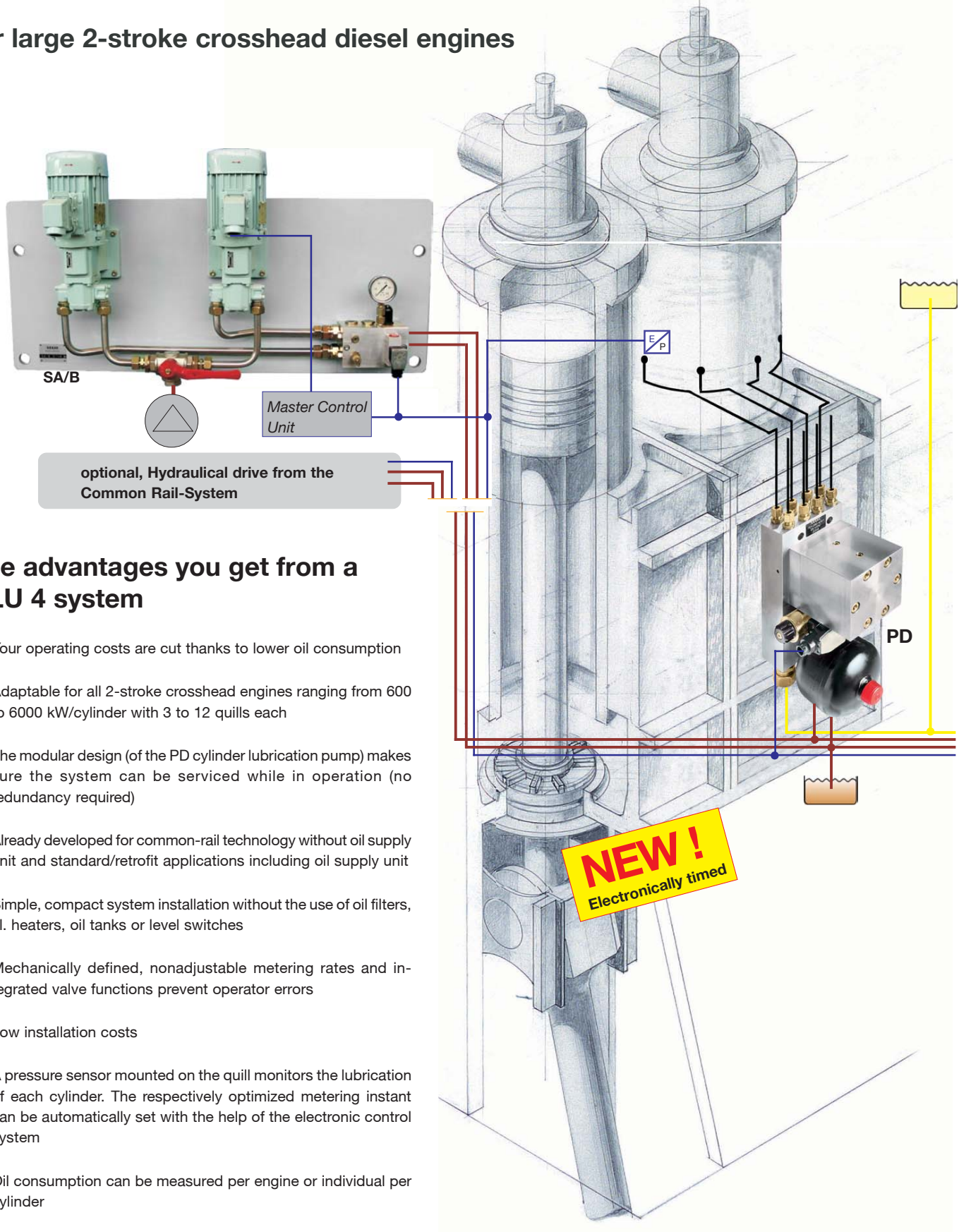


# Cylinder Lubrication System CLU 4

1-0304-US

for large 2-stroke crosshead diesel engines



## The advantages you get from a CLU 4 system

- Your operating costs are cut thanks to lower oil consumption
- Adaptable for all 2-stroke crosshead engines ranging from 600 to 6000 kW/cylinder with 3 to 12 quills each
- The modular design (of the PD cylinder lubrication pump) makes sure the system can be serviced while in operation (no redundancy required)
- Already developed for common-rail technology without oil supply unit and standard/retrofit applications including oil supply unit
- Simple, compact system installation without the use of oil filters, el. heaters, oil tanks or level switches
- Mechanically defined, nonadjustable metering rates and integrated valve functions prevent operator errors
- Low installation costs
- A pressure sensor mounted on the quill monitors the lubrication of each cylinder. The respectively optimized metering instant can be automatically set with the help of the electronic control system
- Oil consumption can be measured per engine or individual per cylinder



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**VOGEL**  
Centralized  
Lubrication

Willy Vogel AG has been making cylinder lubrication systems for large 2-stroke crosshead diesel engines for many decades now. Specially developed lube pumps in conjunction with so-called accumulators ensure efficient, load-dependent lubrication of the cylinders.

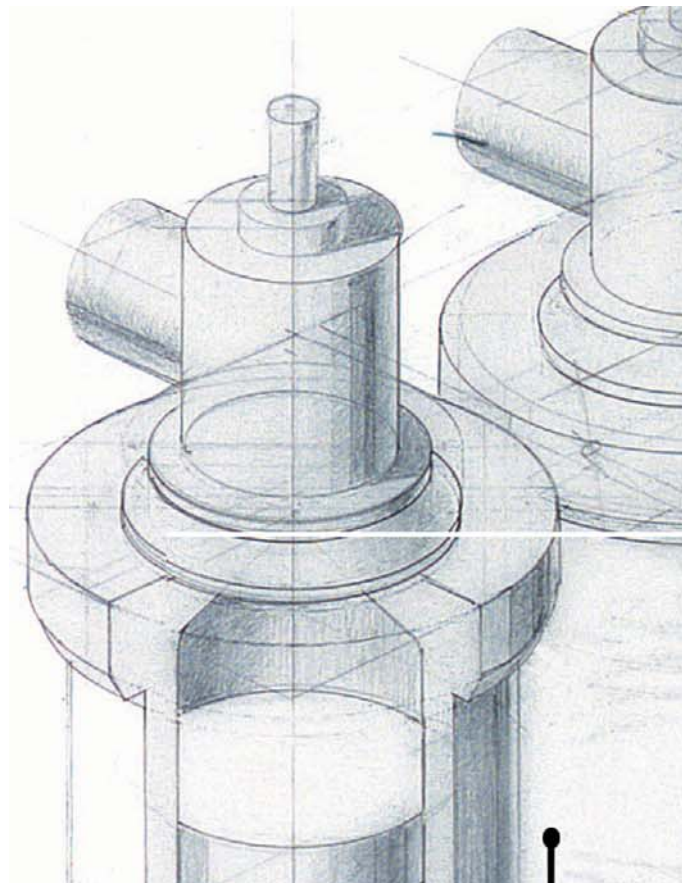
The fully electronically controlled CLU 4 cylinder lubrication system was developed to supplement the existing CLU 3 system and its system-related advantages (such as high dependability, ease of operation and simple maintenance).

The CLU 4 system was developed with the aim of bringing oil consumption even more into line with the main load factors and operating conditions.

The main factors involved include the engine speed, load, running- in status etc.. Moreover, attention is also paid to the fuel and the lubricant's composition.

After the Master Control Unit evaluates the load factors it optimizes the cycle rate and metering instant. With an optimal system design and adjustment it is possible to cut oil consumption even more to roughly 0.7g/kWh (0.5g/BHP), thus going easy on resources.

The newly developed CLU 4 electronic cylinder lubrication system does this with the help of the latest control electronics. Thanks to a smart combination with special quills in the wall of the cylinder it is possible to wet every point on the moving pistons, e.g. the ring package, piston skirt, etc. or surfaces of the heavily loaded cylinder wall, with defined quantities of lubricating oil (multipoint).



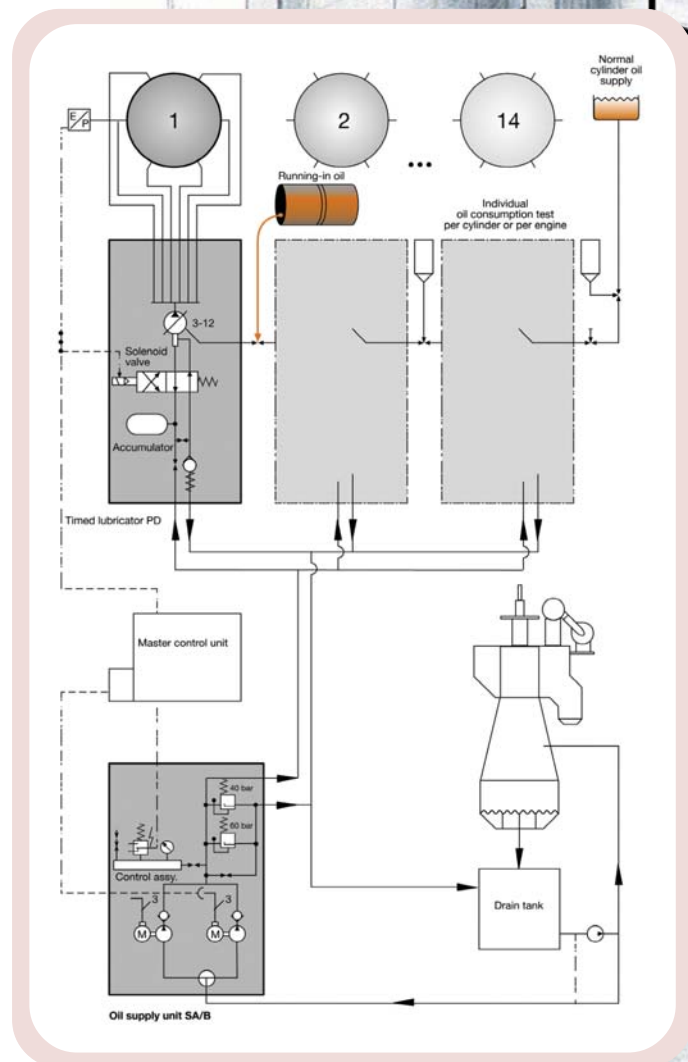
## System function CLU 4

The CLU 4 lube system consists primarily of:

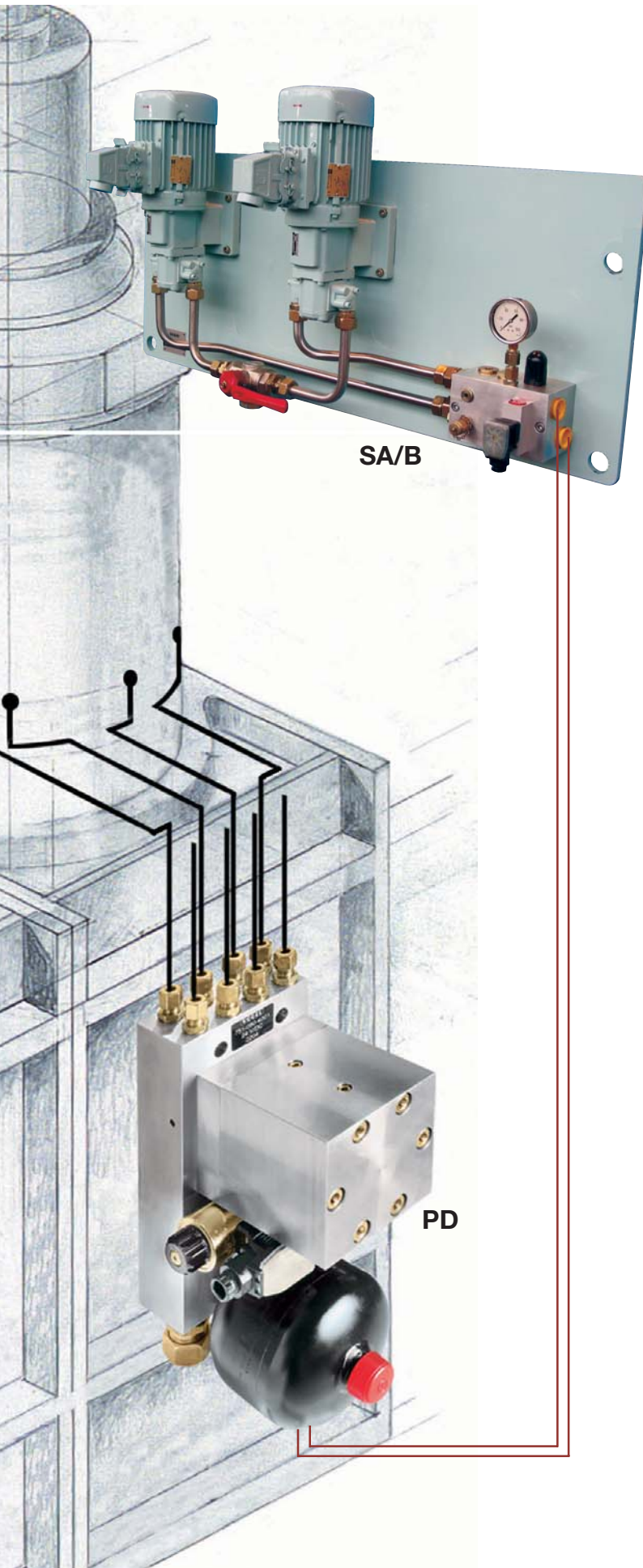
- oil supply unit type SA/B to drive the type PD timed lubricator
- timed lubricator type PD (1 per cylinder) with 3 to 12 outlet ports
- quills and special developed electronic control system (provided by the customer).

The oil supply unit is activated before the engine is started up. The unit then takes the system's oil from its oil tank or circulating oil supply. The oil is delivered to the timed lubricators at pressure of roughly 40 bars, where it serves as the drive medium. The amount of lubricating oil needed by a cylinder is determined by the electronic control system and a lube pulse is triggered by the actuation of a 4/2-way solenoid valve.

The metering pistons nested in the central drive piston abruptly execute a jointly defined metering stroke. The special quills with/without a spray/injection function discharge their exact quantity of lubricant with pinpoint accuracy. Depending on the load and operating state a lube pulse is triggered with every 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> or n<sup>th</sup> piston stroke or crankshaft revolution.







SA/B

PD

### oil supply unit Type SA/B

The oil supply unit comes in three performance ranges for small, medium-size and large two-stroke engines. The two pump units (one of them a standby pump) are preinstalled on a baseplate together with a valve block.

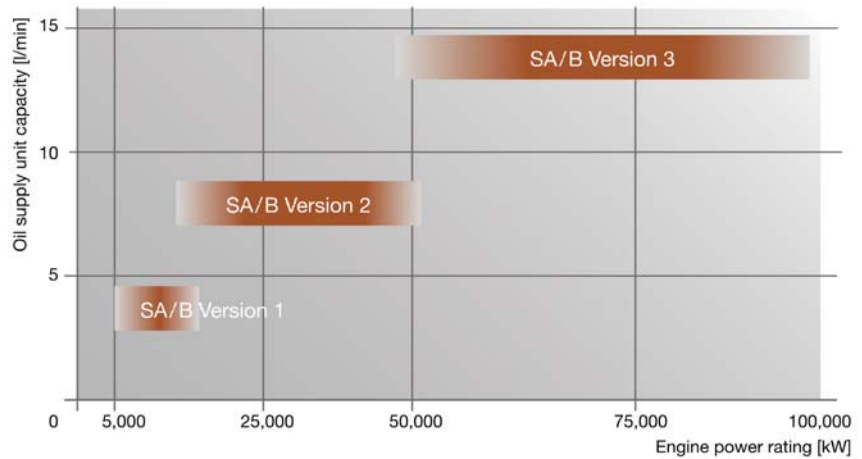
- Vibration-free version of an electric motor with secure plug-type connection
- Rugged high-pressure gear pump, also suitable for oil feed systems (5 bar max.)
- Valve block with multiple functions and integrated outlet-port connectors for system pressure relief and maintenance while in operation
- Simple and clear layout of components, individually tailor made to meet your needs on request

### timed lubricator Type PD

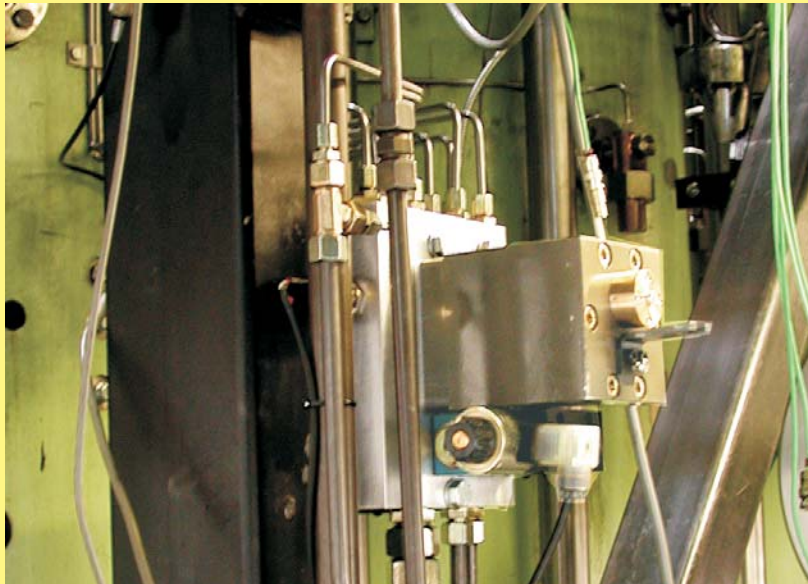
Depending on the application and type of engine the pumps are outfitted with 3 to 12 metering pistons and a calibrated metering screw. The baseplate contains the valve functions and is supplemented with a pressure accumulator and solenoid valve.

- Forced metering of the lubricant
- Wide range of lube oil viscosities - thanks to port control
- Solenoid valves with pushbutton for manual and electrical pre-lubrication
- Compact design with integrated valve screws to stop the system and relieve pressure during maintenance work
- Only one pressure accumulator per pump, which permits fast metering strokes and “soft” operation
- Only two centrally located venting screws (lube oil and drive oil)
- If required, direct drive (without oil supply unit SA/B) from a common rail control system possible (max. 200 bar)
- If necessary, e.g. to test individual cylinders, it is possible to deliver running-in oil or special oil
- Powerful pressure boost, can also be used for metering purposes in pressure zones or together with **nozzle concepts**
- Calibrated to your needs and tested at the factory, adjustable by means of exchangeable metering nipples
- Long service life thanks to the mating of special materials and extra long guide arrangements
- Constant stroke volume ensures constant delivery characteristics and/or spray patterns
- All important components are mounted on a baseplate and thus quickly exchangeable

Selection chart, SA/B oil supply unit



Extensive test series over a number of years prove the efficiency of our CLU 4 cylinder lubrication system.



Efficiency, dependability, ruggedness and maintenance ease are the preconditions underlying the CLU 4 cylinder lubrication system. What's more, the CLU 4 system completely satisfies the economic and ecological benchmarks called for by the market. With the CLU 4 cylinder lubrication system you get a product that meets the latest lube technology requirements in the large diesel engine sector and can be expanded to handle any later development. Talk to your 2-stroke engine manufacturer.

**Decide in favor of a modern cylinder lubrication system with a future**

**CLU 4**



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