On field test

Cylinder lubrication system

Product series CLU4eco

For safe and reliable lubrication of large, two-stroke, crosshead diesel engines

Large diesel engines with a power range from 7 to 75 megawatts now are used for the economical propulsion of merchant vessels. These engines are electronically controlled, have a large bore-to-stroke ratio to obtain optimized propeller efficiency and utilize state-of-the-art fuel injection systems.

To accommodate this new engine design, for instance the Wärtsilä X Engine series, SKF has adapted its proven CLU4 cylinder lubrication technology to connect directly to the rail box. This new product, the CLU4eco, provides optimized connections and internal pump ports, as well as lube oil stroke volumes that are balanced with the engine characteristics. In addition, this economical cylinder lubrication system focuses on reducing operational costs for ship owners.

SKF's new CLU4eco cylinder lubrication system provides:

- Economic efficiency
- Ease of engine integration
- Improved safety standards
- Ease of service
- Improved environmental standards

For nearly 100 years, SKF has developed and manufactured cylinder lubrication systems for large diesel engines. Today's CLU4eco technology is a result of system refinements to better serve our customers. SKF's timed lubricators, in connection with tangentially located spray nozzles and engine electronics, lubricate every point above, under or on the moving pistons. Due to the piston's movement, the lube oil reaches all calculated high-stress areas, reduces friction and wear, and neutralizes acid corrosion.

How the new CLU4eco cylinder lubrication system can be benefitial for you:

Economic efficiency

- Reduces the oil feed rate to lower operating costs*
- Compact hardware simplifies assembly and service
- SKF global product support

Ease of engine integration

- All system oil and lube oil inlets are simply located in the rail box
- 6, 8 or 10 horizontal pump outlets configured for easy assembly

Improved safety standards

- Due to direct rail mounting, no risk of external leakage; double-wall piping no longer required
- Preset and calibrated stroke volumes for the running-inn and normal operating mode prevent improper adjustment
- Utilizes gas-tight, non-return valve technology for functional safety
- Unique port arrangement reduces risk of mixing system and lubricating oil
- Easy and quick replacement

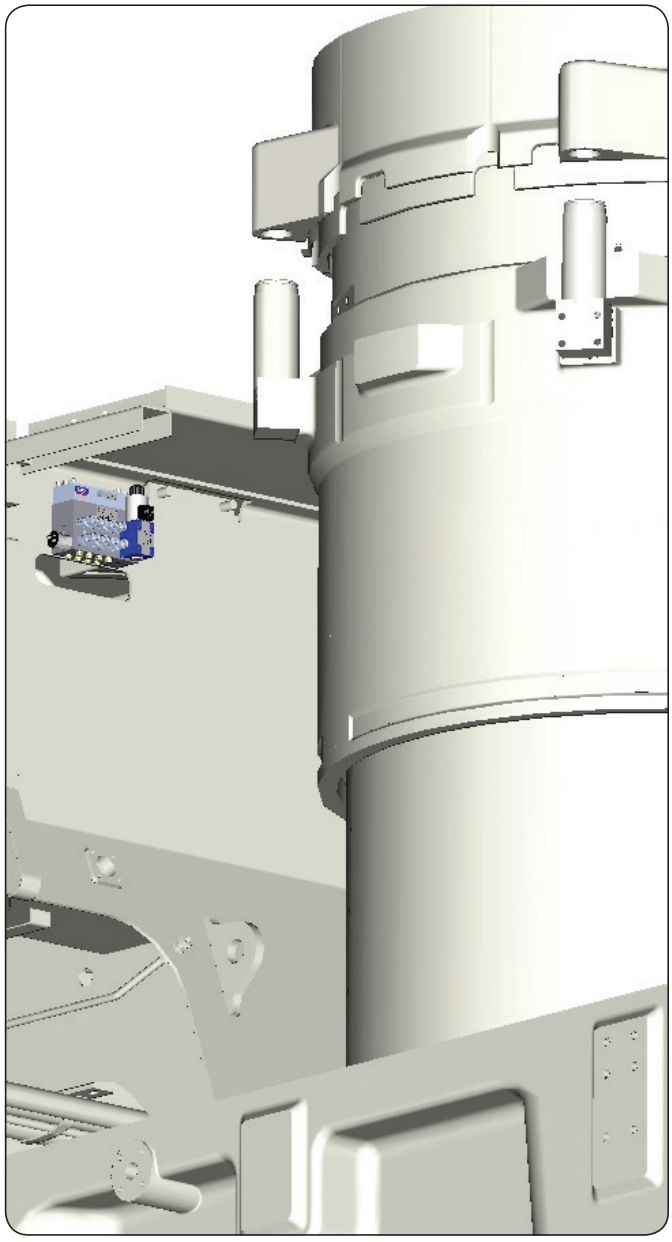
Ease of service

- Easy access to main components
- Compact, lighter-weight design
- Optimized self-venting function
- Requires no service-intensive accumulators

Improved environmental standards

- Optimized liner oil film thickness prevents liner wear, thanks to quill/nozzle techology
- Same pump pressure ratios for stable oil spray patterns independent of engine bore size and outlet quantity
- More frequent delivery of smaller oil portions reduces the oil feed consumption. Contact your engine supplier for actual recommendations
- Reduces CO_2, soot and other emissions

* Compared to SKF lubrication system CLU4



Why specify SKF's CLU4eco cylinder lubrication system for your next engine?

- Unique customer and service friendly design
- High operational safety standards
- SKF quality standards, in-house design, production, inspection, upgrades and life cycle care
- Global customer support

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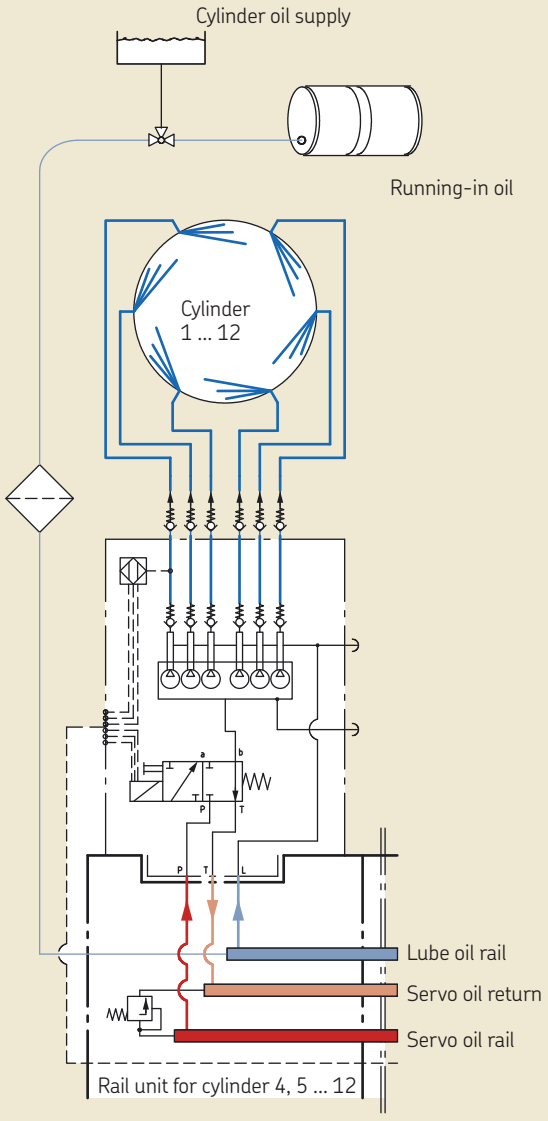
CLU4eco with rail unit connection



System function

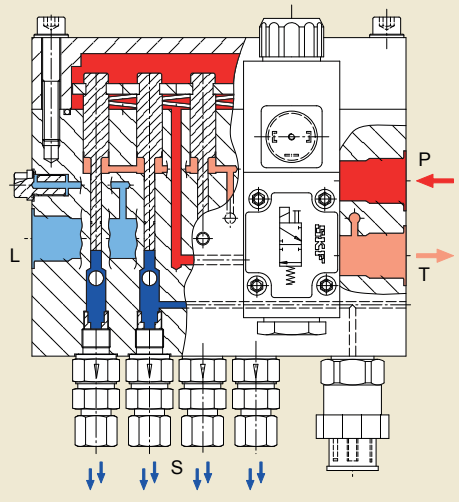
The engine's master control unit monitors the load data and generates an exact lube pump algorithm based on the selected pump version and individual cylinder.

The two-way solenoid valve on the pump follows this signal and opens the system oil supply to the metering pistons. A predefined lube oil volume is dispensed through non-return valves, "spaghetti pipes" and quills/nozzles to the liner. The solenoid valve returns to its starting position, the spring-loaded metering pistons refill with oil and the system is ready for the next injection. This dynamic process is monitored by a high-speed pump sensor.

Technical data

Temperature	+5 to 75 °C
Inlet pressure	50–65 bar
Working principle	Piston pump
Operating system	Electro-hydraulic
Operating viscosity	25–2 000 mm²/s
Number of outlets	6, 8, 10
Stroke volume	45–240 mm³/outlet
Mounting position	Vertical, outlets to front

CLU4eco working principle



Outlets and sensor drawn in a vertical position

(**P**) Servo oil high-pressure inlet
(**T**) Servo oil return
(**L**) Lubrication oil inlet
(**S**) Lubrication oil outlet

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Important information on product usage
SKF and Lincoln lubrication systems or their components are not approved for use with gases, liquefied gases, pressurized gases in solution and fluids with a vapor pressure exceeding normal atmospheric pressure (1 013 mbar) by more than 0,5 bar at their maximum permissible temperature.

Additional brochures for more information

PUB LS/S2 14673 EN	*Improve fleet reliability*
951-130-314-DE/-EN	*CLU4 - Operating instructions*
951-130-332-DE/-EN	*CLU4-C - Operating instructions*
951-160-012-DE/-EN	*CLU4/CLU4-C - Spare part list*
951-170-225-DE/-EN	*CLU4eco - Operating and assembly instructions*
951-170-210-DE/-EN	*CLU5 - Operating and assembly instructions*

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This brochure was presented to you by:

PUB LS/P2 14751 EN · April 2016 · 1-0363-EN