Routine Compressor Maintenance

Establishing a regular, well-organized maintenance program and strictly following it is critical to maintaining the performance of a compressed air system. One person should be given the responsibility of ensuring that all maintenance is performed properly, on schedule, and is adequately documented.

The following are typical recommended minimum maintenance procedures for air-cooled reciprocating compressors; water-cooled, double-acting reciprocating compressors; lubricant-injected rotary compressors; lubricant-free rotary compressors; and centrifugal compressors.

Routine Maintenance for Air-Cooled Reciprocating Compressors

Every 8 Hours (or Daily)
- Maintain lubricant level between high- and low-level marks on bayonet gauge. (Discoloration or a higher lubricant level reading may indicate the presence of condensed liquids). If lubricant is contaminated, drain and replace.
- Drain receiver tank, drop legs and traps in the distribution system.
- Give compressor an overall visual inspection and be sure safety guards are in place.
- Check for any unusual noise or vibration.
- Check lubricant pressure on pressure lubricated units. Maintain 18 to 20 psig when compressor is at operating pressure and temperature. High-pressure rated compressors should maintain 22 to 25 psig of lubricant pressure.
- Check for lubricant leaks.

Every 40 Hours (or Weekly)
- Be certain pressure relief valves are working.
- Clean the cooling surfaces of the intercooler and compressor.
- Check the compressor for air leaks.
- Check the compressed air distribution system for leaks.
- Inspect lubricant for contamination and change if necessary.
- Clean or replace the air intake filter. Check more often under humid or dusty conditions.

Every 160 Hours (or Monthly)
- Check belt tension.

Every 500 Hours (or 3 Months)
- Change lubricant (more frequently in harsher environments).
- Check lubricant filter on pressure lubricated units (more frequently in harsher environments).
- Torque pulley-clamp screws or jam-nut.

Every 1,000 Hours (or 6 Months)
- When synthetic lubricant is used, lubricant change intervals may be extended to every 1,000 hours or every 6 months, whichever occurs first (change more frequently in harsher conditions).
- Inspect compressor valves for leakage and/or carbon build-up. The lubricant sump strainer screen inside the crankcase of pressure-lubricated models should be thoroughly cleaned with a safety solvent during every lubricant change. If excessive sludge build-up exists inside the crankcase, clean the inside of the crankcase as well as the screen. Never use a flammable or toxic solvent for cleaning. Always use a safety solvent and follow the directions provided.

Every 2,000 Hours (or 12 Months)
- Inspect the pressure switch diaphragm and contacts. Inspect the contact points in the motor starter.

Lubrication
Compressors may be shipped without lubricant in the crankcase. Before starting the compressor, add enough lubricant to the crankcase to register between the high and low marks on the dipstick or on bull’s eye sight gauge. Use the specified lubricant or consult the manufacturer for recommendations.

Certain synthetic lubricants have proven under extensive testing to minimize friction and wear, limit lubricant carryover, and reduce carbon and varnish deposits. They will support the performance characteristics and life and are highly recommended. Refer to the manufacturer’s specifications to determine the correct amount of lubricant and viscosity to use for your model and application. Use the supplier’s lubricant analysis program.
### Routine Maintenance for Water-Cooled, Double-Acting Reciprocating Compressors

**Every 8 Hours (or Daily)**
- Check compressor lubricant level in crankcase and cylinder lubricator and, if necessary, add to level indicated by sight gauge.
- Check cylinder lubrication feed rate and adjust, as necessary.
- Check lubricant pressure and adjust as necessary to meet specified operating pressure.
- Check cylinder jacket cooling water temperatures.
- Check capacity control operation. Observe discharge pressure gauge for proper LOAD/UNLOAD pressures.
- Drain control line strainer.
- Check operation of automatic condensate drain trap (intercooler and aftercooler).
- Drain condensate from discharge piping as applicable (dropleg and receiver).
- Check intercooler pressure on multi-stage machines, and refer to manufacturer’s manual if pressure is not as specified.

**Every 360 Hours (or Monthly)**
- Check piston rod packing for leaks and for blow-by at gland. Repair or replace as necessary per manufacturer’s manual.
- Inspect lubricant scraper rings for leakage. Replace as necessary per manufacturer’s manual.
- Inspect air intake filter. Clean or replace as necessary.
- Drain lubricant strainer/filter sediment.
- Lubricate unloader mechanism per manufacturer’s manual.
- Check motor amperes (amps) at compressor full capacity and pressure.

**Every 3,000 Hours (or Semi-Annually)**
- Perform valve inspection per manufacturer’s manual.
- Inspect cylinder or cylinder liner, through valve port, for scoring.
- Change crankcase lubricant, if required.
- Clean crankcase breather, if provided.
- Change lubricant filter element.
- Remove and clean control air filter/strainer element.
- Check all safety devices for proper operation.
- Perform piston ring inspection on non-lubricated design. Replace as necessary per manufacturer’s manual.

**Every 6,000 Hours (or Annually)**
- Remove and clean crankcase lubricant strainer.
- Check foundation bolts for tightness. Adjust as necessary.
- Perform piston ring inspection. Replace as necessary per manufacturer’s manual.

### Routine Maintenance for Lubricant-Injected Rotary Compressor

The following are typical minimum maintenance requirements.

**Periodically/Daily (8 Hours Maximum)**
- Monitor all gauges and indicators for normal operation.
- Check lubricant level and top off as necessary.
- Check for lubricant leaks.
- Check for unusual noise or vibration.
- Drain water from air/lubricant reservoir.
- Drain control line filter.

**Weekly**
- Check safety valve operation.

**Monthly**
- Service air filter as needed (daily or weekly if extremely dusty conditions exist).
- Wipe down entire unit to maintain appearance.
- Check drive motor amps at compressor full capacity and design pressure.
- Check operation of all controls.
- Check operation of lubricant scavenger/return system. Clean, as necessary.

**6 Months Or Every 1,000 Hours**
- Take lubricant sample.
- Change lubricant filter.*

**Periodically/Annually**
- Go over unit and check all bolts for tightness.
- Change air/lubricant separator.
- Change air filter.
- Lubricate motors per manufacturer’s instructions.
- Check safety shutdown system. Contact authorized service person.
Routine Maintenance for Lubricant-Free Rotary Screw Compressor

The following are typical minimum requirements for this type of compressor. Routine maintenance is relatively minimal. The microprocessor control panel monitors the status of the air and lubricant filters. When maintenance to either device is required, the control panel may display the appropriate maintenance message and flash the location on the display as a visual remainder.

Do not remove caps, plugs, and/or other components when compressor is running or pressurized. Stop compressor and relieve all internal pressure before doing so.

Every 15,000 Hours of Operation
In addition to those items covered in the 3,000-hour maintenance interval, the following items must also be checked every 15,000 hours of operation, depending upon conditions of service.

• Operate/test all safety devices.
• Check/clean heat exchangers.
• Check/clean blowdown valve.
• Check operation of balancing switch/valve assembly.
• Check/clean water regulating valve.
• Check/clean check valve.
• Check/clean galvanized interstage pipe work.
• Check condition of isolation mounts under compressor unit and motor.
• Check/clean strainer and check valve included in lubricant pump suction line, inside lubricant sump.

Be aware that work on the compressor stages and gearbox must be conducted by manufacturer’s personnel only. Any work done by unauthorized personnel can render the manufacturer’s equipment warranty null and void.

Parts Replacement and Adjustment Procedures
Familiarize yourself with the safety guidelines offered in the safety section of the manufacturer’s manual before attempting any maintenance on the package.

Every 3,000 Hours of Operation
The following items should be checked every 3,000 hours of operation, although service conditions, such as relative cleanliness of process air or quality of cooling water, may require shorter inspection intervals.

• Check/change lubricant charge and filter element.
• Check/change air filter element.
• Check/change sump-breather filter element.
• Check/clean control line filter element.
• Check/clean condensate drain valve.
• Check condition of shaft coupling element and tightness of fasteners.
• Measure and record vibration signatures on compressor, gearbox, and motor (optional).
• Annual rebuilding of the inlet valve is normally recommended.

Note: Please refer to the motor manufacturer’s documentation for recommended maintenance. Keep in mind that the specified type and quantity of lubricating grease for motor bearings is crucial.
Routine Maintenance for
Centrifugal Air Compressors

The following are typical maintenance requirements for this type of compressor.

**Daily**
- Record operating air inlet, interstage and discharge pressures and temperatures.
- Record cooling water inlet and outlet pressures and temperatures.
- Record lubricant pressure and temperatures.
- Record all vibration levels.
- Check air-inlet filter differential pressure.
- Check proper operation of drain traps.
- Drain control air filter.
- Check for leaks, air, water, and lubricant. Repair and clean as necessary.
- Check lubricant sump level and adjust as necessary.
- Check drive motor for smooth operation and record amps.

**Every 3 Months**
- Check lubricant filter differential pressure. Replace element as necessary.
- Check lubricant sump venting system. Replace filter elements as necessary.
- Check operation of capacity control system.
- Check operation of surge control system.
- Check main-drive motor amps at full-load operation.
- Check automatic drain traps and strainers. Clean and/or replace as necessary.

**Every 6 Months**
- Check air-inlet filter and replace element as necessary.
- Take oil sample for analysis. Replace lubricant as necessary.

**Annually**
- Inspect intercooler, aftercooler, and lubricant cooler. Clean and/or replace as necessary.
- Inspect main drive motor for loose mounting bolts, frayed or worn electrical cables, and accumulated dirt. Follow manufacturer’s recommendations, including lubrication.
- Inspect main drive coupling for alignment and required lubrication.
- Inspect gearbox for loose mounting bolts, vibration, unusual noise or wear and axial clearances per manufacturer’s manual.
- Check impeller inlets and diffusers for signs of wear, rubbing or cracking.
- Check control panel for complete and proper operation.
- Check all control valves for proper operation.
- Check all safety devices for proper settings and operation.
- Inspect check valve; replace worn parts.

Keep all components/accessories clean and follow all recommended safety procedures.

Information Provided By:
Improving Compressed Air System Performance: A Sourcebook for Industry