

Rotary Screw Air Compressor Oil and Separator Change

1.0 Maintenance Objective & Frequency

The objective of this procedure is to replace the compressor lubricating oil and the air/oil separator element on a rotary screw air compressor. This PM prevents oil degradation, reduces the risk of oil carryover into the compressed air system, maintains proper lubrication of the airend, and extends the service life of the compressor. This procedure is typically performed every 1,000 operating hours or as specified by the OEM (e.g., every 6 months under normal conditions).

2.0 Lockout/Tagout (LOTO) & Safety

- **Electrical Isolation:** Disconnect and lock out the main disconnect switch for the compressor. Verify zero voltage with a voltmeter.
- **Pneumatic Isolation:** Close the discharge isolation valve. Depressurize the compressor by opening the manual blowdown valve or running the compressor in unloaded mode until the sump pressure gauge reads 0 psi.
- **Thermal Hazard:** Allow the compressor to cool for at least 30 minutes after shutdown. Oil and separator temperatures can exceed 80°C (176°F) and cause severe burns.
- **Mandatory PPE:** Safety glasses, oil-resistant gloves (e.g., nitrile), steel-toed boots, and long sleeves. Have a spill kit nearby.

3.0 Required Tools, Parts & Lubricants

- OEM-approved compressor lubricating oil (e.g., ISO VG 46 or 68 synthetic oil, quantity per sump capacity)
- New air/oil separator element (OEM part number)
- New oil filter element (OEM part number)
- New O-rings or gaskets for separator cover and oil fill cap
- Oil drain pan (capacity at least 20 litres)
- Socket set (metric, including 10mm, 13mm, 17mm, 19mm)
- Torque wrench (range 20-100 Nm)
- Oil filter wrench (strap or cup type)
- Clean rags and absorbent pads
- Funnel with flexible spout
- Personal lock and tag for LOTO

4.0 Step-by-Step Maintenance Procedure

1. Perform Lockout/Tagout as per Section 2.0. Confirm the compressor is electrically isolated and fully depressurized (sump pressure gauge reads 0 psi).
2. Place the oil drain pan under the oil drain valve or plug. Slowly open the drain valve or remove the drain plug to drain the used oil. Allow the oil to drain completely. Dispose of used oil in accordance with local environmental regulations.

3. Remove the oil filter using the appropriate filter wrench. Clean the filter mounting surface with a clean rag. Apply a thin film of clean oil to the gasket of the new oil filter. Install the new oil filter and hand-tighten it 3/4 to 1 full turn after the gasket contacts the mounting surface. Do not overtighten.
4. Remove the bolts securing the air/oil separator cover. Note the bolt pattern and torque sequence for reinstallation. Carefully lift off the cover. Remove the old separator element and inspect the interior of the separator housing for debris or sludge. Clean if necessary.
5. Install the new separator element, ensuring it seats properly in the housing. Replace any O-rings or gaskets on the cover. Reinstall the cover and tighten the bolts in a crisscross pattern to the OEM-specified torque (typically 25-35 Nm).
6. Close the oil drain valve or reinstall the drain plug. Torque the plug to the OEM specification (typically 30-40 Nm).
7. Remove the oil fill cap. Using a clean funnel, add the recommended amount of new compressor oil. Refer to the OEM manual for the exact capacity (e.g., 15 litres). Do not overfill. Replace the oil fill cap and tighten securely.
8. Inspect all hoses, fittings, and connections for signs of leaks or wear. Tighten any loose connections. Ensure the blowdown valve is closed.
9. Remove all tools, rags, and debris from the compressor area. Verify that the LOTO devices are removed only by the authorized person who applied them.

5.0 Verification & Return to Service

1. Restore power to the compressor. Open the discharge isolation valve.
2. Start the compressor and allow it to run in unloaded mode for 2-3 minutes to circulate the new oil. Check the oil level sight glass and add oil if necessary to bring the level to the centre of the sight glass while the compressor is running at operating temperature.
3. Switch the compressor to loaded mode and run for 5 minutes. Monitor the discharge pressure and temperature gauges for normal readings. Listen for unusual noises.
4. Inspect the oil filter, separator cover, drain plug, and all connections for leaks. Tighten as needed.
5. Record the maintenance completion date, hours run, and any observations in the compressor logbook or CMMS (e.g., ServiceGrid). 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.