

# Technical support

Document name:

## Air compressor maintenance

Contents:

### Routine running maintenance / General maintenance and adjustment / Fault chart

Regular maintenance will ensure maximum efficiency for the longest period. This guide takes you through the entire process of keeping your machinery running at its best.

## Routine Running Maintenance

### 1.1 Oil

Check the oil level of the crankcase DAILY or every time you start the compressor and top up with the recommended oil if required. The initial fill of oil should be drained after the first 50 hours of operation (1 month). Replace the oil to the correct level every 500 hours (6-12 months).

### 1.2 Water

Condensation should be drained from inside the tank DAILY. Simply turn the drain valve underneath. A similar operation is necessary to remove water from the pressure regulator and after cooler (if fitted). Again, unscrew the drain valve daily.

### 1.3 Cylinder bolt heads

These should be checked and tightened down after the first day's operation when the cylinder head has completely cooled. Bolts should be checked regularly afterwards on a weekly basis. (Torque settings: 1.5 to 4 Hp pump = 2.4 Kgm – 5 to 15 Hp = 5 Kgm.).

### 1.4 Air filter

This should be checked WEEKLY and cleaned as necessary by reverse blowing with compressed air. If badly contaminated – replaced the cartridge.

### 1.5 Leaks

On starting EACH DAY the compressor and its fittings should be checked for air leaks. Delivery lines and couplings should also be checked.

### 1.6 Belt tension and alignment

CHECK WEEKLY WITH MAINS ISOLATED. The motor pulley and pump flywheel should be in line and the movement (in millimetres) at the centre equal to 16 x centre distance (in metres). Centre to centre 300 mm = .3m, .3x 16 = 4.8 mm of movement with slight pressure – 4 to 5lbs). At the same time check that motor securing bolts are tight, and check for belt wear.

### 1.7 Cut out and cut in pressure

Check WEEKLY that the compressor is cutting out and in at the correct pressures (130 psi and 90 psi respectively). If the pressures have varied since delivery the compressor may be working harder than is necessary. Adjust these pressures as instructed in Section 2.5.

### 1.8 Safety valve

This is set to protect in case of pressure switch malfunction. With the pressure at 130 psi on the gauge, the centre shaft can be lifted with ease to check its function.

### 1.9 Compressor unloader valve

The button at the top of the pressure switch activates a small non-return valve, which exhausts air from above the piston and in the tank supply pipe. Turn the button from time to time to ensure the valve is exhausting air, test when motor is running.

### 1.10 Suction action

Gently place your hand over the filter inlet holes; the suction of air can be clearly heard. Poor suction would suggest a blocked air filter or damaged inlet valves.

### 1.11 Non return valve

Should be removed and examined every MONTH. Oil, coke and scale deposits should be removed and the seal checked for soundness or replaced. A faulty non-return valve can be diagnosed by stopping the machine at the pressure switch (turn button). If air continually

escapes after the initial HISS then the valve is faulty. The air should be drained from the receiver before removing the valve for service.

## General Maintenance and Adjustment

### 2.1 Clean equipment

Keep your National Air Compressor internally and externally clean (regular oil changes and cleaning down the outside). A clean inside leads to good mechanical efficiency, a clean outside to a more efficient loss of heat to the circulating air.

### 2.2 Valves

Pump efficiency largely depends upon the condition of the valves and valve seats. The cylinder head should be removed every 6-12 MONTHS and the valves cleaned, dirt/carbon/varnish should be brushed and washed away, and the parts checked and dried before replacement. Valve seats should be checked for deposits and such removed. Chipped valve plates should be replaced along with broken springs. Where valves cannot be removed (i.e. the riveted type) carefully clean all accessible carbon, particularly on the sealing faces of the valves. On replacing the cylinder head, always use new head gaskets, and "gently" tighten all bolts, then secure in a diagonal pattern to ensure a uniform seal (see 'Cylinder bolt heads' (above) for torque specifications).

### 2.3 Piston rings

Compression rings and oil scraper rings should be inspected at least once a year or when excessive oil is being used by the compressor, other major component charges (see Section 1.1).

### 2.4 Bearings

When checking or changing piston rings, the compressor crankshaft and conrod bearings should be checked for wear and replaced as necessary.

### 2.5 Pressure switch

To adjust the "cut out" and "cut in" pressures, the pressure switch cover should be removed. ENSURE ELECTRICAL SUPPLY IS DISCONNECTED. This exposes the adjusting bolt (for "switch off" pressure switch cover should be removed. ENSURE ELECTRICAL SUPPLY IS DISCONNECTED. This exposes the adjusting bolt (for "switch off pressure

setting) and knurled ring (for "switch on" pressure setting). Both pressures are INCREASED by turning CLOCKWISE, and REDUCED by turning ANTI-CLOCKWISE. PRESSURE SWITCH is factory set and should only be adjusted by your local distributor/service agent. Unauthorised tampering will void warranty.

### 2.6 Pressure regulator / filter

If fitted, it should be removed and thoroughly cleaned every 6 MONTHS. The rubber diaphragm is located in the top sub-assembly and should be replaced if you have difficulty adjusting the pressure or in a badly worn condition.

### 2.7 Motor drive pulley

Following electrical isolation and guard and belt removal, the pulley may be removed using a set of pliers. Refrain from hammering the pulley from the shaft as this may damage the motor bearings.

### 2.8 Motor

Failure to start, or motor stoppage during operation, does not necessarily point to complete motor failure. A "buzzing" motor may indicate a faulty capacitor, relay, or low supply voltage (especially if on a long lead), or just loose connections. Stoppage during operation can be caused by:

1. Motor overload button tripping. Caused by low voltage or high temperature. Allow to cool and reset.
2. A pump running dry and causing seizure of the rings to the bore.
3. Faulty non-return valves causing a continual back pressure condition (see 2.6).
4. A faulty starter switch or pressure switch.

Each item should be checked out to identify the failed component.

### 2.9 Compressor Oil

Shell Corena P100 – BP RCR100. These are special compressor oils and automotive oils should not be used.

### 2.10 Ordering spares

All spares for your compressor should be ordered through your distribution. Be as precise as possible, quote: Model Code, Date of Purchase, Air Receiver Serial Number, Description of the item required.

## Fault chart

1. Clogged intake filter.
- 1 Loose pulley or a motor with excessive play in its shaft.
- 2 Receiver needs draining.
- 3 Air to flywheel blocked off.
- 4 Air leaks in piping (on machine or in outside systems).
- 5 Receiver safety valve leaking.
- 6 Oil viscosity too low.
- 7 Oil viscosity too high.
- 8 Oil level too high (where overfilling possible.)
- 9 Oil level too low.
- 10 Incorrect oil being used. Change to oil.
- 11 Extremely light duty or located in a damp humid spot.
- 12 Check line voltage (all phases if 3 phase), motor terminals for good contact, tight starter connections, correct motor overload and fuses.
- 13 Poor power regulation (unbalanced line). Consult with competent electrician.
- 14 Carbon on top of piston.
- 15 Leaking, broken, carbonised or loose valve or restricted air passages.
- 16 Worn or scored connecting rod bearings.
- 17 Defective bearing on crankshaft or on motor shaft. Loose motor fan.
- 18 Piston rings broken or not seated in, end gaps not staggered, stuck in grooves.
- 19 Cylinders or pistons scratched, worn or scored.
- 20 Wrong direction of rotation.
- 21 Extremely dusty atmosphere. Need more effective air inlet filter.
- 22 Drive belt too tight.
- 23 Drive belt slack.
- 24 Check that motor capacitors and relays are functioning (single phase units only).
- 25 Check if receiver pressure is higher than pressure switch cut-in pressure (Motor will restart when receiver pressure drops below cut-in pressure).
- 26 Non return valve faulty.
- 27 Check if starter or motor overload has tripped.