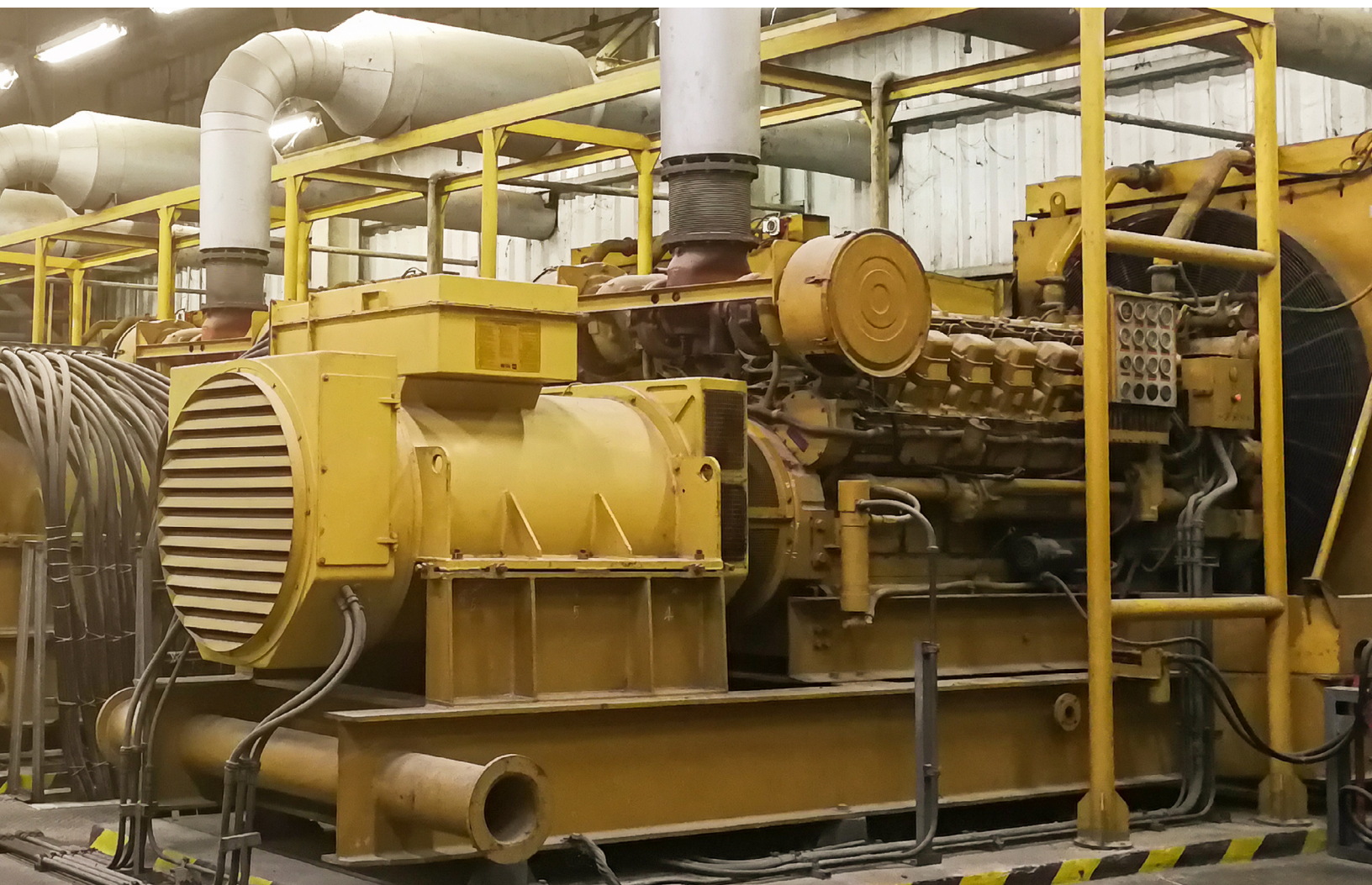


The Care and Selection of Lubricants for Stationary Gas Engines

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Evolving environmental regulations are requiring operators in power generation, oil and gas, and manufacturing to adapt to using cleaner energy while running efficient, profitable plants. As facilities are faced with the challenge of tackling emissions, stationary gas engines are increasingly being turned to for reliable power generation.

To ensure their optimal performance and longevity, selecting the right lubricants and implementing proper maintenance practices is crucial. Factors for the selection and care of lubricants for stationary gas engines include oxidation resistance, regular oil analysis, and consideration of the type of fuel being used.

Benefits of Stationary Gas Engines

Stationary gas engines consist of an internal combustion engine that drives an alternator or generator to produce electrical power. They are commonly used in commercial buildings, hospitals, data centers, and other applications where a reliable and continuous power supply is required. They boast several benefits including:

Energy Independence: By deploying stationary gas engines, businesses and industries can gain energy independence by generating their own electricity and heat on-site. This reduces reliance on the grid and mitigates the risk of power outages or disruptions, ensuring continuous operations and increased resilience.



Environmental Benefits: Stationary gas engines offer environmental advantages by utilizing cleaner-burning fuels, such as natural gas or biogas. Compared to traditional energy sources like coal or oil, gas engines produce lower greenhouse gas emissions, contributing to improved air quality and reduced carbon footprint. Additionally, stationary gas engines can utilize renewable biogas derived from organic waste, providing a sustainable and renewable energy solution.

Flexibility and Scalability: Stationary gas engines are flexible and scalable, making them suitable for a wide range of applications and industries. They can be utilized in various sectors, and they can be configured in modular units, allowing for easy expansion or adaptation to changing energy demands.

It's important to note that the efficiency of an engine depends on various factors, including design, technology, fuel quality, and proper lubrication and upkeep.

Factors for Lubricant Selection

Selecting the right lubricant is crucial for stationary gas engines because it directly affects their performance, reliability, and longevity. The lubricant provides essential protection to engine components, reducing friction, wear, and heat generation. A suitable lubricant will have the correct viscosity, additives, and compatibility with the gas fuel used while keeping ash generation to a minimum.



Consideration of Fuel Type

The type of fuel used in stationary engines has a significant impact on lubricant selection. The lubricant should be compatible with the fuels used to avoid any adverse interactions or degradation. Incompatibility issues can lead to oil thickening, filter plugging, or the formation of harmful deposits.

Different types of fuels may contain varying levels of contaminants. These contaminants can include sulfur compounds, moisture, acids, and particulate matter. The presence of these contaminants can affect the lubricant's performance and its ability to protect engine components. Lubricants designed for stationary gas engines should have appropriate additive packages to combat the specific contaminants present in the fuel. The two primary gas types are natural gas and landfill/biogas.

Natural Gas: Natural gas engines generally have a cleaner combustion process and produce fewer contaminants compared to landfill/biogas engines. Consequently, lubricants used in natural gas engines require lower levels of detergent-dispersant additives to manage deposits and maintain engine cleanliness. It is important to choose lubricants specifically formulated for natural gas engines to ensure compatibility and optimum performance.

Landfill/Biogas: Landfill/biogas engines burn gases produced by the decomposition of organic matter. These gases contain higher levels of contaminants such as hydrogen sulfide and siloxanes. Lubricants used in landfill/biogas engines require enhanced additive packages to combat the corrosive nature of these contaminants. Lubricants designed explicitly for landfill/biogas engines, with higher levels of detergents, dispersants, and anti-corrosion additives should be selected.



Managing Ash Potential

Ash potential in stationary gas engines refers to the propensity of the fuel used in the engine to generate ash during the combustion process. Excessive amounts of ash can lead to deposits which will lead to a range of performance issues. It can cause fouling and clogging of engine components, reduce heat transfer efficiency, disrupt combustion processes, and increase exhaust backpressure. These effects can lead to reduced engine power, increased fuel consumption, and decreased overall efficiency.

Furthermore, the presence of excessive ash in stationary gas engines may necessitate more frequent maintenance activities. Ash deposits can require cleaning and removal from various engine parts to restore optimal performance. Regular inspection and cleaning of components, such as spark plugs, injectors, and valves, may be required to mitigate the negative impact of ash.

When evaluating lubricants, check the product specifications for the Total Base Number (TBN) and the ash content. The TBN of an oil is a measure of its reserve alkalinity, or its ability to neutralize acidic compounds formed during the combustion process. Since stationary gas engines, specifically natural gas, have less of a propensity to form acids, a high TBN is not necessary unless the engine is a dual fuel engine.



Viscosity

Viscosity is a critical property of lubricants that affects their ability to form a protective film between moving parts and reduce friction. Oil viscosity directly affects an oil's load-bearing capacity, which refers to its ability to withstand pressure and support heavy loads. Engines with higher loads or operating at higher temperatures may require oils with higher viscosity to maintain proper lubrication and prevent excessive wear.

In some gas engines, fuel can potentially mix with the oil, leading to fuel dilution. Higher viscosity oils are less prone to fuel dilution as they provide better resistance to the penetration of fuel into the oil. Controlling fuel dilution helps maintain the oil's lubricating properties and prevents engine damage.



Oxidation Resistance

Stationary gas engines typically operate continuously or for long periods, which can expose the oil to high temperatures and oxidative stress. Oxidation of oil can lead to the formation of sludge, varnish, and other deposits, which also causes changes in the viscosity and can impair the lubricating properties of the oil. Additionally, when oil oxidizes, it produces acidic compounds and harmful byproducts that can corrode engine components, such as bearings, seals, and surfaces. These byproducts can accelerate wear, increase the likelihood of component failure, and lead to increased maintenance and repair costs. Therefore, selecting **lubricants with excellent oxidation resistance is vital.** Oxidation inhibitors and antioxidants are additives commonly used in gas engine lubricants to prolong oil life and maintain its performance throughout the service interval.

OEM Recommendations

Original equipment manufacturers (OEMs) often provide specific recommendations regarding lubricant selection and maintenance practices for their gas engines. These recommendations are based on extensive testing and field experience, and they take into account the unique characteristics and requirements of the engine. Following OEM recommendations ensures that the lubricant used is suitable for the specific engine model, maximizing performance, and protecting warranties.



Monitoring Lubricant and Machine Health with Oil Analysis

Oil analysis for stationary gas engines offers several benefits, including early detection of engine problems, optimizing maintenance intervals, preventing catastrophic failures, extending equipment life, and improving overall operational reliability. By proactively monitoring the condition of the engine and its lubricating oil, operators can take timely actions to minimize downtime, reduce maintenance costs, and enhance the performance and longevity of their gas engines.

Testing should include viscosity, oxidation, nitration, the total acid number (TAN); initial pH, which is particularly important in landfill and biogas applications; the total base number (TBN), a measure of alkalinity reserve that is most relevant to diesel engine oils, which have higher amounts of detergents, but can and should be used in stationary gas engine oils as required by the manufacturer; and finally, water. Water is a very detrimental contaminant in gas engine oil. Not only does water reduce the film strength of the oil, it is also a catalyst for oxidation; as mentioned, it is a major risk for stationary gas engines, and causes rust and corrosion, and even encourages the formation of acids. By monitoring these parameters through regular oil analysis, you can detect abnormalities and take proactive measures to prevent potential engine damage or failures. This can include adjusting the oil change interval, identifying fuel or coolant leaks, or addressing issues with filtration systems.

Conclusion

Selecting and caring for lubricants in stationary gas engines is crucial for maintaining their performance and extending their operational life. Consider factors such as ash generation, viscosity, and oxidation resistance when choosing a lubricant, and implement regular oil analysis to monitor lubricant condition and detect potential engine issues. Additionally, pay attention to the type of gas being used, whether natural gas or landfill/biogas, and choose lubricants formulated for the specific gas type to ensure optimal performance and protection.

By following these guidelines and working closely with lubricant suppliers and engine manufacturers, you can ensure that your stationary gas engines operate efficiently, minimize downtime, and maximize their service life.

Shell Mysella Stationary Gas Engine Oils

Growing energy demands mean gas engines are exposed to increasingly severe conditions. To protect against high temperatures and pressures, Shell Mysella oils deliver superior deposit control – keeping your ring belts, pistons and cylinder liners less susceptible to wear. The ongoing protection provided by Shell Mysella reduces the likelihood of unexpected maintenance or part replacement, providing a reliable operation by sustaining planned maintenance intervals.



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