



**UNIT 6 - Accumulator
Charging**



**PRESSURE & LEAK TESTING
TRAINING**

Function of an Hydraulic Accumulator

- **Safety And Emergency:** An accumulator can provide flow and pressure to perform an additional job or complete the cycle of the machine in the event of an electrical power failure.
- **Compensation Of Leakage:** An accumulator can maintain the pressure and make up for lost fluid due to internal leakage of the components of a system including the cylinders as well as valves.

Charging Hydraulic Accumulator

The charging procedures for hydraulic accumulators are as follows:

- First, you need to use dry nitrogen gas to pre-charge the accumulator, as it is an inert gas that does not react with hydraulic oil or other chemicals. Never use oxygen or compressed air, as they can cause fire or explosion when mixed with hydraulic oil.
- Second, you need to use a charging rig that matches the type and style of the accumulator. The charging rig consists of a hose, a gauge, a gas chuck, and a bleed valve. The hose connects the charging rig to the nitrogen bottle, the gauge displays the pre-charge pressure, the gas chuck attaches to the accumulator's gas valve, and the bleed valve releases excess nitrogen.

Charging Hydraulic Accumulator, contd

- Third, you need to release any pressure at the accumulator inlet and drain any oil from the accumulator. The accumulator should be pre-charged with no oil in it. Then, screw the charging rig onto the accumulator's gas valve and turn the gas chuck clockwise to depress the pin. The current pre-charge pressure can be read on the gauge.
- Fourth, you need to adjust the pre-charge pressure according to the desired level for the application. If the pre-charge is too high, you can open the bleed valve to lower the pressure. If the pre-charge is too low, you can open the nitrogen bottle valve to increase the pressure. The pre-charge pressure should be somewhat below the maximum system pressure if the accumulator is used to add volume to the system, or close to the maximum system pressure if the accumulator is used to absorb shock.

Charging Hydraulic Accumulator, contd

- Fifth, you need to shut off the valve on the nitrogen bottle and let the pre-charge set for 10 to 15 minutes. Then, check the pre-charge pressure again and make any necessary adjustments. Do not reduce the pre-charge pressure by depressing the gas valve core with a foreign object, as this may damage the valve seat. Once the pre-charge pressure is correct, screw the gas chuck out and open the bleed valve to relieve any pressure trapped in the assembly.
- Finally, you need to remove the charging rig from the accumulator and reinstall the sealing cap on the gas valve. The accumulator is now ready to be used in the hydraulic system

Checks to Maintain Safety of Hydraulic Accumulator

- Ensure that the accumulator is pre-charged with dry nitrogen only, and never with oxygen or air, as this can cause a fire or explosion hazard.
- Use a charging rig to pre-charge the accumulator with the correct pressure level, depending on the application and type of accumulator.
- Release any pressure at the accumulator inlet before pre-charging, and use a dump valve to release the pressurized fluid in the accumulator back to the tank when the pump is turned off.

Checks to Maintain Safety of Hydraulic Accumulator

- Secure the accumulator with a clamp and install a safety and shut-off block to release the pressure in case of an emergency.
- Follow the manufacturer's recommendations for maintenance and routine checks, such as hydraulic fluid levels, seals, fittings, hoses, etc.
- Carry out examinations in accordance with the written scheme of examination (WSE), and produce a written report for each examination.

Checks to Maintain Safety of Hydraulic Accumulator

- Supervise couplings and pressure taps, and avoid contact with hot or pressurized hydraulic fluid³.