Biesse Rover Gantry Rail Cleaning and Lubrication PM

1.0 Maintenance Objective & Frequency

The objective of this procedure is to remove accumulated dust, chip debris, and dried lubricant from the gantry rail surfaces and recirculating ball slides, then apply fresh lubricant to restore smooth motion and prevent premature wear. This PM directly addresses stick-slip behavior, reduces servo motor load, and maintains positioning repeatability within OEM tolerances.

Frequency: Every 500 operating hours or monthly, whichever comes first. More frequent intervals are required if the machine processes MDF, particleboard, or other high-dust materials.

2.0 Lockout/Tagout (LOTO) & Safety

- Electrical Isolation: Turn the main disconnect switch to the OFF position and apply a personal lock and tag. Verify zero voltage with a rated voltmeter at the disconnect terminals.
- Pneumatic Isolation: Close the main compressed air supply valve and bleed any residual pressure from the machine's air system by actuating the pneumatic brake release (if equipped) until no air escapes.
- Mechanical Lockout: Ensure the gantry is parked in a safe, accessible position (typically at the home or service position). Chock the gantry wheels if the machine is on an incline.
- Mandatory PPE: Safety glasses with side shields, cut-resistant gloves, and steel-toed boots. Hearing protection is recommended if the area has ambient noise above 85 dBA.

3.0 Required Tools, Parts & Lubricants

- Lint-free, non-abrasive shop towels (e.g., Kimtech WypAll or equivalent)
- Plastic or nylon bristle brush (1 inch wide) for dislodging debris from rail grooves
- Isopropyl alcohol (99% concentration) in a spray bottle for degreasing
- Biesse-approved linear guide grease (e.g., Kluber Lubrication Staburags NBU 12 or equivalent NLGI 2 lithium soap grease with EP additives)
- Grease gun with a compatible coupler (manual or pneumatic, rated for the grease consistency)
- Small flathead screwdriver or pick tool for cleaning wiper seals
- Flashlight or inspection mirror for visual inspection of rail surfaces

4.0 Step-by-Step Maintenance Procedure

1. Perform LOTO as described in Section 2.0. Verify that all machine motion is disabled and that the gantry cannot be moved by any stored energy source.
2. Visually inspect the full length of both gantry rails (X-axis) for any signs of damage, corrosion, or foreign objects. Use the flashlight to check the rail surfaces and the wiper seals on each carriage. Document any abnormalities on the PM work order.
3. Using the plastic brush, gently dislodge any chips, dust, or dried grease from the rail grooves and the carriage wiper seals. Work from one end of the rail to the other, brushing debris away from the carriage path.

4. Spray a small amount of isopropyl alcohol onto a clean lint-free towel. Wipe the exposed rail surface thoroughly to remove all old grease and contaminants. Do not spray alcohol directly onto the carriage seals to avoid washing lubricant out of the recirculating ball tracks.

5. Use the pick tool or small screwdriver to carefully clean the wiper seal lips on each carriage. Remove any embedded debris that could score the rail. Wipe the seals with an alcohol-dampened towel afterward.

6. Apply a thin, even film of the approved linear guide grease to the entire length of each rail using a clean towel or a grease applicator pad. The film should be just enough to leave a visible sheen—excess grease will attract more debris.

7. Locate the grease fittings (Zerk fittings) on each carriage. There are typically two fittings per carriage (one for each recirculating circuit). Wipe each fitting clean with an alcohol-dampened towel before attaching the grease gun.

8. Using the grease gun, pump 3 to 5 strokes of fresh grease into each fitting. Watch for old grease and contaminants to purge from the wiper seals. Stop pumping immediately if you see clean grease exiting the seals. Do not over-grease, as this can cause seal damage and attract debris.

9. Wipe away any purged grease from the carriage and rail area with a clean lint-free towel. Ensure no excess grease remains on the rail surface that could drip onto the machine bed or workpieces.

10. Manually slide the gantry (if possible with LOTO removed and under manual control) back and forth along the full rail travel a few times to distribute the grease evenly. If manual movement is not possible, proceed to Section 5.0 for a powered test cycle.

5.0 Verification & Return to Service

1. Remove all LOTO devices and restore power and pneumatic supply to the machine. Ensure all guards and panels are reinstalled and secured.

2. Jog the gantry at low speed (10% of maximum) along the full X-axis travel. Listen for any unusual noises (grinding, clicking, or squeaking) that indicate insufficient lubrication or a mechanical issue.

3. Run a full-axis rapid traverse cycle at 100% speed. Verify smooth, stick-free motion. If stick-slip is observed, repeat the cleaning and lubrication procedure, paying extra attention to the wiper seals and grease distribution.

4. Perform a positioning accuracy check by commanding the gantry to move to a known reference point (e.g., a fixed stop or laser-marked position) and measuring the actual position with a dial indicator or laser interferometer. Acceptable deviation is within ±0.005 inches (±0.127 mm) for general woodworking; tighter tolerances may apply per OEM specifications.

5. If all checks pass, sign off on the PM work order in ServiceGrid, noting the date, technician name, and any observations (e.g., rail condition, grease type used). Update the machine's maintenance log.