

METERING PUMPS

TopLine pumps - X9 series Maintenance Plan



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- To check
- To correct
- To avoid



Topline Pumps

WHAT IS ?

- Maintenance Plan
- Corrective Maintenance
- Preventive Maintenance
- Predictive Maintenance



Maintenance PLAN

- **Ensures long life** and correct pump operation.
- **Helps to prevent** faults that would cause production downtime.
- **Avoids wasting time** and allows saving money.
- **Schedule the maintenance** considering pump/plant downtime.



CORRECTIVE Maintenance

- It is currently the most commonly used method.
- It is an **urgent** maintenance work to repair an **unexpected failure**.
- Forces unscheduled pump/plant downtime, generating **leaks of time and money**.
- Usually happens that the user **does not have** spare parts available from stock.



PREVENTIVE Maintenance

- It is better than Corrective Maintenance.
- It is a **set of activities** to keep the optimal pump performance and prevent failures.
- It is based on **pre-established periodic inspections**.
- The components subject to wear are **systematically replaced**.



PREDICTIVE Maintenance

- It is better than Preventive Maintenance.
- With specific periodicity, **precise parameters of the pump** (and of the process) are checked.
- **The results are** recorded on specific reports and **compared with the previous ones.**
- Finding any anomalous "deviations" reveals the need to **organize a maintenance.**

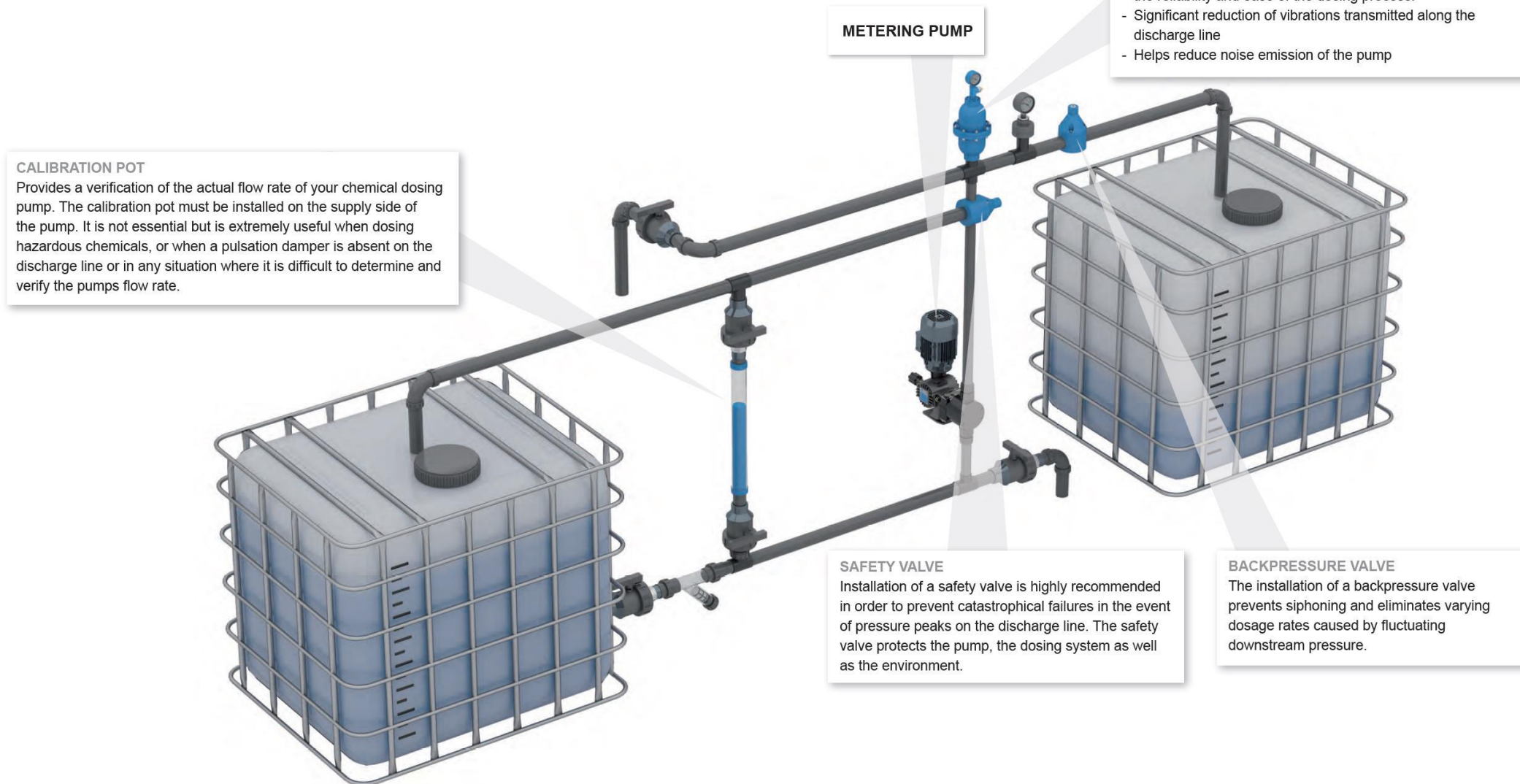


TEST

PLANT EXAMPLE

Accessories usefull for maintenance

Example of system for metering pumps



Accessories usefull for pump check and maintenance

To be installed on **discharge** pipeline:

- **Pressure gauge.**
- Pulsation dampener.
- Backpressure valve.
- Safety valve.

To be installed on **suction** pipeline:

- **Calibration pot.**
- Filter.

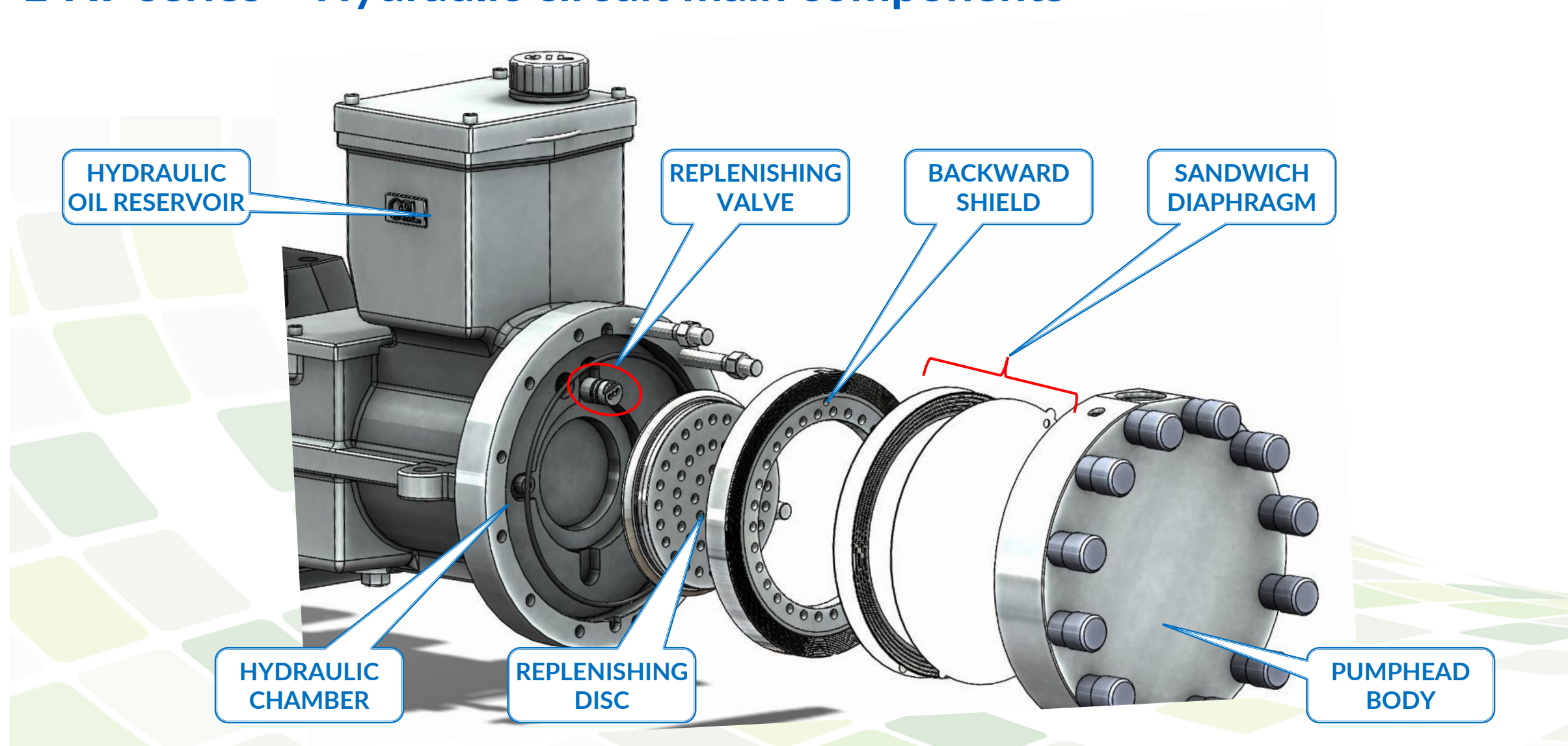


L-X9 series

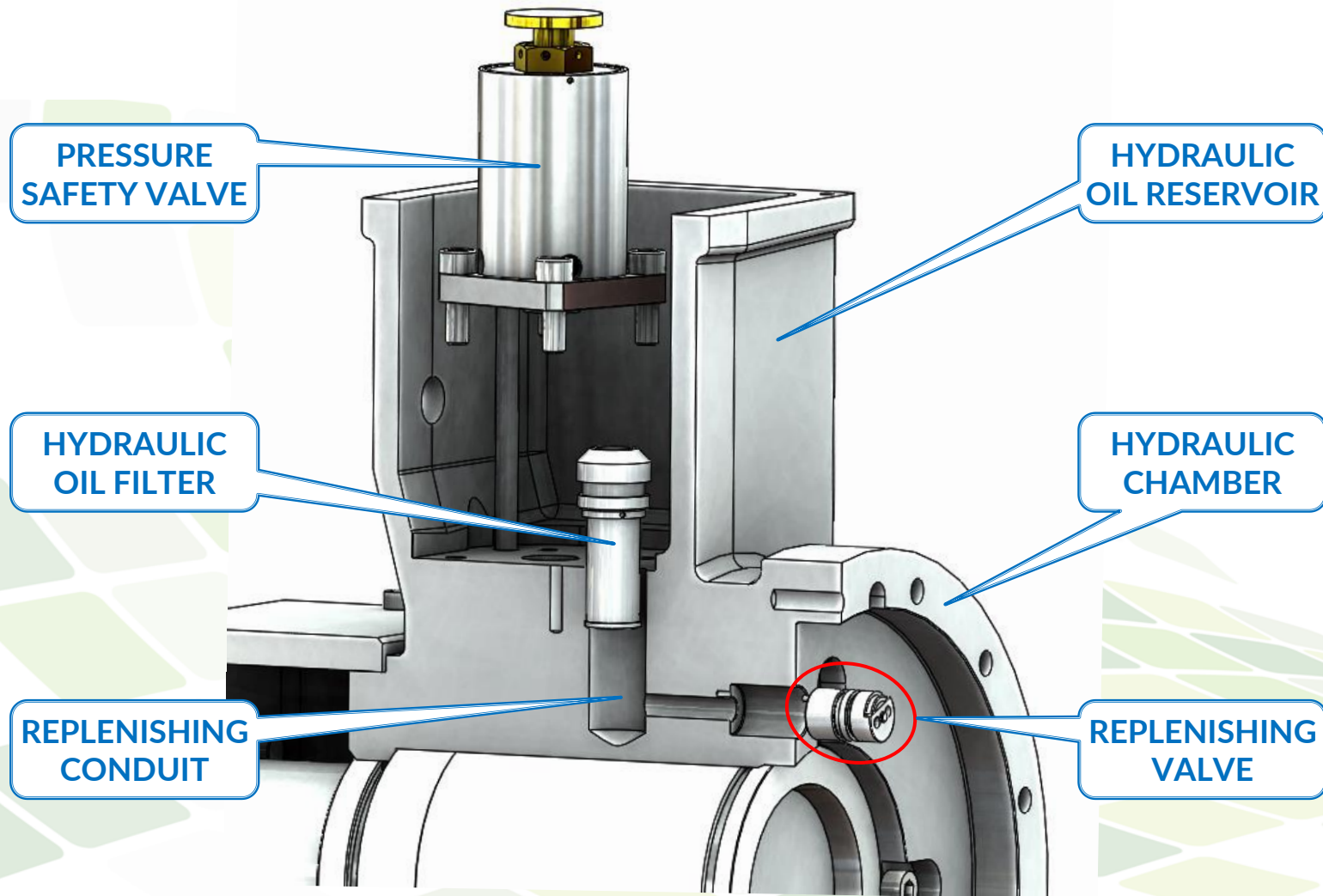
Sandwich Hydraulic Diaphragm

API675 pump for the toughest processing applications

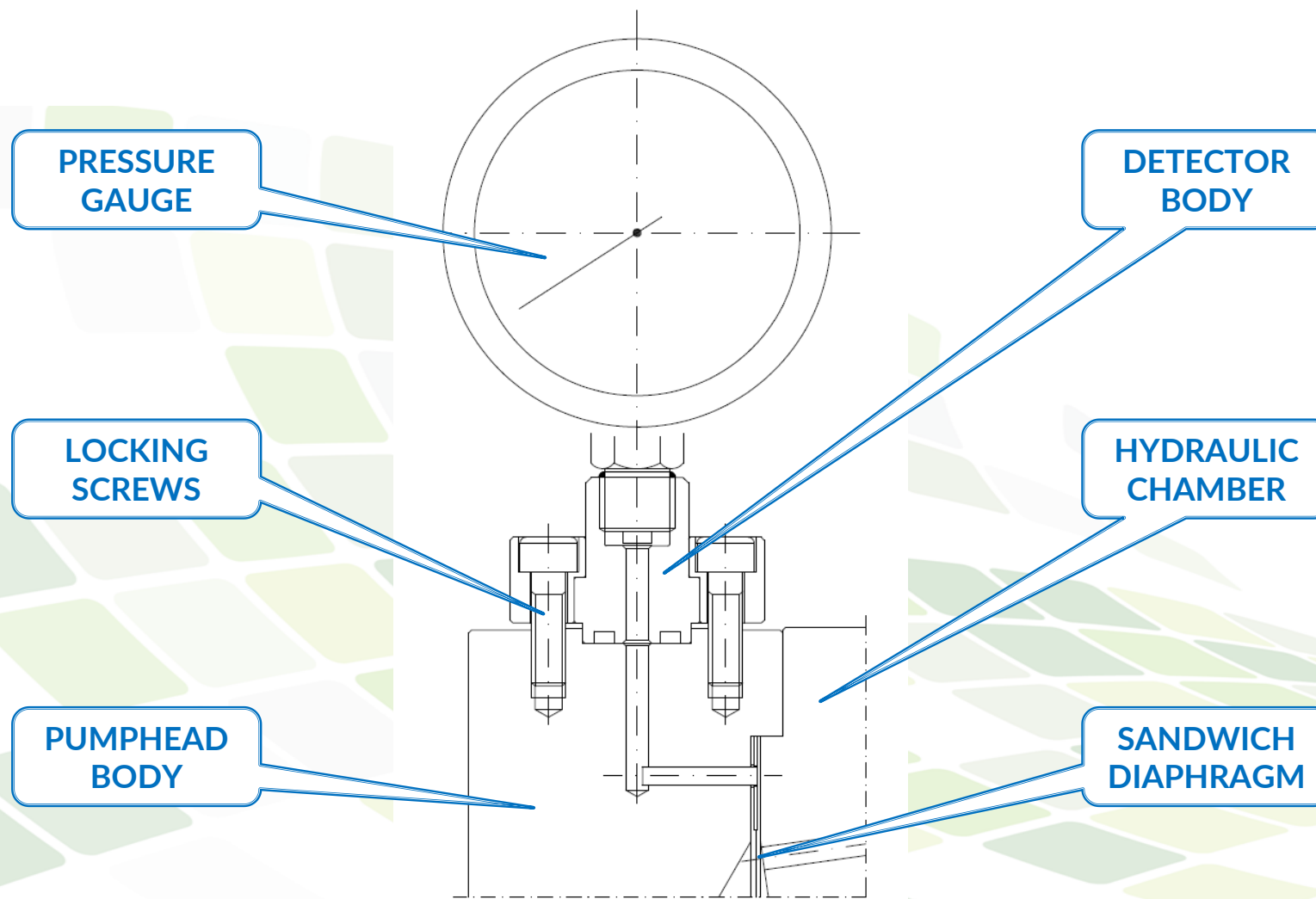
L-X9 series – Hydraulic circuit main components



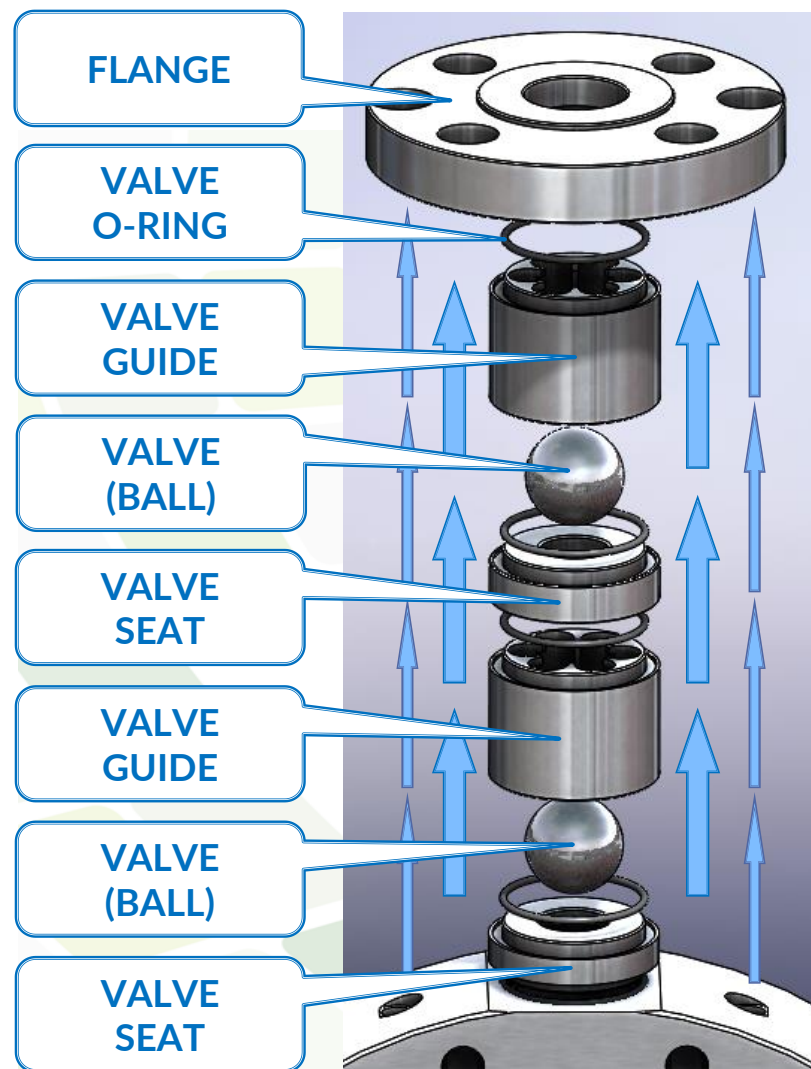
L-X9 series – Hydraulic circuit main components



L-X9 series – Diaphragm rupture detector (basic version)



L-X9 series – Valve unit components



**WRONG
MOUNTING**



**CORRECT
MOUNTING**

L-X9 series – Inspection and maintenance plan

WHEN ?	INSPECTION	MAINTENANCE ACTION
Every week.	Check the oil condition: - hydraulic in the oil reservoir. In case of BAD condition -> - lubricant in the gear reducer. In case of BAD condition ->	Replace the oil: - hydraulic (viscosity ISO VG 32). - lubricant (viscosity ISO VG 320).
Every week.	Check if there are no product leakages from connections elements to the plant pipelines.	Verify: - The screws, nuts and bolts, flanges, are firmly tightened. - The sealing components are efficient and in perfect condition.
Every month.	Verify the external cleaning and the general conditions.	Remove the presences of: - Corrosive product or incrustations. - Rusty (re-paint or apply a grease layer).
Every month.	Check, also based on the process importance and danger, the hydraulic seal and any pumphead deformations (combined action of pressure and temperature).	Verify: - The pumphead locking screws tightening, if necessary adjust the tightening torque.
Every month.	Check if the pumped product temperature is: - lower than 100°C (212°F) for metallic pumpheads. - lower than 40°C (104°F) for plastic pumpheads.	Verify the conditions: - Atmospherics of the plant, the storage of the pumped product. - The pumphead, hydraulic oil, diaphragm rupture detector.
Every 3 months.	Check if the lubricating oil temperature in the gear reducer is lower than 95°C (203°F) .	Verify: - The last change date and the possible oil contamination. - The actual pump operating conditions.
Every 6 months.	Verify (on the pump): - The flowrate conformity. - The valves and diaphragm conditions.	Evaluate the revision of: - The pumphead components. - The complete pump.
Every 2 years or 15,000 hours.		Replace the lubricant oil (ISO VG 320) and hydraulic (ISO VG 32). Replace both the pumphead valve units.
Every 5 years or 50,000 hours.		Replace the diaphragm. Replace the ball bearings.
Technical Note: X9 pumps need two (2) different type of oil; lubricating in the gear reducer (viscosity ISO VG 320) and hydraulic on the hydraulic system (viscosity ISO VG 32).		

Topline Pumps

PUMP AND PLANT

WHAT ?

- To check
- To check
- To avoid

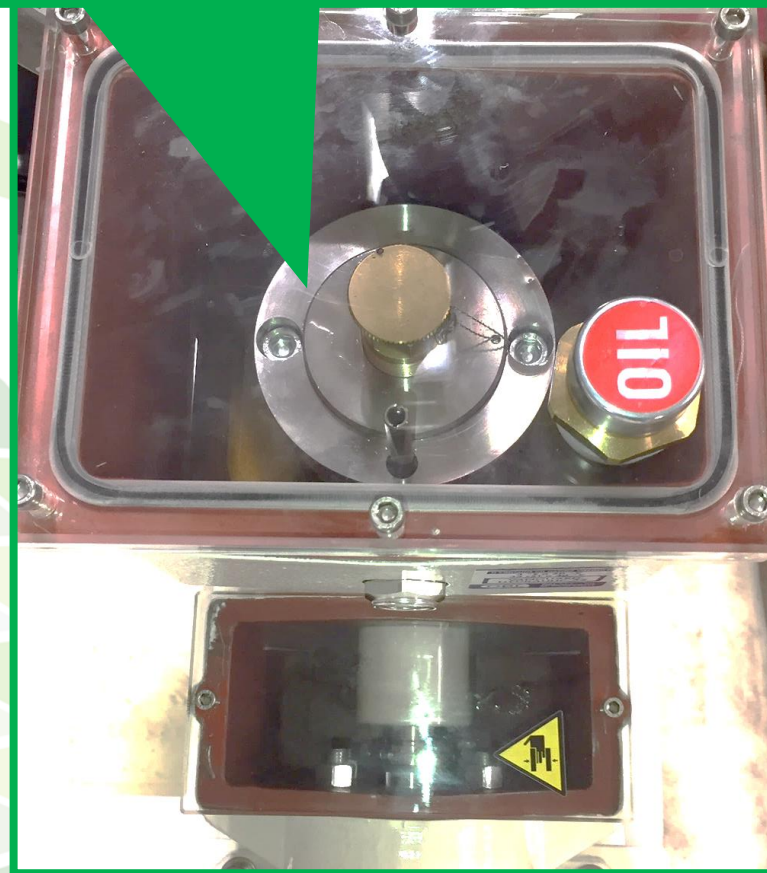
Component analysis:

Poor cleaning and inadequate control of the pump condition.

DIRTY TRANSPARENT COVERS.
IT IS NOT POSSIBLE TO CHECK THE ACTUAL
CONDITIONS OF THE HYDRAULIC OIL.



CLEAN TRANSPARENT COVERS.
IT IS POSSIBLE AND EASY TO CHECK THE ACTUAL
CONDITIONS OF THE HYDRAULIC OIL.

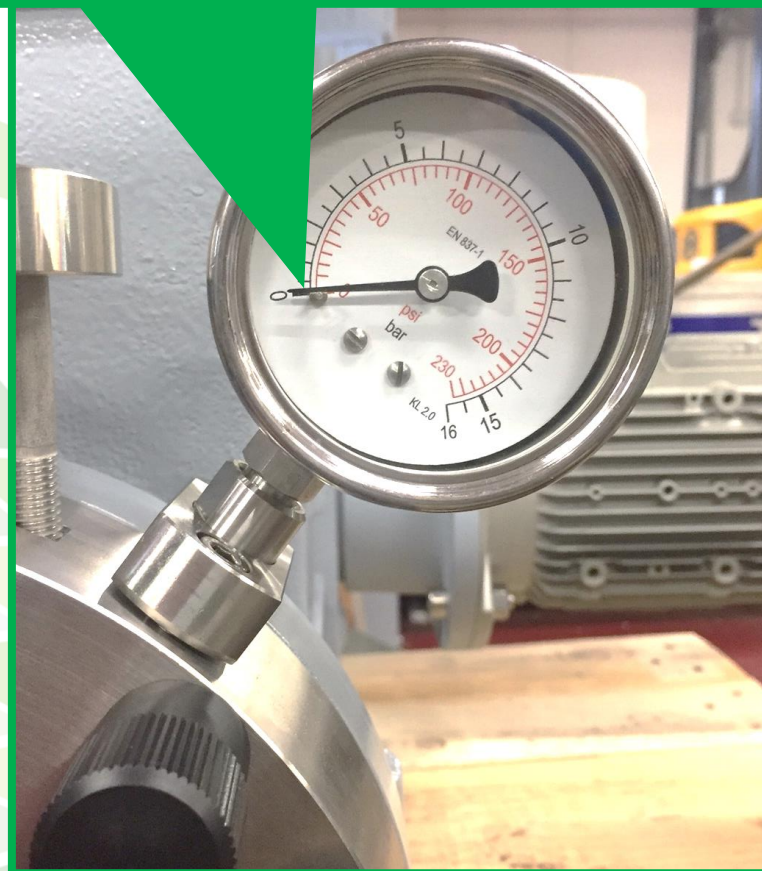


Component analysis: Inadequate control of the pump condition.

THE DIAPHRAGM RUPTURE DETECTOR DOES NOT SHOWS "ZERO PRESSURE". DIAPHRAGM IS BROKEN OR "FALSE SIGNAL" OF RUPTURE.



THE DIAPHRAGM RUPTURE DETECTOR SHOWS "ZERO PRESSURE". DIAPHRAGM IS INTACT AND THE RUPTURE DETECTOR WORKS CORRECTLY.

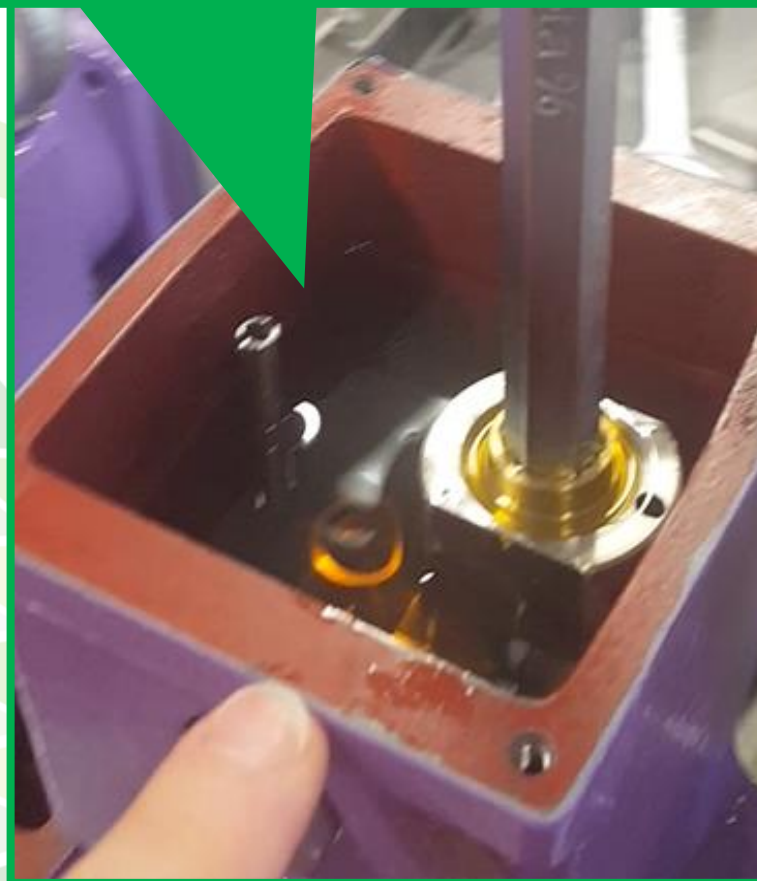


Component analysis: Inadequate control of the pump condition.

HYDRAULIC OIL IN BAD CONDITION.
THE OPERATION OF THE HYDRAULIC SYSTEM IS
COMPROMISED.



HYDRAULIC OIL IN GOOD CONDITION.
(FLUID, TRANSPARENT, WITHOUT SUSPENSION).
ALL THE HYDRAULIC SYSTEM IS EFFICIENT.

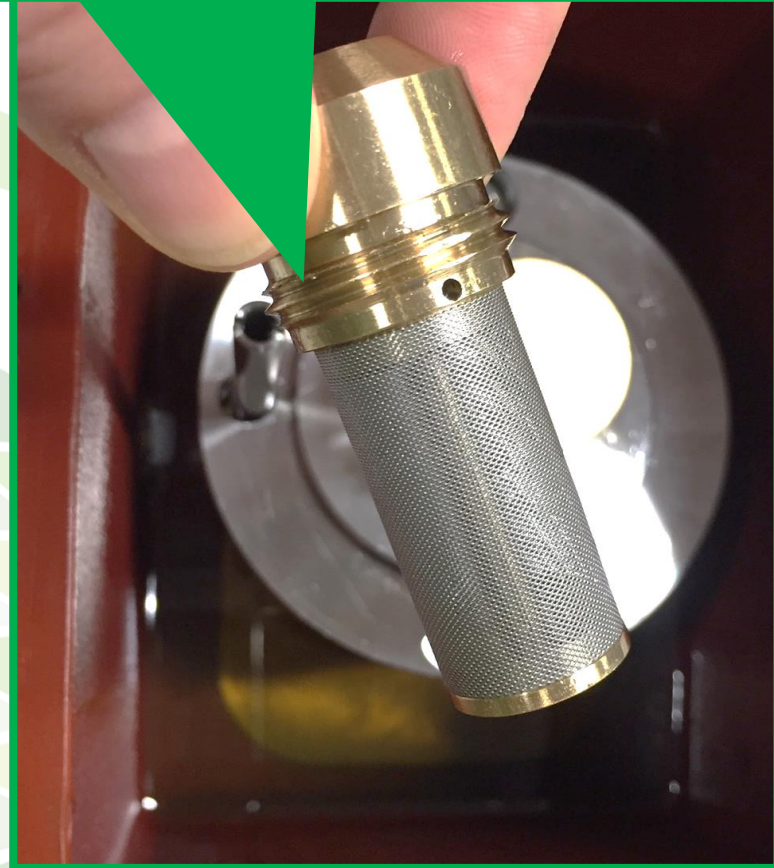


Component analysis: Inadequate control of the pump condition.

HYDRAULIC OIL FILTER IN BAD CONDITION.
(CLOGGED BY SOLID PARTICLES AND RUST).
THE OIL REPLENISHING SYSTEM IS COMPROMISED.



HYDRAULIC OIL FILTER IN GOOD CONDITION.
(HYDRAULIC OIL IN GOOD CONDITION).
THE OIL REPLENISHING SYSTEM IS EFFICIENT.

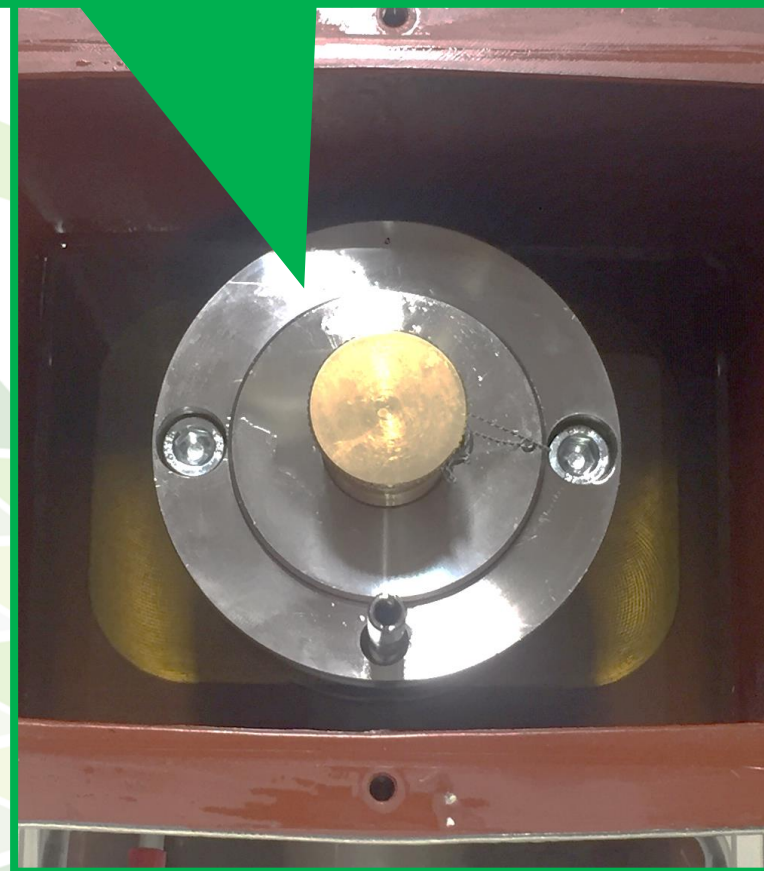


Component analysis: Inadequate control of the pump condition.

INTERNAL SAFETY VALVE IN BAD CONDITIONS.
(SHUTTER LOCKED BY SOLID PARTICLES AND
RUST). THE HYDRAULIC SYSTEM IS COMPROMISED.



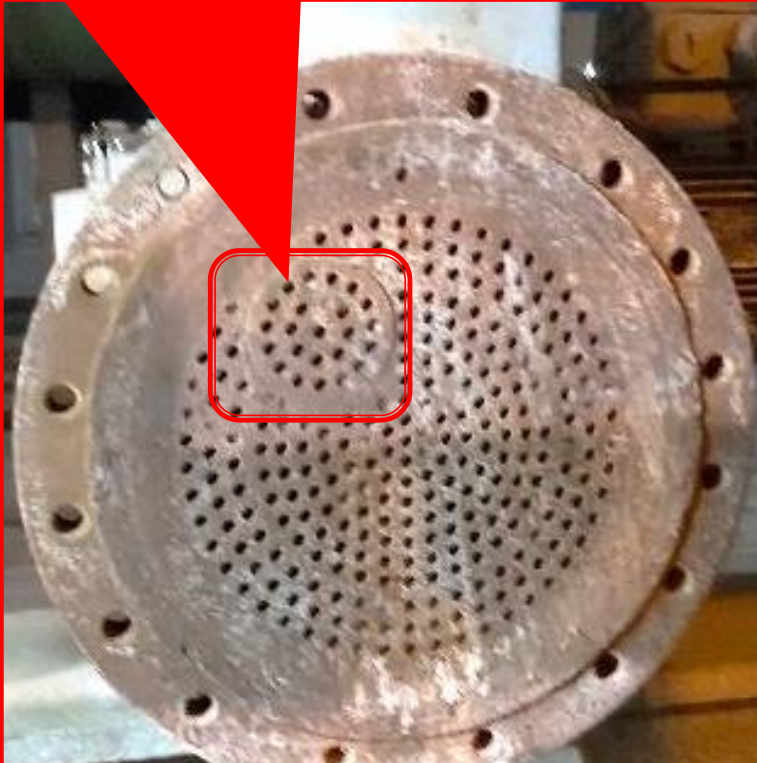
INTERNAL SAFETY VALVE IN GOOD CONDITION.
(HYDRAULIC OIL IN GOOD CONDITION).
ALL THE HYDRAULIC SYSTEM IS EFFICIENT.



Component analysis:

Pump disassembled and waiting for spare parts to finish maintenance.

COMPONENTS OF THE HYDRAULIC SYSTEM IN BAD CONDITION. REPLENISHING DISK LOCKED IN THE BACKWARD SHIELD BY OXIDATION/RUST.



COMPONENTS OF THE HYDRAULIC SYSTEM IN GOOD CONDITION. REPLENISHING DISC FREE TO MOVE IN THE BACKWARD SHIELD.



TECHNICAL TIP: IF THE PUMP IS INTENDED TO REMAIN DISASSEMBLED FOR A PERIOD OF TIME, APPLY GREASE ON THE METALLIC SURFACES TO PRESERVE THEIR INTEGRITY AND AVOID OXIDATION/RUST FORMATION.

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- Reduced downtime
- Reduces cost
- Increases uptime
- Improves parts availability
- Extends service life



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OBL has built a reputation for superior reliability by supplying carefully designed high-quality products.

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OBL offers KOPKITS designed to avoid unnecessary downtime and guarantee the highest level of efficiency and uninterrupted service from your OBL pump.

Many Pump models have a unique KOPKIT containing all the parts necessary to ensure reliable operation.

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OBL ensures ready availability of KOPKITS for most pumps.





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