



HYDROSTATIC SYSTEM MANUAL

AND MAINTENANCE SCHEDULE

VERY IMPORTANT INSTRUCTIONS!

**PLEASE READ THIS INSTRUCTION
MANUAL FIRST BEFORE USING MACHINE!**

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Your Hydrostatic system maintenance schedule

VERY IMPORTANT YOU FOLLOW THESE INSTRUCTIONS

Hydrostatic Transmission Daily Checklist:

It is important to check the basic components of your system daily. Ensure the system oil level is correct. Check for visible wear or damage, as well as leaks. **DO NOT** use your hand (or other body parts) to check for leaks as high pressure oil leaks can cause serious injury or even death.

Do these things before starting the machine:

- ✓ Check oil level in reservoir. It should not be over filled, or too low. An oil level that is too high may indicate foreign material in the tank, such as water from being washed down or a gearbox shaft seal leak. This needs to be corrected before operating or damage will occur. Low oil can also cause problems from excessive heat to catastrophic unit failure. Make sure to only add the correct oil to the system. Please check with the OEM as to which one they recommend. Mixing brands or types of oil can cause chemical reactions in the system and damage components.
- ✓ Inspect any couplings and driveline for damage and wear. U-joints with excessive play or worn out jaw type coupling inserts can cause excessive shaft vibration and lead to leaks and shaft damage. A coupling that is not solidly locked on the shaft can cause damage or failure to a machine, serious injury or even death. A failed U-joint can turn a shaft into a high speed flail, causing damage to the machine, injury or even death.
- ✓ Inspect hoses for any rubbing and worn areas, excessively tight bends or kinks, and damage to the cover. Worn or damaged hoses can fail under high pressure causing serious injury and even death. Use a sleeve or protector on contact points and replace any hose with a damaged cover. **DO NOT** use your hand or other body part on the hose to feel for damage or leaks! High pressure oil injection can cause severe injury or even death.
- ✓ Inspect control linkage, cables, and wires for wear and damage. Make sure the linkages are not sloppy and worn, this can cause unintended machine movement or a loss of control. Wire casings that are worn and allowing a short to ground can also cause a loss of control.
- ✓ Inspect the oil cooler, hoses and wiring. Ensure it is free from debris, and the fan and body is not damaged. Keep your fingers out of the fan. Use compressed air to blow out the fins of the oil cooler to ensure adequate cooling.
- ✓ Inspect the oil reservoir fill cap and area. Ensure it is clean and not plugged. Contamination can enter your system through a dirty or clogged breather and cause damage that is not covered by warranty.

- ✓ Check the hour meter, perform all other maintenance as needed based on the recommended schedule from the OEM.

After starting the machine, allow it to warm up before operation. While it is warming up, ensure the machine cannot make any sudden movements and make the following checks:

- ✓ Walk around the machine and look for leaks. It may be easier to find a leak with the machine running than with it off. **DO NOT** use your hand or other body parts to feel for leaks!
- ✓ Check the filter indicator gauges. When the oil is at operating temperature, the gauges should be in the **GREEN**. If the gauge indicates (in the RED) need for service, turn the machine off and change the filters.
- ✓ Operate the machine safely, in accordance to OEM instructions.

Service Recommendations:

- Your first hydraulic filter change should be performed at 18-20 hours of operation. After that, change the hydraulic filters at the more frequent of: every 250 hours or once per operating season. It may be necessary to change them more often based on gauge readings!
- Change the oil at the more frequent of: every 1000 hours or once per operating season

When you change your oil, drain it from the bottom of the reservoir. Do not put a hose or pipe into the tank to suck out the fluid. To refill the reservoir, the oil should be pumped into the reservoir through a 10 micron or finer absolute filter to prevent contamination in the new fluid from entering the system.

Your hydrostatic transmission (pump and motor pair) is a high performance, tight tolerance unit. Cleanliness of the fluid in a hydrostatic system is extremely important. Eaton recommends that the fluid used in its hydrostatic components be maintained at ISO Cleanliness Code 18/13 per SAE J1165. This code allows a maximum of 2500 particles per millimeter greater than 5 microns and a maximum of 80 particles per milliliter greater than 15 microns.

Your system can run at pressures exceeding 6000 PSI, and any contamination in the oil can cause severe damage that is not covered by any warranty! If you put cheap, cellulose, nominal rated filters on your machine, you will see premature failure that is not covered by any warranty. The filters that are recommended are:

- -10 micron or finer
- Absolute rated, **NOT NOMINAL**
- Micro glass or synthetic media

Some examples of good filters:

MP Filtri: CSG150A10A CSG150A06A

Donaldson: P165876 P165762

Baldwin: BT8308-MPG

The use of one of these filters listed above is not a 100% guarantee that your oil will be clean, however. It is important that you do your part and keep your machine clean and in good condition.

This is a closed loop type hydrostatic drive system. This means the oil goes from the pump, to the motor, then back to the pump again **WITHOUT** going through a filter. The only way to keep the high pressure loop clean is to make sure the make-up oil from the charge pump is clean; which means using good high quality filters. Once there is contamination in the high pressure loop, it will continue to do damage for the rest of the (now shorter) life of the unit.

How to correctly change a filter

When you place your machine in operation, record the numbers of the filter in your maintenance log. It is good practice to keep at least one spare set of filters on hand.

Removing the old filter

- First, turn off the machine. Lock out/tag out machine for safety.
- Wash the area of the machine around the filter & head to provide a clean work environment and to keep contamination out of the new filter.
- Make sure the lines are not under pressure.
- If there is a ball valve that will prevent draining the entire reservoir, close the ball valve.
- Place a clean and empty bucket under the filter & head assembly to catch any spills.
- Using the correct filter wrench, remove the old filter. Use caution, the oil may be hot.
- Allow the old filter to drain into the bucket.
- Examine the oil that comes out of the filter for signs of contamination like:
 - Water
 - Brass or steel metal particles, shavings or “sparklies”

- Other foreign material

- Remove and set the filter gasket aside.
- Examine the filter head, gauge and bypass for signs of wear or damage. Replace if damaged or excessively worn.

Installing the new filter

- Take the filter gasket out of the package, make sure it matches the old filter & install it in the filter head.
- Oil the filter gasket

For suction filters

- Fill the filter with CLEAN hydraulic fluid before installing it on the filter head.
- Install the filter on the filter head and torque it properly.
- Open the ball valve

For pressure filters

- Fill the filter with CLEAN hydraulic fluid before installing it on the filter head.
- Install the filter on the filter head and torque it properly.
- Open any shut off valves.

For return filters

- Install the filter on the filter head and torque it properly.
- Open the ball valve.

Bleeding the new filter

For suction filters

- GENTLY apply 5 PSI of clean filtered compressed air to the reservoir.
- Loosen the suction fitting at the hydraulic pump and allow air to bleed out.
- When all air is bled out, tighten fitting per spec based on size. For pressure filters, this may require more than one person.

- If filled with clean oil, this filter should self bleed.
- If this filter cannot be filled with oil, crack loose the charge pressure gauge port fitting.
- Jog the prime mover without starting it until air no longer comes out the charge port.
- Tighten fitting per spec based on size.

For return filters

- Does not need to be bled.
- Allow the machine to idle 5-10 minutes and monitor for leaks, keeping an eye on the oil level.
- If the oil level is low, add CLEANED FILTERED oil that matches the type and brand in the system to bring it up to the correct level.
- Record the hour meter reading in your maintenance log.
- Your machine should be ready to operate.

How to correctly change the hydraulic oil

- You should have information in your maintenance log indicating your type of oil and quantity.
- You should replace your oil with the same brand and type that the OEM recommends in your machine.
- Never, ever use cooking oil (unless specified by the OEM). It will prematurely damage your hydrostat.

Draining the fluid

- First, turn off the machine. Lock out/tag out machine for safety.
- Then, secure a clean drum to dispose of the used oil.
- Locate the drain plug/bung on the bottom of the reservoir.
- If there is no drain bung, you may have to remove a suction line to drain the oil. Drain from the lowest port possible.

- To prevent reservoir contamination, DO NOT put a pump or stand-pipe into tank to pump the fluid out. Drain the oil into a bucket and pump from your bucket into your waste oil container.
- Allow the reservoir to fully drain before replacing the plugs.
- Remove the filters per the “Removing the old filters” section.
- Examine the inside of the reservoir with a bright light. The tank should be free of sediment or “shavings”.
- If debris or shavings are found, contact your distributor!

Refilling the fluid

- Bleed the system as per “bleeding the new filter” section.
- Allow the machine to idle for 5-10 minutes and monitor for leaks, and keep an eye on the oil level.
- If the oil is low, add CLEAN FILTERED oil that matches the type and brand in the system to bring it up to the correct level.
- Record the hour meter reading in your maintenance log
- Your machine should be ready to operate.

How to correctly replace a high pressure hose

If you see a damaged or worn hose in your daily inspection, or if your hose fails, shut the machine down immediately. High pressure oil is dangerous and can cause serious injury or even death!

To remove the old hose

- First, turn off the machine. Lock out/tag out machine for safety.
- Locate both ends of the hose.
- Clean the area around both ends of the hose to prevent contamination from entering the system.
- Relieve any trapped pressure in the hydraulic lines. The pressure can cause serious injury or death.

- Carefully remove the old hose, install a clean cap or plug in the fittings in the hose and the ports the hose was connected to.
- Hydraulic hose contain high strength steel wire, handle with care, this can be very sharp. Possibly wear gloves.
- Source a replacement hose, paying close attention to the pressure rating of the hose.
- ***Caution! A lower pressure rated hose could burst under load causing serious injury or even death!***
- Before installing the hose, make SURE the hose is clean inside. You can't just blow it out with air and get all the rubber and steel debris out. We ***strongly*** recommend a product like those from Ultraclean www.ultracleantech.com be used to clean out all new hoses prior to installation.
- Damage caused by contamination from hose debris **is not covered by warranty**, and may cause catastrophic damage to your units.
- It is YOUR responsibility (not the vendor's) to clean the hose prior to installation.
- After cleaning the hose with the UltraClean product, plug the ends of the hose with clean caps or plugs until you are ready to use thread the hose end onto the fitting.
- Install the hose onto the fittings, and torque the connectors to spec
- Check for any rubbing or pressure points on the hose.
- Install a sleeve or protector on the areas that rub.
- Allow the machine to idle for 5-10 minutes and monitor for leaks, at the same time keeping an eye on the oil level.
- If the oil level is low, add CLEAN FILTERED oil that matches the type and brand in the system to bring it up to the correct level.
- Your machine should now be ready to operate.

How to correctly replace a suction hose

If you see a damaged or worn hose in your daily inspection, or if a hose fails, shut the machine down immediately. Suction hoses are critical to pump and motor integrity, and if they fail, catastrophic system damage could occur.

To remove the old hose

- First, turn off the machine. Lock out/ tag out machine for safety.
- Locate both ends of the hose.
- Clean the area around both ends of the hose to prevent contamination from entering the system.
- Carefully remove the old hose and install a clean cap or plug in the fittings on the hose and the ports the hose was connected to.
- Hydraulic hoses contain high strength steel wire, handle with care, this can be very sharp.
- Before installing the hose, make SURE the hose is clean inside. You can't just blow it out with air and get all the rubber and steel debris out. We STRONGLY recommend a product like those from UltraClean (www.ultraclean.tech.com) be used to clean out all the new hoses prior to installation.
- Damage caused by contamination from hose debris **is not covered by warranty**, and may cause catastrophic damage to your units.
- It is your responsibility (not the vendor's) to clean the hose prior to installation
- After cleaning the hose with the ultraclean product, plug the ends of the hose with clean caps or plugs until you are ready to thread the hose end onto the fitting.
- Install the hose onto the fittings, and torque the connectors to spec
- Check for any rubbing or pressure points on the hose.
- Install a sleeve or protector to protect the hose from rubbing points.
- Bleed the system as per "bleeding the new filter, for suction filters" section
- If bleeding a closed center, open loop, piston pump; crack the high pressure line and jog the prime mover without starting it until air no longer comes out.
- ***Use caution! High pressure oil is dangerous and can cause serious injury or even death!***
- Allow the machine to idle for 5-10 minutes and monitor for leaks, at the same time keeping an eye on the oil level.
- If the oil level is low, add CLEAN FILTERED oil that matches the type and brand in the system to bring it up to the correct level.
- Your machine should be ready to operate.