Inside Knowledge About Diesel Engines

By Thomas Yoon

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One of the most reliable internal combustion engines around is the diesel engine. In many industrial installations, diesel engines are used as prime movers for the generation of electricity and for emergency air compressors.

It's true that they are rugged, but one of the most important advantages of these engines is the fact that they can be started by manual cranking. In remote areas, diesel engines can be counted upon for starting up from scratch.

Once a small diesel engine is started, it can be used to drive a small electrical generator that can then be used to produce electrical supply for driving other machines like pumps, compressors, and for lighting.

How does a diesel engine work?

First there must be combustion of fuel. As we have discussed in our previous articles, combustion or burning of fuel occurs whenever there is sufficient heat, fuel and oxygen. When conditions are just right, combustion can be very rapid. Rapid combustion causes an explosion in an enclosed area. This is because of the rapid built−up of hot gases during the process.

In an internal combustion engine like a diesel engine, this rapid combustion, and built−up of hot gas pressure is used to push a piston away from the enclosed combustion space.

The piston is attached to a crankshaft through a connecting rod. Because of this, the engine is able to convert the linear movement of a piston to a rotating movement of a crankshaft.

The outward movement of the piston turns the crankshaft. However, the momentum of the turning crankshaft forces the piston back again towards the engine combustion space in a reciprocating movement.

Once the piston moves away from the combustion space, the pressure drops. The next stage of operation depends on the design of the engine. These can be either 2−stroke or 4−stroke designs.

Regardless of the type of design, the spent exhaust gas is first driven out, and then new fresh air is drawn back into the combustion chamber.

After this, the rotating crankshaft drives the piston to compress the fresh air inside the combustion chamber. The piston acts as a reciprocating compressor at this stage.

The compression of the air causes the latter to become hot − hot enough to ignite finely distributed fuel particles.

At this moment, fuel is sprayed in at high pressure. The tiny sprayed fuel particles form a mist inside the combustion chamber.

What do think will happen when you have heat, fuel and oxygen? A fire! Each tiny particle of the fuel burns rapidly, and an explosion occurs.

The cycle starts again, and the crankshaft turns continuously, the pistons move continuously, and the engine runs.

How does the engine know when to spray fuel, let in air, compress the air, and exhaust the spent combustion product?

Well folks, start your engines.

Many years of working experience in Marine, Facilities, Construction has given the author material for writing e−books and articles related to engineering, and management.

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The Ins And Outs Of Diesel Generators

By Christopher H. Waters

Generators are used for electric power generation. Two categories of diesel generators are basically available in market− one is portable generator and the other is standby generator. Diesel Generators are mostly used to make sure that electric appliances can be run when there is a power failure. Standby diesel generators are mostly used in homes and offices and installed outside the house or office building. These are plugged in home wiring or electric power circuit. These can automatically detect power failure and start supplying power with in moments. Portable diesel generators are used on sites where there is much less supply of electric power and they can only run few small appliances like refrigerators, televisions and turnaces.

Diesel generators use comparatively less fuel and thus are more fuel efficient than power generated by gasoline or natural gas. For every liter of fuel consumed, diesel generators can run 2 to 3 times more efficiently than natural gas engines. There is no need of frequent maintenance for diesel engines, but gasoline engines need more frequent maintenance. Most diesel engines designed with water−cooled engine up to a speed of 1800 rounds per minute. This makes sure that the engine is durable, and makes it most dependable of all generators.

Unlike other natural gas generators and gasoline generators, diesel engines are very safe to use because they work on direct injection principle and they do not have any spark plugs. The unavailability of spark plug keeps them safe from fire. Diesel generator has a better shelf life. This is the least flammable source of fuel, hence can be stored for more time.

The fuel for the diesel generators is available at all gas stations and can be collected in comfortable cans. Main problems in case of diesel generators are: it is very hard to start them in cold weather, they are noisy and emit more smoke. Home diesel generators may cost $ 800 for 4 kilowatt to $10000 for a 15−kilowatt depending upon the rating, voltage consumption, quality and brand name. Diesel generators can also be used in industrial purposes. For industrial purpose they are available in range of 500 kilowatt to 2000 kilowatt.

Fuels such as diesel, gasoline, natural gas, or propane can basically power home generators. Some models of diesel generators also designed with multi fuel capabilities. The fuel choice of will depend on availability of fuel during emergency times.

Christopher H. Waters writes on many topics. For more info on diesel generators visit

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