Heavy Equipment Hydraulic Hose Inspection And Safe Depressurization

1.0 Maintenance Objective & Frequency

The objective of this procedure is to systematically inspect all hydraulic hoses on heavy equipment for signs of wear, abrasion, kinking, blistering, or leakage, and to safely depressurize the hydraulic system before any hose replacement or component service. This prevents catastrophic hose bursts, high-pressure fluid injection injuries, and environmental spills. The inspection is performed at 250-hour intervals or monthly, whichever comes first, and depressurization is performed prior to any hydraulic system maintenance.

2.0 Lockout/Tagout (LOTO) & Safety

- Engine Shutdown: Turn off the engine and remove the key. Place the key in your personal lockbox.
- Hydraulic Isolation: Close the hydraulic tank isolation valve (if equipped) to prevent fluid flow from the reservoir.
- Pneumatic Isolation: If the equipment has a hydraulic oil cooler with a pneumatic fan, isolate and bleed the pneumatic supply.
- Electrical Isolation: Disconnect the battery negative terminal to prevent accidental engine start or electric pump activation.
- Mandatory PPE: Wear safety glasses, chemical-resistant gloves, steel-toed boots, and a face shield when working near pressurized hydraulic lines.
- Fluid Injection Hazard: Never use hands or fingers to check for leaks. Use a piece of cardboard or wood. High-pressure fluid can penetrate skin and cause severe injury or death.

3.0 Required Tools, Parts & Lubricants

- Hydraulic hose inspection mirror (telescoping with LED light)
- Hydraulic pressure gauge (0-5000 psi, with appropriate fitting)
- Cardboard or wooden stick for leak detection
- Crescent wrench set (1/2 to 1-1/2 inch)
- Hydraulic hose replacement kit (OEM-specified hoses, fittings, and O-rings)
- Catch pan (minimum 5-gallon capacity)
- Rags and absorbent pads
- Hydraulic fluid (OEM-specified viscosity and type)
- Torque wrench (0-200 ft-lb, calibrated)
- Personal lockout/tagout kit

4.0 Step-by-Step Maintenance Procedure

1. Perform full LOTO as described in Section 2.0. Confirm the engine is off, key is removed, battery is disconnected, and hydraulic isolation valve is closed.

2. Relieve residual pressure in the hydraulic system by slowly loosening the hydraulic tank filler cap (if equipped with a pressure relief valve) or by cycling the hydraulic control levers in all directions with the engine off. Listen for the sound of pressure release.

3. Connect a hydraulic pressure gauge to a test port on the main hydraulic pump or a convenient service port. Record the gauge reading. If pressure is above 50 psi, repeat step 2 until pressure drops below 50 psi.

4. Visually inspect all hydraulic hoses from the pump to the cylinders, motors, and valves. Use the inspection mirror to see hidden sides. Look for: abrasion, cuts, kinks, bulges, blisters, exposed wire braid, and corrosion on fittings.

5. Check hose routing for contact with sharp edges, moving parts, or hot surfaces. Ensure hoses are not twisted or under tension. Verify that clamps and guards are in place and secure.

6. Inspect all hose fittings and connections for signs of leakage. Use cardboard or wood to check for fluid seepage at fittings. Tighten any loose fittings to OEM torque specifications (typically 30-50 ft-lb for JIC 37° flare fittings, 45-60 ft-lb for O-ring face seal fittings). Do not overtighten.

7. Check the hose cover for blistering or soft spots, which indicate internal liner degradation. If any hose shows signs of wear, blistering, or leakage, mark it for replacement and proceed to step 8. If all hoses pass, skip to step 10.

8. For hose replacement: Place a catch pan under the hose ends. Slowly loosen the fittings at both ends of the hose to drain residual fluid. Remove the old hose and install the new OEM-specified hose, ensuring proper routing and no twists. Tighten fittings to OEM torque specifications.

9. After hose replacement, refill the hydraulic reservoir with the correct fluid to the proper level. Reconnect the battery and open the hydraulic isolation valve.

10. Start the engine and let it idle. Cycle all hydraulic functions slowly through their full range of motion to purge air from the system. Check for leaks at all serviced connections. Shut off the engine and re-check fluid level, topping off as needed.

5.0 Verification & Return to Service

1. With the engine running at idle, verify that all hydraulic functions operate smoothly without hesitation, chatter, or unusual noise. Confirm that no warning lights or alarms are active.

2. Perform a final visual inspection of all hoses and fittings under operating pressure. Use cardboard to check for any new leaks. Ensure no hoses are rubbing against any components.

3. Check the hydraulic fluid level with the system at operating temperature and all cylinders retracted. Top off if necessary.

4. Remove all LOTO devices, return the equipment to service, and complete the PM work order in ServiceGrid, noting any hoses replaced and the condition of the system.