

## 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.

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### 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 Compressor Maintenance***

### **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.

### **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 Compressor Maintenance***

### **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.

#### **Daily**

Following a routine start, observe the various control panel displays and local gauges to check that normal readings are being displayed. Previous records are very helpful in determining the normalcy of the measurements.

These observations should be made during all expected modes of operation (i.e., full-load, no-load, different line pressures, and cooling water temperatures).

#### **After Initial 50 Hours of Operation**

Upon completion of the first 50 hours of operation, essential readings of operating conditions should be verified and any necessary adjustments made.

#### **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.

#### **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.

## ***Routine Compressor Maintenance***

### **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.

# Air Compressor Trouble Shooting

This guide will help you determine what may be causing your air compressor problems. A proper preventative maintenance schedule will limit these common issues over time.

All equipment in the compressed air system should be maintained in accordance with manufacturers' specifications. Manufacturers provide inspection, maintenance, and service schedules that should be followed strictly. In many cases, it makes sense, from efficiency and economic standpoints, to maintain equipment more frequently than the intervals recommended by manufacturers, which are primarily designed to protect equipment.

Symptom	Cause	Correction
<b>Decreased Discharge Pressure</b>	Excessive leaks in piping	Inspect plant for air leaks and check air demand
	Faulty inlet valve	Inspect inlet valve assembly and repair or replace as needed
	Service valve open	Close valve
	Plugged oil filter and/or air/oil separator	Inspect elements and replace if needed
<b>Excessive Lubricant Consumption</b>	Oil sump overfilled	Drain receiver to proper level
	High compressor discharge temperature	Inspect and clean coolers; Inspect temperature control valve
	Incorrectly adjusted scavenger line; Plugged scavenger line	Check scavenge line connections; Make sure scavenge line is cut at 45° angle, reaches the bottom of the separator and isn't blocked
<b>Failure to Start</b>	Power failure	Check power supply
	Disconnected main switch	Check switch and verify that power is ON
	Safety shut-down tripped	Re-set compressor safety
	Plugged or dirty intake air path/filter	Inspect inlet filter and air path, check for voids; Replace and repair if needed
<b>High Power Consumption</b>	Plugged air/oil separator and/or inlet air filter	Inspect and replace element as needed
	Lubricant viscosity issues	Test and replace oil as needed; Clean with flush if necessary
	Wrong air pressure setting	Adjust setting to proper operating conditions
	Airend bearings starting to fail	Inspect and repair or replace parts as needed
	Obstruction in air lines	Inspect connections and air paths for leaks or blockages

Symptom	Cause	Correction
<b>High Discharge Temperature</b>	Low oil levels	Inspect and fill lubricant to proper level
	Clogged or dirty heat exchanger	Inspect lubricant lines for blockage; Analyze lubricant quality; Flush with cleaner if varnish is present
	Defective or damaged thermal by-pass valve	Rebuild or replace by-pass valve
	Plugged oil filter	Replace oil filter element(s)
	Plugged air/oil separator	Replace air/oil separator element(s)
<b>Premature Lubricant Breakdown</b>	Compressor temperature too hot	See corrections for high discharge temperature
	Mixing incompatible lubricants	Drain, replace and analyze oil; Flush compressor with a cleaner
	Excessive condensate in system	Periodically drain receiver condensate; Inspect or replace drain lines and drain valves
	Ingestion of foreign substance through intake	Review operational make-up of air; Analyze oil and correct inlet air source if needed
<b>Air/Oil Separator Collapse</b>	Minimum pressure valve sticking	Rebuild or replace valve
	Dirty or incompatible oil in compressor	Review and analyze oil; Replace with proper lubricant; Flush with cleaner is necessary
	Faulty check valve	Rebuild or replace valve
	Plugged or dirty intake air path/filter	Inspect inlet filter and air path, check for voids; Replace and repair if needed

Please contact us at 866-650-1937 or [www.eCompressedair.com](http://www.eCompressedair.com) with any questions.