



Marine Engine fuel injection system

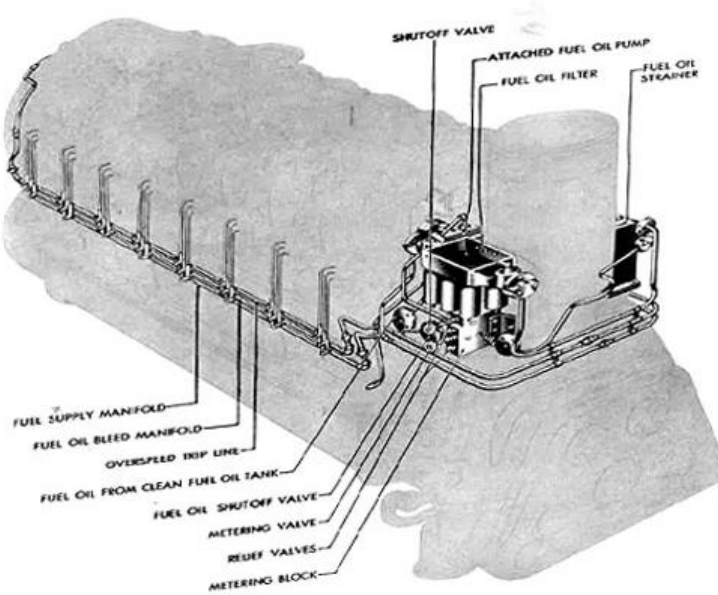
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Marine Engine fuel injection system

The Marine Engine fuel injection system is one of the most important parts of a marine diesel engine. A fuel injection system does the work of providing the right amount of fuel to the engine [cylinder](#) at the right moment. It is also extremely important that the fuel-injected inside the engine enters the cylinder at the right combustion situation for the highest combustion efficiency. It is for this reason that there is a need for a measured fuel supply system that times and monitors the delivery of the fuel and oil in the combustion chamber. This timing device helps to have perfect atomization of the fuel. The device is known as a fuel injector.

Fuel Injection System pictures and Sketch

Fuel injection is done with the help of cams and camshaft. The speed of the [camshaft](#) is the same as the engine speed in a two-stroke engine and half the engine speed in a four-stroke engine. The adjacent fuel injection system diagram gives a broad view to the reader regarding the fuel injection system. The faded sketch shows the engine in the background, whilst the dark-colored schematic represents the fuel system. This helps the reader to understand the concept with the given theory.



The injection system comprises the most important part, which combines both mechanical and hydraulic operations. We know this as the Jerk Pump.

Jerk Pump

The Jerk pump system comprises individual fuel injectors for each [cylinder](#). This means that the injection of each cylinder is exclusive to each other. The injector pump is operated once every cycle using the cam and [camshaft](#). In order to ensure that the camshaft and the injection run simultaneously to deliver the perfect timing of fuel injection, the barrel and plunger of the injector pumps are selected of appropriate size to suit the engine fuel requirements. The fuel delivery is facilitated with the help of ports in the barrel and slots in the plunger or adjustable spill valves.

All the injector valves are preset to a specific pressure. The needle of the valve lifts exactly to this pre-set pressure, ensuring that the fuel completely atomizes once it enters the cylinder.

Two types of fuel pumps

- Valve control discharge type
- Helix or helical edge pump

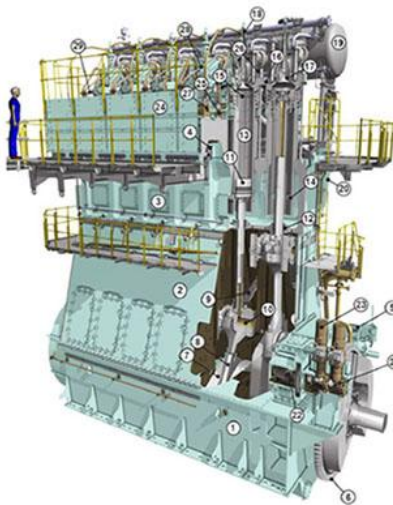
The valve control discharge type pump is generally found on slow speed two-stroke engines and the helix type is found on high or medium speed four-stroke engines.

Common Rail



In the common rail system, each [cylinder](#) doesn't have an individual fuel pump, but only one high-pressure multiple fuel plunger pumps for all the cylinders. A manifold or rail is where the fuel accumulates at high pressure before entering the cylinders. This common-rail supply fuel to all the cylinders. A timing valve in provided between the rail and the injector to control the timing and extent of fuel delivery. The common rail is also provided with spill valves to release excess pressure. The injectors in a common rail system are often known as fuel valves.

Engine fuel injection system Spares:



- | | |
|--------------------------|---------------------------|
| 1. Bedplate | 16. Cylinder cover |
| 2. Column | 17. Exhaust valve |
| 3. Cylinder block | 18. Exhaust valve drive |
| 4. Tie rods | 19. Exhaust manifold |
| 5. Turning gear | 20. Scavenge air receiver |
| 6. Flywheel | 21. Supply unit |
| 7. Crankshaft | 22. Gearwheel supply unit |
| 8. Connecting rod | 23. Fuel pumps |
| 9. Knee lever | 24. Rail unit |
| 10. Crosshead | 25. Fuel common rail |
| 11. Piston | 26. Fuel Injector |
| 12. Gland box piston rod | 27. Servo Oil Rail |
| 13. Cylinder liner | 28. High pressure pipes |
| 14. Scavenge air ports | 29. Starting air valve |
| 15. Anti-polishing ring | |

Engine fuel injection system Brands





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