

Filter Management

Environment Surrounding Us:

~Emission gas has become a critical issue~

Diesel Engines boast such excellent features as reduced CO2 emissions to which global warming is widely attributed. However, diesel engines emit nitrogen oxides (NOx) and particulate matter (PM), and concerns regarding their impact on the atmosphere and human body have fueled demand for the development of "clean" diesel engines that dramatically reduce these substances.

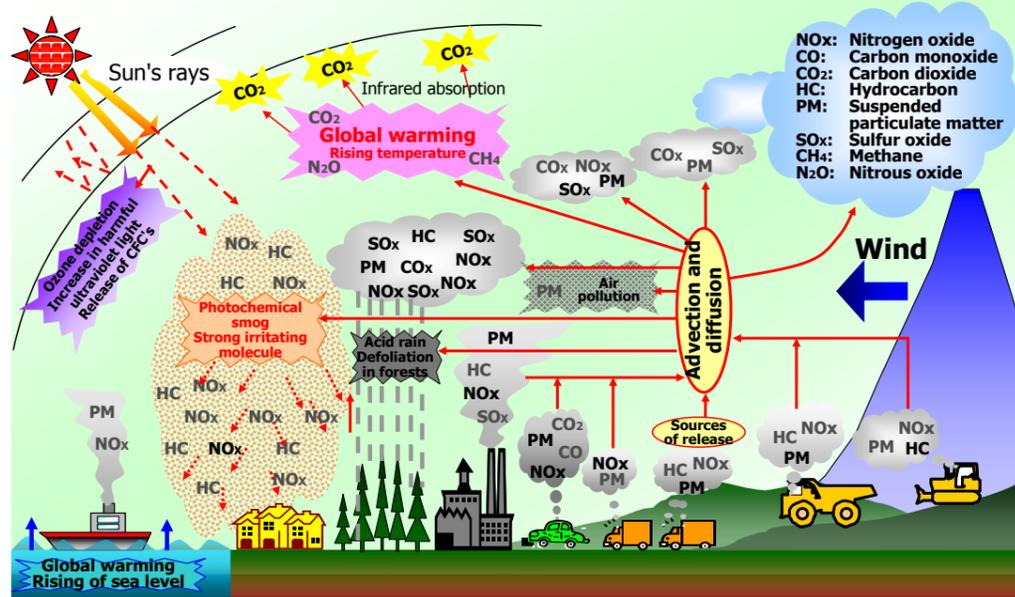


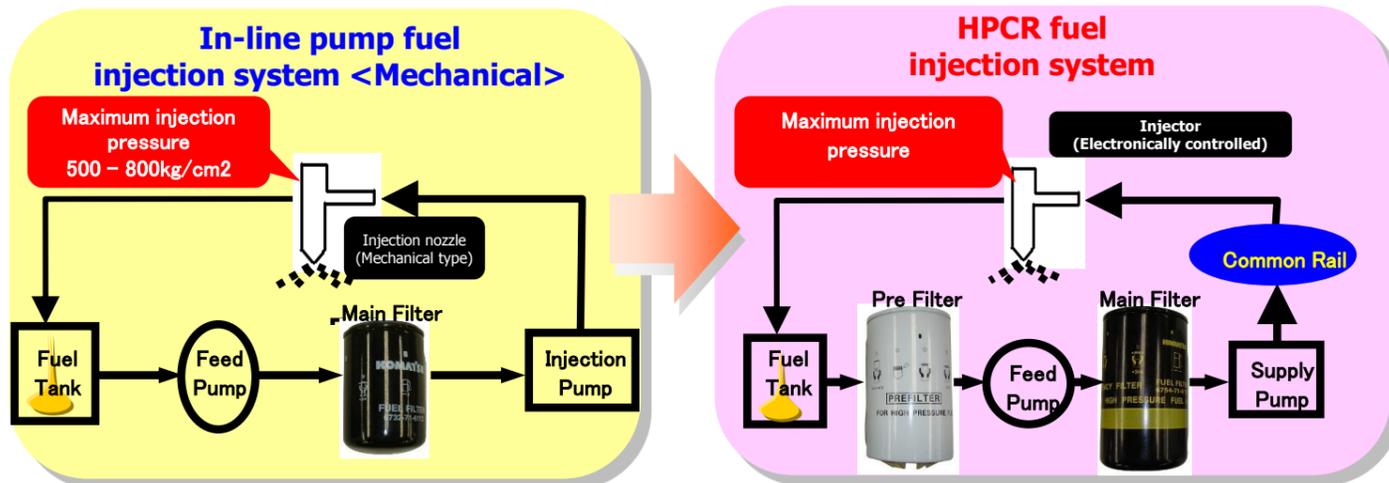
Diagram 1 : Global Environmental issues

Development of Technology that:

Komatsu incorporated a heavy-duty High-Pressure Common Rail (HPCR) fuel injection system in our current diesel engines to achieve both NOx and PM reductions and better fuel efficiency. Specific features of the heavy-duty HPCR fuel system are its ability to inject high-pressure fuel accumulated in the common rail into the combustion chamber, thus atomizing fuel spray and optimizing combustion for better fuel efficiency, lower emissions and higher performance. Another feature is its flexibility to maintain the optimal fuel injection volume, pressure and timing through precision electronic control. This results in near complete combustion, contributing to PM emissions reduction and dramatically improved fuel efficiency. (See Diagram 2 below)

Komatsu is one of the front runners in the construction and mining equipment industry to use the heavy-duty cooled Exhaust Gas Recirculation (EGR) system in medium and large engines, which is effective in lowering NOx without sacrificing fuel economy. Cooled EGR is considered the best technology for reducing NOx in diesel engines, and most of the leading engine manufacturers have employed cooled EGR with resounding success in engines that meet stringent on-road engine regulations since 2002. The air-to-air charge air cooling system is effective for lowering the charge air temperature to inhibit NOx emissions without sacrificing fuel economy.

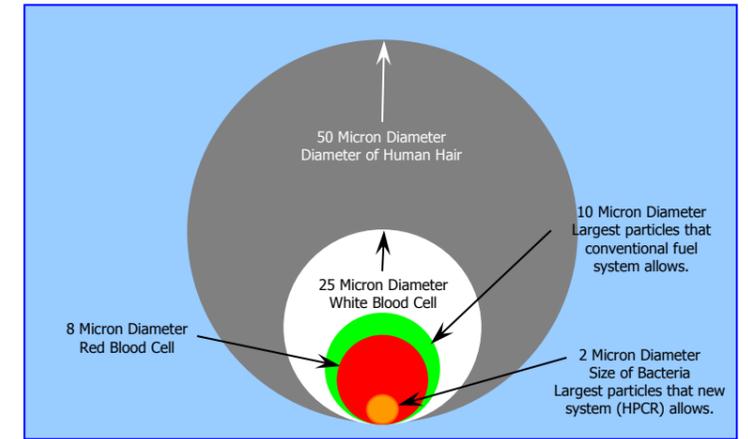
Diagram 2 : Engine Mechanism



Importance of Fuel Control

- Due to extremely high injection pressure of HPCR fuel system (1,600kg/cm²), the such clearance between supply pump and injector requires micron accuracy.
- Since avoiding the penetration of water and dust is more serious issue than before, our Pre-fuel filters (with water separator) is designed to remove most of the dust which diameter is as small as 10µm and Main fuel filters is even smaller as 2µm. <Diagram 3 : Comparison of size>
- 85% of the cause of fuel system failure is water and dust. In order to use our machine economically, we must avoid those trouble causing agents from penetrating into the system.

<Diagram 3 : Comparison of Size>



Komatsu Genuine Fuel Filter

Common Rail system requires very clean fuel when compared that of conventional engines (Mechanical type) due to its very sensitive and accurate structure. However, it is nearly impossible to prevent water and dust from entering the system. Important thing for the machine is to take away water and dust as much as possible with the high-quality fuel filter to provide clean fuel into the system so that the machine will last longer and can be used economically.

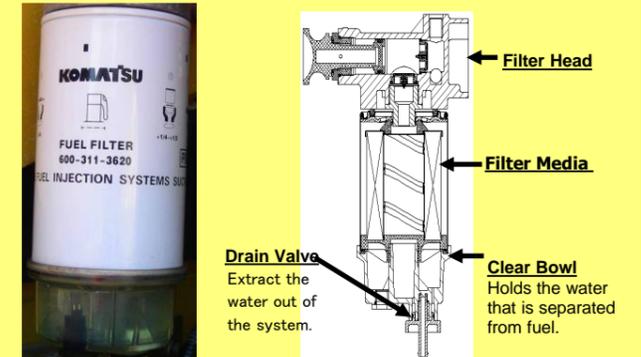
High-performance main fuel filter

Highly efficiency main fuel filter that will capture the very small particles that goes through Pre-Filter.



Pre fuel filter for HPCR system

Integrated with Clear Bowl that separate and eliminate water from fuel. Its filter media is coarser than Main Filter.



Consequence of Using Poor Fuel

