**Standard Operating Procedure (SOP) for Repairing Bottling Machines**

**Department:** Maintenance  
**Machine Model:** BrewMaster Pro 3000  
**Brewery:** Irvine Plant  
**Location:** Line 401

**1. Purpose**

This Standard Operating Procedure (SOP) outlines the steps required to troubleshoot and repair the BrewMaster Pro 3000 bottling machine. The objective is to ensure that the machine operates efficiently, minimizing downtime and maintaining the quality of bottled products.

**2. Scope**

This SOP applies to all maintenance personnel responsible for the upkeep, troubleshooting, and repair of the BrewMaster Pro 3000 bottling machine. It covers common issues that may arise during the operation of the machine, including mechanical, electrical, and software-related problems.

**3. Responsibilities**

* **Maintenance Technicians:** Execute repairs as outlined in this SOP.
* **Supervisors:** Ensure that all repairs are carried out according to this SOP and provide additional support as needed.
* **Operators:** Report any issues to the maintenance team promptly and assist in identifying the problem.

**4. Tools and Equipment**

* Basic Hand Tools (screwdrivers, wrenches, pliers)
* Multimeter
* Lubricants and Grease
* Spare Parts (belts, gears, sensors, fuses)
* Diagnostic Software (specific to BrewMaster Pro 3000)
* 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.
* Wear appropriate PPE at all times.
* Be aware of hot surfaces and sharp edges on the machine.

**6. Procedure**

**6.1. Initial Assessment**

1. **Machine Shutdown:** Verify that the BrewMaster Pro 3000 is properly shut down. Ensure that 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 obvious signs of wear and tear, loose components, or any unusual conditions (e.g., leaks, broken parts).
3. **Diagnostic Check:** Use the BrewMaster Pro 3000 diagnostic software to perform a preliminary 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: Belt Slippage**

**Symptoms:** The machine operates with a noticeable squeal, and bottles are not properly aligned under the filling nozzles.

**Solution:**

1. **Power Off:** Ensure the machine is turned off and locked out.
2. **Inspect the Belt:** Check the condition of the belt. Look for signs of wear, fraying, or stretching.
3. **Tension Adjustment:** If the belt is in good condition, adjust the tension using the tensioner bolts located on either side of the machine. The belt should have a slight give but should not be too loose.
4. **Replace the Belt:** If the belt is damaged, replace it with a new one. Ensure that the replacement belt is the correct size and type as specified in the machine’s manual.
5. **Test Run:** After replacing or adjusting the belt, run the machine at low speed to verify that the issue is resolved.

**6.2.2. Issue: Sensor Malfunction**

**Symptoms:** The machine stops intermittently, or bottles are not being detected properly.

**Solution:**

1. **Check Sensor Alignment:** Verify that all sensors are properly aligned with their targets. Misalignment can cause the machine to stop unexpectedly.
2. **Clean Sensors:** Use a soft cloth and mild cleaner to remove any dirt, dust, or residue from the sensor lenses.
3. **Test the Sensor:** Use a multimeter to check the sensor’s electrical output. Compare the readings with the specifications in the machine’s manual.
4. **Replace Sensor:** If the sensor is faulty, replace it with a new one. Ensure that the replacement sensor is compatible with the BrewMaster Pro 3000.
5. **Calibration:** After replacing the sensor, calibrate it according to the manufacturer’s instructions to ensure proper operation.

**6.2.3. Issue: Electrical Failure**

**Symptoms:** The machine does not power on, or certain components do not function correctly.

**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 ones of the correct rating.
3. **Test Electrical Components:** Use a multimeter to test the electrical components, such as relays, switches, and circuit boards, for continuity and proper operation.
4. **Replace Faulty Components:** If any electrical components are found to be faulty, replace them with new parts specified by the manufacturer.
5. **Test and Verify:** After making electrical repairs, reconnect the power and perform a test run to ensure the machine is functioning correctly.

**6.3. Final Steps**

1. **Machine Restart:** Once repairs are completed, restart the machine and monitor its operation. Ensure that it runs smoothly without any abnormal sounds or behaviors.
2. **Document Repairs:** Record all repairs made, including parts replaced, in the maintenance log. Include any recommendations for future maintenance or potential issues to watch for.
3. **Notify Operators:** Inform the machine operators of the repairs performed and any changes made to the machine’s operation.

**7. Maintenance Schedule**

Regular maintenance of the BrewMaster Pro 3000 should be conducted according to the following schedule:

* **Daily:** Visual inspection and cleaning
* **Weekly:** Lubrication of moving parts, tension check on belts
* **Monthly:** Full diagnostic check, inspection of sensors and electrical components
* **Quarterly:** Comprehensive inspection, replacement of worn parts, system calibration

**8. Troubleshooting Guide**

Refer to the BrewMaster Pro 3000 Troubleshooting Guide (Appendix A) for additional information on resolving less common issues.