नाम
Name : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

अनुक्रमांक
Roll No : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

प्राप्त अंक
Marks Awarded :

पाठ्यक्रम
Course : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

दिनांक
Date : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

अनुदेशक का अधाक्षर
Instructor Initial :

STUDY OF DIESEL ENGINE.

AIM: To study about Diesel engine and its parts.

THEORY: Diesel engine is an internal combustion engine. It utilises heavy liquid fuel. Heat engine cycle is used diesel cycle in which the heat used for converting heat to work, is supplied at constant pressure in side the cylinder. The four events constituting a Cycle are the intakes stroke, compression stroke, power stroke and exhaust stroke.

THE INTAKE STROKE:

In this, the engine with its piston at the top of the cylinder, or at top center, and ready to draw in a charge of air. The inlet valve is open the other valves are closed. The crankshaft is turning. As the shaft turn to the right and downward, it pulls down on the connecting rod and the rod in turn pulls down on the piston thus the piston descend in the cylinder. When the piston has descended to the bottom of its stroke, the inlet value closes. The cylinder is now full of fresh air.

THE COMPRESSION STROKE:

As the crank turn to the left and upward, the connecting rod likewise pushes the piston upward. Since all the valves are closed, the air charge cannot escape. The air is therefore, forced into a smaller space. This increases the pressure of the air and also occupies only about 1/16 of its original space and its temperature has risen to 540° c or more. This is compression stroke.

THE POWER STROKE:

The air is now so hot that it can automatically ignite oil if the oil is sprayed into it. That is what now happens when the fuel is injected through the fuel injection Nozzle. The oil burns quickly because it is well mixed with hot air. The burning process naturally produces heat, which makes the burning mixture still hotter. Because this hot body of gases is confined in the small space between the top of the piston and the top of the cylinder, its pressure goes up too. This pressure is exerted on top of the piston and pushes it down on the power stroke. By the time the piston starts coming down the oil has all been sprayed in and has finished burning. The hot gases now occupy a larger space and therefore they are expanding. This is called the power stroke. The piston continues to descend with the hot gases gradually lose pressure and become cooler. Meanwhile, the pressure of the gases on the piston is transmitted through the connecting rod to the crank. The force on the crank makes the crankshaft turn.

Shortly before the piston reaches bottom center on the power stroke, the exhaust valve is pushed open mechanically and the spent gases, which have now lost of their temperature and

pressure because of the expansion start to blow out through the exhaust value. This is end of power stroke.

THE EXHAUST STROKE:

When the exhaust valve open at the end of the power stroke, the spent gases in the cylinder escape only until their pressure falls to a little above the pressure of the outdoor air. The cylinder still remains full of dead gas, which must be cleared out to make way for fresh charge of air. The engine does this on the next stroke, when the piston rises with the exhaust valve open and pushes out the spend gases through the exhaust valve. When the piston has risen to top center, the spent gases have all been expelled from the cylinder and the exhaust stroke has been completed.

From the above it is clear that there is no separate ignition system in diesel engine. The ignition is by compression alone. Hence diesel engines are also called as compression ignition engine.

The fuel system in diesel engine consists of fuel filters, fuel pump, and injectors (NOZZLES). In small engines usually the release pressure of the fuel from the nozzles lies between 150 kgs/sq.cms. to 200 kgs/sq.cms.

As more heat is involved in diesel engines, these engines will have efficient cooling and lubrication system.

Study the engine and indicate the function of the following parts: -

1) Rocker levers:

2) Push Rod:

3) Fuel oil strainers:

4) Lubricating oil strainers:

5) Plunger Pump:

6) Fuel pump

7) Nozzle

8) Leak of pipe

9) Ceramic filter in the fuel tank:

10) Dip stick

11) De- compression Lever

12) Gasket

13) Cylinder Head:

14) Breathing Hole:

15) Air filter:

REVIEW QUESTIONS:

1) For stopping the engine remove the load if connected and operate the fuel-controlling lever towards gear casing side and maintain it till the engine stops. What happens if lever is released before engine stops?

2) What type of cooling system is employed in this engine? How continuous circulation of water ensured? Explain with neat sketch?

3) Draw a block diagram of the system, showing various components.

4) How is the lubrication done in this engine?

5) What are differences between Petrol and diesel engine?

6) What are the differences between two stroke and four stroke engine?

7) Describe the maintenance procedure to be carried on in Diesel engines?

Date: **Signature of Trainee**