**Standard Operating Procedure (SOP) for Repairing the Roaster**

**Department:** Maintenance  
**Machine Model:** RoastMaster 5000  
**Brewery:** Irvine Plant  
**Location:** Roaster 100

**1. Purpose**

This Standard Operating Procedure (SOP) provides detailed instructions for troubleshooting and repairing the RoastMaster 5000 roaster. The goal is to ensure the roaster operates at optimal efficiency, minimizing downtime and maintaining the quality of roasted grains for brewing.

**2. Scope**

This SOP applies to all maintenance personnel responsible for the upkeep, troubleshooting, and repair of the RoastMaster 5000 roaster. It covers common mechanical, electrical, and software-related issues that may arise during operation.

**3. Responsibilities**

* **Maintenance Technicians:** Perform repairs as outlined in this SOP.
* **Supervisors:** Oversee the repairs, ensuring adherence to this SOP and providing additional support when needed.
* **Operators:** Promptly report any issues to the maintenance team and assist in identifying problems.

**4. Tools and Equipment**

* Basic Hand Tools (screwdrivers, wrenches, pliers)
* Multimeter
* Temperature Probe
* Lubricants and Grease
* Spare Parts (belts, motors, heating elements, sensors)
* Diagnostic Software (specific to RoastMaster 5000)
* Personal Protective Equipment (PPE) - gloves, safety glasses, ear protection

**5. Safety Precautions**

* Ensure the machine is powered off and disconnected from the main power supply before beginning any repair.
* Follow lockout/tagout (LOTO) procedures to prevent accidental startup during maintenance.
* Use appropriate PPE at all times.
* Be cautious of hot surfaces and moving parts.

**6. Procedure**

**6.1. Initial Assessment**

1. **Machine Shutdown:** Confirm that the RoastMaster 5000 is properly shut down. Ensure the emergency stop button is engaged, and the main power is disconnected.
2. **Visual Inspection:** Conduct a thorough visual inspection of the machine. Look for signs of wear and tear, loose components, or any unusual conditions (e.g., burnt components, misaligned parts).
3. **Diagnostic Check:** Utilize the RoastMaster 5000 diagnostic software to perform an initial check of the machine’s systems. Review any error codes or warnings that could indicate the source of the problem.

**6.2. Common Issues and Repairs**

**6.2.1. Issue: Uneven Roasting**

**Symptoms:** Grains are inconsistently roasted, with some areas under-roasted or over-roasted.

**Solution:**

1. **Power Off:** Ensure the machine is turned off and locked out.
2. **Inspect Heating Elements:** Check the heating elements for signs of wear or malfunction. Ensure they are heating evenly across their surface.
3. **Calibrate Temperature Sensors:** Use a temperature probe to verify that the sensors are reading accurately. If discrepancies are found, recalibrate the sensors according to the manufacturer’s instructions.
4. **Clean Airflow Paths:** Inspect and clean the airflow paths within the roaster. Blockages or uneven airflow can cause uneven roasting. Use compressed air to clear any obstructions.
5. **Test and Adjust:** Run a test batch to verify that the issue is resolved. Adjust the settings if necessary to ensure even roasting.

**6.2.2. Issue: Belt Slippage on Drum**

**Symptoms:** The roasting drum does not rotate smoothly, causing uneven roasting or machine stoppage.

**Solution:**

1. **Inspect the Belt:** Check the belt that drives the roasting drum for signs of wear, fraying, or stretching.
2. **Tension Adjustment:** Adjust the belt tension using the tensioner mechanism. The belt should be taut but not overly tight.
3. **Replace the Belt:** If the belt is damaged or excessively worn, replace it with a new one of the correct size and type.
4. **Lubricate Bearings:** Lubricate the drum bearings to ensure smooth rotation. Use a high-temperature grease suitable for the operating environment.
5. **Test Run:** After making adjustments or replacing the belt, perform a test run to ensure the drum rotates smoothly and consistently.

**6.2.3. Issue: Overheating**

**Symptoms:** The machine overheats during operation, triggering automatic shutdowns or causing damage to roasted grains.

**Solution:**

1. **Inspect Cooling System:** Check the cooling system, including fans and vents, for blockages or malfunctions. Ensure all fans are operating correctly and vents are clear of debris.
2. **Check Thermostats:** Use a multimeter to test the thermostats controlling the roaster’s temperature. Replace any faulty thermostats.
3. **Inspect Heating Elements:** Ensure that the heating elements are not overheating due to electrical issues. If necessary, replace them with new ones.
4. **Test and Monitor:** After repairs, run the machine and monitor its temperature closely to ensure it does not overheat.

**6.2.4. Issue: Electrical Failure**

**Symptoms:** The machine fails to start, or certain components do not function properly.

**Solution:**

1. **Check Power Supply:** Verify that the machine is receiving power. Inspect the main power cord and connections for damage or loose connections.
2. **Inspect Fuses:** Check the machine’s fuse box for blown fuses. Replace any blown fuses with those of the correct rating.
3. **Test Electrical Components:** Use a multimeter to test electrical components, such as relays, switches, and circuit boards, for continuity and proper operation.
4. **Replace Faulty Components:** Replace any faulty electrical components with manufacturer-approved parts.
5. **Test and Verify:** After repairs, reconnect power and perform a test run to ensure all components are functioning properly.

**6.3. Final Steps**

1. **Machine Restart:** Once repairs are complete, restart the machine and monitor its operation. Ensure that it runs smoothly and at the correct temperatures.
2. **Document Repairs:** Record all repairs made, including parts replaced, in the maintenance log. Include any recommendations for future maintenance or potential issues to monitor.
3. **Notify Operators:** Inform the machine operators of the repairs performed and any changes to the machine’s operation.

**7. Maintenance Schedule**

Regular maintenance of the RoastMaster 5000 should be conducted according to the following schedule:

* **Daily:** Visual inspection and cleaning
* **Weekly:** Lubrication of moving parts, belt tension check
* **Monthly:** Full diagnostic check, inspection of heating elements and sensors
* **Quarterly:** Comprehensive inspection, replacement of worn parts, system calibration

**8. Troubleshooting Guide**

Refer to the RoastMaster 5000 Troubleshooting Guide (Appendix A) for additional information on resolving less common issues.