
Beam Saw Scoring Blade Motor Brush Check & Replacement

1.0 Maintenance Objective & Frequency

The objective of this procedure is to inspect and replace the carbon brushes on the scoring blade motor of a beam saw. Worn brushes cause arcing, reduced motor torque, and eventual motor failure, leading to unplanned downtime and poor cut quality. This PM ensures reliable motor commutation and extends motor life.

Frequency: Every 500 operating hours or quarterly, whichever comes first. Perform more frequently if the saw operates in a dusty environment or if the motor shows signs of excessive sparking.

2.0 Lockout/Tagout (LOTO) & Safety

- **Electrical Isolation:** Disconnect the main power supply to the beam saw at the disconnect switch. Apply a personal lock and tag.
- **Pneumatic Isolation:** Close the compressed air supply valve to the saw and bleed any residual pressure from the system.
- **Mechanical Lockout:** Ensure the scoring blade is fully stopped and cannot rotate. Use a blade lock or wedge if available.
- **PPE:** Wear safety glasses, cut-resistant gloves, and hearing protection. Use a dust mask if the motor housing is contaminated with sawdust.

3.0 Required Tools, Parts & Lubricants

- Replacement carbon brushes (OEM-specified size and grade for the scoring motor)
- Screwdriver set (flathead and Phillips, sizes as needed for brush holder caps)
- 5mm or 6mm Allen key (depending on motor access panel fasteners)
- Digital caliper or micrometer (to measure brush length)
- Compressed air gun with nozzle (for cleaning brush track and commutator)
- Lint-free cloth or shop towel
- Electrical contact cleaner (non-residue, plastic-safe)
- Torque wrench (if brush holder screws have specified torque)

4.0 Step-by-Step Maintenance Procedure

1. Perform full LOTO as per Section 2.0. Verify zero energy state by attempting to start the scoring motor (it must not run).
2. Locate the scoring blade motor access panel. Typically this is on the side or rear of the beam saw carriage. Remove the panel using the appropriate Allen key or screwdriver. Set fasteners aside in a safe location.
3. Visually inspect the motor exterior for excessive sawdust buildup, oil leaks, or physical damage. Use compressed air to gently blow away loose debris from the motor housing and brush holder area. Avoid directing air into the motor vents at high pressure to prevent forcing debris deeper.

4. Identify the brush holders on the motor. There are typically two per motor, located 180 degrees apart on the commutator end. Note the orientation of the brush holder caps or retaining screws.
5. Remove the brush holder cap or retaining screw using the appropriate screwdriver. Carefully extract the carbon brush from its holder. Do not pull on the brush wire; gently slide it out.
6. Measure the remaining length of the carbon brush using a digital caliper. Compare to the OEM minimum length specification (typically 6mm or 1/4 inch). If the brush is at or below the minimum, replace it. Also inspect the brush for chipping, cracking, or uneven wear. Replace if any defects are found.
7. If replacing, insert the new brush into the holder, ensuring the curved face matches the commutator radius. The brush wire must be properly seated in the holder channel. Reinstall the cap or retaining screw and tighten to the OEM torque specification (typically 2-3 Nm for small screws). Do not overtighten.
8. Repeat steps 5-7 for the second brush. If only one brush is worn, replace both to ensure even wear and consistent motor performance.
9. With brushes removed or loosened, use a lint-free cloth lightly dampened with electrical contact cleaner to wipe the commutator surface. Rotate the motor shaft by hand to access all segments. Do not use abrasive materials. Look for pitting, grooving, or discoloration. If the commutator is damaged, schedule a motor overhaul.
10. Reinstall the motor access panel and secure all fasteners. Remove all tools and debris from the work area. Verify that no loose items remain inside the motor compartment.

5.0 Verification & Return to Service

1. Remove LOTO devices and restore power to the beam saw. Ensure all safety guards are in place.
2. Perform a dry run of the scoring blade motor without material. Listen for abnormal noise (grinding, squealing) and observe for excessive sparking at the brush holders through the access panel vent slots. Normal sparking is minimal and blue; heavy orange sparking indicates poor brush seating or commutator issues.
3. Run a test cut on a scrap piece of material. Verify that the scoring blade cuts cleanly and the main blade follows without tear-out. Check that the scoring blade speed is consistent and the motor does not overheat after 2-3 cuts.
4. Record the brush length measurements and replacement date in the maintenance log or ServiceGrid work order. Note any abnormalities observed. Sign off on the PM 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.