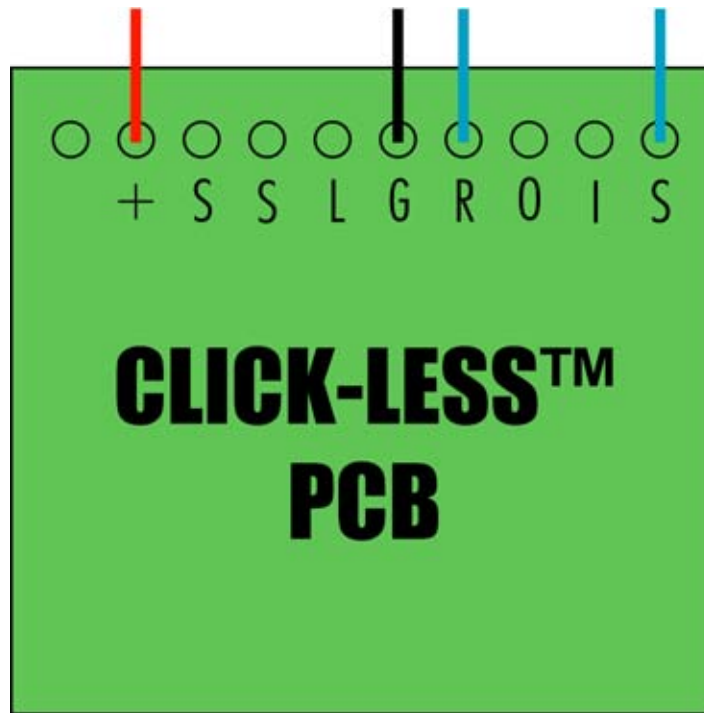
- The input jack wire on the pedal
- The output jack wire on the pedal
- The two wires connected to the small LED PCB
- The two wires connected to the pedal's switch
- The **+** power wire from the Click-Less™ PCB
- The **G** ground wire from the Click-Less™ PCB
- The **S** send wire from the Click-Less™ PCB
- The **R** return wire from the Click-Less™ PCB

Disconnect the input jack wire from the effect PCB and write down the hole that the wire was connected to.

Repeat this procedure for the output jack wire, LED PCB wires and switch wires.

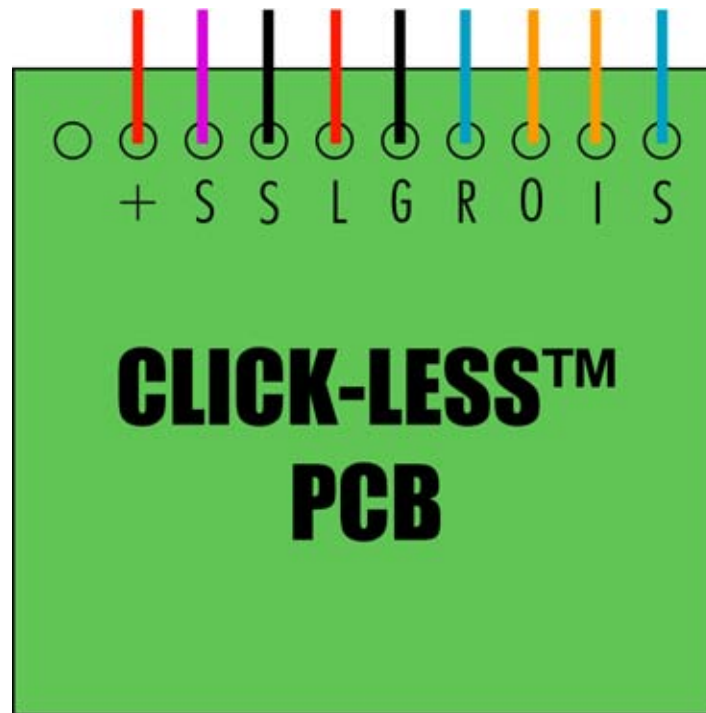
Connect the four of the supplied wires to the Click-Less™ PCB pads following the diagram below:

*NOTE: Wire color employed may vary. Colors indicated below are for reference only.*



- **+** power pad. (Red wire shown)
- **G** ground pad. (Black wire shown)
- **R** return pad. (Blue wire shown)
- **S** send pad. (Blue wire shown)

Connect the ten wires to the Click-Less™ PCB pads, effect PCB and to ground as shown below:



- **+** power wire to 9V source
- **S** pads on the left side of the Click-Less™ PCB to the switch (Purple and Black wires)
- **L** pad to the anode (positive side) of the LED PCB
- **G** ground wire to suitable ground\*
- **R** return pad to the hole on the effect PCB that the output jack was connected to
- **O** output pad to the output jack
- **I** input pad to the input jack
- **S** pad at the right side of the PCB to the hole that the input jack was connected to
- Remaining LED PCB wire\*\* to a suitable ground\*

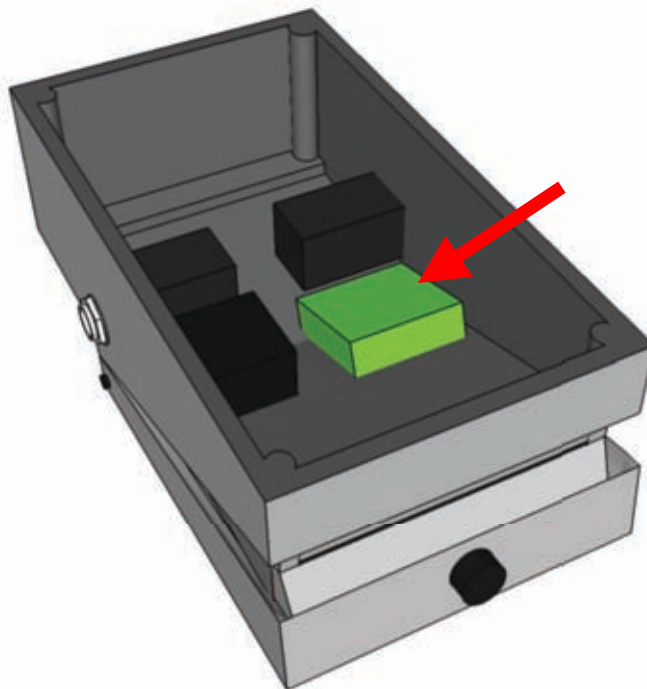
\*The output jack sleeve lug serves as a convenient ground

\*\*LED PCB wire not shown above

## COMPLETING THE JOB

Installation is nearly complete. All that remains to be completed is securing the Click-Less™ PCB and putting the pedal back together.

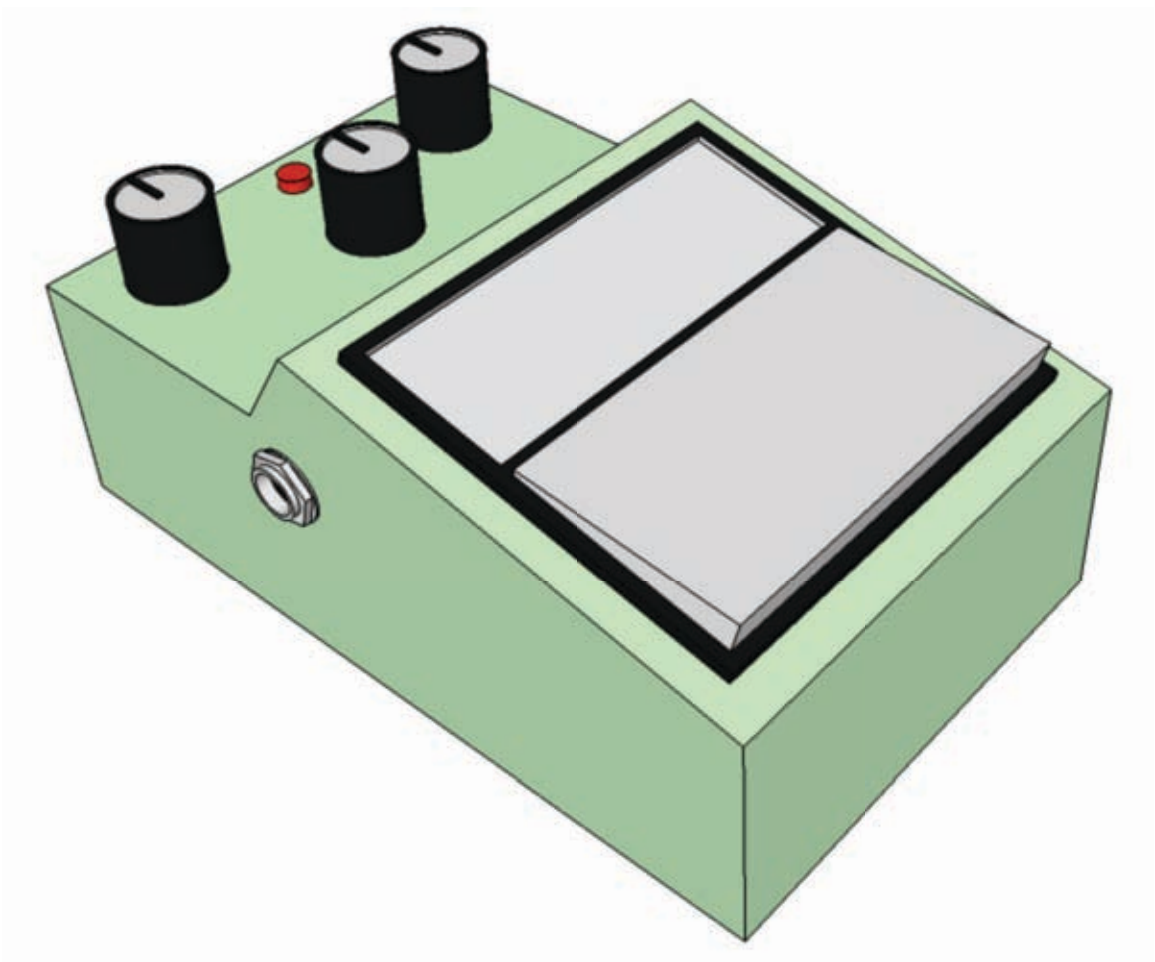
The recommended placement for most BOSS compact analog effect pedals is on the inside of the chassis just below the output jack. See illustration below:



Apply double stick tape to the back of the Click-Less™ PCB and secure it to the chassis in the desired location, taking care to insure that no leads are poking through the tape. This will prevent the board from shorting to the chassis.

Congratulations! Your BOSS pedal has been converted to Click-Less™ True-Bypass.

# IBANEZ 9-SERIES EFFECTS



## OVERVIEW

Ibanez 9-series analog effects employ buffered electronic switching comprised of four main circuit elements:

- A buffer/driver circuit used to prevent loading of the signal path and to drive the electronic switching circuit
- Two FETs (field effect transistors) used to block/permit signal flow through the bypass and effect circuits
- A flip-flop circuit used to select which FET is ON/OFF (BYPASS/EFFECT) and route the signal appropriately
- A mechanical momentary contact switch used to control the flip-flop circuit

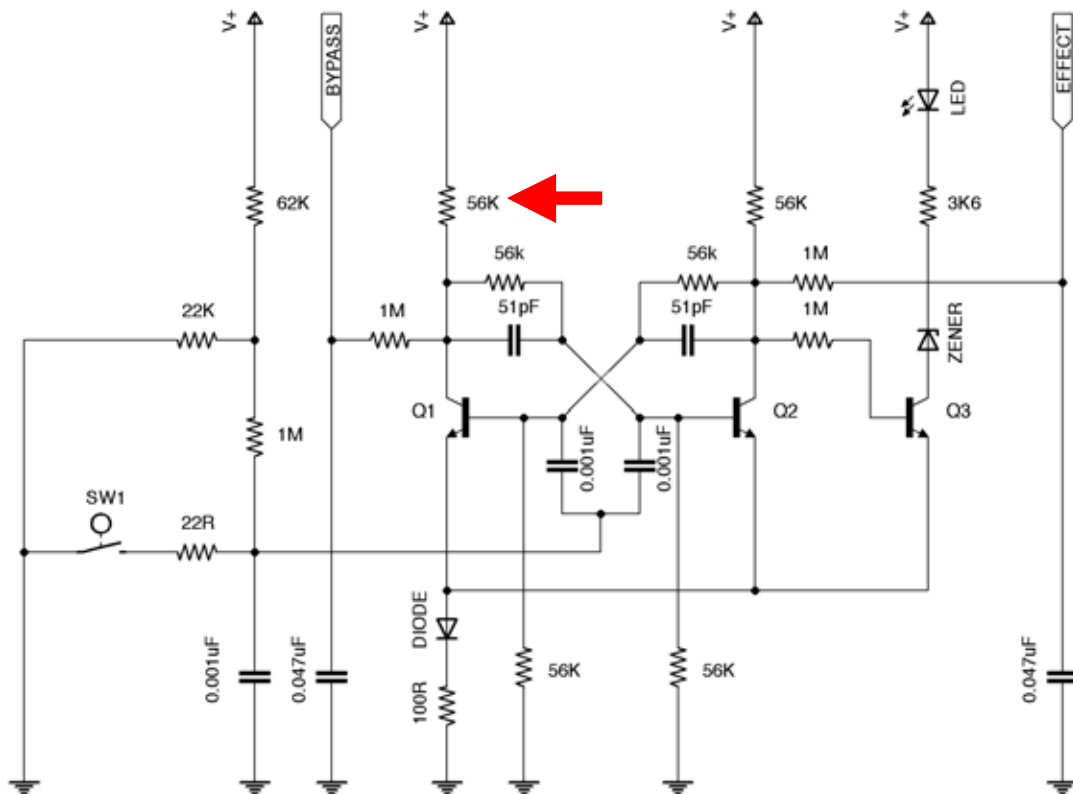
Installing Click-Less™ True-Bypass requires circumvention of the electronic switching system and re-routing the signal path through the Click-Less™ PCB.

This manual will focus on the flip-flop circuit and signal routing.



## DEFEATING THE FLIP-FLOP

In order to install the Click-Less™ system, the flip-flop circuit must be forced into the EFFECT mode at all times so that signal is flowing through the effect circuit when the pedal is activated. This can be accomplished quickly and easily by simply de-soldering and removing one resistor:



Removing the 56K resistor indicated above (actual value may vary) insures Q2 will not turn on by preventing its base from ever receiving voltage. This forces the flip-flop circuit into permanently retaining the EFFECT mode state.

## RE-ROUTING SIGNAL FLOW

Now that the flip-flop circuit has been defeated the pedal is locked in EFFECT mode. Signal must now be re-routed from the input and output jacks through the Click-Less™ PCB in order to accomplish Click-Less™ True-Bypass switching.

There are a total of ten wires you will need to address in order to re-route signal flow through the Click-Less™ PCB:

- The input jack wire on the pedal
- The output jack wire on the pedal
- The two wires connected to the LED daughter PCB
- The two wires connected to the pedal's switch
- The **+** power wire from the Click-Less™ PCB
- The **G** ground wire from the Click-Less™ PCB
- The **S** send wire from the Click-Less™ PCB
- The **R** return wire from the Click-Less™ PCB

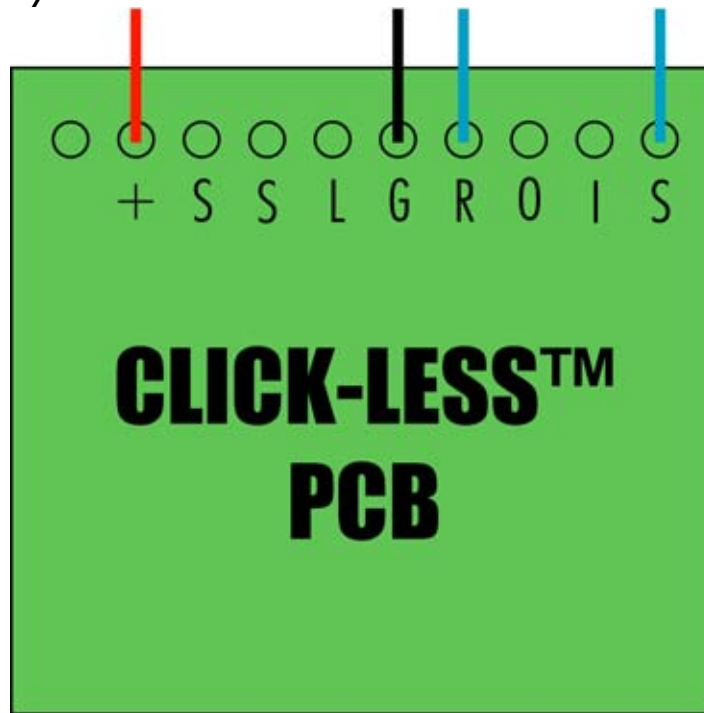
De-solder the input jack wire from the effect PCB, clean any remaining solder from the pad and write down the reference number of the hole and associated function of the wire that was removed. Repeat this procedure for the output jack wire, LED PCB wires and switch wires.

### E.G.:

- Hole X - Input Jack
- Hole Y - Output Jack
- Hole ... - ...

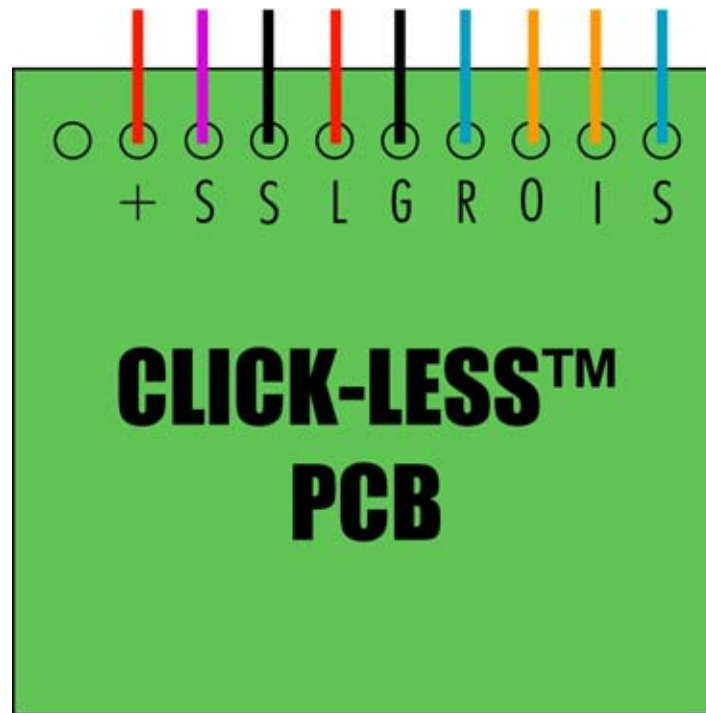
Solder four of the supplied wires to the Click-Less™ PCB pads following the diagram below:

*NOTE: Wire color employed may vary. Colors indicated below are provided for reference only.*



- **+** power pad. (Red wire shown)
- **G** ground pad. (Black wire shown)
- **R** return pad. (Blue wire shown)
- **S** send pad. (Blue wire shown)

Solder the ten wires to the Click-Less™ PCB pads, effect PCB and to ground as shown below:



- **+** power wire to 9V source
- **S** pads on the left side of the Click-Less™ PCB to the switch wires (Purple and Black shown above)
- **L** pad to the anode (positive side) of the LED PCB
- **G** ground wire to suitable ground\*
- **R** return wire to the hole on the effect PCB that the output jack was connected to
- **O** output pad to the output jack wire
- **I** input pad to the input jack wire
- **S** send wire at the right side of the PCB to the hole on the effect PCB that the input jack was connected to
- Remaining LED PCB wire\*\* to a suitable ground\*

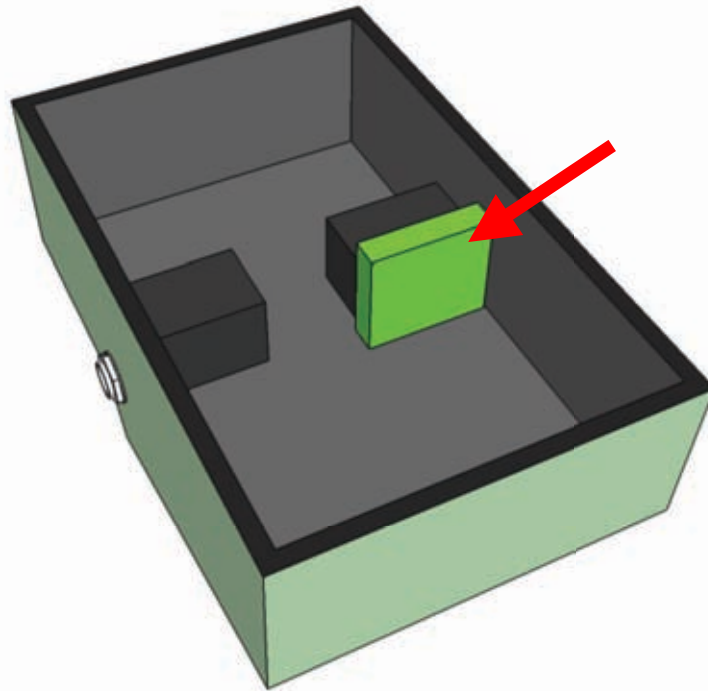
*\*The output jack sleeve lug serves as a convenient ground*

*\*\*LED PCB wire not shown above*

## COMPLETING THE JOB

Installation is nearly complete. All that remains to be completed is securing the Click-Less™ PCB and putting the pedal back together.

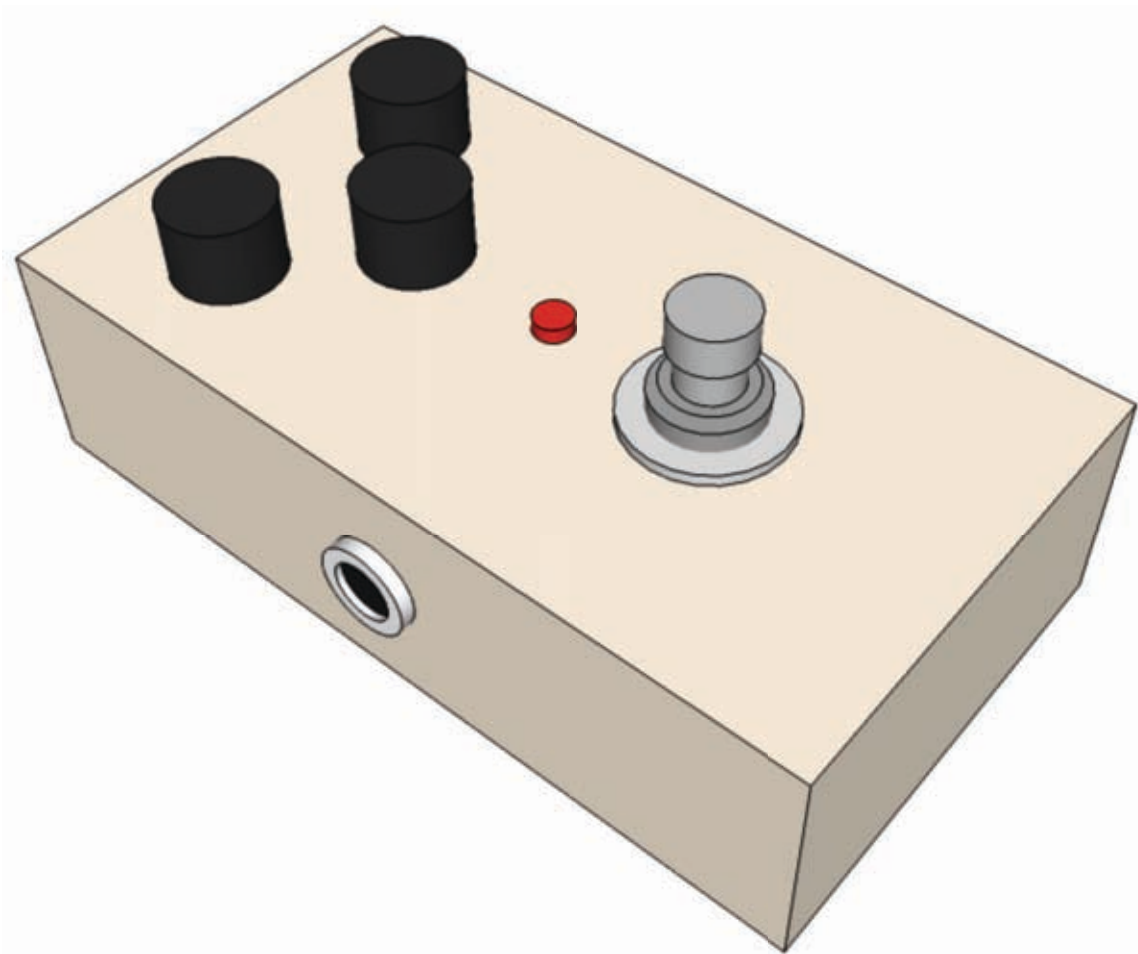
The recommended placement for most Ibanez 9-series compact analog effect pedals is on the inside of the chassis on the side of the output jack. See illustration below:



Apply double stick tape to the back of the Click-Less™ PCB and secure it to the chassis in the desired location, taking care to insure that no leads are poking through the tape. This will prevent the board from shorting to the chassis.

Congratulations! Your Ibanez 9-series pedal has been converted to Click-Less™ True-Bypass.

# MECHANICAL BYPASS



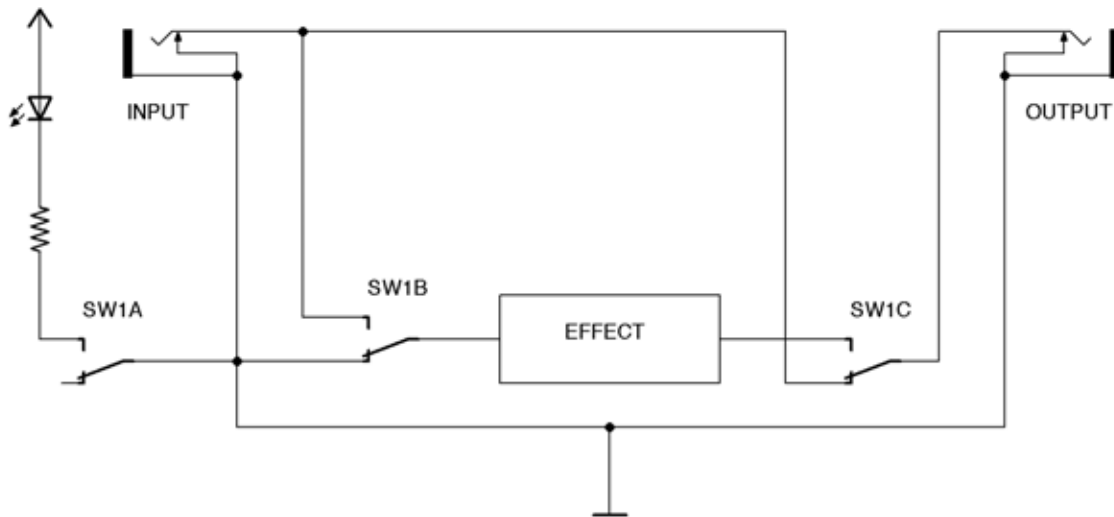
## OVERVIEW

There are many methods of achieving mechanical bypass switching. This manual will address two of the most common:

- True-bypass mechanical switching using a 3PDT switch
- “Vintage-style” mechanical bypass switching using a SPDT switch

Installing Click-Less™ True-Bypass requires that you remove the mechanical stomp switch, replace it with a Click-Less™ switch and re-route the signal path through the Click-Less™ PCB.

## TRUE-BYPASS SWITCHING USING A 3PDT\* SWITCH (SCHEME A: GROUNDED EFFECT INPUT)



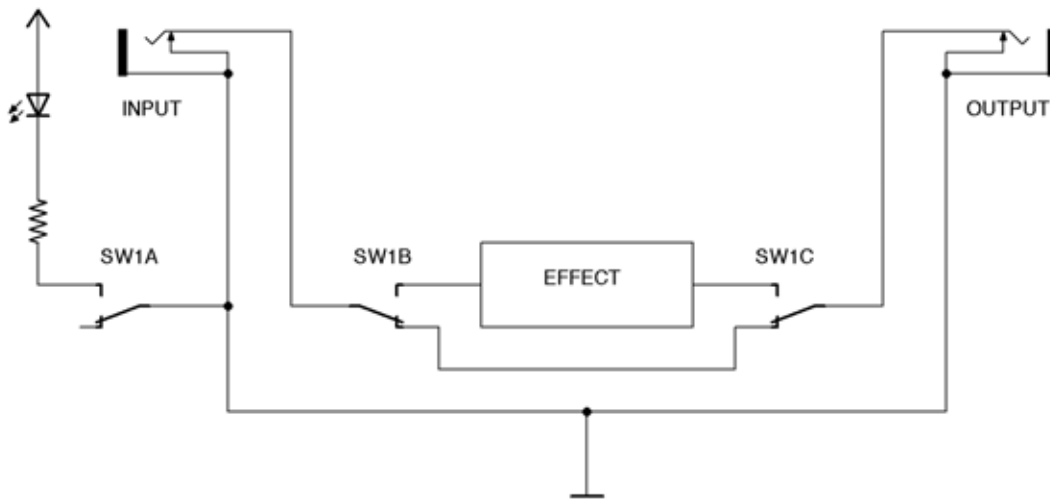
### OPERATION:

- If the switch (SW1) contacts are in the DOWN position BYPASS mode is selected (shown above).
- If the switch contacts are in the UP position EFFECT mode is selected.

### ACTION:

In BYPASS mode (shown above) the LED circuit is open preventing the LED from illuminating, the effect input is grounded reducing noise generated by the effect circuit, and the output jack is directly connected to the input jack. In EFFECT mode the LED circuit is closed illuminating the LED, the effect input is connected to the input jack, and the output jack is connected to the effect circuit output.

## TRUE-BYPASS SWITCHING USING A 3PDT\* SWITCH (SCHEME B: FLOATING EFFECT INPUT)



### OPERATION:

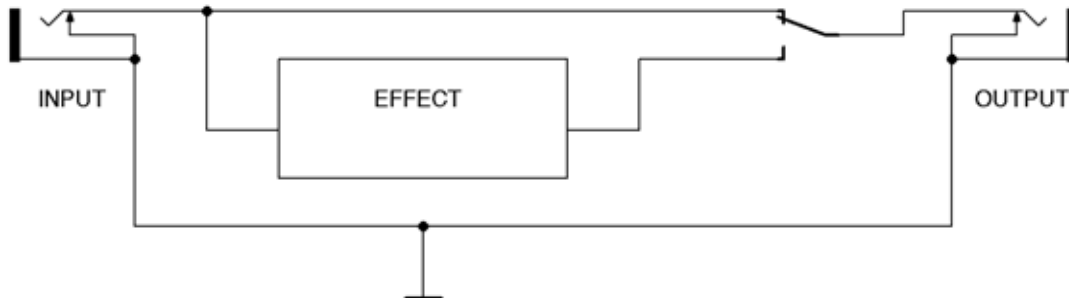
- If the switch (SW1) contacts are in the DOWN position BYPASS mode is selected (shown above).
- If the switch contacts are in the UP position EFFECT mode is selected.

### ACTION:

In BYPASS mode (shown above) the LED circuit is open preventing the LED from illuminating, the input jack is directly connected to the output jack, and the effect circuit input and output are disconnected from the signal path. In EFFECT mode the LED circuit is closed illuminating the LED, the input jack is connected to the effect circuit input, and the output jack is connected to the effect circuit output.

*\*A 3PDT (Triple Pole Dual Throw) switch is comprised of three Single Pole Dual Throw switches sharing a common actuator. Poles indicate the number of individual switches in the assembly, throws indicates the number of positions the switch is capable of resting in. A 3PDT switch allows three changes to occur simultaneously when the switch actuator is toggled (stomped).*

## "VINTAGE STYLE" MECHANICAL BYPASS USING A SPDT\* SWITCH



### OPERATION:

- If the switch contact is in the UP position BYPASS mode is selected (shown above).
- If the switch contact is in the DOWN position EFFECT mode is selected.

### ACTION:

In BYPASS mode (shown above) the output jack is connected to the input jack and to the effect circuit input. In EFFECT mode the output jack is connected to the effect circuit output and the input jack is connected to the effect circuit input.

*\*SINGLE POLE DUAL THROW.*

### TECHNICAL NOTE:

*THE INPUT JACK REMAINS CONNECTED TO THE EFFECT CIRCUIT INPUT AT ALL TIMES. THIS CAN CAUSE LOADING OF THE INPUT SIGNAL AND PRODUCE "TONE SUCK."*

## REMOVING THE STOMP SWITCH (TRUE-BYPASS SWITCHING)

In order to install Click-Less™ True-Bypass, the original stomp switch must be replaced with a Click-Less™ switch and the signal path must be re-routed through the Click-Less™ PCB.

You will need to disconnect the following wires connected to the stomp switch in order to replace the original stomp switch with a Click-Less™ switch and re-route signal flow through the Click-Less™ PCB:

- The input jack wire
- The output jack wire
- The two LED leads
- The effect circuit send/input wire
- The effect circuit return/output wire
- Ground wire(s) at the stomp switch

De-solder the input jack wire from the stomp switch. Label the wire with a small piece of tape and repeat the procedure for the output jack wire, effect circuit send/input wire, effect circuit return/output wire, LED wires and ground wire(s) at the stomp switch.

Once all wires connected to the original stomp switch's terminals have been disconnected, remove the original stomp switch from the chassis.

## REMOVING THE STOMP SWITCH ("VINTAGE STYLE" SWITCHING)

In order to install Click-Less™ True-Bypass, the original stomp switch must be replaced with a Click-Less™ switch and the signal path must be re-routed through the Click-Less™ PCB.

You will need to disconnect the following wires connected to the stomp switch in order to replace the original stomp switch with a Click-Less™ switch and re-route signal flow through the Click-Less™ PCB:

- The input jack wire
- The output jack wire
- The effect circuit send/input wire
- The effect circuit return/output wire

De-solder the input jack wire from the stomp switch. Label the wire with a small piece of tape and repeat the procedure for the output jack wire, and effect circuit send/input wire, effect circuit return/output wire.

Once all wires connected to the original stomp switch's terminals have been disconnected, remove the original stomp switch from the chassis.

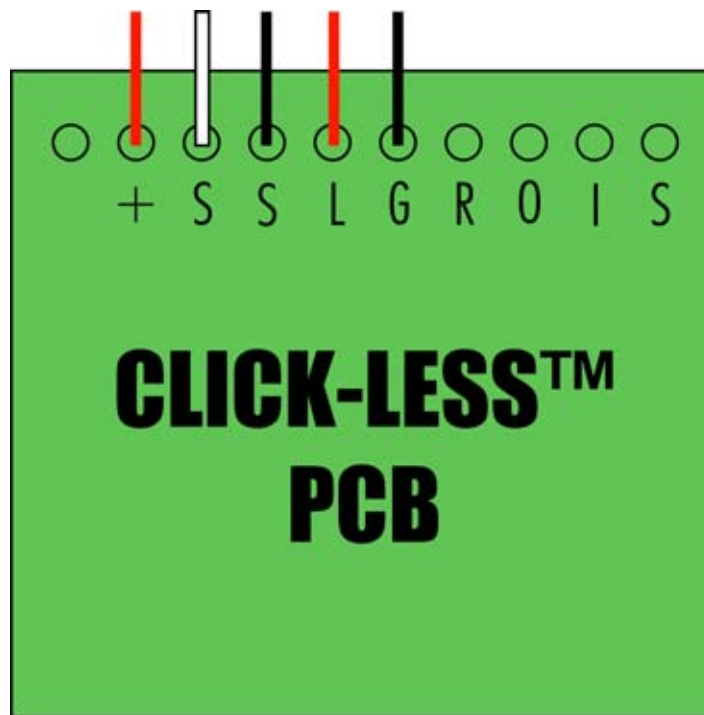
### *TECHNICAL NOTE:*

*THE CLICK-LESS™ SYSTEM INCLUDES SUPPORT FOR AN LED INDICATOR. IF AN LED INDICATOR IS DESIRED, FIND A SUITABLE LOCATION ON THE CHASIS AND MOUNT AN LED IN THE DESIRED FASHION.*

## RE-ROUTING SIGNAL FLOW (3PDT & SPDT)

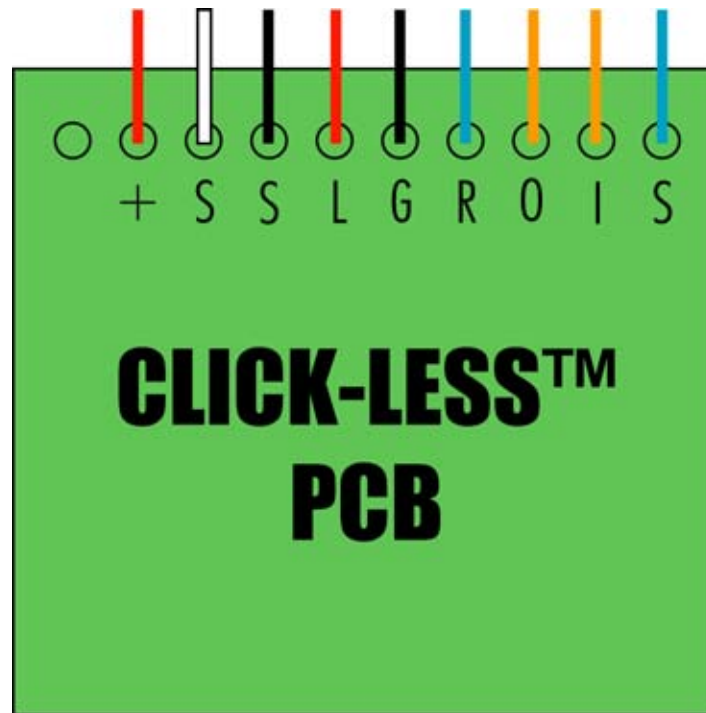
Solder five of the provided wires to the Click-Less™ PCB following the diagram below:

*NOTE: Wire color employed may vary. Colors indicated below are provided for reference only.*



- **+** power pad. (Red wire shown)
- **S** switch pad. (White wire shown)
- **S** switch pad. (Black wire shown)
- **L** LED pad\*\*. (Red wire shown)
- **G** ground pad. (Black wire shown)

Solder the ten wires to the Click-Less™ PCB pads, LED leads and to circuit ground as shown below:



- **+** wire to 9V source
- **S** wires on the left side of the Click-Less™ PCB to the Click-Less™ switch (non-polar leads)
- **L** wire to the LED anode (+ lead)\*\*
- **G** wire to circuit ground
- LED cathode (- lead) to circuit ground\*\*
- **R** pad on the Click-Less™ PCB to the effect circuit return/output wire
- **O** pad on the Click-Less™ PCB to the output jack
- **I** pad on the Click-Less™ PCB to the input jack
- **S** pad on the Click-Less™ PCB to the effect circuit send/input wire

\*\*If LED indicator is employed

## COMPLETING THE JOB

Install the Click-Less™ switch into the hole where the original stomp switch was. Apply double stick foam tape to the back of the Click-Less™ PCB and secure it to the chassis in a location where it will not interfere with or touch any other components or parts of the circuit. Take care to ensure that no leads are poking through the double stick tape– this will prevent short circuits.

Congratulations! Your pedal has been converted to Click-Less™ True-Bypass.