**The major components of a diesel generator can be classified as follows:**

Diesel Engine: The source of mechanical energy input for generators. Its size and output capacity determine how much power a unit can generate.

Alternator: Produces electrical energy from the mechanical input supplied by the diesel engine.

Radiator & Cooling System: As using the generator continually heats up various components, the cooling system helps withdraw heat produced when the generator is working.

Air Filter: The filter is composed of fibrous materials, which removes solid particles such as dust, pollen, mold and bacteria from the air.

Exhaust System: Exhaust fumes emitted by a diesel generator contain highly toxic chemicals that need to be properly managed.

Control Panel: The user interface controls the generator, including start up and shut down controls, fuel gauges, phase selector switches etc.

Base Frame & Fuel Tank: The base frame provides a structural base support. The fuel tank stores fuel to be used by the generator, and it usually has an adequate capacity to keep the generator to run for 6-8 hours on an average.

<https://www.topone-power.com/diesel-generators/>

https://www.nomaallim.com/small-diesel-generator-wiring-diagrams.html#

AVR

<http://portable.generatorguide.net/avr.html#:~:text=An%20automatic%20voltage%20regulator%20%28AVR%29%20is%20a%20electronic,coil%20and%20comparing%20it%20to%20a%20stable%20reference>.

A transfer switch is an electrical switch that switches a load between two sources. Some transfer switches are manual, in that an operator effects the transfer by throwing a switch, while others are automatic and trigger when they sense one of the sources has lost or gained power.

An Automatic Transfer Switch (ATS) is often installed where a backup generator is located, so that the generator may provide temporary electrical power if the utility source fails.

<https://en.wikipedia.org/wiki/Transfer_switch>

<https://constructionreviewonline.com/2019/07/components-parts-of-a-diesel-generator/>

I KNOW I’ve answered this one before, so either quora lost it, somebody deleted it or it didn’t come up in a casual search for already answered questions. It’s okay, I love talking about this stuff because it’s going to be my living for the next ten years or more.

I don’t know how far you want the component list broken down so I’ll outline it:

o Diesel Engine, consisting of:  
- Air Intake and Exhaust System: to include air filters, turbocharger and aftercooler (in most cases), ports into and out of to the cylinder head, exhaust manifold, muffler and exhaust stack  
- Fuel Distribution and Injection System: fuel supply (onboard and/or external), pump, filter, governor, distribution lines, injectors for each cylinder, return lines  
- Coolant system: coolant reservoir, radiator, pump to push coolant through the engine block (and aftercooler if attached)  
- Lube/Oil System: oil reservoir (sump, drip pan), dip tube, pump, filters, drilled and machined paths through the engine, bearings and ANY moving parts and path back to the sump  
- Electrical system: sensors, switches and controls to start engine, monitor and maintain operation  
- (conditional) Hydraulic System: for generators that use hydraulic motors to power attached devices like cooling fans

o Synchronous Generator (Alternator) consisting of:  
- Field Rotor: attached to the output shaft of the diesel engine, consisting of laminated iron cores wrapped in many turns of wire to create a stable magnetic field using Direct current  
- Exciter: either an external exciter powered by another source of electricity or a brushless exciter built into the rotor, normally incorporating a permanent magnet generator and a rotating rectifier  
- Armature windings, located in stator (outer housing): large coils of wire wound around the outside of the rotor where voltage is developed  
- Output cables: connected to the stator windings to achieve the desired voltage configuration  
- Instrument Transformers: to take large voltage and current values and create a level that electrical meters can read and display  
- Voltage Regulator: usually a solid state device that monitors output values (from the instrument transformers) and adjusts field current to correct actual output

o Distribution system - not actually part of the generator itself, but a necessary step to safely and efficiently connect the generator and whatever is consuming the power it generates to whatever consumes said power

**A Circuit Breaker is a protective device used to control the flow of current same like a**[**fuse**](https://www.electricaltechnology.org/2014/11/fuse-types-of-fuses.html)**. It break the circuit in case of fault conditions like**[**short circuit**](https://www.electricaltechnology.org/2018/02/short-circuit-currents-and-symmetrical-components.html)**and overload. It also capable to operate automatically, manually or by remote control in normal and faulty conditions. A**[**relay**](https://www.electricaltechnology.org/2018/12/what-is-relay-different-types-of-relays-its-operation-applications.html)**inside the circuit breaker sense the errors signal and sends to the mechanical switch which make and close the contacts.**

**Why do we have two grounding switches?**

**I was thinking about when current can and can't flow to ground. I came up with that current will only flow to ground when we have at least two grounds in the circuit, since then we have a complete circuit and current can flow. I can't however, think of why current will not flow to ground if we only have one ground in the circuit? I would say that it is because the we do not have a closed circuit through which current can flow. But, current, does not need a closed circuit to flow (like with a capacitor). So please can you explain why current does not flow to ground if we only have one ground (or if current does flow to ground if we have only one ground why)?**

**When I say ground I mean actually physically attached to the earth rather then a conductor (I say this because the earth has so many more electrons that a electrons flowing to/from it would have a negligible effect on the overall number of electrons in it) does this make a difference??**

**The following circuit is one where I think current should flow to and from ground (sorry for the poor diagram my computer is slow so I can't draw a proper one)**

**https://en.wikipedia.org/wiki/Standby\_generator**