

WHY IS IT IMPORTANT TO HAVE AN INSPECTION AND MAINTENANCE PLAN ?

- Because pumps will work better and last longer.
- Because it shows us when and what checks we must do to prevent any unexpected fault and avoid any problem.
- Because it reduces the time of pump/plant downtime.
- Because it helps in saving time and money.

INTRODUCTION: Pump operating manual provide a lot of instructions and suggestions so that the End User can create an effective Maintenance Plan. Not always it is possible to know where the pump will be installed. More in detail, know the “operation philosophy of the process”, nor the specific importance of the plant in which it will be used.

As a general rule in the operating manual, after the first start-up the End User it is highly recommended to carry out a close initial inspection of the pump operation, to practically define the Maintenance Plan and also determine the effective periodicity of the general inspections and planned maintenance.

The pump and the plant in which it works are closely linked. Malfunctions in one can generate failures in the other. In order to make an effective Maintenance Plan it is important to expand the considerations by including in the inspections to be carried out also plant elements that are not part of the pump, but which may affect correct operation of both.

IMPORTANT: Any defect or irregularity detected during inspections should be promptly solved.

EXAMPLE OF A CONTROL AND MAINTENANCE PLAN

WHEN ?	INSPECTION	MAINTENANCE ACTION
After the first 2,000 hours.		Replace the lubricant oil (viscosity ISO VG 320).
Every week.	Verify the cleaning and the conditions of the inside of the yoke and its transparent covers.	Clean the inside of the yoke and its transparent covers (replace if damaged).
Every week.	Make sure there are no product leaks from the plunger gasket. In case of leaks ->	Pumphead WITH gland nut: Tighten the gland nut to compress the plunger packing gasket. Pumphead WITHOUT gland nut: Replace the plunger lip seals.
Every week.	Check the lubricant oil condition in the gear reducer. In case of BAD condition ->	Replace the lubricant oil (viscosity ISO VG 320).
Every week.	Check there are no product leakages from pump connections or from 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 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 (see Instruction Manual).
Every month.	Check if the pumped product temperature is: - lower than 90°C (194°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 and the plunger packing.
Every 3 months.	Check the lubricating oil temperature in the gear reducer is lower than 95°C (203°F) .	Verify: - The last oil 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 plunger packing conditions.	Evaluate the revision of: - The pumphead components. - The complete pump.
Every 6 months	Verify (on the plan) the effectiveness of: - The pulsation dampener. - The back pressure valve. - The external safety valve.	Evaluate the revision of: - The pulsation dampener. - The back pressure valve. - The external safety valve.
Every 2 years or 15,000 hours.		Replace the lubricant oil (viscosity ISO VG 320). Replace both the valve units and the plunger packing.
Every 4 years 40,000 hours.		Replace the plunger. Replace the ball bearings.
At each end of cycle or stop.	If the pump works in a batch dosing system, and the handled fluid tends to coagulate, solidify or crystallize easily. It is highly suggested to ->	Wash the pumphead to prevent the pumped product from solidifying in the valves or in the pumphead.

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After the first 2,000 hours.		Replace the lubricant oil (viscosity ISO VG 320).
Every week.	Check the lubricant oil condition in the gear reducer. In case of BAD condition ->	Replace the lubricant oil (viscosity ISO VG 320).
Every week.	Check there are no product leakages from pump connections or from 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 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 (see Instruction Manual).
Every month.	Check if the pumped product temperature is lower than 45°C (113°F) both for metallic and plastic pumpheads.	Verify the condition: - Atmospherics of the plant, the storage of the pumped product. - The pumphead and the diaphragm.
Every 3 months.	Check the lubricating oil temperature in the gear reducer is lower than 95°C (203°F) .	Verify: - The last oil 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 6 months	Verify (on the plant) the effectiveness of: - The pulsation dampener. - The back pressure valve. - The external safety valve.	Evaluate the revision of: - The pulsation dampener. - The back pressure valve. - The external safety valve.
Every 2 years or 15,000 hours.		Replace the lubricant oil (viscosity ISO VG 320). Replace both the valve units and the diaphragm.
Every 4 years or 40,000 hours.		Replace the ball bearings.
At each end of cycle or stop.	If the pump works in a batch dosing system, and the handled fluid tends to coagulate, solidify or crystallize easily. It is highly suggested to ->	Wash the pumphead to prevent the pumped product from solidifying in the valves or in the pumphead.

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Every week.	Verify the cleaning and the conditions of the inside of the yoke and its transparent covers.	Clean the inside of the yoke and its transparent covers (replace if damaged).
Every week.	Make sure there are no product leaks from the plunger gasket. In case of leaks ->	Pumphead WITH gland nut: Tighten the gland nut to compress the plunger packing gasket. Pumphead WITHOUT gland nut: Replace the plunger lip seals.
Every week.	Check the lubricant oil condition in the gear reducer. In case of BAD condition ->	Replace the lubricant oil (viscosity ISO VG 320).
Every week.	Check there are no product leakages from pump connections or from 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 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 (see Instruction Manual).
Every month.	Check if the pumped product temperature is: - lower than 90°C (194°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 and the plunger packing.
Every 3 months.	Check the lubricating oil temperature in the gear reducer is lower than 95°C (203°F) .	Verify: - The last oil 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 6 months	Verify (on the plan) the effectiveness of: - The pulsation dampener. - The back pressure valve. - The external safety valve.	Evaluate the revision of: - The pulsation dampener. - The back pressure valve. - The external safety valve.
Every 2 years or 15,000 hours.		Replace the lubricant oil (viscosity ISO VG 320). Replace both the valve units and the plunger packing.
Every 4 years 40,000 hours.		Replace the plunger. Replace the ball bearings.
At each end of cycle or stop.	If the pump works in a batch dosing system, and the handled fluid tends to coagulate, solidify or crystallize easily. It is highly suggested to ->	Wash the pumphead to prevent the pumped product from solidifying in the valves or in the pumphead.

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WHEN ?	INSPECTION	MAINTENANCE ACTION
After the first 2,000 hours.		Replace the lubricant oil (viscosity ISO VG 320).
Every week.	Verify the cleaning and the conditions of the yoke and hydraulic oil reservoir transparent covers.	Remove, clean and reassemble the yoke and hydraulic oil reservoir transparent covers (replace if damaged).
Every week.	Check the hydraulic oil condition in the oil reservoir. In case of BAD condition ->	Replace the hydraulic oil (viscosity ISO VG 32).
Every week.	Check the lubricant oil condition in the gear reducer. In case of BAD condition ->	Replace the lubricant oil (viscosity ISO VG 320).
Every week.	Check there are no product leakages from pump connections or from 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 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 (see Instruction Manual).
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 the lubricating oil temperature in the gear reducer is lower than 95°C (203°F) .	Verify: - The last oil 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 6 months	Verify (on the plan) the effectiveness of: - The pulsation dampener. - The back pressure valve. - The external safety valve.	Evaluate the revision of: - The pulsation dampener. - The back pressure valve. - The external safety valve.
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 50,000 hours.		Replace the diaphragm. Replace the ball bearings.
At each end of cycle or stop.	If the pump works in a batch dosing system, and the handled fluid tends to coagulate, solidify or crystallize easily. It is highly suggested to ->	Wash the pumphead to prevent the pumped product from solidifying in the valves or in the pumphead.

Technical Note: X9 pumps need two (2) type of oil; lubricating in the gear reducer (viscosity **ISO VG 320**) and hydraulic on the hydraulic system (viscosity **ISO VG 32**).

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WHEN ?	INSPECTION	MAINTENANCE ACTION
After the first 2,000 hours.		Replace the hydraulic/lubricant oil (viscosity ISO VG 68).
Every week.	Check the hydraulic/lubricant oil condition in the gear reducer. In case of BAD condition ->	Replace the hydraulic/lubricant oil (viscosity ISO VG 68).
Every week.	Check there are no product leakages from pump connections or from 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 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 (see Instruction Manual).
Every month.	Check if the pumped product temperature is: - lower than 60°C (140°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 and the hydraulic/lubricant oil.
Every 3 months.	Check the hydraulic/lubricating oil temperature is lower than 60°C (140°F) .	Verify: - The last oil 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 6 months	Verify (on the plan) the effectiveness of: - The pulsation dampener. - The back pressure valve. - The external safety valve.	Evaluate the revision of: - The pulsation dampener. - The back pressure valve. - The external safety valve.
Every 2 years or 15,000 hours.		Replace the hydraulic/lubricant oil (viscosity ISO VG 68). Replace both the pumphead valve units.
Every 4 years 40,000 hours.		Replace the diaphragm. Replace the ball bearings.
At each end of cycle or stop.	If the pump works in a batch dosing system, and the handled fluid tends to coagulate, solidify or crystallize easily. It is highly suggested to ->	Wash the pumphead to prevent the pumped product from solidifying in the valves or in the pumphead.

Technical Note: XR-XRN pumps are all with single-block body. They need only one (1) type of oil that plays the dual role of lubricating oil and hydraulic oil (viscosity **ISO VG 68**).

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Every week.	Check the hydraulic/lubricant oil condition in the gear reducer. In case of BAD condition ->	Replace the hydraulic/lubricant oil (viscosity ISO VG 68).
Every week.	Check there are no product leakages from pump connections or from 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 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 (see Instruction Manual).
Every month.	Check if the pumped product temperature is: - lower than 60°C (140°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 the hydraulic/lubricating oil temperature is lower than 60°C (140°F) .	Verify: - The last oil 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 6 months	Verify (on the plan) the effectiveness of: - The pulsation dampener. - The back pressure valve. - The external safety valve.	Evaluate the revision of: - The pulsation dampener. - The back pressure valve. - The external safety valve.
Every 2 years or 15,000 hours.		Replace the hydraulic/lubricant oil (viscosity ISO VG 68). Replace both the pumphead valve units.
Every 5 years 50,000 hours.		Replace the diaphragm. Replace the ball bearings.
At each end of cycle or stop.	If the pump works in a batch dosing system, and the handled fluid tends to coagulate, solidify or crystallize easily. It is highly suggested to ->	Wash the pumphead to prevent the pumped product from solidifying in the valves or in the pumphead.

Technical Note: XL-XLB-XLC pumps are all with single-block body. They need only one (1) type of oil that plays the dual role of lubricating oil and hydraulic oil (viscosity **ISO VG 68**).