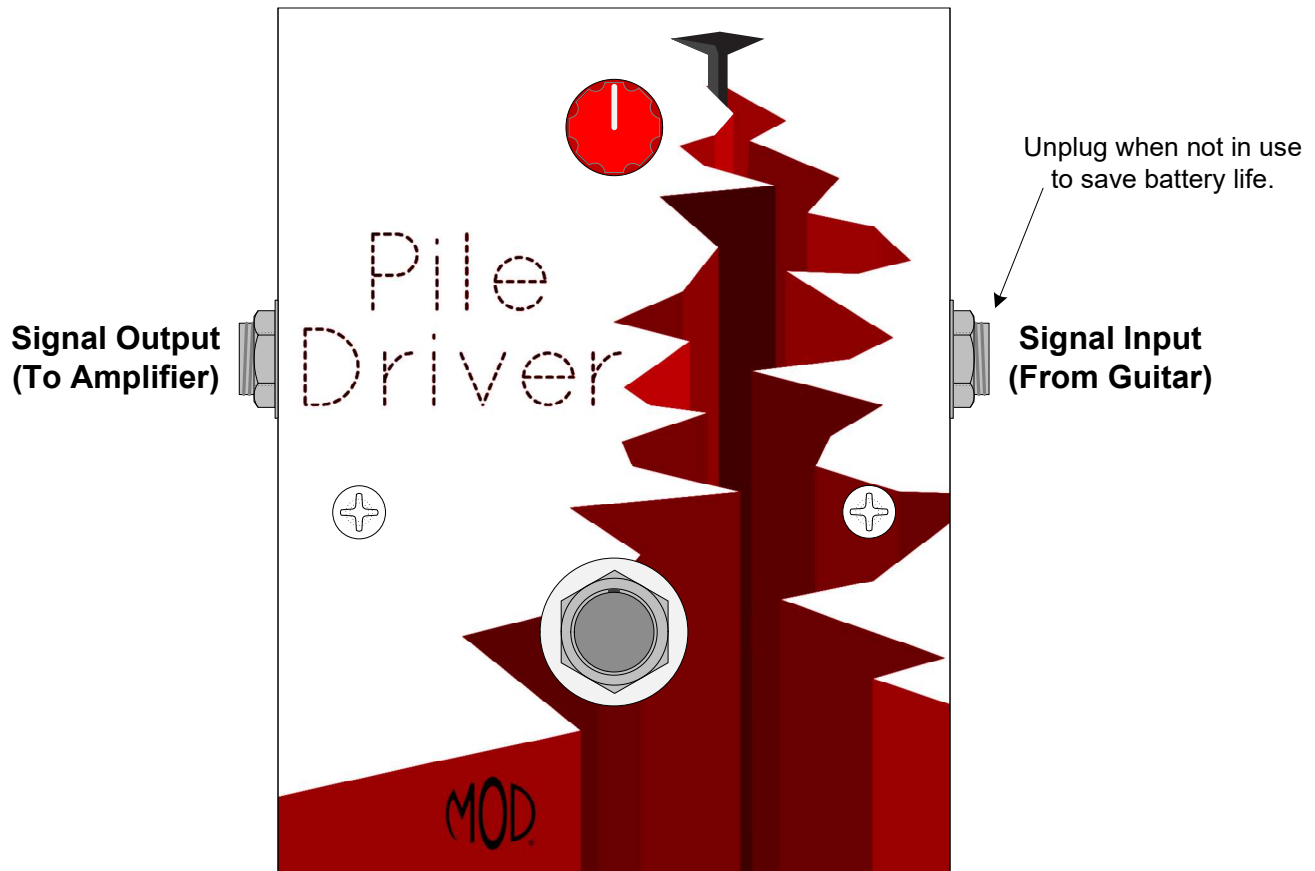


# THE PILEDRIVER (K-920)



## Use these instructions to learn:

- How to build an effects pedal for clean boost.

The PileDriver is a clean boost that will provide up to 38 dB of voltage gain to your guitar signal. Use it to push your preamp into overdrive or as a line driver if you are experiencing signal degradation from your effects chain.

**Warning:** This circuit was designed for use with a 9 VDC power supply only.



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These are the last 2 pages. They should be separated and used as a reference to help assemble the kit correctly.

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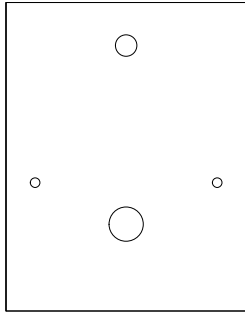
### **TOOL LIST**

- Wire Strippers
- Needle Nose Pliers
- Cutting Pliers
- Desoldering Pump
- Solder (60/40 rosin core)
- Soldering Station
- Phillips Head Screwdrivers
- Slotted tip screwdrivers (3 mm tip)
- Channellock Pliers (or similar type)
- Ruler
- Hobby Vise (or other means to secure box while working)
- Exacto knife or similar cutting tool

# PARTS LIST 1

Stranded Wire (22 AWG) - Red  
K-PUL1569 (3 FT)

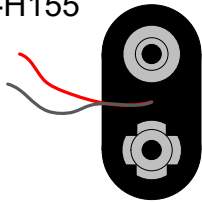
Enclosure  
P-H1590BBCE-W (1)



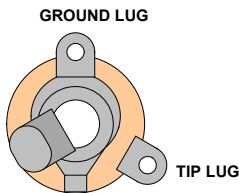
Knob  
P-K801-BRASS-R (1)



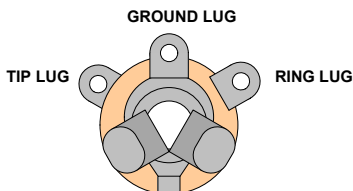
Battery Clip  
S-H155 (1)



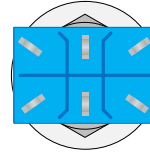
1/4" Mono Jack (Output Jack)  
W-SC-11-T (1)



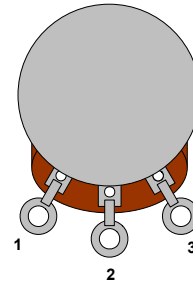
1/4" Stereo Jack (Input Jack)  
W-SC-12B (1)



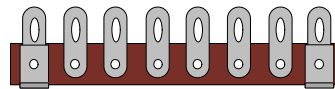
DPDT Foot Switch  
P-H498 (1)



5kΩ Potentiometer with Linear Taper  
R-VA5KL (1)



Terminal Strip with 8 Terminals  
P-0802H (1)



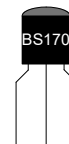
#6 Screws (3/8" long)  
S-HS632-38 (2)



#6 Nuts  
S-HHN632 (2)



N-Channel MOSFET (BS170)  
P-QBS170 (1)



Caution: MOSFETs can easily be damaged by static electricity. Handle with care.

## PARTS LIST 2

0.1 $\mu$ F Capacitor 400V

C-TD1-400 (1)



1N4005 SOLID STATE DIODE

P-Q1N4005 (2)

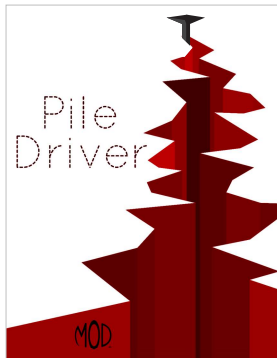


10 $\mu$ F Polarized Capacitor 50V

C-ET10-50 (1)

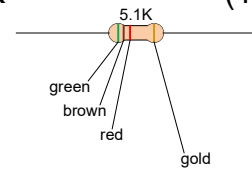


Piledriver Sticker (1)



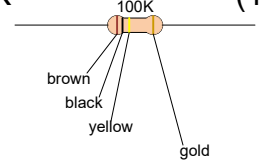
5.1k $\Omega$  Resistor  $\frac{1}{2}$  W

R-A5D1K (1)



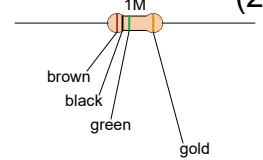
100k $\Omega$  Resistor  $\frac{1}{2}$  W

R-A100K (1)



1M $\Omega$  Resistor  $\frac{1}{2}$  W

R-A1M (2)

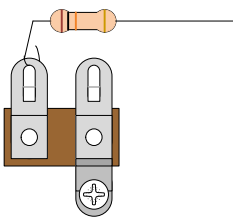


## SOLDERING TIPS

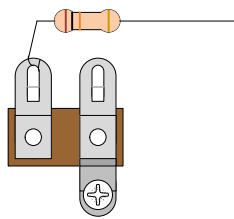
It is important to make a good solder joint at each connection point. A cold solder joint is a connection that may look connected but is actually disconnected or intermittently connected. (A cold solder joint can keep your project from working.)

Follow these tips to make a good solder joint. *Take your time with each connection and make sure that all components are connected and will remain connected if your project is bumped or shaken.*

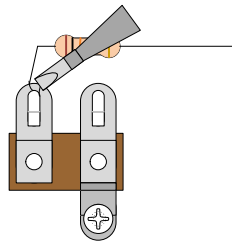
1. Bend the component lead or wire ending and wrap it around the connection point.
  - Make sure it is not too close to a neighboring component which could cause an unintended connection.
2. Wrap the component lead so that it can hold itself to the connection point.
3. Touch the soldering iron to both the component lead and the connection point allowing both to warm up just before applying the solder to them.
4. Be sure to adequately cover both component lead and connection point with melted solder.
  - Remove the soldering iron from your work and allow the solder joint to cool. (The solder joint should be shiny and smooth after solidifying.)
  - Cut off any excess wire or component leads with cutting pliers.
  - Clean the soldering iron's tip by wiping it across the wet sponge again after making the solder joint.



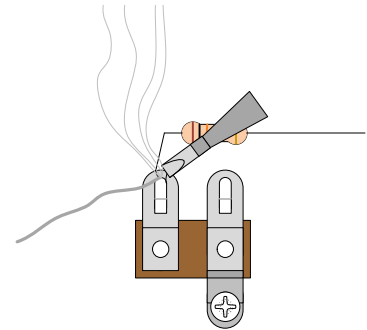
1. Bend the component lead and wrap it around the connection point.



2. Wrap the component lead so that it can hold itself to the connection point.

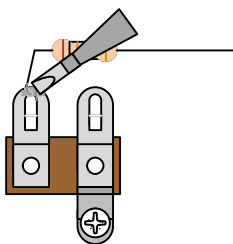


3. Heat up both component lead and connection point with the soldering iron.

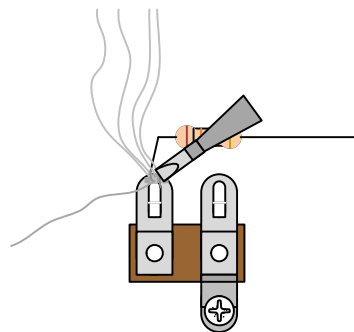


4. Apply solder to both component lead and connection point.

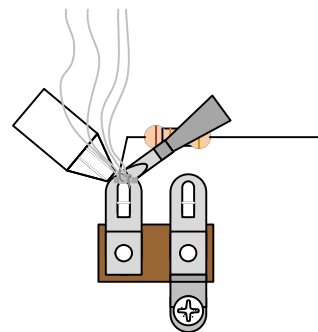
### De-Soldering Tip



1. Heat up old solder joint with the soldering iron.



2. Apply fresh solder to mix in with old solder joint



3. Use a de-soldering tool to remove the old solder joint while it is heated.

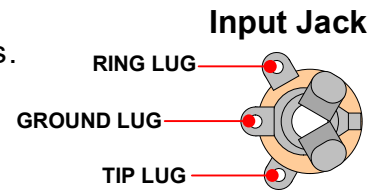
## SECTION 1 – Mount 1/4" Jacks and Terminal Strip Components

Please refer to **DRAWING 1** and **DRAWING 2**.

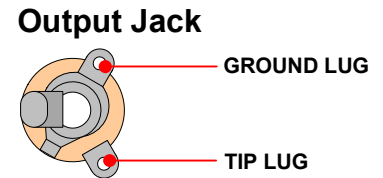
Orient box with single centered 5/16" hole on top and 1/2" hole nearest you.

Apply the sticker to the top of the box then use a blade to cut out the holes.

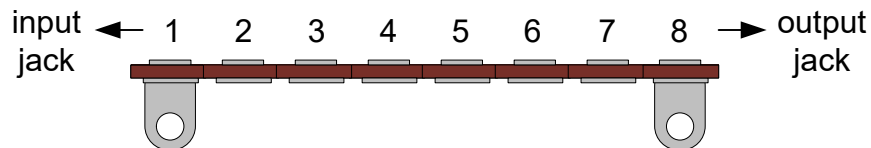
Mount input jack in 3/8" hole on left side of box with hardware provided. Washer goes under nut on outside of box. Make sure center solder lug of input jack is facing up. Correct positioning of jack will make soldering connections much easier. When positioned correctly, tighten nut.



Mount output jack in 3/8" hole on right side of box with hardware provided. Washer goes under nut on outside of box. Make sure two solder lugs are in most upright position before tightening nut.



Mount the terminal strip to the two 9/64" holes as shown in drawing 2. We will refer to terminal numbers as illustrated below when connecting components.



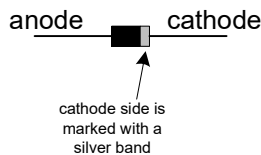
Connect and solder all of the following to their respective terminals as listed. (Make sure none of the component leads are so close together that it could lead to an unintended connection). *Be careful not to overheat the solid state devices (diodes and transistor) when soldering.*

Terminal #3 will have six components connected to it. Because of this we will use both the upper and lower portion of the terminal.

1) Mount the diodes to the *lower set of holes*, but do not solder.

**Terminals #1 & 3:**

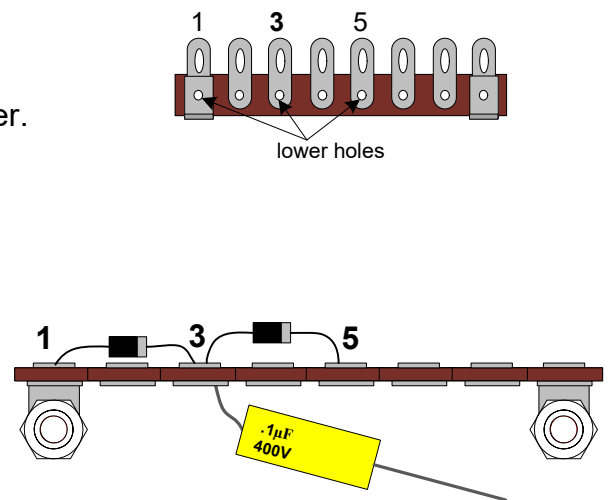
- "Anode" to terminal #1
- "Cathode" to terminal #3



**Terminals #3 & 5:**

- "Anode" to terminal #3
- "Cathode" to terminal #5

2) Mount one end of the .1μF capacitor to the *lower hole* of terminal #3. Now solder the lower set of holes at terminals #1, 3, and 5.



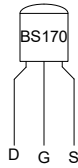
The remaining components and wires can be connected to the upper portion of their respective terminals. Unless otherwise noted, "mount" means to mount the component, solder the component in place and trim the leads.

3) Mount the BS170 MOSFET.

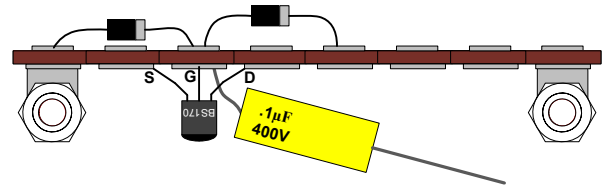
Caution: MOSFETs can easily be damaged by static electricity. Handle with care.

**Terminals #2, 3 & 4:**

- "Source" to terminal #2
- "Gate" to terminal #3
- "Drain" to terminal #4



This component is delicate, be careful not to burn it or break off the leads by bending them repeatedly.



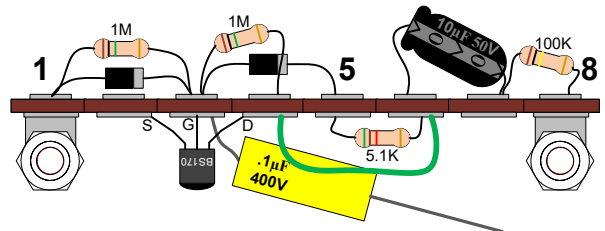
4) Mount the 1M resistors.

**Terminals #1 & 3:**

- mount one of the 1M resistors to 1 & 3.

**Terminals #3 & 4:**

- mount the other 1M resistor to 3 & 4.



5) Mount the 5.1K resistor.

**Terminals #5 & 6:**

6) Mount a 2" piece of wire to connect:

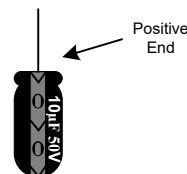
**Terminals #4 & 6:**

Cut the wire to length, then strip ¼" of insulation off each end. Twist each end of the stranded wire, and apply a small amount of solder to each end (i.e. tin the wire ends) before mounting and soldering the wire ends to their respective terminals.

7) Mount the 10µF capacitor.

**Terminals #6 & 7:**

- mount the positive end to terminal 6.
- mount the negative end to terminal 7.



8) Mount the 100K resistor.

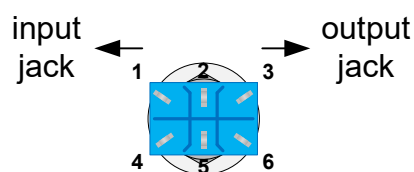
**Terminals #7 & 8:**

## SECTION 2 – Mount the Potentiometer and Footswitch

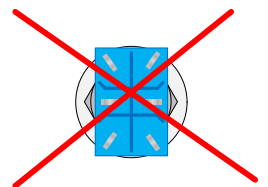
Please refer to **DRAWING 3**.

Mount potentiometer using hardware provided. Solder lugs should be pointed to large ½" hole for footswitch. (You can break off the small mounting tab on the pot by bending it back with pliers).

Mount footswitch in ½" hole. Large nylon washer goes under mounting nut on outside of box. Lock washer mounts on inside of box between the box surface and the other nut. Make sure that the footswitch solder lugs are oriented left to right, not up and down as illustrated below.



Correct Orientation



Incorrect Orientation

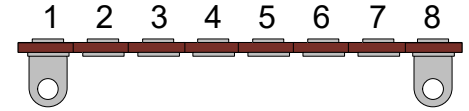
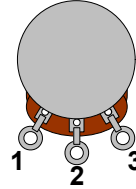
## SECTION 3 – Wiring the PileDriver

Please refer to DRAWING 4.

**Stripping and tinning wire.** Throughout these instructions you will be told to strip and tin a length of wire numerous times. Unless noted otherwise, cut the wire to the length stated in the instructions. Then strip  $\frac{1}{4}$ " of insulation off each end. Twist each end of the stranded wire, and apply a small amount of solder to each end (tin the wire ends). This will prevent the stranded wire from fraying and will make the soldering much easier.

1) Strip and tin a 2" piece of wire and connect:

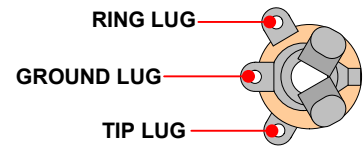
- Potentiometer Lug #1.
- Terminal Strip #2.



2) Connect the battery clip:

- Red wire to Terminal Strip # 5.
- Black wire to ring lug of the input jack.

### Input Jack



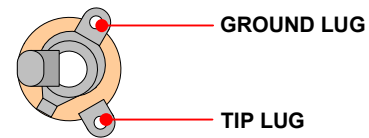
3) Strip and tin a 3" piece of wire and connect:

- Footswitch Lug #6.
- Terminal Strip #7.

4) Strip and tin a 4" piece of wire and connect:

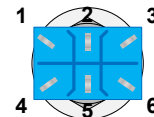
- Footswitch Lug #5.
- Tip lug of the output jack.

### Output Jack



5) Strip and tin a 1  $\frac{1}{2}$ " piece of wire and connect:

- Footswitch Lug #1.
- Footswitch Lug #4.

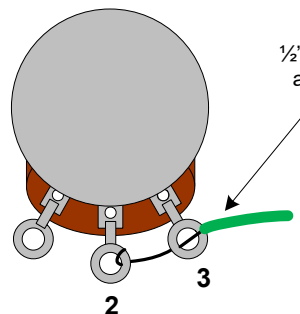


6) Strip and tin a 4" piece of wire and connect:

- Footswitch Lug #2.
- Tip lug of the input jack.

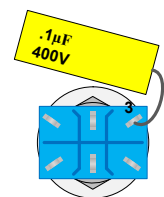
7) Strip and tin a 3" piece of wire (on one end strip off about  $\frac{1}{2}$ " of insulation) and connect:

- Ground lug of output jack.
- Potentiometer Lug #2 & 3.



$\frac{1}{2}$ " of one of the wire ends is stripped to allow connection of pot lug #2 and 3.

8) Connect and solder the other end of the  $.1\mu\text{F}$  capacitor to footswitch lug #3.





## **SECTION 4 – Finishing Up**

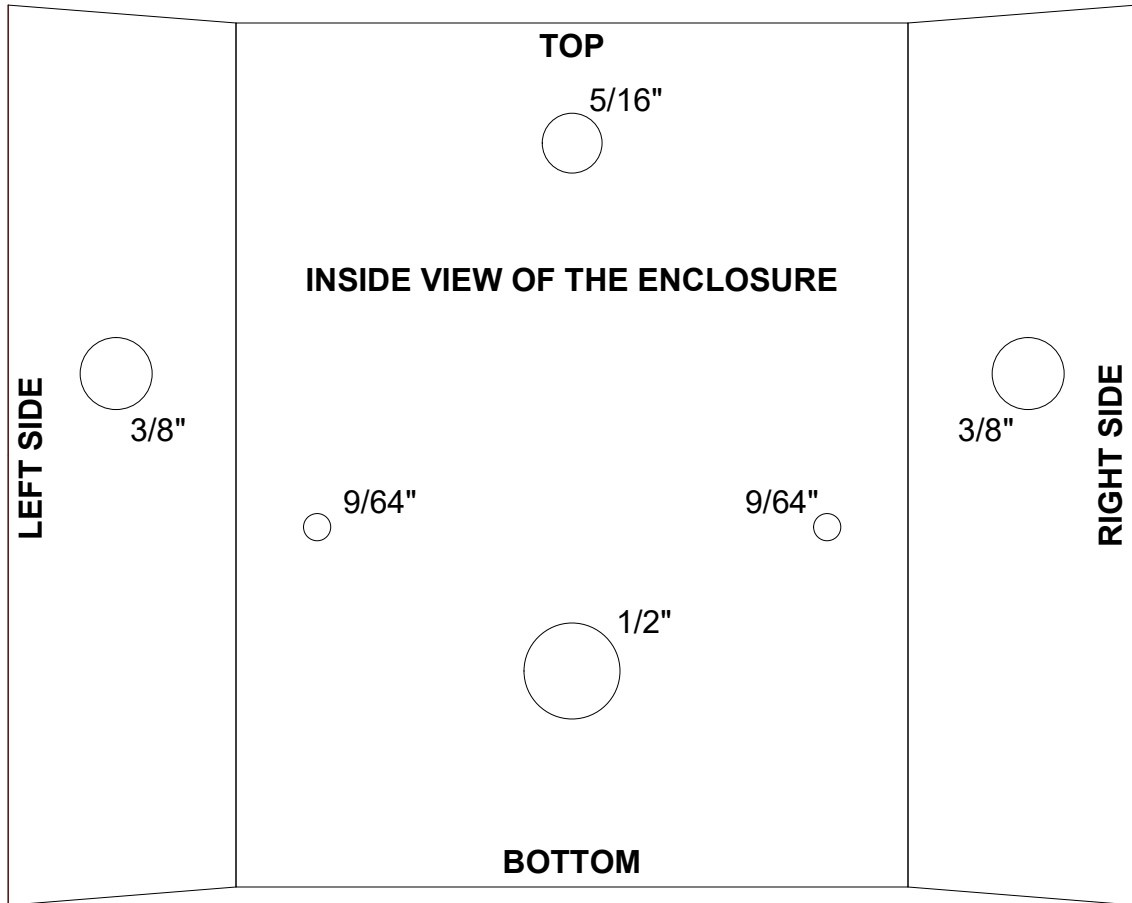
Visually inspect all solder connections to make sure everything is connected properly with no cold solder joints. Make sure none of the component leads are so close together that they could lead to an unintended short.

Connect a 9 volt battery and place it in the space below the footswitch.

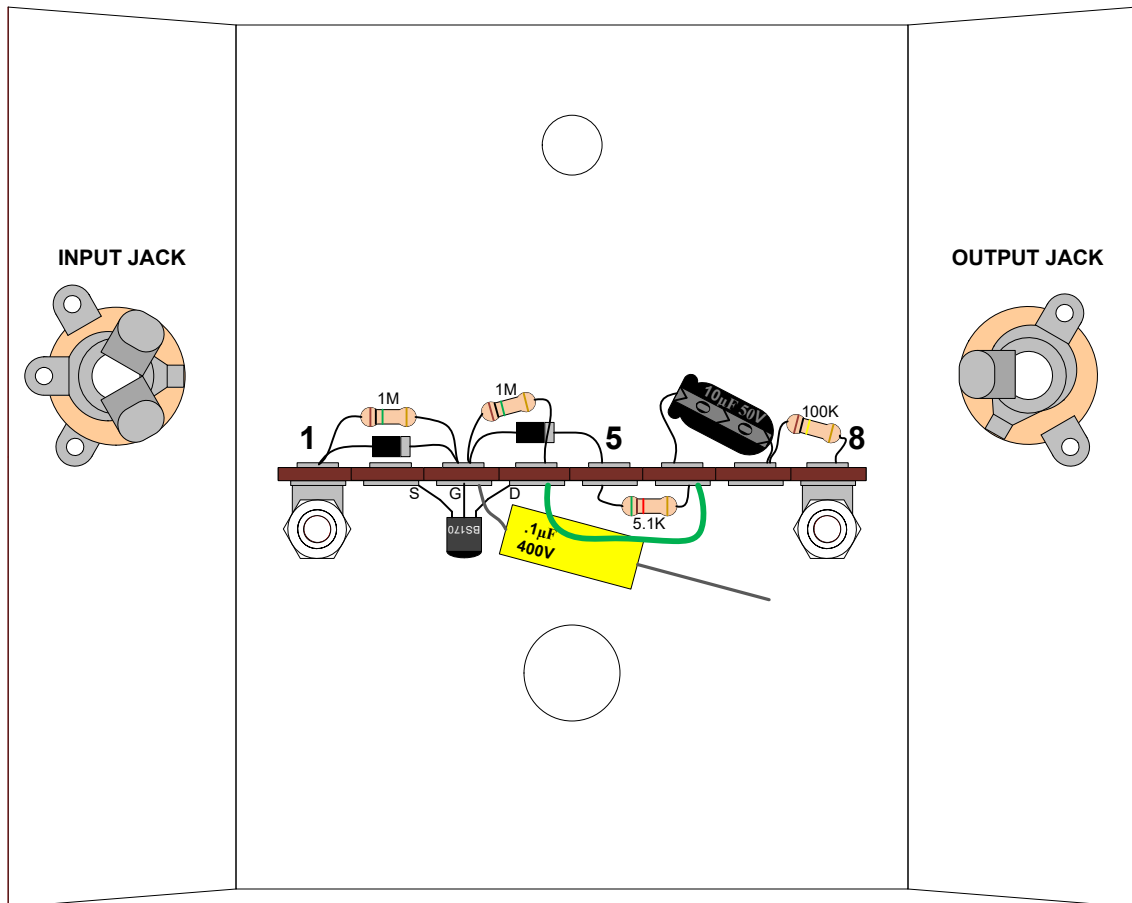
Fasten the cover plate and attach the knob to the potentiometer shaft.

In order to save battery life, disconnect your guitar cable from the pedal's input jack when not in use.

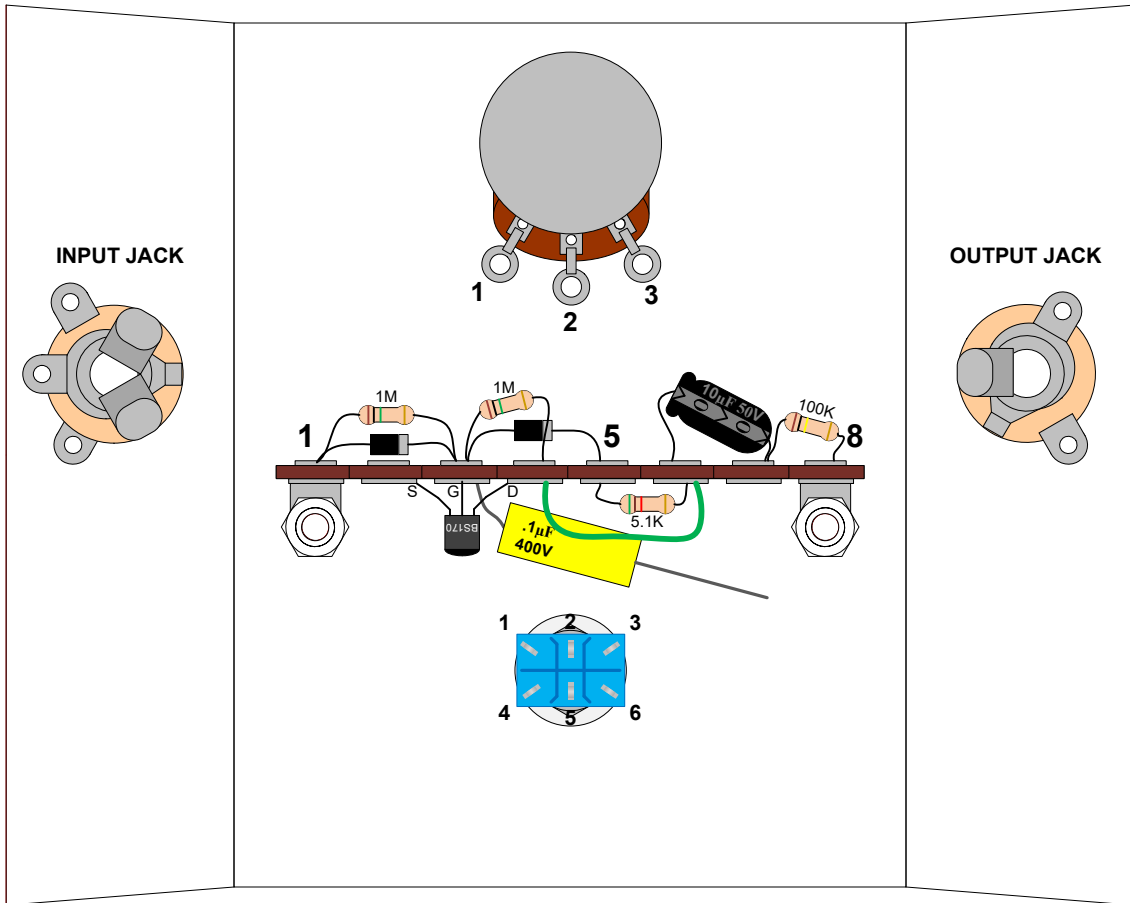
# DRAWING 1



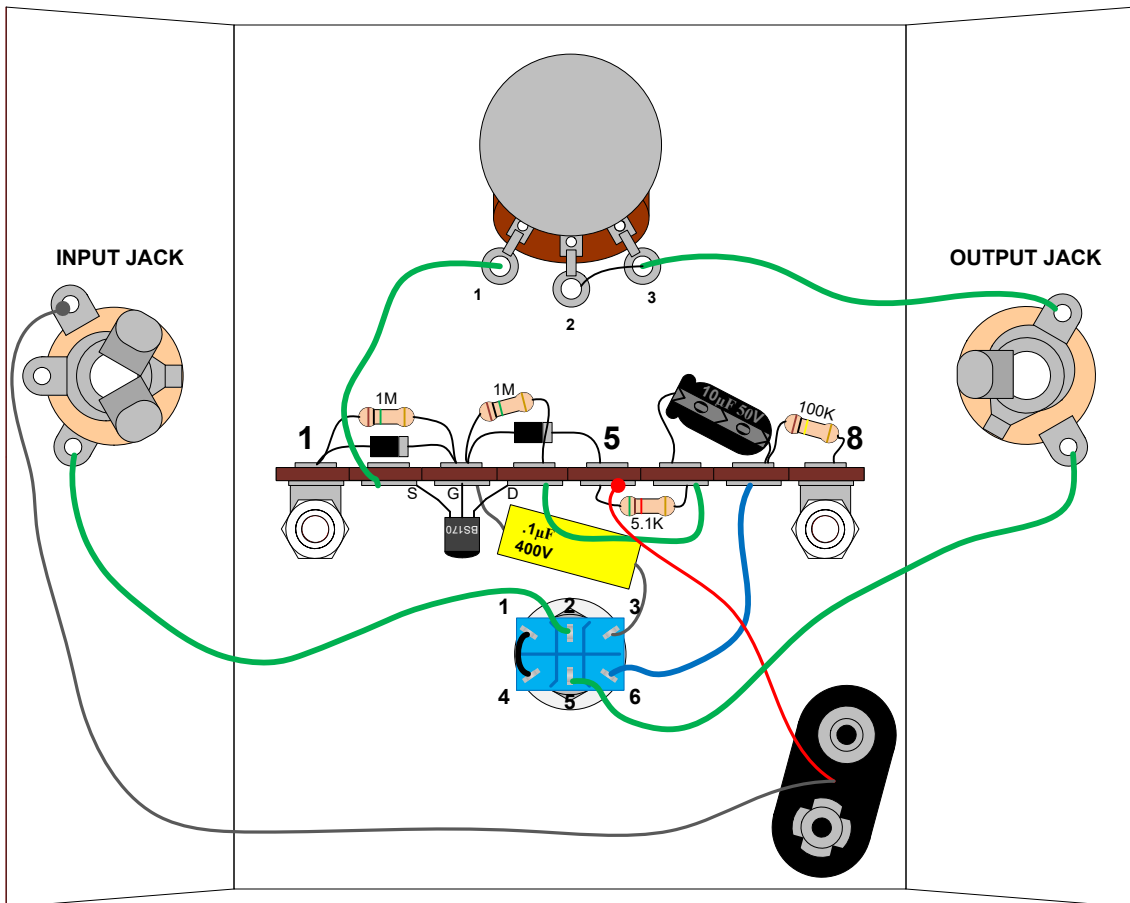
# DRAWING 2



### DRAWING 3



### DRAWING 4

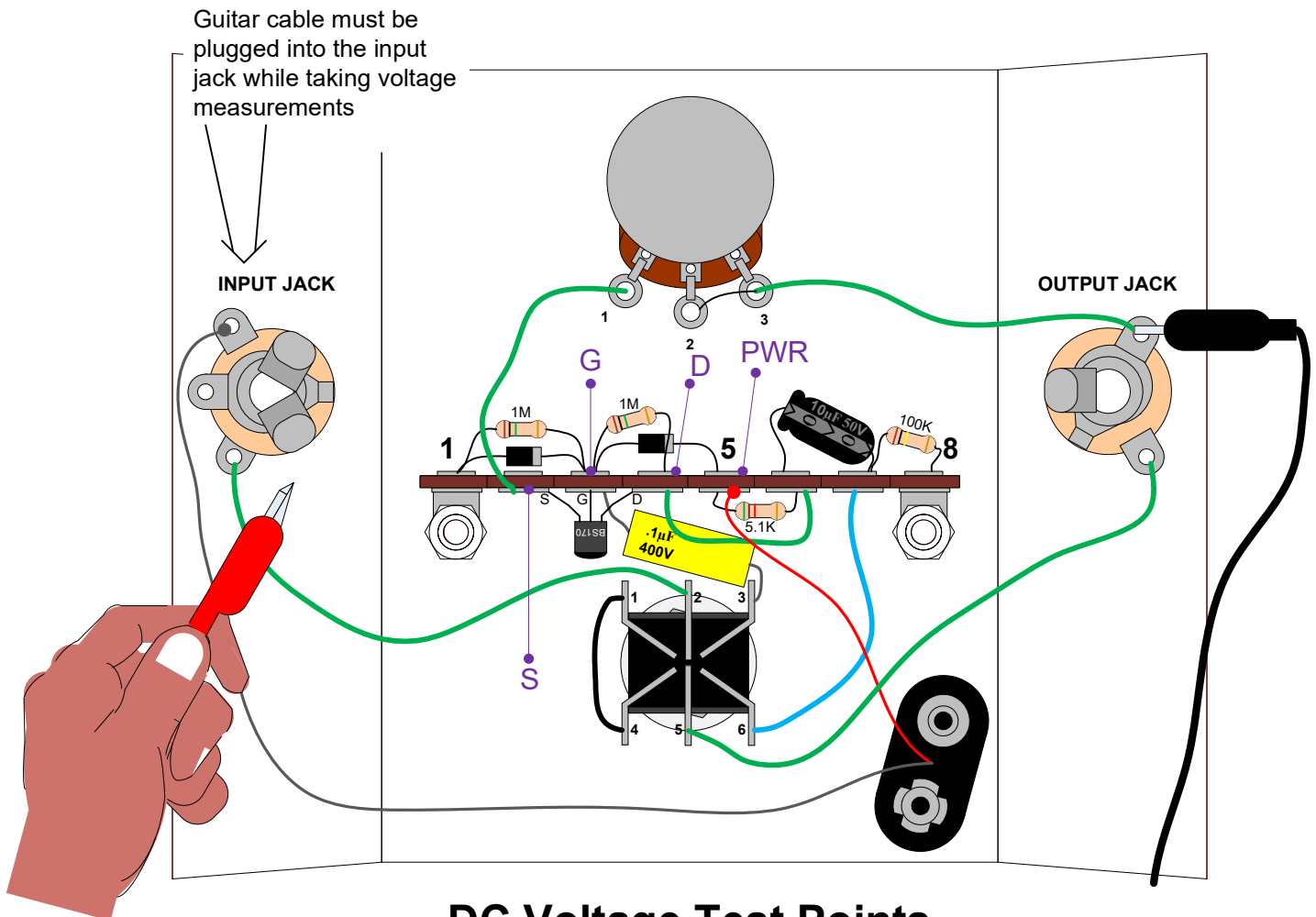


## Use this troubleshooting supplement to help:

- Measure DC voltage test points to identify major discrepancies and locate problem areas.

(Keep in mind that the voltage measurements will vary slightly from kit to kit. The voltages you measure should be in the same ballpark, but do not expect to get the exact same value.)

Using a volt meter, connect the ground side lead of the meter to any ground point on the pedal. One ground point would be the output jack's ground lug. The other volt meter lead will be used to measure DC voltage at the test points shown below.



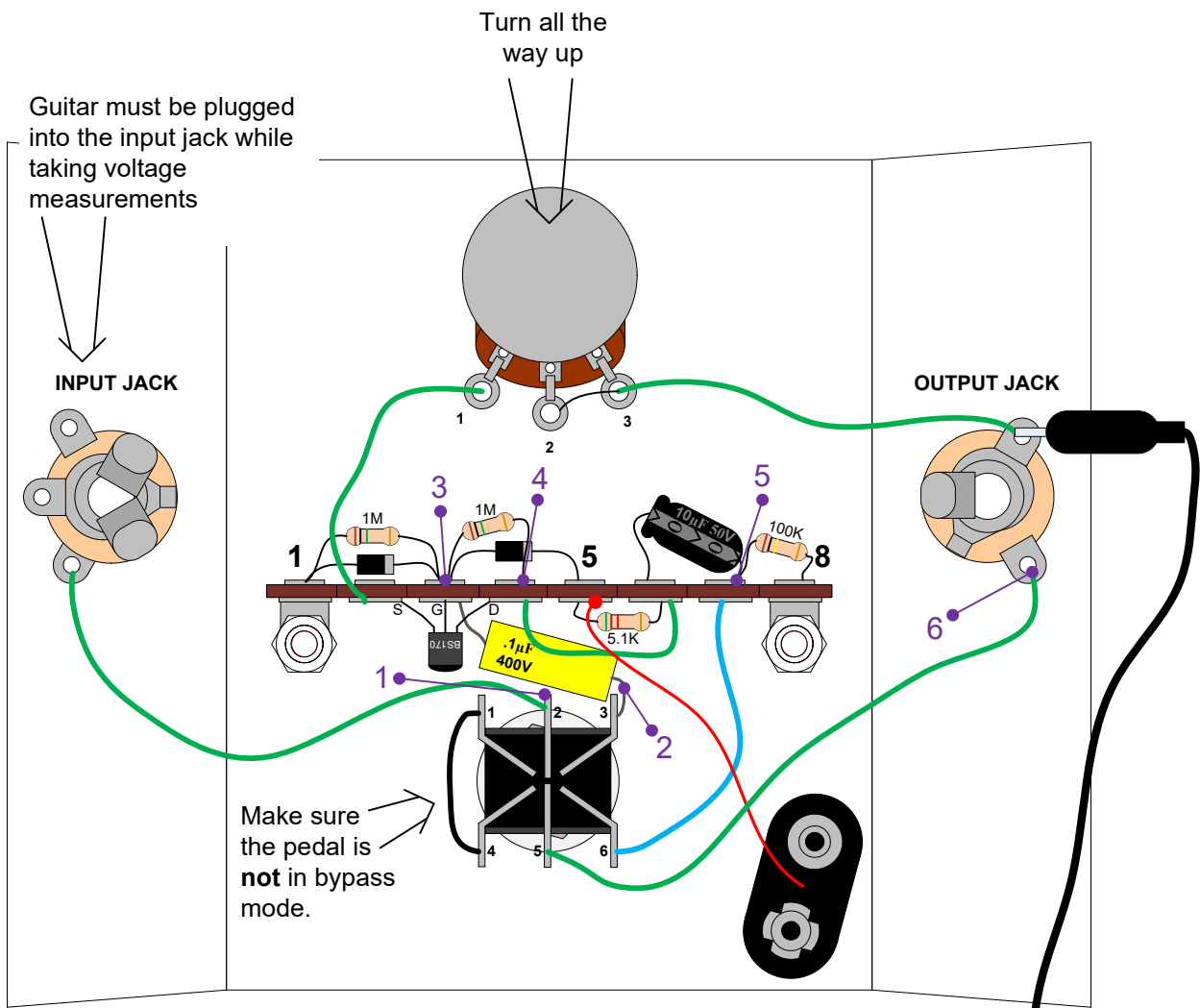
First, plug a guitar cable into the input jack and take measurements at each test point with the control turned all the way down (min gain) taking note of each measurement. Next, take measurements at each test point with the control turned all the way up (max gain) and take note of each measurement. Any major differences between the voltages listed above should indicate a problem area.

### Measured at Minimum Gain

S = 2.4 VDC  
G = 3.4 VDC  
D = 7.0 VDC  
PWR = 9.49 VDC

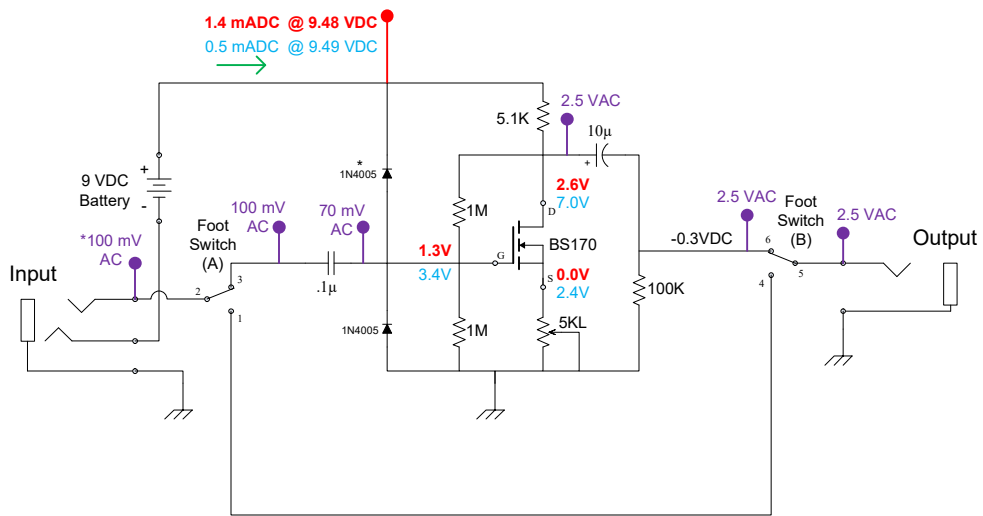
### Measured at Maximum Gain

S = 0.0 VDC  
G = 1.3 VDC  
D = 2.6 VDC  
PWR = 9.48 VDC



## AC Voltage (Signal) Test Points

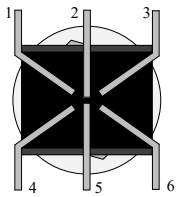
Connect your guitar to the input jack and take AC voltage measurements at each test point with the control turned all the way up. At each test point, the AC voltage should increase dramatically each time you strum the guitar. (No strum = 0.0 VAC, Hard strum = anywhere from 10 mV to 3 V).



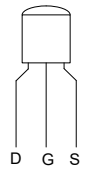
1.4 mADC @ 9.48 VDC  
 0.5 mADC @ 9.49 VDC

\*AC voltages were measured while strumming an open E chord on a Mexican strat in neck pickup position with volume and tone controls at max.

DPDT Foot Switch



BS170 N-Channel MOSFET



**BOLD** = DC measurement at maximum gain  
**PLAIN** = DC measurement at minimum gain

\*Diodes are there to protect the MOSFET from static and accidental reverse polarity.

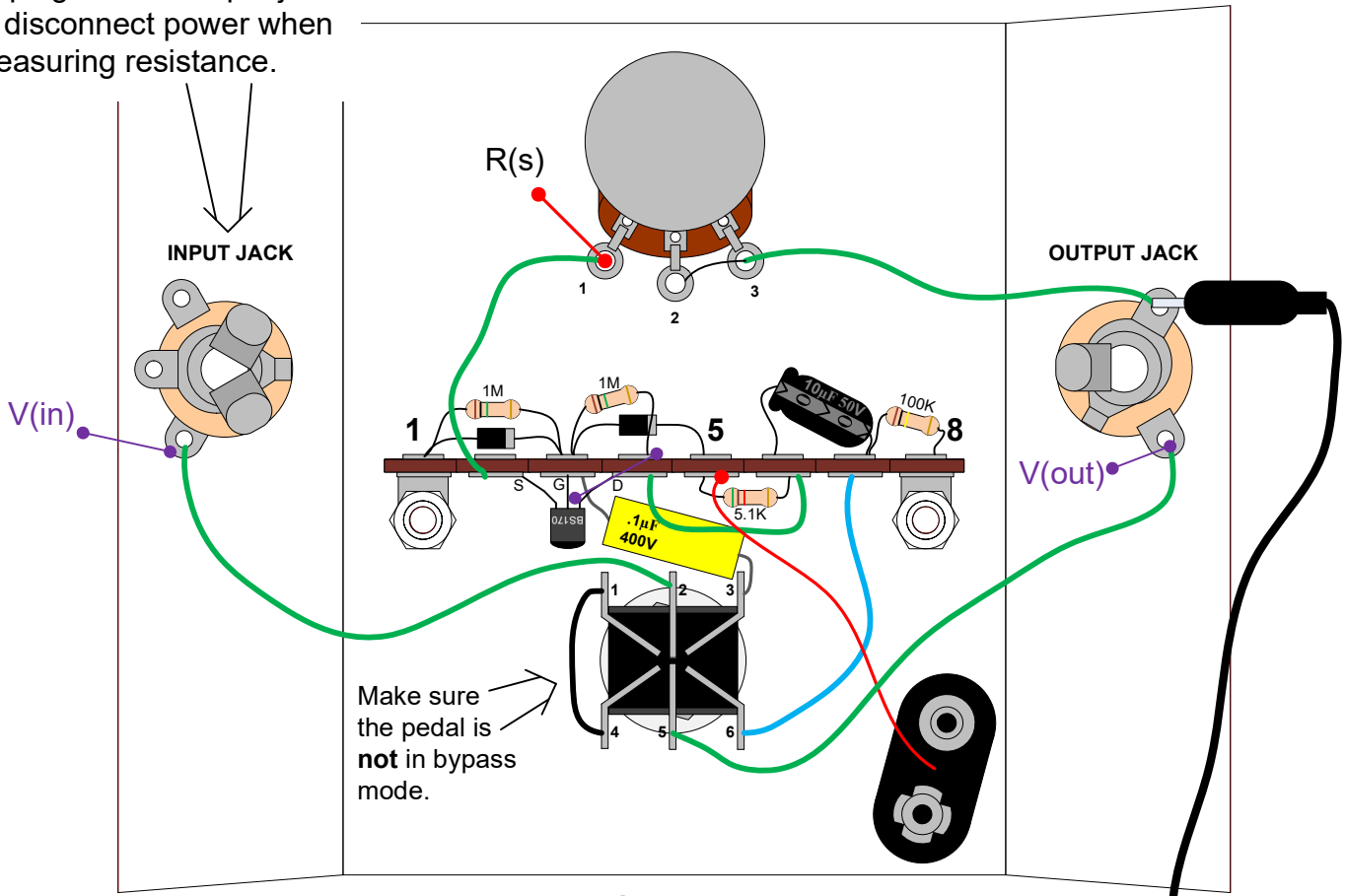


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"The PileDriver" (K-920)  
 Schematic

R(s) = Resistance from Source to Ground.	V(in)	V(out)
4.86K	.16 VAC	.16 VAC
2.42K	.16 VAC	.24 VAC
1.22K	.16 VAC	.45 VAC
0K	.16 VAC	2.60 VAC

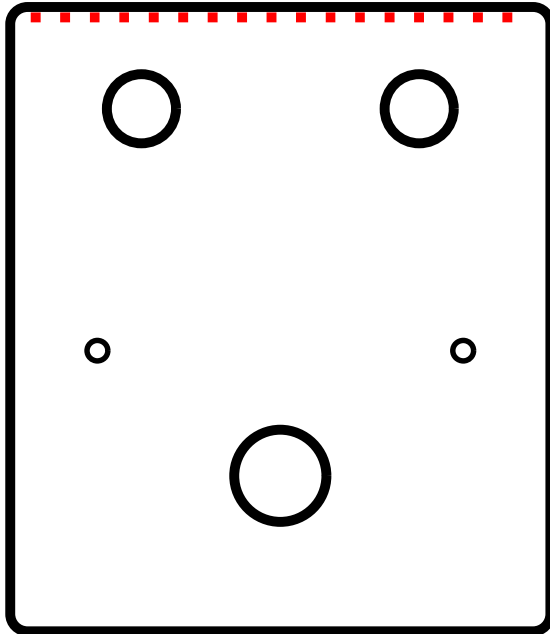
Unplug from the input jack to disconnect power when measuring resistance.



### Voltage Gain Test Points

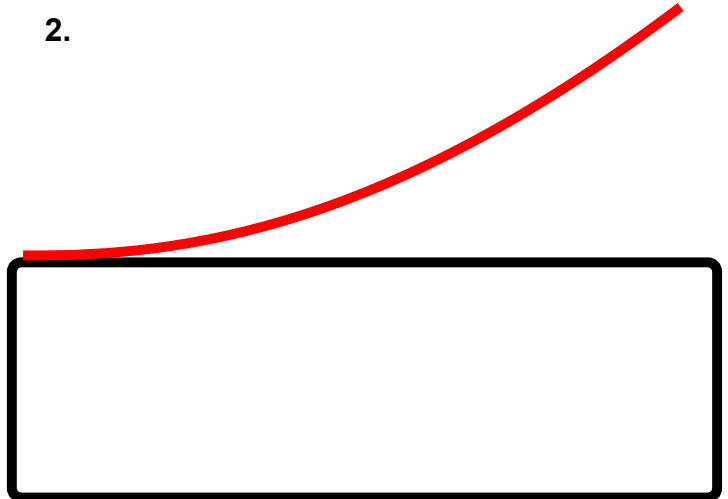
## APPLYING THE STICKER TO MOD PEDAL ENCLOSURES

1.



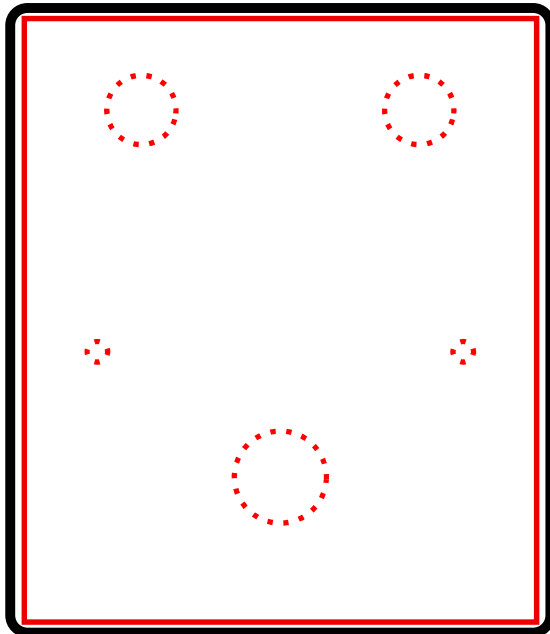
- Locate the top of the pedal as well as the top of the sticker. Page one of the instructions for your kit will have an image of the pedal that can be used for reference.

2.



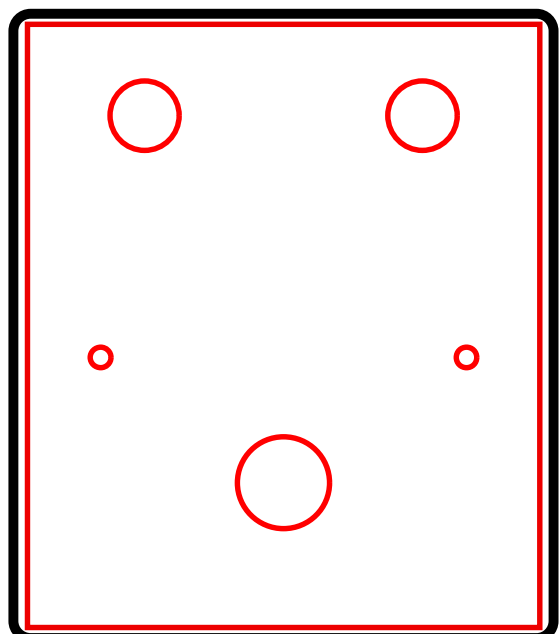
- Peel the backing from the sticker. Carefully line up the top edge of the sticker with the top of the pedal. Press down to apply the sticker only to the edge. Run a finger across the edge to push any air out from beneath the sticker. Continue this motion as you work your way down the pedal until the sticker is fully attached.

3.



- Locate the holes beneath the sticker and depress them using a fingertip. Be sure that the area of the sticker surrounding the holes is fully adhered to the surface.

4.



- With an Xacto knife or similar tool, carefully pierce the sticker in the center of each hole. Carefully work the knife from the center of the hole to the edge and begin cutting fully around the edge until the sticker has been fully cleared from the hole.