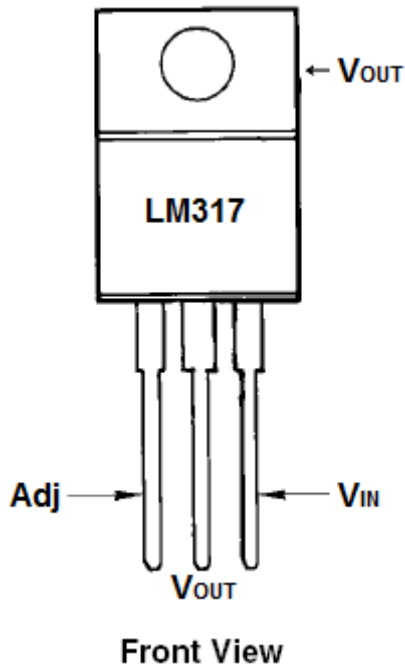


### LM317 Pinout

The LM317 Voltage Regulator has 3 pins. Below is the pinout:



Looking from the front of the voltage regulator, the first pin (on the left) is the Adjustable Pin, the middle is Vout, and the last pin (on the right) is Vin. Vin- Vin is the pin which receives the incoming voltage which is to be regulated down to a specified voltage. For example, the input voltage pin can be fed 12V, which the regulator will regulate down to 10V. The input pin receives the incoming, unregulated voltage.

**Adjustable-** The Adjustable pin (Adj) is the pin which allows for adjustable voltage output. To adjust output, we swap out resistor R2 value for a different resistance. This creates adjustable voltages.

Vout- Vout is the pin which outputs the regulated voltage. For example, the LM317 may receive 12V as the input and output a constant 10V as output.

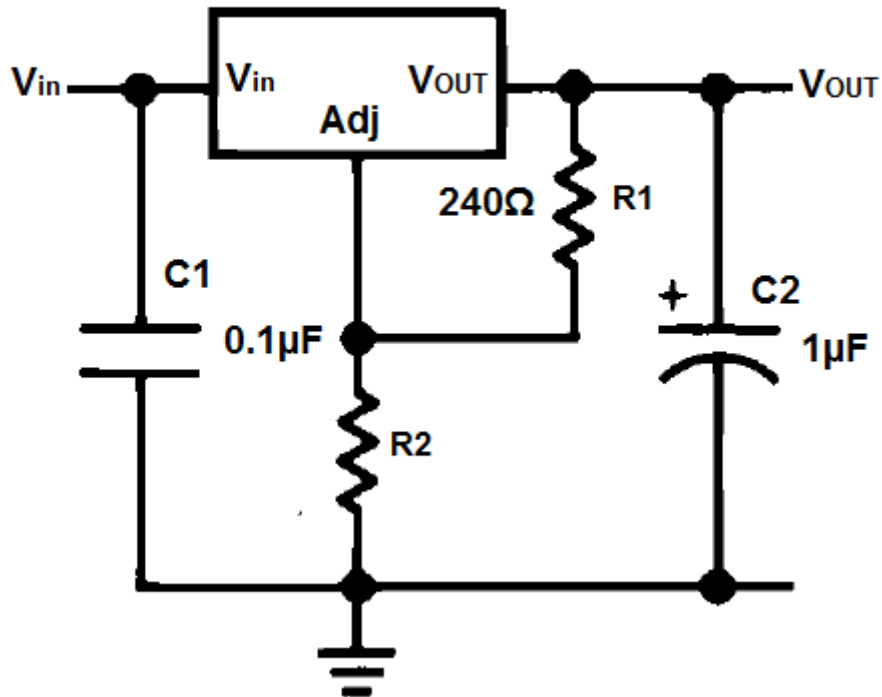
### [LM317 Schematic Diagram](#)

Now that you know the pins, how do we modify the voltage to that which we want output?

We do this by changing the value of the resistor connected to the Adj pin of the voltage regulator.

Let's see how the schematic is set up:

## LM317 Voltage Regulator Circuit



Here you see we connect two resistors to the voltage regulator. These resistors determine the voltage that the voltage regulator adjusts to and outputs.

The voltage that the adjustable regulator outputs is determined by the equation below:

$$V_{OUT} = 1.25V \left(1 + \frac{R2}{R1}\right)$$

Now swap out the R2 resistor and place a 1.5KΩ resistor in its place. Now the voltage output should be near 10V.

This is the advantage of adjustable voltage regulators. You can adjust it to any voltage within the range that the voltage regulator supports.

**Note:** The capacitors C1 and C2 are used to clean up the power line. C1 is optional and it's used to clean up transient response. C2 is needed if the device is far from any filter capacitors. This capacitors helps smooth out the power supply line in case of abrupt current spikes.