



# SKF solutions for the shipping industry



## Environmental benefits

- Reduces lubricant consumption
- Lowers CO<sub>2</sub> emissions
- No spillage of lubricant

**SKF cylinder lubrication systems can reduce oil consumption from 30 to 50 percent.**



## Reduce oil consumption with SKF CLU4 and CLU5 cylinder lubrication systems

Large, two-stroke diesel engines on container vessels, oil and gas tankers and bulk carriers require large quantities of cylinder lubricating oil, resulting in high operating costs and emissions. SKF's electronically controlled CLU4 and CLU5 cylinder lubrication systems offer effective timed and load-dependent lubrication of the cylinder liner and piston areas. By reducing oil consumption and eliminating the spillage of lubricant, the CLU4 and CLU5 deliver significant environmental and operational savings.

With the systems' pulse-jet principle, it is possible to utilize cylinder oil more efficiently on engines with bore diameters ranging from 350 to 960 mm (13.7 to 37.7 in.). The improved cylinder lubrication means less oil consumption and more reliable piston operation. In addition, the systems' lower guide feed rate means less particulate emissions from the funnel and reduced sludge oil from below the piston.

SKF BeyondZero solutions can help reduce CO<sub>2</sub> emissions, preserve limited resources and protect the environment from the use and spread of toxic substances. For more details, including documentation of reduced environmental impact, visit [www.beyondzero.com](http://www.beyondzero.com)



# Optimize lubrication with CLU4 and CLU5 systems

## Operational benefits

- Reduces operating costs due to lower oil consumption
- Minimizes installation costs with its modular design
- Improves overall efficiency and environmental impact
- Reduces deposit build-up due to optimized lubrication

## Operational features

- Modular structure of timed lubricator allows system servicing while operating
- Mechanically defined, non-adjustable metering rates and integrated valve functions prevent operating errors
- High performance filter system with scale to measure oil consumption
- Separate electronic control unit to monitor the lubrication function of each cylinder
- Double-wall piped system automatically traces possible leaks and provides maximum fire prevention

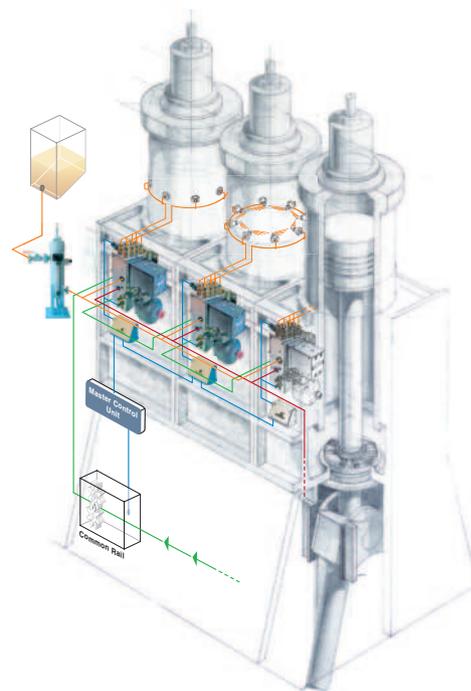
## SKF's cylinder lubrication systems utilize electronic controls to achieve significant results

Key components of the CLU4 and CLU5 cylinder lubrication systems include a timed lubricator, quills and a filter system. Both the CLU4 and CLU5 can be driven by hydraulic oil from an existing common rail system or an optional oil supply unit. A master control unit evaluates the engine condition and load factors and optimizes the cycle rate and metering. The lubricant stroke volume is displaced to the quill, and the metered oil quantity is sprayed on the liner or piston ring package.

With proper design and adjustment, it is possible to reduce oil consumption to approximately 0.6 g/kWh (0.44 g/BHP-h). In combination with the quills in the

cylinder wall, every point on the moving pistons can be lubricated. Special quills with integrated spray nozzles are available and can lubricate the cylinder walls directly.

An example of how the system provides savings involves an overseas container ship with a 65 600 kW engine. When travelling normally between continents, the ship's engine uses 450 000 liters (118 877 gal.) of lubrication oil per year. By using SKF's CLU4 system, a savings of approximately 135 000 liters (35 663 gal.) per year can be achieved. This 30 percent savings in lubrication oil means the system can pay for itself in its first year of operation.



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