
Forklift Chain Tension and Lubrication Preventative Maintenance SOP

1.0 Maintenance Objective & Frequency

The objective of this procedure is to inspect, adjust tension, and lubricate the forklift lift chains to ensure smooth mast operation, prevent chain stretch, and avoid uneven load distribution. Proper chain tension and lubrication reduce wear on sprockets, chains, and mast components, extending service life and preventing sudden chain failure.

Frequency: Every 250 operating hours or monthly, whichever comes first. More frequent checks are required in dusty, wet, or high-usage environments.

2.0 Lockout/Tagout (LOTO) & Safety

- **Electrical Isolation:** Turn the key switch to OFF, remove the key, and apply a personal lockout tag on the ignition or battery disconnect.
- **Hydraulic Isolation:** Lower the forks fully to the ground. Relieve hydraulic pressure by cycling the tilt and lift controls several times with the engine off.
- **Mechanical Blocking:** Chock the drive wheels and place a mechanical mast safety prop or block under the carriage to prevent accidental mast movement.
- **PPE:** Wear safety glasses, cut-resistant gloves, and steel-toed boots. Use hearing protection if operating in a noisy environment.

3.0 Required Tools, Parts & Lubricants

- Chain tension gauge (or tape measure and straightedge)
- Open-end or combination wrenches (typically 19mm, 22mm, or 24mm depending on chain anchor bolts)
- Torque wrench (capable of 50-150 Nm range)
- Chain lubricant (ISO 150 or SAE 90 gear oil, or OEM-recommended chain spray)
- Clean lint-free rags
- Wire brush or parts cleaning brush
- Mast safety prop or wooden block
- Personal lockout/tagout kit

4.0 Step-by-Step Maintenance Procedure

1. Perform full LOTO as described in Section 2.0. Ensure the forks are fully lowered, the mast is blocked, and the key is removed.
2. Visually inspect both lift chains for signs of wear, corrosion, broken links, or uneven stretch. Replace any chain that shows more than 2% elongation or has damaged links.
3. Clean the chains thoroughly using a wire brush and rag to remove dirt, old grease, and debris. Do not use solvents that may remove internal lubricant.

4. Measure chain tension: With the forks on the ground and mast vertical, apply a 50 lb (22.7 kg) downward force at the midpoint of the chain span. Measure the deflection. Acceptable deflection is typically 1/2 to 1 inch (13-25 mm) per foot of chain span. Refer to OEM spec for exact value.
5. If deflection exceeds OEM spec, loosen the chain anchor locknut and adjust the tensioning nut to tighten the chain. Tighten evenly on both sides to maintain equal tension. Re-measure deflection after each adjustment.
6. Once correct deflection is achieved, torque the chain anchor locknut to the OEM specification (typically 80-120 Nm). Verify both chains have identical tension by measuring deflection on each side.
7. Apply chain lubricant evenly along the full length of each chain while rotating the mast by hand (if possible) to distribute lubricant into the pins and bushings. Use a spray or drip application; do not over-apply.
8. Wipe off excess lubricant from the chain surface and surrounding mast components to prevent dirt attraction.
9. Inspect sprockets for wear, cracks, or missing teeth. Replace if worn beyond OEM limits.
10. Check chain anchor bolts and mast mounting bolts for torque. Re-torque if necessary.

5.0 Verification & Return to Service

1. Remove all tools, rags, and the mast safety prop. Verify no obstructions remain in the mast area.
2. Remove LOTO devices and restore power. Start the forklift and allow it to idle.
3. Cycle the mast through full lift and lower range three times, listening for abnormal noise and watching for smooth, even movement. Check that the carriage does not tilt or bind.
4. Perform a load test with a known weight (e.g., 80% of rated capacity). Lift and lower the load, checking for chain slack or uneven lifting.
5. Re-check chain tension after the load test. If deflection has changed, repeat adjustment steps.
6. Record the PM completion in ServiceGrid, noting chain condition, tension measurements, and any parts replaced. Sign off on the work order.

Regulatory Disclaimer: This document is a generic maintenance template provided for educational and informational purposes only. It does not constitute professional engineering or reliability advice. The end-user assumes all liability for validating all step sequences, torque specs, and LOTO protocols against specific machinery OEM manuals before deployment to a live production floor.