

# Dual Dynamic Generators

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## ABSTRACT

In this project we can increase the total power production in the generator by using emissions emitted by the engine. In our project we will be replacing the radiator on to the different side of the engine and by using another dynamo we will produce extra power. To produce this extra power we use exhaust turbo charger. The advantage of this project is more amount of power can be developed with the same amount of fuel supplied in the previous generator.

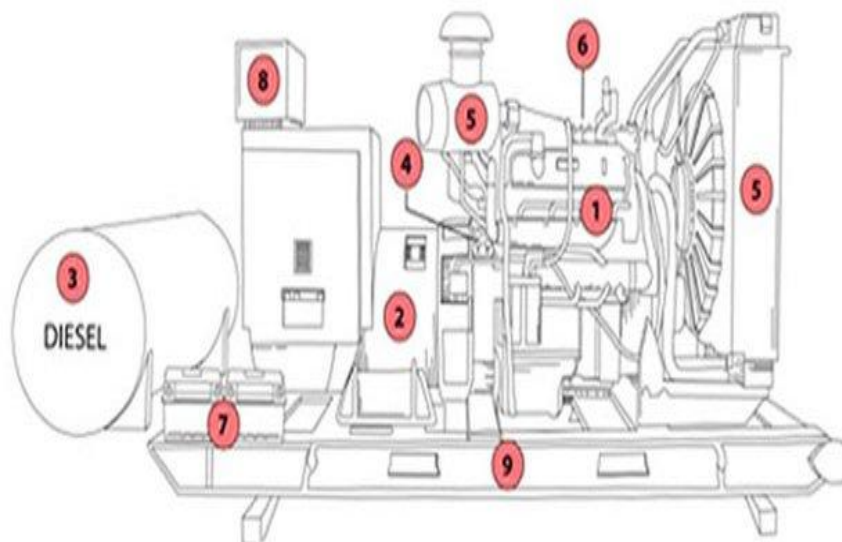
**KEYWORDS:** Dynamo, Exhaust Turbo Charger

These machines use a combination of an electric generator and a diesel engine to generate electricity. Diesel generators convert some of the chemical energy, contained by the diesel fuel, to mechanical energy through combustion. This mechanical energy then rotates a crank to produce electricity. Electric charges are induced in the wire by moving it through a magnetic field. In an electric generator application, two polarized magnets usually produce the magnetic field. A wire is then wound around the crankshaft of the diesel generator many times, which is placed between the magnets and in the magnetic field. When the diesel engine rotates the crankshaft, the wires are then moved throughout the magnetic field, which can induce electric charges in the circuit.

## INTRODUCTION

Diesel generators are very useful machines that produce electricity by burning diesel fuel.

## GENERATOR CONSTRUCTION



1. Engine
2. Alternator
3. Fuel System
4. Voltage Regulator
5. Cooling & Exhaust Systems
6. Lubrication System
7. Battery Charger
8. Control Panel
9. Main Assembly Frame

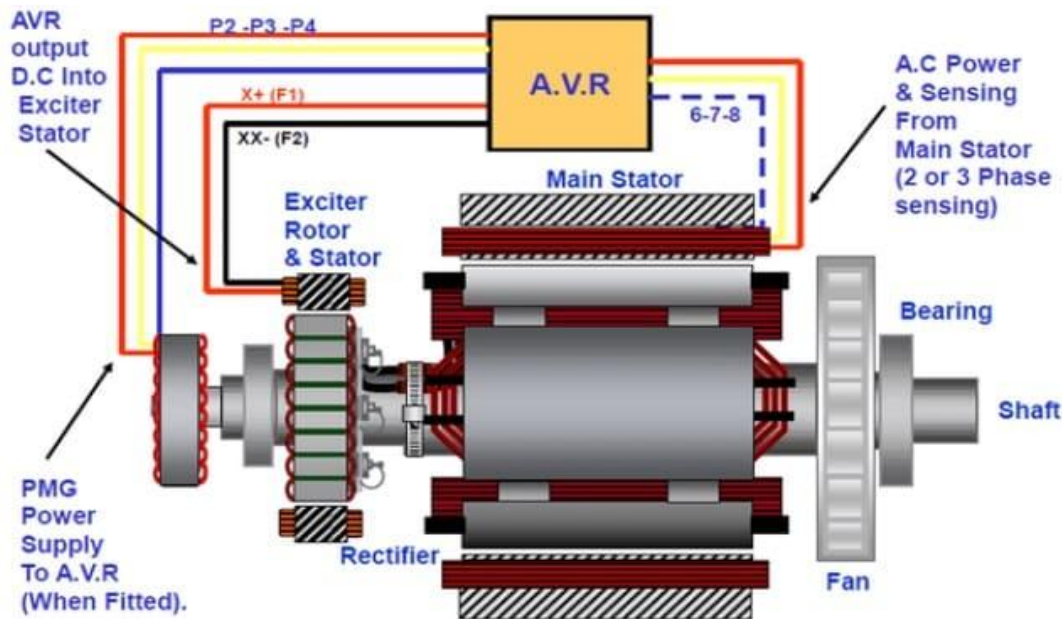
### WORKING PRINCIPLE

The basic principle of operation of a diesel generator is based on the thermodynamics law of energy conversion. According to this law, energy cannot be generated or destroyed, but only converted from one form to another.

### DIESEL GENERATOR PARTS AND FUNCTIONS

- **IC Engine**– The engine is the principal component of a diesel generator set, supplying mechanical energy that is then converted to electrical power. In reality, the power output of these diesel generators is proportional to the size of the engine. The more powerful the engine is, more output we get as electricity.

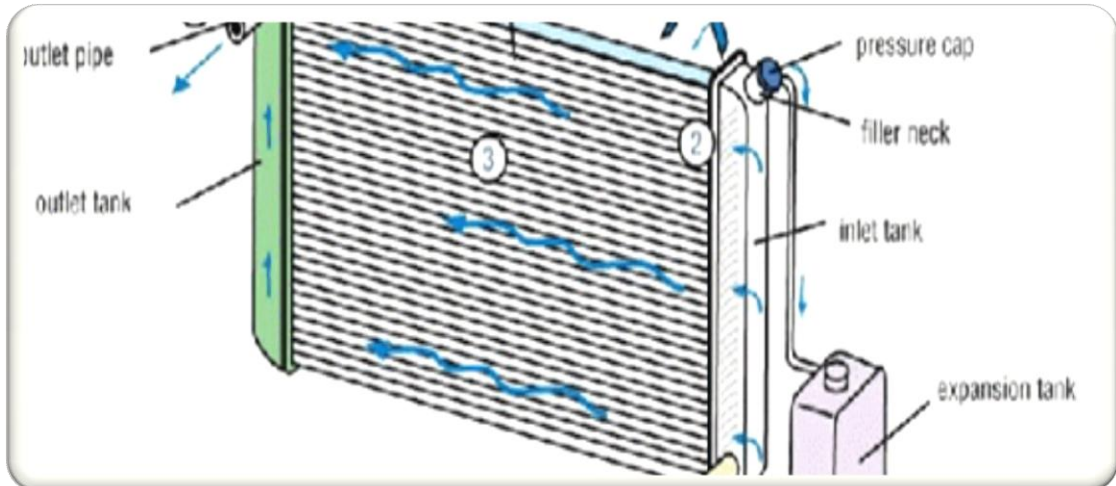
- **Fuel System**–This component stores and distributes the generator’s fuel. Fuel is the most important thing to make the engine run. The engine converts the Chemical energy of the fuel into mechanical energy, and then this mechanical energy is converted to electrical energy.
- **Alternator**–Another important component of a diesel generator is the alternator. It turns the mechanical input from the engine into electrical output. An alternator is made out of a rotor that generates a magnetic field in order to generate alternating electricity. This is why the rotor is referred regarded as the alternator’s major component



- **Exhaust System:** The exhaust system routes exhaust gas from the engine and exhaust it into the environment, while providing noise attenuation and aftertreatment of the exhaust gas to reduce emissions.
- **Cooling system(radiator):**The Radiator working is very simple. In radiator, the coolant flows from the inlet to the outlet through many

tubes mounted in a parallel arrangement. The hot water enters the radiator through the inlet port. And a fan is attached on behind the radiator to cool down the hot water in the tubes.

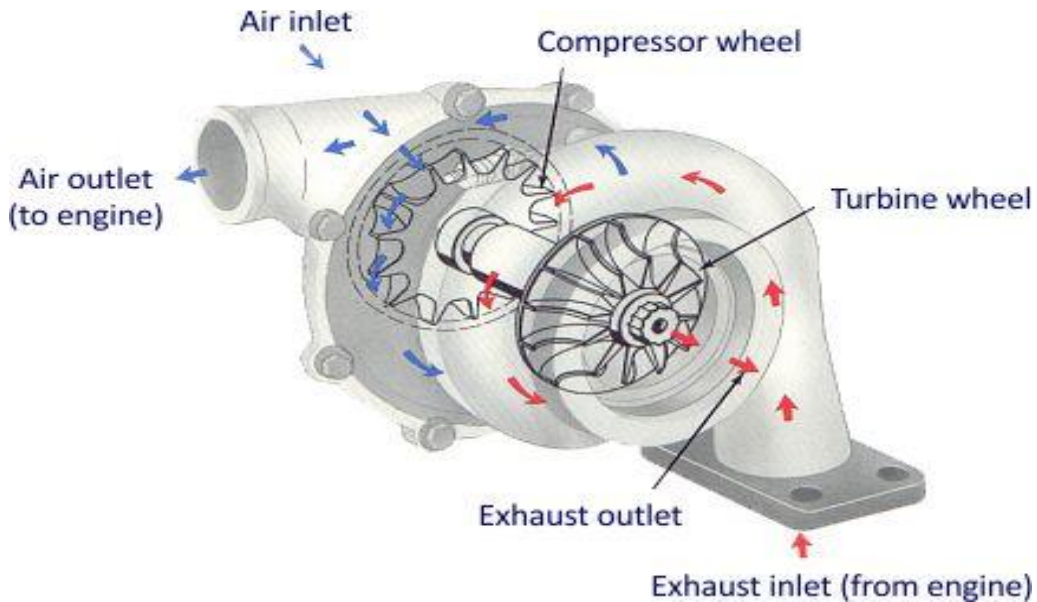
- **WORKING OF RADIATOR**



Coolant flows from the inlet to the outlet through many tubes mounted in a parallel arrangement

- **Exhaust Turbocharger**-The exhaust turbocharger comprises a turbine and a compressor between which there is a fixed mechanical connection established via a common shaft. The turbine is driven by the

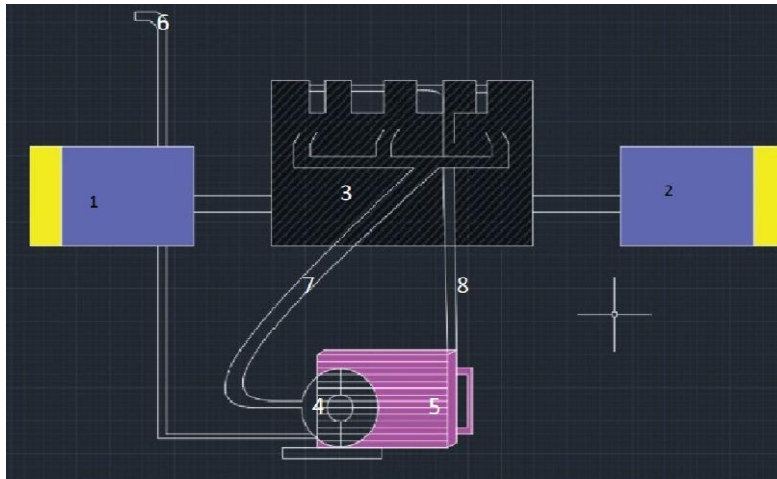
exhaust gases from the engine and supplies the drive energy for the compressor. In most cases, centripetal turbines and centrifugal compressors are used for turbochargers.



**DESCRIPTION OF DUAL DYNAMIC GENERATORS**

By addition of a new alternator in the place of radiator, extra power can be produced. And the

radiator is powered by an exhaust turbo, which works through exhaust gases emitted by the engine. By this method we can increase the power output of the generator with same amount of fuel.



### DESIGN OF DDG

- 1-2 Alternators
- 3 Engine
- 4 Exhaust Turbo
- 5 Radiator
- 6 Final Exhaust
- 7 Exhaust To Turbo
- 8 Coolant Supply

### WORKING OF DDG

- In these generators we use the exhaust as an useful source to run the radiator, this radiator is coupled with an exhaust turbo and also an air filter is coupled to an exhaust turbocharger.
- Now through this cycle we run the exhaust turbo by allowing the filtered exhaust into turbo and its shaft is connected to the radiator. Now the working of radiator is same. Therefore there is no change in the cooling system.
- Now at the old position of radiator an alternator is being fixed to the engine shaft.
- So now with a single mechanical power source two alternators will produce power at a time.
- By adding different or lower output alternator on another side output can be increased.

### ADVANTAGES

- By using exhaust from the generator and using it to run the radiator allows us to use extra mechanical energy from the generator.

- By using both alternators which might be same or different power output can be connected to the shaft.
- The exhaust turbo also sucks atmospheric air and cools the external parts of the generator.
- By using filter pads some of the impure particles are being removed.
- We can also put a dc output generator to store power direct to batteries.

### DISADVANTAGES

- Load must be particular to the connected alternators or else the fuel intake will be increased.

### APPLICATIONS

- Mining operations
- Oil & gas operations
- Manufacturing facilities & processing plants
- Medical industry
- Telecom tower

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