Single-line lubrication system

Pumps 603S and 653S, QSL/SL injectors

Reliable operation in harsh environments

- Wind turbines – especially offshore
- Construction and mining
- Commercial vehicles
- Compact and medium-sized machines and industrial applications

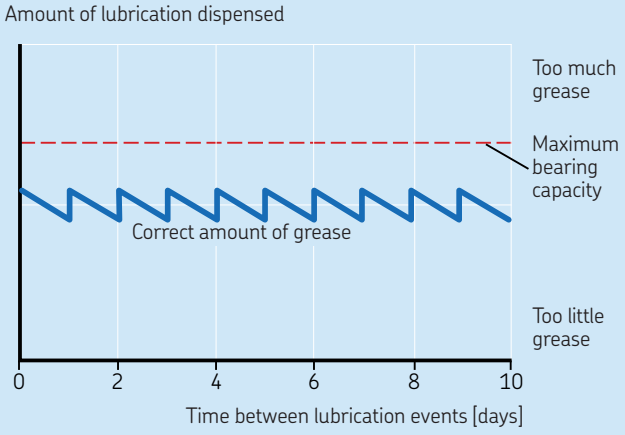
- Robust and easy system layout
- Simple maintenance – easy to expand
- SE1 suction elements for used lubricant
- QSL/SL injectors suitable for high pressure
- Suitable for quick separating lubricants

Advantages of automated lubrication

Centralized or automated lubrication offers several advantages when compared to manual lubrication.

- Increased profits and productivity
- Improved operating times; less costly downtime resulting from improper lubrication
- Lower costs for repairs and spare parts
- Exactly matched metering reduces the cost of lubricant
- Precise metering reduces the environmental impact. No dripping of "too much" lubricant
- Improved safety by minimizing slipping
- Hard-to-reach points are easily accessible from a convenient point – which also improves safety
- Reliable supply of all connected lubrication points. No point is "overlooked"

Lincoln Quicklub cycles



The path to cost reduction

A lack of lubrication can bring your machines and equipment to a screeching halt. Manual lubrication is often awkward and expensive. Automated lubrication offers an efficient, rational and environmentally friendly solution.

From a few lubrication points to a few thousand – Lincoln offers the complete range of lubrication equipment and systems for professional lubrication of construction and mining equipment.

Lincoln lubrication systems are based on the principle of grouping lubrication points together that can be serviced from one supply point.

Our modules build upon each other – enabling the system to grow in accordance with our customer's requirements. This enables us to offer a custom-tailored lubrication solution for individual needs.

Applications

Equipment that operates in harsh conditions requires regular lubrication to ensure performance. When a bearing or component fails as a result of insufficient lubrication the result is downtime and losses. The single-line 603S and 653S pumps/systems automatically supply the lubrication points with exact metered quantities in programmed interval while the equipment is in operation.

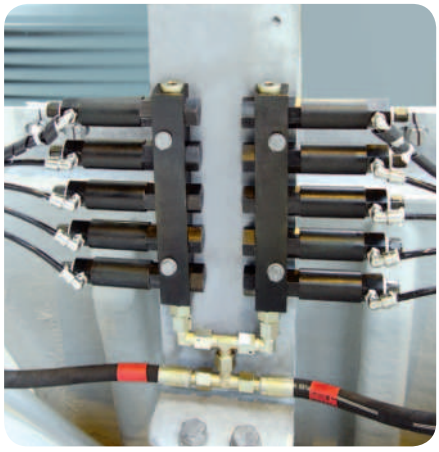
As a result, the robust system is ideally suited for wind turbines – even offshore applications – and for off-road mobile equipment such as construction and mining machines and heavy-duty commercial vehicles.

In the general industry the system is used to lubricate small to mid-sized stationary machines or machine groups.

Reliable performance in harsh environments

QSL and SL injectors are designed for 300 bar pressure. As a result, NLGI 2 greases can be pumped at temperatures below zero without problems. All injectors operate independently of each other. This means that in the event of a blockage or fault of one injector, all other injectors will continue to supply lubricant.

The metal-to-metal fit of the injectors-makes them suitable for high pressure. Each injector's output can be individually set. The injector function is generally visually monitored, but optional electrical monitoring or a GSM controlled system is available.



Simple system design – easy to service and to expand

Pump and accessories – all-in-one

The pump with integrated controller is easy to install. The all-in-one design of the pump includes the programmable controller, a pressure switch/transducer and a vent valve.

Simple system design – easy to expand

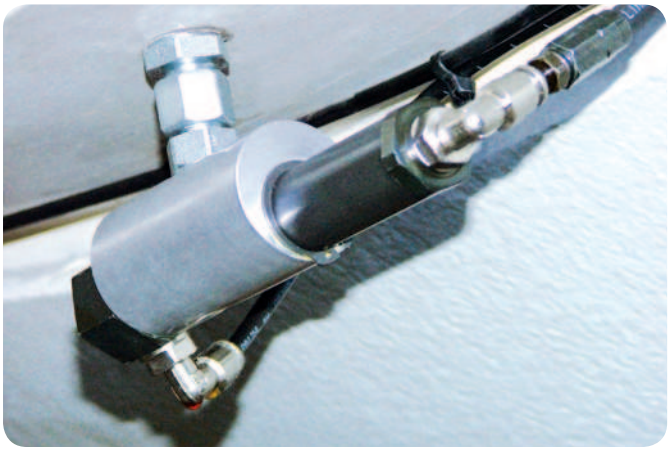
The single-line system's design and layout is uncomplicated, making it easy to install and operate. A single mainline reduces material and installation costs.

Easy to service

It is quick and easy to exchange out an in-jector. The mainline or neighbouring injectors do not have to be removed. The exchange can be performed between lubrication cycles so that there is no wastage of lubricant or excessive costly downtime.

603S Lubrication System including SE1 suction element and used lubricant container

QSL and SL injectors



SE1 suction element

Visual monitoring – to ensure all is well

Each injector has an indicator pin that moves with the pressure buildup and venting. This facilitates easy trouble-shooting when required by simply observing the indicator pins.

Additional pressure switch

An additional pressure switch at the end of larger systems can be used for added pressure control to ensure correct lubrication.

SE1 suction element for the extraction of used lubricant from a single-line system

The SE1 suction element was especially developed to extract the used lubricant from single-line systems used in wind turbines. The used lubricant is collected in a separate 10 liter container AFB 10 and can be recycled – or used fo example for the lubrication of gear drives.

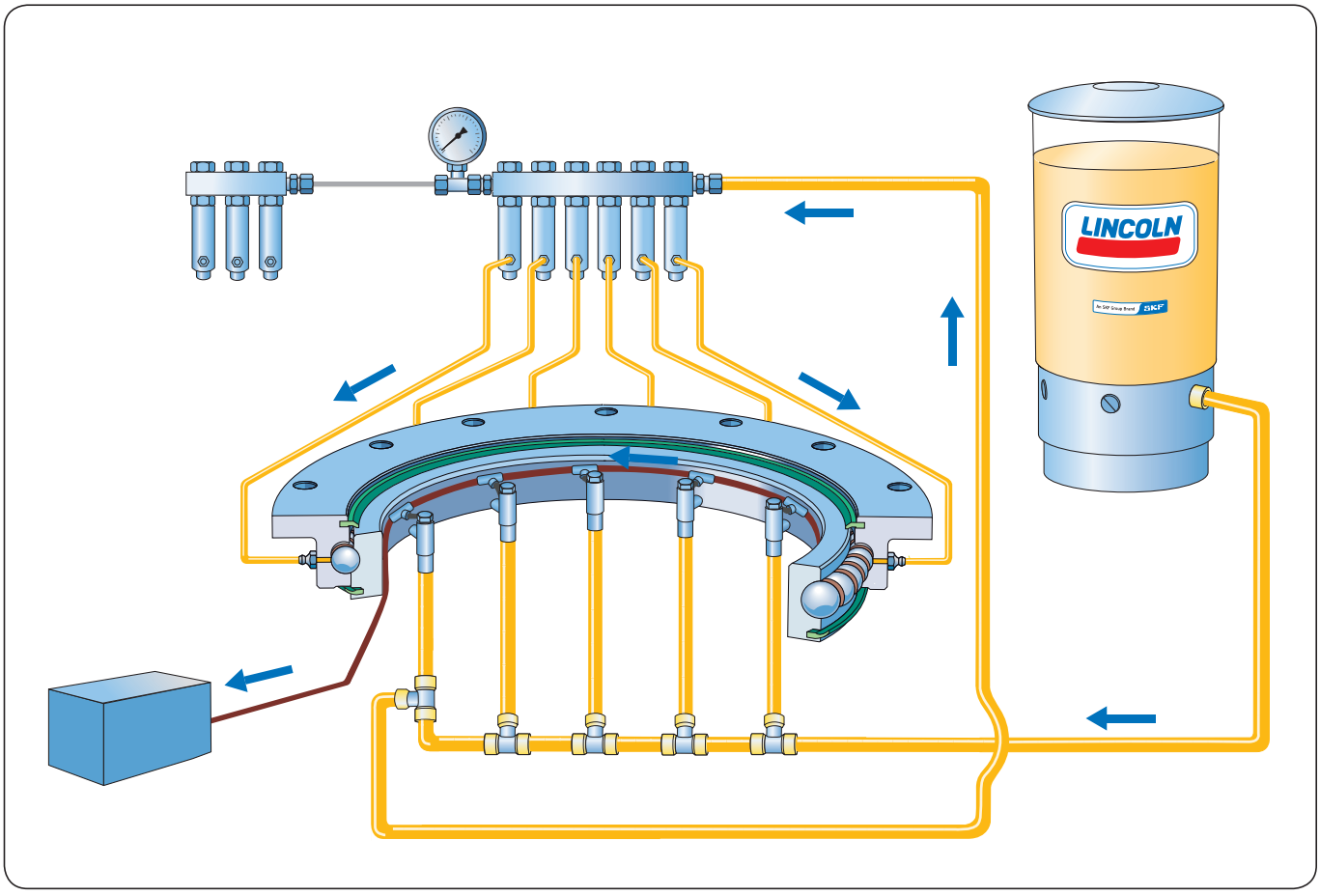
Special features for wind turbine applications – also for off-shore systems

Lincoln single-line systems completely vent during the pause interval. As a result, they are suitable for fast separating lubricants.

For rotating operation in wind turbines the reservoir is equipped with a follower plate and stirring paddle – which also facilitates the usage of fast separating lubricants. For stationary operation a stirring and fixed paddle is sufficient.

As a result, the problem of used lubricants in bearings is reduced. The lubricant no longer pushes through seals and doesn't spoil or pollute the bearing environment. Additionally, a re-usage of the lubricant conserves resources and preserves the environment.

The 603S and 653S lubrication system compatible with SE1 suction elements



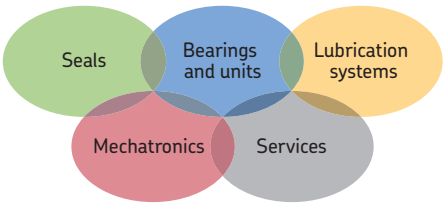
Lincoln single-line systems can be integrated with SE1 suction elements for the collection of used lubraicant. The recovered lubricant can be used for the lubrication of open gears. As a result, this system offers a complete recycling circuit of the lubricant.

Functional principle

The lubrication system consists of a pump 603S/653S and direct operating QSL/SL injectors. The injectors supply lubricant under full pump pressure (direct operating) to the individual lubrication points. The max working pressure is 300 bar. NLGI 2 lubricants can be pumped even at below zero temperatures without problems.

The pumps are designed to internally combine the lubricant of 3 pump elements. This provides sufficient output performance to supply connected injectors. The internal pressure sensor monitors the pressure buildup and venting of the system, and the integrated vent valve ensures that the mainline pressure is relieved after a lubrication impulse.

Pump	P 603S	P 653S
Injector metering	0,05 to 0,4 cm^3/stroke	0,25 to 5 cm^3/stroke
Pump output	12 cm^3	26 cm^3
Supply voltage	12 V DC, 24 V DC, 100 to 240 V AC	24 V DC, 100 to 240 V AC
Visual monitorng (indicator pin)	•	•
Programmable controller	•	•
Additional remote signaling for OEM satellite communication systems		•
Reservoir capacity/liter	4, 8, 10, 15, 20	4, 8, 15, 20
Integrated pressure sensor and vent	•	•
Visual low-level	•	•
Compatible with SE1 suction elements	•	•



The Power of Knowledge Engineering

Drawing on five areas of competence and application-specific expertise amassed over more than 100 years, SKF brings innovative solutions to OEMs and production facilities in every major industry worldwide. These five competence areas include bearings and units, seals, lubrication systems, mechatronics (combining mechanics and electronics into intelligent systems), and a wide range of services, from 3-D computer modelling to advanced condition monitoring and reliability and asset management systems. A global presence provides SKF customers uniform quality standards and worldwide product availability.

Important information on product usage

All products from SKF may be used only for their intended purpose as described in this brochure and in any instructions. If operating instructions are supplied with the products, they must be read and followed.

Not all lubricants are suitable for use in centralized lubrication systems. SKF does offer an inspection service to test customer supplied lubricant to determine if it can be used in a centralized system. SKF 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.

Hazardous materials of any kind, especially the materials classified as hazardous by European Community Directive EC 67/548/EEC, Article 2, Par. 2, may only be used to fill SKF centralized lubrication systems and components and delivered and/or distributed with the same after consulting with and receiving written approval from SKF.

Lincoln GmbH
Heinrich-Hertz-Str. 2–8
69190 Walldorf
Germany

Tel. +49 (0)6227 33-0
Fax +49 (0)6227 33-259

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