

LUBRICATION METHODS USED IN INDUSTRIES

IMPORTANCE OF LUBRICATION !!!

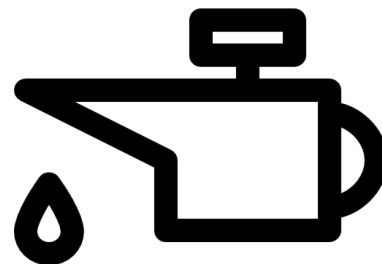


Appropriate lubrication is an important factor to be considered in Industrial Maintenance. Without proper lubrication systems, many industrial and manufacturing processes would wear down from friction, overheating etc. Lubricating systems are the systems used to assist the smooth and healthy operation of rotating machinery parts like gears, bearings, dies, chains, spindles, cable, pumps and rails. Without proper lubrication, Industrial bearings rarely last more than 10% of their working life span. Machinery that requires constant maintenance increases production downtime and negatively affects overall commercial productivity.

Most of Industries agree that over 50% of total industrial bearing failures occurs due to a lack of proper lubrication.

Classification of Lubrication Methods

1. Conventional lubrication methods
2. Automated lubrication methods



CONVENTIONAL LUBRICATION METHODS

Different methods are used to apply lubricants to machinery. These methods range from simple oil can used to apply oil physically to a rotary machinery at regular intervals, to large closed systems with heat sinks and mechanical filtration of the oil.

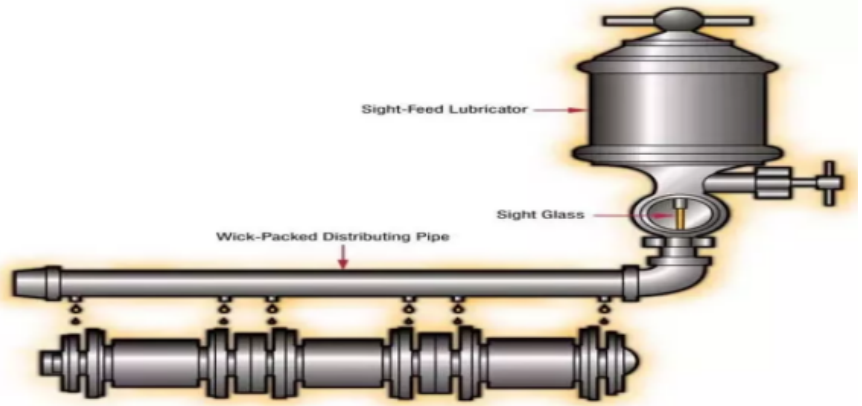
Most common methods used for lubrication in conventional methods are:

- Drip oil feed lubrication
- Splash oil feed lubrication
- Force oil feed lubrication
- Grease lubrication

conventional

Drip oil feed Lubrication

Systems operating on low speed, low load & low to moderate speed have bearings where small quantity of oil at regular intervals is expected. Drip oil feed systems consists of a loosely covered manifold of oil placed above the bearing that meters out oil at regular intervals. The supply is controlled by needle valve and can be adjusted as per requirement.

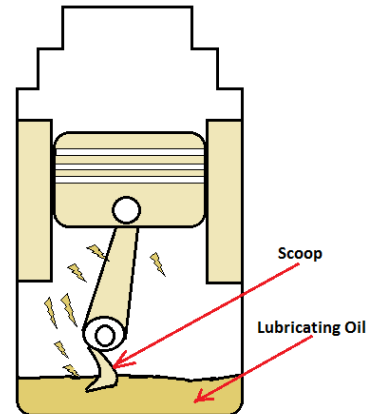


A drip feed reservoir connected to one bearing is called as single point system and when connected to several bearings is referred as multiple point systems. A drip oil feed system can also be pressurized to supply oil to bearing system under pressure. The reservoir is partially or completely transparent and can be refilled by hand.

Splash oil feed Lubrication

Splash oil feed is a term applied to a variety of continuously lubricated bushings or pistons. Oil is splashed on the bearings or pistons from the action of various moving parts regularly dipped in lubricating oil.

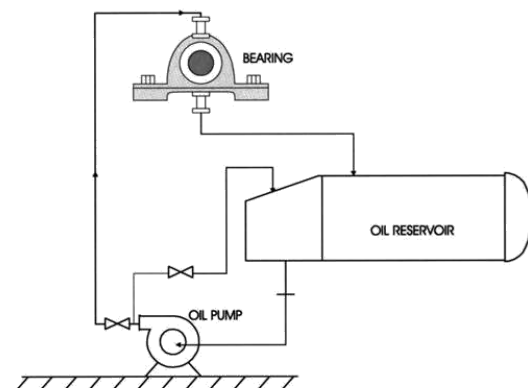
Splash oil feeding is practical when the housing can be positively oil tight and the rotation is not so fast enough to churn up the oil.



Splash oil feed system has a oil scoop directly resting on the shaft. The lower half of the ring is submerged in a oil reservoir located in the lower half of bearing housing. As the shaft rotates, the oil scoop turns carrying oil from reservoir up to the top of casing. The oil spreads across the shaft and bearings thus lubricating it and any excess runs back down into the reservoir.

Force oil feed Lubrication

High speed or High load equipment can develop High temperatures from friction. To protect equipment from such high temperatures, a high flow of oil is needed. In force oil feed lubrication system, the pressurized oil from oil pump is directed to the rotating component. Turbine generators, boiler feed pumps, compressors and gear boxes mostly use Force oil feed lubrication.



The system usually has three steps of continuous operation. Firstly, oil from gearbox is collected and send to oil reservoir; Then the oil pump takes the suction from the reservoir, and lastly the pump discharges oil through an oil cooler and back to gear box.

Grease Lubrication

Greases are semi solid lubricants. They are used instead of oil when the lubricant has to stay in one place or stay adhered to the part. Greases do not leak out as easily as oils. Greases are also used when the component cannot be lubricated often and are not accessible during operation. Greases are thick & viscous. Therefore, unlike oil, cannot be pumped continuously through equipment to remove heat. Greases prevent friction and wear, protect against corrosion. Greases used for lubrication must necessarily provide seal from dirt and water and does not leak or drip off the surface to which it is applied and to lubricate for long time without breaking down.



Greases are applied to machinery by:-

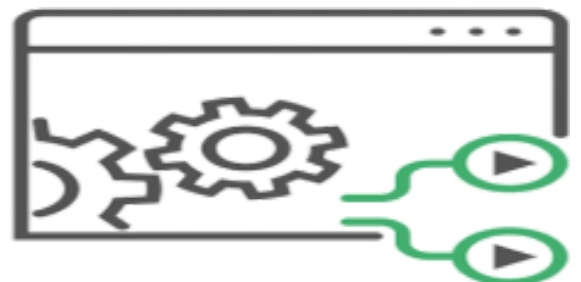
- Grease guns
- Hand filling
- Spray machines or aerosols



AUTOMATED LUBRICATION METHOD

Generally known as Centralized Lubrication system, is a system that is Automated and delivers specific amount of lubricant to multiple locations on a machine at the same time while the machine is operating.

Automated lubrication system is designed to apply lubricants in small, measured amounts over short & frequent time intervals. Human resources, time constraints and sometimes the physical location on machine often makes it impractical to manually lubricate the points.



Regardless of the manufacturer of system, all automated lubrication systems have these 5 main components:

- Controller / Timer - activates the system to distribute the lubricant. Lubrication can be linked to a POS system.
- Pump with Reservoir - stores and supplies the lubricant to the system.
- Supply Line - line that connects the pump to the metering valves or injectors. The lubricant flows through this line.
- Metering Valves / injectors - Components that measures/dispenses the lubricant to the application points.
- Feed lines - line that connects the metering valves & injectors to the application points.

Some of Most commonly used Automated Lubrication systems are:

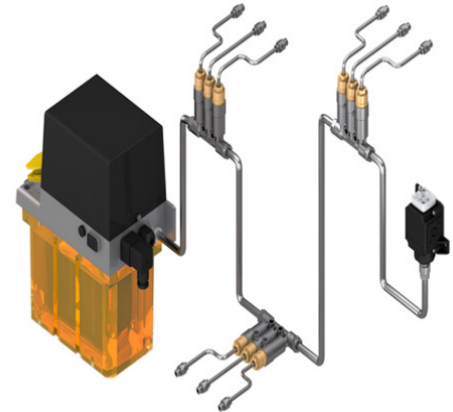
- Single Line Parallel,
- Dual Line Parallel &
- Multi point direct Lubrication.



Single line parallel Automated Lubrication

Operation begins as the controller sends signal to the pump. The pump begins pumping lubricant to build up pressure in the supply line. Once the required pressure is reached, injectors dispense a predetermined amount of lubricant to the points via feed lines.

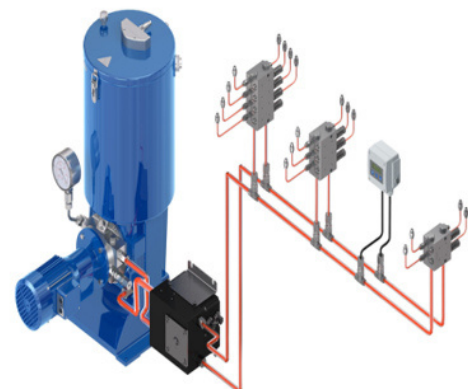
Once the entire system reaches the desired pressure, a pressure switch sends a signal to the controller and the pump shuts off. Pressure is vented and grease in the line is redirected back to pump reservoir, until normal pressure is restored.



Dual line parallel Automated Lubrication

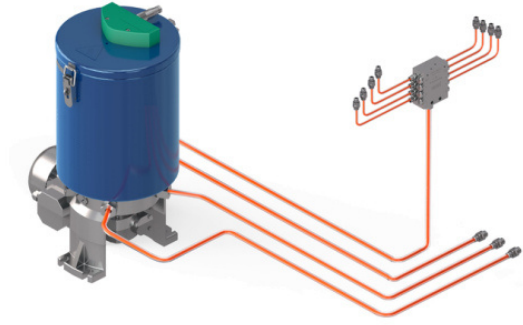
A Dual line parallel system is same as the single line parallel system that uses two main supply lines which are alternatively used as pressure and vent lines. Advantage of a dual line system is it can handle hundreds of lubrication points from single pump station over thousands of feet.

Operation begins as the controller sends the signal. The pump begins pumping lubricant to build up pressure in the first pressure line, simultaneously venting the second line. Once the required pressure is reached, a fixed amount of lubricant is dispensed.



Multi - point direct Lubrication

The Controller in the pump activates the drive motor, a set of cams turns and activates individual injectors or pump elements to dispense fixed amount of lubricants to each point. These systems are easy to design, direct pump to point without additional accessories.



ADVANTAGES OF AUTOMATED LUBRICATION

- All critical components are lubricated.
- Lubrication occurring in operating condition of machinery.
- Safe operation of machinery due to proper lubrication.
- Energy consumption is less due to less friction.
- Overall productivity is increased due to reduction in down time.
- Lubrication is carried out in proper safety.



SCOPE FOR MOSIL

MOSIL has a wide range of speciality lubricants that can be used in both Conventional as well as Automated lubrication methods.

All Mosil products can be used in Conventional Lubrication method. Mosil lubricants having NLGI 000,00,0 & 1 can be used for Automated lubrication methods. NLGI 2 & 3 lubricants can also be used in centralized or Automated lubrication, provided the pumpability of pumps and the flow pipe diameters are increased.