Atlas Copco

Instruction Manual

Instruction Manual
for Portable Compressors
English

V900 WUX
XATS 1200 WUX
XAVS 1000 WUX

Engine DCEC QSL8.9-C360-30

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for Portable Compressors

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XATS 1200 WUX
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Atlas Copco

ATLAS COPCO - PORTABLE ENERGY DIVISION
www.atlascopco.com

Warranty and Liability Limitation

Use only authorized parts.
Any damage or malfunction caused by the use of unauthorized parts is not covered by Warranty or Product Liability.
The manufacturer does not accept any liability for any damage arising from modifications, additions or conversions made without the manufacturer's approval in writing.
Neglecting maintenance or making changes to the setup of the machine can result in major hazards, including fire risk.
While every effort has been made to ensure that the information in this manual is correct, Atlas Copco does not assume responsibility for possible errors.

Preface

Please read the following instructions carefully before starting to use your compressor.

It is a solid, safe and reliable machine, built according to the latest technology. Follow the instructions in this booklet and we guarantee you years of troublefree operation.

Always keep the manual available near the machine.

In all correspondence always mention the compressor type and serial number, shown on the data plate.

The company reserves the right to make changes without prior notice.

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Safety precautions

To be read attentively and acted accordingly before towing, lifting, operating, performing maintenance or repairing the compressor.

INTRODUCTION

The policy of Atlas Copco is to provide the users of their equipment with safe, reliable and efficient products. Factors taken into account are among others:

- the intended and predictable future use of the products, and the environments in which they are expected to operate,
- applicable rules, codes and regulations,
- the expected useful product life, assuming proper service and maintenance,
- providing the manual with up-to-date information.

Before handling any product, take time to read the relevant instruction manual. Besides giving detailed operating instructions, it also gives specific information about safety, preventive maintenance, etc.

Keep the manual always at the unit location, easy accessible to the operating personnel.

See also the safety precautions of the engine and possible other equipment, which are separately sent along or are mentioned on the equipment or parts of the unit.

These safety precautions are general and some statements will therefore not always apply to a particular unit.

Only people that have the right skills should be allowed to operate, adjust, perform maintenance or repair on Atlas Copco equipment.

It is the responsibility of management to appoint operators with the appropriate training and skill for each category of job.

Skill level 1: Operator

An operator is trained in all aspects of operating the unit with the push-buttons, and is trained to know the safety aspects.

Skill level 2: Mechanical technician

A mechanical technician is trained to operate the unit the same as the operator. In addition, the mechanical technician is also trained to perform maintenance and repair, as described in the instruction manual, and is allowed to change settings of the control and safety system. A mechanical technician does not work on live electrical components.

Skill level 3: Electrical technician

An electrical technician is trained and has the same qualifications as both the operator and the mechanical technician. In addition, the electrical technician may carry out electrical repairs within the various enclosures of the unit. This includes work on live electrical components.

Skill level 4: Specialist from the manufacturer

This is a skilled specialist sent by the manufacturer or its agent to perform complex repairs or modifications to the equipment.

In general it is recommended that not more than two people operate the unit, more operators could lead to unsafe operating conditions.

Take necessary steps to keep unauthorized persons away from the unit and eliminate all possible sources of danger at the unit.

When handling, operating, overhauling and/or performing maintenance or repair on Atlas Copco equipment, the mechanics are expected to use safe engineering practices and to observe all relevant local safety requirements and ordinances. The following list is a reminder of special safety directives and precautions mainly applicable to Atlas Copco equipment.

These safety precautions apply to machinery processing or consuming air. Processing of any other gas requires additional safety precautions typical to the application and are not included herein.

Neglecting the safety precautions may endanger people as well as environment and machinery:

- endanger people due to electrical, mechanical or chemical influences,
- endanger the environment due to leakage of oil, solvents or other substances,
- endanger the machinery due to function failures.

All responsibility for any damage or injury resulting from neglecting these precautions or by non-observance of ordinary caution and due care required in handling, operating, maintenance or repair, also if not expressly mentioned in this instruction manual, is disclaimed by Atlas Copco.

The manufacturer does not accept any liability for any damage arising from the use of non-original parts and for modifications, additions or conversions made without the manufacturer's approval in writing.

If any statement in this manual does not comply with local legislation, the stricter of the two shall be applied.

Statements in these safety precautions should not be interpreted as suggestions, recommendations or inducements that it should be used in violation of any applicable laws or regulations.

GENERAL SAFETY PRECAUTIONS

1 The owner is responsible for maintaining the unit in a safe operating condition. Unit parts and accessories must be replaced if missing or unsuitable for safe operation.

2 The supervisor, or the responsible person, shall at all times make sure that all instructions regarding machinery and equipment operation and maintenance are strictly followed and that the machines with all accessories and safety devices, as well as the consuming devices, are in good repair, free of abnormal wear or abuse, and are not tampered with.

3 Whenever there is an indication or any suspicion that an internal part of a machine is overheated, the machine shall be stopped but no inspection covers shall be opened before sufficient cooling time has elapsed; this to avoid the risk of spontaneous ignition of oil vapour when air is admitted.

4 Normal ratings (pressures, temperatures, speeds, etc.) shall be durably marked.

5 Operate the unit only for the intended purpose and within its rated limits (pressure, temperature, speeds, etc.).

6 The machinery and equipment shall be kept clean, i.e. as free as possible from oil, dust or other deposits.

7 To prevent an increase in working temperature, inspect and clean heat transfer surfaces (cooler fins, intercoolers, water jackets, etc.) regularly. See the **Preventive maintenance schedule**.

8 All regulating and safety devices shall be maintained with due care to ensure that they function properly. They may not be put out of action.

9 Care shall be taken to avoid damage to safety valves and other pressure-relief devices, especially to avoid plugging by paint, oil coke or dirt accumulation, which could interfere with the functioning of the device.

10 Pressure and temperature gauges shall be checked regularly with regard to their accuracy. They shall be replaced whenever outside acceptable tolerances.

11 Safety devices shall be tested as described in the maintenance schedule of the instruction manual to determine that they are in good operating condition. See the **Preventive maintenance schedule**.

12 Mind the markings and information labels on the unit.

13 In the event the safety labels are damaged or destroyed, they must be replaced to ensure operator safety.

14 Keep the work area neet. Lack of order will increase the risk of accidents.

15 When working on the unit, wear safety clothing. Depending on the kind of activities these are: safety glasses, ear protection, safety helmet (including visor), safety gloves, protective clothing, safety shoes. Do not wear the hair long and loose (protect long hair with a hairnet), or wear loose clothing or jewelry.

16 Take precautions against fire. Handle fuel, oil and anti-freeze with care because they are inflammable substances. Do not smoke or approach with naked flame when handling such substances. Keep a fire-extinguisher in the vicinity.

SAFETY DURING TRANSPORT AND INSTALLATION

When towing, lifting or transporting the compressor in any way, the battery switch must always be in the "OFF" position!

To lift a unit, all loose or pivoting parts, e.g. doors and towbar, shall first be securely fastened.

Do not attach cables, chains or ropes directly to the lifting eye; apply a crane hook or lifting shackle meeting local safety regulations. Never allow sharp bends in lifting cables, chains or ropes.

Helicopter lifting is not allowed.

It is strictly forbidden to dwell or stay in the risk zone under a lifted load. Never lift the unit over people or residential areas. Lifting acceleration and retardation shall be kept within safe limits.

1 Before towing the unit:
   - ascertain that the pressure vessel(s) is (are) depressurized,
   - check the towbar, the brake system and the towing eye. Also check the coupling of the towing vehicle,
   - check the towing and brake capability of the towing vehicle,
   - check that the towbar, jockey wheel or stand leg is safely locked in the raised position,
   - ascertain that the towing eye can swivel freely on the hook,
   - check that the wheels are secure and that the tyres are in good condition and inflated correctly,
   - connect the signalisation cable, check all lights and connect the pneumatic brake couplers,
   - attach the safety break-away cable or safety chain to the towing vehicle,
   - remove wheel chocks, if applied, and disengage the parking brake.
2 To tow a unit use a towing vehicle of ample capacity. Refer to the documentation of the towing vehicle.
3 If the unit is to be backed up by the towing vehicle, disengage the overrun brake mechanism (if it is not an automatic mechanism).
4 Never exceed the maximum towing speed of the unit (mind the local regulations).
5 Place the unit on level ground and apply the parking brake before disconnecting the unit from the towing vehicle. Unclip the safety break-away cable or safety chain. If the unit has no parking brake or jockey wheel, immobilize the unit by placing chocks in front of and/or behind the wheels. When the towbar can be positioned vertically, the locking device must be applied and kept in good order.
6 To lift heavy parts, a hoist of ample capacity, tested and approved according to local safety regulations, shall be used.
7 Lifting hooks, eyes, shackles, etc., shall never be bent and shall only have stress in line with their design load axis. The capacity of a lifting device diminishes when the lifting force is applied at an angle to its load axis.
8 For maximum safety and efficiency of the lifting apparatus all lifting members shall be applied as near to perpendicular as possible. If required, a lifting beam shall be applied between hoist and load.
9 Never leave a load hanging on a hoist.
10 A hoist has to be installed in such a way that the object will be lifted perpendicular. If that is not possible, the necessary precautions must be taken to prevent load-swinging, e.g. by using two hoists, each at approximately the same angle not exceeding 30° from the vertical.
11 Locate the unit away from walls. Take all precautions to ensure that hot air exhausted from the engine and driven machine cooling systems cannot be recirculated. If such hot air is taken in by the engine or driven machine cooling fan, this may cause overheating of the unit; if taken in for combustion, the engine power will be reduced.
12 Before moving the compressor, switch it off.
13 If the warning light on the ABS module or in the vehicle lights up, please contact Atlas Copco.

SAFETY DURING USE AND OPERATION

1 When the unit has to operate in a fire-hazardous environment, each engine exhaust has to be provided with a spark arrestor to trap incendiary sparks.
2 The exhaust contains carbon monoxide which is a lethal gas. When the unit is used in a confined space, conduct the engine exhaust to the outside atmosphere by a pipe of sufficient diameter; do this in such a way that no extra back pressure is created for the engine. If necessary, install an extractor. Observe any existing local regulations. Make sure that the unit has sufficient air intake for operation. If necessary, install extra air intake ducts.
3 When operating in a dust-laden atmosphere, place the unit so that dust is not carried towards it by the wind. Operation in clean surroundings considerably extends the intervals for cleaning the air intake filters and the cores of the coolers.

4 Close the compressor air outlet valve before connecting or disconnecting a hose. Ascertain that a hose is fully depressurized before disconnecting it. Before blowing compressed air through a hose or air line, ensure that the open end is held securely, so that it cannot whip and cause injury.

5 The air line end connected to the outlet valve must be safeguarded with a safety cable, attached next to the valve.

6 No external force may be exerted on the air outlet valves, e.g. by pulling on hoses or by installing auxiliary equipment directly to a valve, e.g. a water separator, a lubricator, etc. Do not step on the air outlet valves.

7 Never move a unit when external lines or hoses are connected to the outlet valves, to avoid damage to valves, manifold and hoses.

8 Do not use compressed air from any type of compressor, without taking extra measures, for breathing purposes as this may result in injury or death. For breathing air quality, the compressed air must be adequately purified according to local legislation and standards. Breathing air must always be supplied at stable, suitable pressure.

9 Distribution pipework and air hoses must be of correct diameter and suitable for the working pressure. Never use frayed, damaged or deteriorated hoses. Replace hoses and flexibles before the lifetime expires. Use only the correct type and size of hose end fittings and connections.

10 If the compressor is to be used for sand-blasting or will be connected to a common compressed-air system, fit an appropriate non-return valve (check valve) between compressor outlet and the connected sand-blasting or compressed-air system. Observe the right mounting position/ direction.

11 Before removing the oil filler plug, ensure that the pressure is released by opening an air outlet valve.

12 Never remove a filler cap of the cooling water system of a hot engine. Wait until the engine has sufficiently cooled down.

13 Never refill fuel while the unit is running, unless otherwise stated in the Atlas Copco Instruction Book (AIB). Keep fuel away from hot parts such as air outlet pipes or the engine exhaust. Do not smoke when fuelling. When fuelling from an automatic pump, an earthing cable should be connected to the unit to discharge static electricity. Never spill nor leave oil, fuel, coolant or cleansing agent in or around the unit.

14 All doors shall be shut during operation so as not to disturb the cooling air flow inside the bodywork and/or render the silencing less effective. A door should be kept open for a short period only e.g. for inspection or adjustment.

15 Periodically carry out maintenance works according to the maintenance schedule.

16 Stationary housing guards are provided on all rotating or reciprocating parts not otherwise protected and which may be hazardous to personnel. Machinery shall never be put into operation, when such guards have been removed, before the guards are securely reinstalled.

17 Noise, even at reasonable levels, can cause irritation and disturbance which, over a long period of time, may cause severe injuries to the nervous system of human beings. When the sound pressure level, at any point where personnel normally has to attend, is:

- below 70 dB(A): no action needs to be taken,
- above 70 dB(A): noise-protective devices should be provided for people continuously being present in the room,
- below 85 dB(A): no action needs to be taken for occasional visitors staying a limited time only,
- above 85 dB(A): room to be classified as a noise-hazardous area and an obvious warning shall be placed permanently at each entrance to alert people entering the room, for even relatively short times, about the need to wear ear protectors,
- above 95 dB(A): the warning(s) at the entrance(s) shall be completed with the recommendation that also occasional visitors shall wear ear protectors,
- above 105 dB(A): special ear protectors that are adequate for this noise level and the spectral composition of the noise shall be provided and a special warning to that effect shall be placed at each entrance.

18 The unit has parts, which may be accidentally touched by personal, of which the temperature can be in exess of 80 °C (176 °F). The insulation or safety guard, protecting these parts shall not be removed before the parts have cooled down to room temperature. As it is technically not possible to insulate all hot parts or to install safety guards around hot parts (e.g. exhaust manifold, exhaust turbine), the operator / service engineer must always be aware not to touch hot parts when opening a machine door.

19 Never operate the unit in surroundings where there is a possibility of taking in flammable or toxic fumes.

20 If the working process produces fumes, dust or vibration hazards, etc., take the necessary steps to eliminate the risk of personal injury.

21 When using compressed air or inert gas to clean down equipment, do so with caution and use the appropriate protection, at least safety glasses, for

the operator as well as for any bystander. Do not apply compressed air or inert gas to your skin or direct an air or gas stream at people. Never use it to clean dirt from your clothes.

22 When washing parts in or with a cleaning solvent, provide the required ventilation and use appropriate protection such as a breathing filter, safety glasses, rubber apron and gloves, etc.

23 Safety shoes should be compulsory in any workshop and if there is a risk, however small, of falling objects, wearing of a safety helmet should be included.

24 If there is a risk of inhaling hazardous gases, fumes or dust, the respiratory organs must be protected and depending on the nature of the hazard, so must the eyes and skin.

25 Remember that where there is visible dust, the finer, invisible particles will almost certainly be present too; but the fact that no dust can be seen is not a reliable indication that dangerous, invisible dust is not present in the air.

26 Never operate the unit at pressures or speeds below or in excess of its limits as indicated in the technical specifications.

27 Do not use aerosol types of starting aids such as ether. Such use could result in an explosion and personal injury.

SAFETY DURING MAINTENANCE AND REPAIR

Maintenance, overhaul and repair work shall only be carried out by adequately trained personnel; if required, under supervision of someone qualified for the job.

1 Use only the correct tools for maintenance and repair work, and only tools which are in good condition.

2 Parts shall only be replaced by genuine Atlas Copco replacement parts.

3 All maintenance work, other than routine attention, shall only be undertaken when the unit is stopped. Steps shall be taken to prevent inadvertent starting. In addition, a warning sign bearing a legend such as ”work in progress; do not start” shall be attached to the starting equipment. On engine-driven units the battery shall be disconnected and removed or the terminals covered by insulating caps. On electrically driven units the main switch shall be locked in open position and the fuses shall be taken out. A warning sign bearing a legend such as ”work in progress; do not supply voltage” shall be attached to the fuse box or main switch.

4 Before dismantling any pressurized component, the compressor or equipment shall be effectively isolated from all sources of pressure and the entire system shall be relieved of pressure. Do not rely on non-return valves (check valves) to isolate pressure systems. In addition, a warning sign bearing a legend such as ”work in progress; do not open” shall be attached to each of the outlet valves.

5 Prior to stripping an engine or other machine or undertaking major overhaul on it, prevent all movable parts from rolling over or moving.

6 Make sure that no tools, loose parts or rags are left in or on the machine. Never leave rags or loose clothing near the engine air intake.

7 Never use flammable solvents for cleaning (fire-risk).

8 Take safety precautions against toxic vapours of cleaning liquids.

9 Never use machine parts as a climbing aid.

10 Observe scrupulous cleanliness during maintenance and repair. Keep away dirt, cover the parts and exposed openings with a clean cloth, paper or tape.

11 Never weld on or perform any operation involving heat near the fuel or oil systems. Fuel and oil tanks must be completely purged, e.g. by steam-cleaning, before carrying out such operations. Never weld on, or in any way modify, pressure vessels. Disconnect the alternator cables during arc welding on the unit.

12 Support the towbar and the axle(s) securely if working underneath the unit or when removing a wheel. Do not rely on jacks.

13 Do not remove any of, or tamper with, the sound-damping material. Keep the material free of dirt and liquids such as fuel, oil and cleansing agents. If any sound-damping material is damaged, replace it to prevent the sound pressure level from increasing.

14 Use only lubricating oils and greases recommended or approved by Atlas Copco or the machine manufacturer. Ascertain that the selected lubricants comply with all applicable safety regulations, especially with regard to explosion or fire-risk and the possibility of decomposition or generation of hazardous gases. Never mix synthetic with mineral oil.

15 Protect the engine, alternator, air intake filter, electrical and regulating components, etc., to prevent moisture ingress, e.g. when steam-cleaning.

16 When performing any operation involving heat, flames or sparks on a machine, the surrounding components shall first be screened with non-flammable material.

17 Never use a light source with open flame for inspecting the interior of a machine.

18 Disconnect –battery-clamp before starting electrical servicing or welding (or turn battery-switch in “off” position).

19 When repair has been completed, the machine shall be barred over at least one revolution for reciprocating machines, several revolutions for rotary ones to ensure that there is no mechanical interference within the machine or driver. Check the direction of rotation of electric motors when starting up the machine initially and after any alteration to the electrical connection(s) or switch gear, to check that the oil pump and the fan function properly.

20 Maintenance and repair work should be recorded in an operator’s logbook for all machinery. Frequency and nature of repairs can reveal unsafe conditions.

21 When hot parts have to be handled, e.g. shrink fitting, special heat-resistant gloves shall be used and, if required, other body protection shall be applied.

22 When using cartridge type breathing filter equipment, ascertain that the correct type of cartridge is used and that its useful service life is not surpassed.

23 Make sure that oil, solvents and other substances likely to pollute the environment are properly disposed of.

24 Before clearing the unit for use after maintenance or overhaul, check that operating pressures, temperatures and speeds are correct and that the control and shutdown devices function correctly.

TOOL APPLICATIONS SAFETY

Apply the proper tool for each job. With the knowledge of correct tool use and knowing the limitations of tools, along with some common sense, many accidents can be prevented.

Special service tools are available for specific jobs and should be used when recommended. The use of these tools will save time and prevent damage to parts.

SPECIFIC SAFETY PRECAUTIONS

Batteries

When servicing batteries, always wear protecting clothing and glasses.

1 The electrolyte in batteries is a sulphuric acid solution which is fatal if it hits your eyes, and which can cause burns if it contacts your skin. Therefore, be careful when handling batteries, e.g. when checking the charge condition.

2 Install a sign prohibiting fire, open flame and smoking at the post where batteries are being charged.

3 When batteries are being charged, an explosive gas mixture forms in the cells and might escape through the vent holes in the plugs. Thus an explosive atmosphere may form around the battery if ventilation is poor, and can remain in and around the battery for several hours after it has been charged. Therefore:

- never smoke near batteries being, or having recently been, charged,
- never break live circuits at battery terminals, because a spark usually occurs.

4 When connecting an auxiliary battery (AB) in parallel to the unit battery (CB) with booster cables: connect the + pole of AB to the + pole of CB, then connect the - pole of CB to the mass of the unit. Disconnect in the reverse order.

Pressure vessels

Maintenance/installation requirements:

1 The vessel can be used as pressure vessel or as separator and is designed to hold compressed air for the following application:

- pressure vessel for compressor,
- medium AIR/OIL,
- and operates as detailed on the data plate of the vessel:
- the maximum working pressure ps in bar (psi),
- the maximum working temperature Tmax in °C (°F),
- the minimum working temperature Tmin in °C (°F),
- the capacity of the vessel V in l (US gal, Imp gal, cu.ft).

2 The pressure vessel is only to be used for the applications as specified above and in accordance with the technical specifications. Safety reasons prohibit any other applications.

3 National legislation requirements with respect to re-inspection must be complied with.

4 No welding or heat treatment of any kind is permitted to those vessel walls which are exposed to pressure.

5 The vessel is provided and may only be used with the required safety equipment such as manometer, overpressure control devices, safety valve, etc.

6 Draining of condensate shall be performed daily when vessel is in use.

7 Installation, design and connections should not be changed.

8 Bolts of cover and flanges may not be used for extra fixation.

Safety valves

Operating & Maintenance

Only trained and technically competent personnel should consider overhaul, re-set or performance testing of safety valves.

The safety valve is supplied with either a lead security seal or crimped cover to deter unauthorised access to the pressure regulation device.

Under no circumstances should the set pressure of the safety valve be altered to a different pressure than that stamped on the valve without the permission of the installation designer.

If the set pressure must be altered then use only correct parts supplied by Atlas Copco and in accordance with the instructions available for the valve type.

Safety valves must be frequently tested and regularly maintained.

The set pressure should be periodically checked for accuracy.

When fitted, the compressors should be operated at pressures not less than 75% of the set pressure to ensure free and easy movement of internal parts.

The frequency of tests is influenced by factors such as the severity of the operating environment and aggressiveness of the pressurised medium.

Soft seals and springs should be replaced as part of the maintenance procedure.

Do not paint or coat the installed safety valve (see also **Preventive maintenance schedule**).

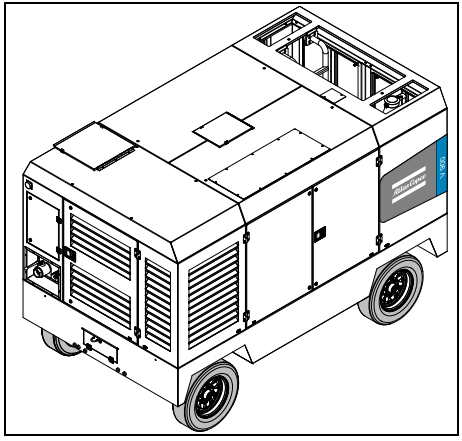
Leading particulars

GENERAL DESCRIPTION

The V900 is a silenced, two-stage, oil-injected screw compressor, built for a nominal effective working pressure of 20 bar and 25 bar (290 psi and 362.5 psi respectively).

The XATS 1200 is a silenced, single-stage, oilinjected screw compressor, built for a nominal effective working pressure of 8.6 bar and 10.3 bar (124.7 psi and 149.34 psi respectively).

The XAVS 1000 is a silenced, single-stage, oilinjected screw compressor, built for a nominal effective working pressure of 12 bar and 14 bar (174 psi and 203 psi respectively)



Engine

The compressors V900, XATS 1200 and XAVS 1000 are driven by a 6 cylinder in-line liquid-cooled diesel engine.

The engine's power is transmitted to the compressor element through a heavy-duty coupling.

Compressor

The compressor casing houses two screw-type rotors, mounted on ball and roller bearings. The male rotor, driven by the engine, drives the female rotor. The compressor delivers pulsation-free air.

Injected oil is used for sealing, cooling and lubricating purposes.

Compressor oil system

The oil is boosted by air pressure. The system has no oil pump.

The oil is removed from the air, in the air/oil vessel first by centrifugal force, secondly by the oil separator element.

The vessel is provided with an oil level indicator.

Regulation

The compressor is provided with a continuous pneumatic regulating system and a blow-off valve which is integrated in the unloader assembly. The valve is closed during operation by air receiver pressure and opens by air receiver pressure via the compressor element when the compressor is stopped.

When air consumption increases, the air receiver pressure will decrease and vice versa.

This receiver pressure variation is sensed by the regulating valve which, by means of control air to the unloader and an electronic engine speed regulator, matches the air output to the air consumption. The air receiver pressure is maintained between the pre-selected working pressure and the corresponding unloading pressure.

Cooling system

The engine is provided with a liquid-cooler and intercooler and the compressor is provided with an oil cooler. For available options see chapter **Available options**.

The cooling air is generated by a fan, driven by the engine.

Safety devices

A thermal shut-down sensor protects the compressor against overheating. The air receiver is provided with a safety valve.

The engine is equipped with low oil pressure and high coolant temperature shut-down sensors.

The electric system is equipped with a 24V main switch.

Frame and axles

The compressor/engine unit is supported by rubber buffers in the frame.

The standard compressor has an adjustable or fixed towbar with brakes.

The braking system consists of an integrated parking brake and overrunbrake. When driving backwards the overrunbrake is not engaged automatically.

Bodywork

The bodywork has openings at the shaped front and rear end for the intake and outlet of cooling air and hinged doors for maintenance and service operations. The bodywork is internally lined with sound-absorbing material.

Lifting eye

A lifting eye is accessible when a small door at the top of the unit is unlocked.

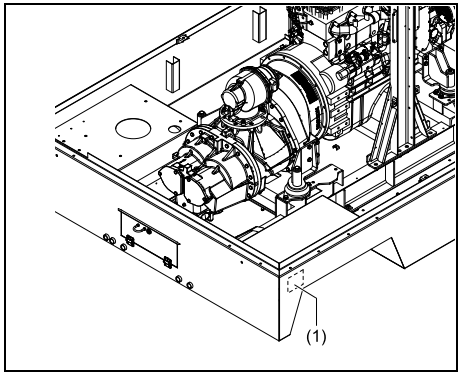
Control panel

The control panel grouping the air pressure gauge, control switch etc., is placed at the left hand/ rear end corner.

Data plate

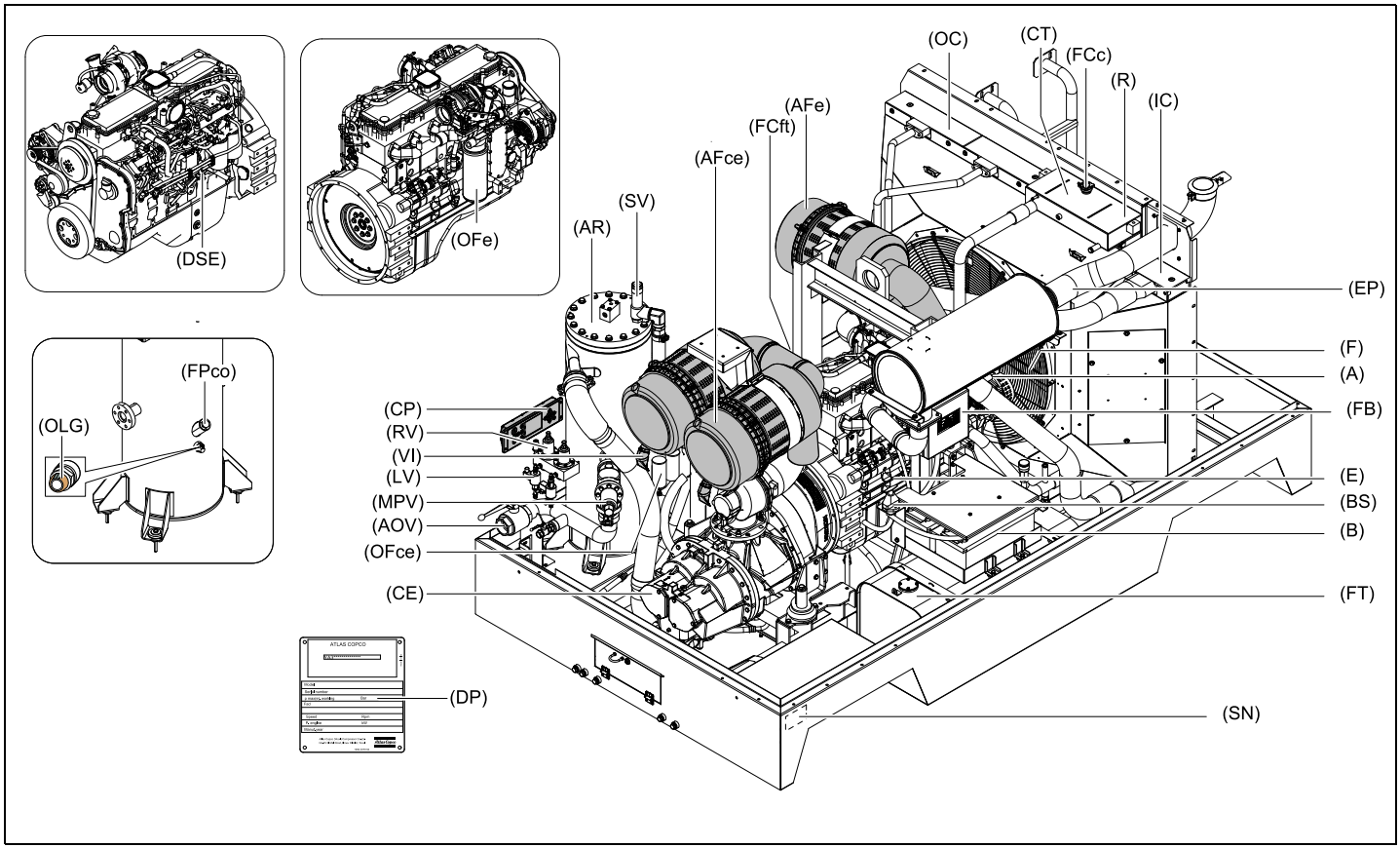
The compressor is furnished with a data plate showing the product code, the unit serial number and the working pressure (see chapter **Data plate**).

Serial number



The serial number (SN) is located on the right-hand side towards the front on the upper edge of the frame.

Main Parts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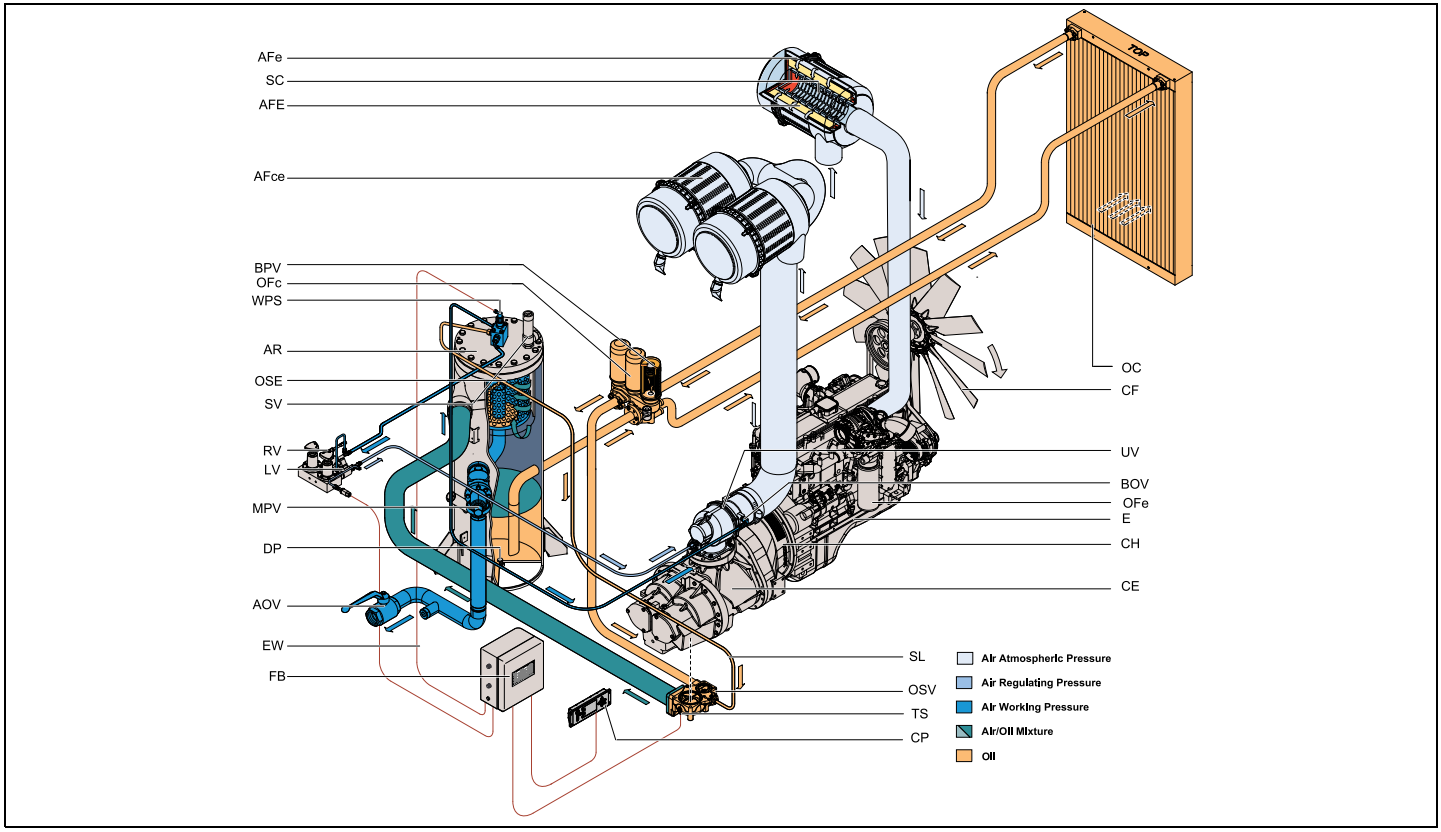
(A)
(FB)
(CP)
(RV)
(VI)
(LV)
(E)
(MPV)
(BS)
(AOV)
(B)
(OFce)
(CE)
(FT)
(DP)
(SN)

Reference	Name
A	Alternator
AFce	Air Filter (compressor element)
AFe	Air Filter (engine)
AOV	Air Outlet Valves
AR	Air Receiver
B	Battery
BS	Battery Switch
CE	Compressor Element
CP	Control Panel
CT	Coolant Tank
DP	Data Plate
DSE	Dipstick of Engine
E	Engine
EP	Exhaust Pipe
F	Fan
FB	Fuse Box
FCft	Filler Cap (fuel tank)
FCc	Filler Cap (coolant)
FPco	Filler Plug (oil compressor element)
FT	Fuel Tank
IC	Intercooler
LV	Loading Valve
MPV	Minimum Pressure Valve
OC	Oil Cooler
OFce	Oil Filter (compressor element)
OFe	Oil Filter (engine)

Reference	Name
OLG	Oil Level Gauge
R	Radiator
RV	Regulating Valve
SN	Serial Number
SV	Safety Valve
VI	Vacuum Indicator

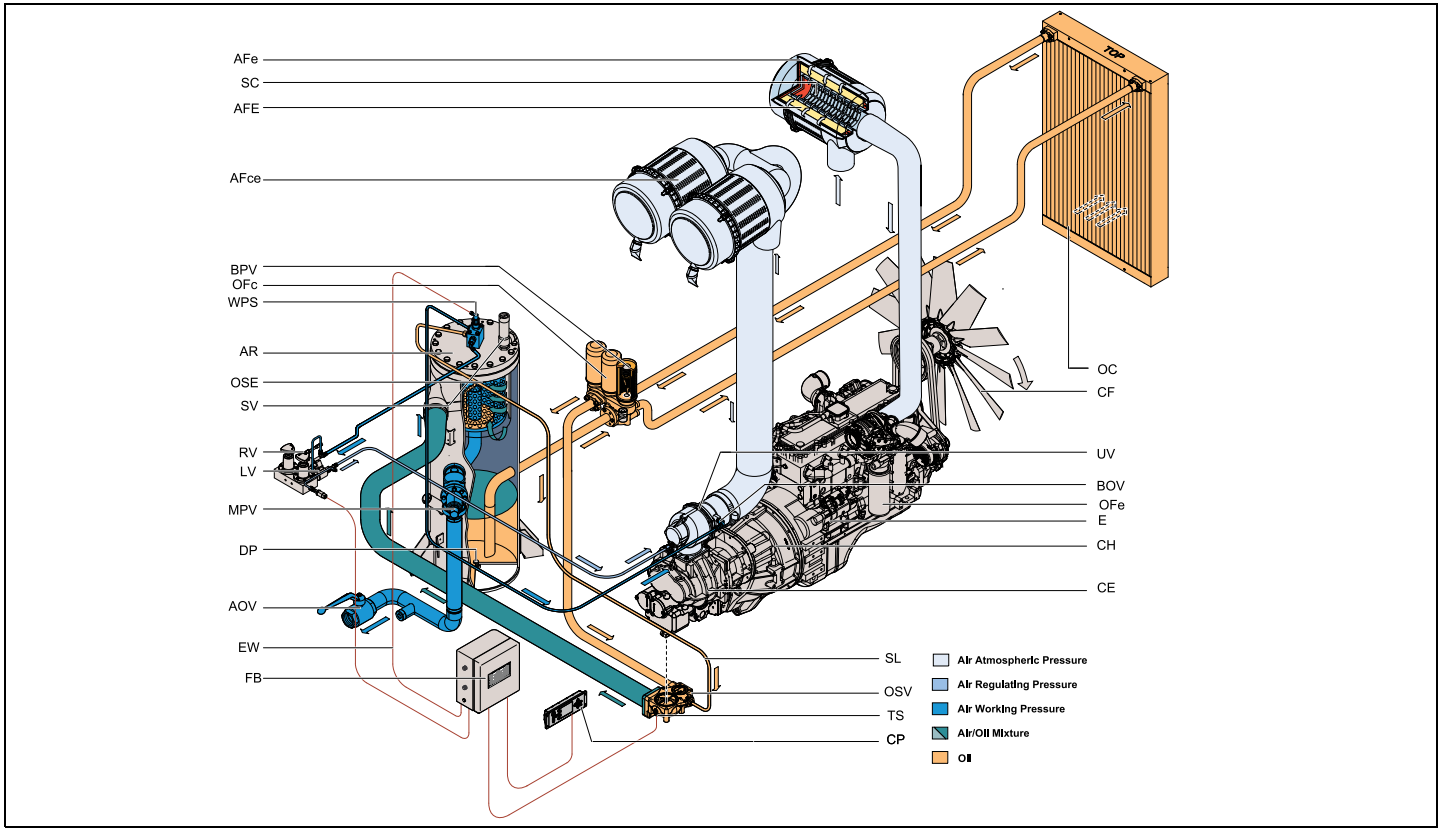
COMPRESSOR REGULATING SYSTEM

OVERVIEW - LP



COMPRESSOR REGULATING SYSTEM

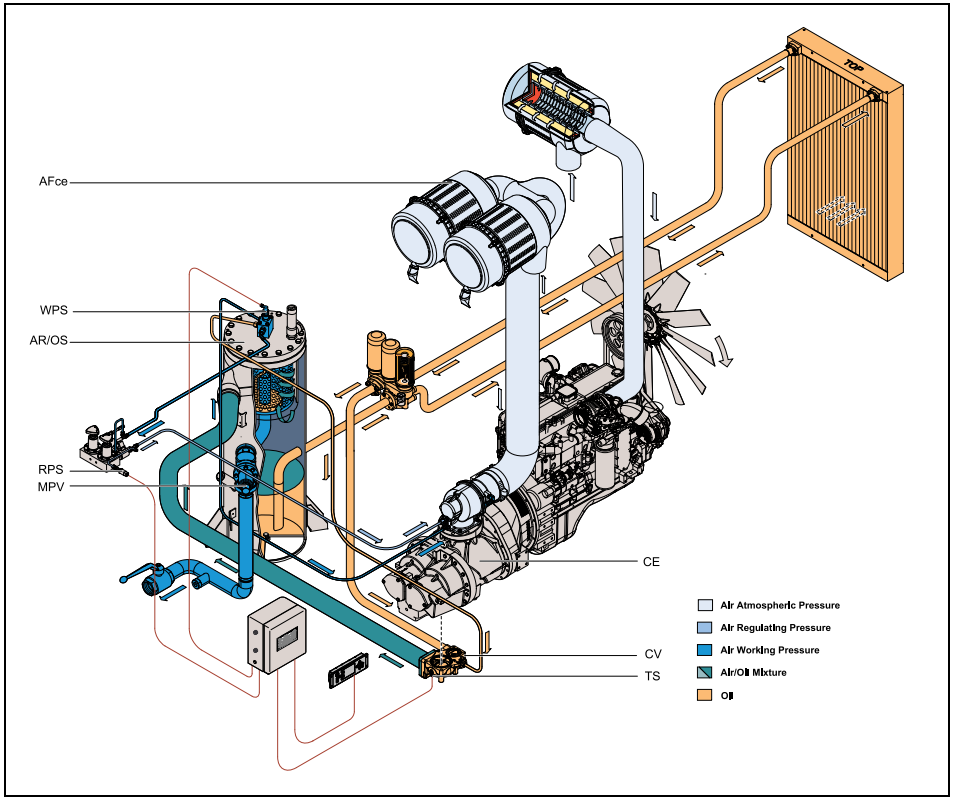
OVERVIEW - HP



Reference	Name
AFce	Air Filter (compressor element)
AFe	Air Filter (engine)
AFE	Air Filter Element
AR	Air Receiver/Oil Seperator
AOV	Air Outlet Valve
BOV	Blow Off Valve
BPV	Bypass Valve oil filter
CH	Coupling Housing
CE	Compressor Element
CP	Control Panel
CF	Cooling Fan
DP	Drain Plug
E	Engine
EW	Elctrical Wiring
FB	Fuse Box
LV	Loading Valve
MPV	Minimum Pressure Valve
OC	Oil Cooler
OSE	Oil Seperator Element
OSV	Oil Stop Valve
OFC	Oil Filter Compressor
OFe	Oil Filter Engine
RV	Regulating Valve
SC	Safety Cartridge
SL	Scavenge Line
SV	Safety Valve

Reference	Name
TS	Temperature Sensor
UV	Unloader Valve
WPS	Working Pressure Sensor

AIR FLOW



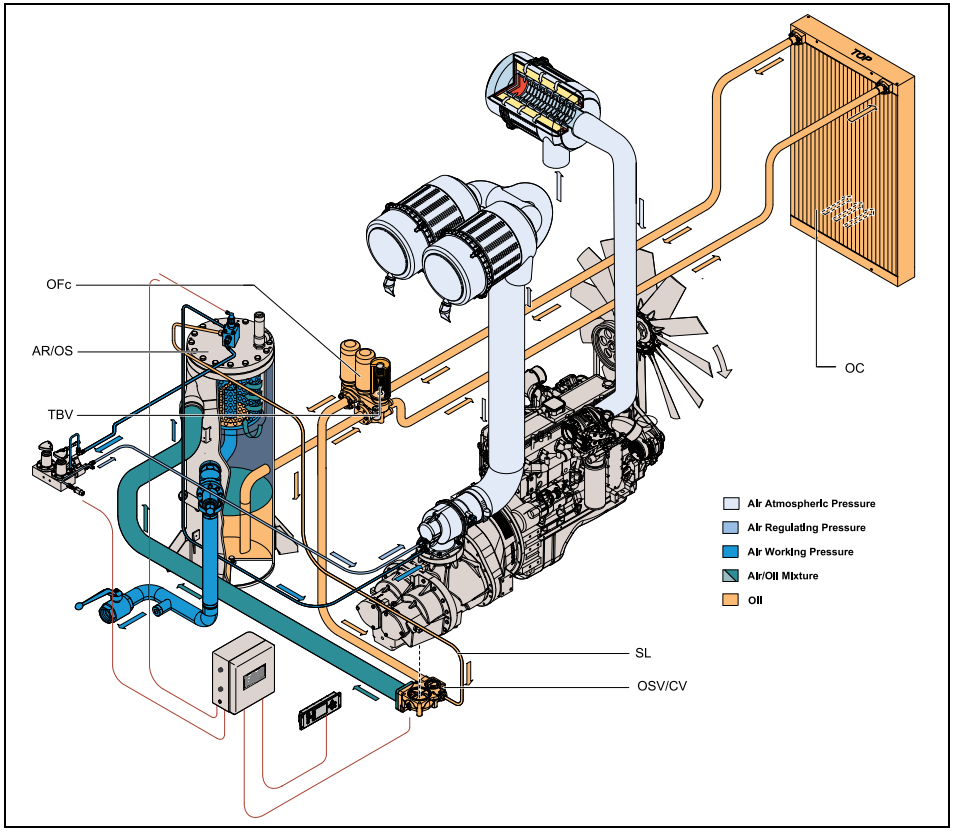
Air drawn through the airfilter (AFce) into the compressor element (CE) is compressed. At the element outlet, compressed air and oil pass into the air receiver/oil separator (AR/OS).

The check valve (CV) prevents blow-back of compressed air when the compressor is stopped. In the air receiver/oil separator (AR/OS), most of the oil is removed from the air/oil mixture.

The oil collects in the receiver and on the bottom of the separator element.

The air leaves the receiver via a minimum pressure valve (MPV) which prevents the receiver pressure from dropping below the minimum working pressure, even when the air outlet valves are open (specified in section **Limitations**). This ensures adequate oil injection and prevents oil consumption. The minimum pressure valve (MPV) also functions as a check valve.

The system comprises of temperature sensors (TS), regulating pressure sensors (RPS) and a working pressure sensor (WPS).



The lower part of the air receiver (AR) serves as an oil tank.

Air pressure forces the oil from the air receiver/oil separator (AR/OS) through the oil cooler (OC), the oil filters (OFc) and the oil stop valve (OSV) to the compressor element (CE).

When the compressor is stopped and / or there is no pressure in the system, the oil stop valve (OSV) prevents the oil from flowing back into the compressor element.

The thermostatic by-pass valve (TBV) starts opening when the oil temperature is 70 °C (158 °F).

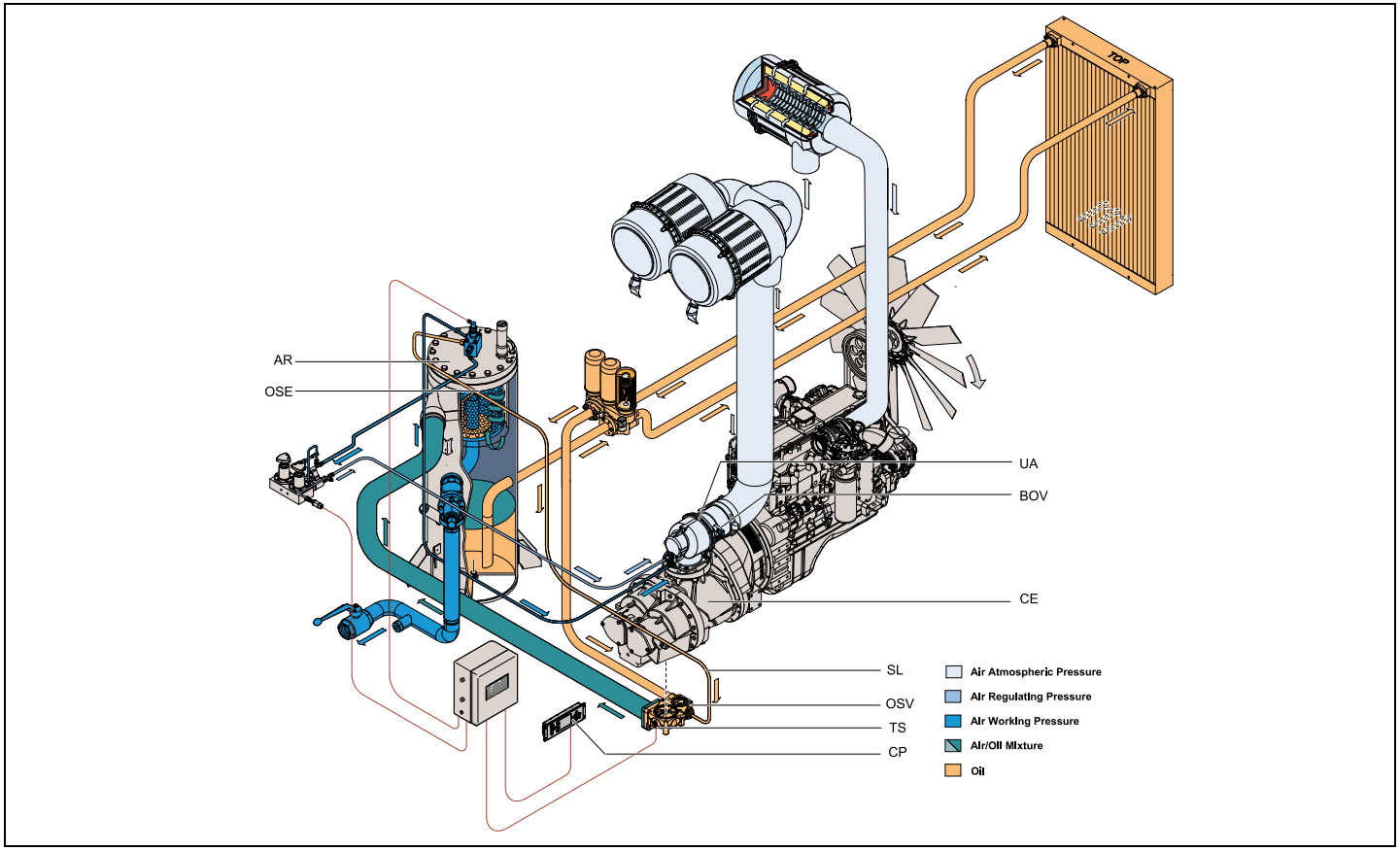
The compressor element has an oil gallery in the bottom of its casing. The oil for rotor lubrication, cooling and sealing is injected through holes in the gallery.

Lubrication of the bearings is ensured by oil injected into the bearing housings.

The injected oil, mixed with the compressed air, leaves the compressor element and re-enters the air receiver, where it is separated from the air as described in section **Air flow**. The oil that collects on the bottom of the oil separator element is returned to the system through a scavenging line (SL), which is provided with a flow restrictor.

The oil filter by-pass valve opens when the pressure drop over the filter is above normal because of a clogged filter. The oil then by-passes the filter without being filtered. For this reason, the oil filter must be replaced at regular intervals (see section **Preventive maintenance schedule**).

CONTINUOUS PNEUMATIC REGULATING SYSTEM



The compressor is provided with a continuous pneumatic regulating system and a blow-off valve (BOV), which is integrated in the unloader assembly (UA). The blow-off valve is kept closed by receiver pressure and opens by compressor element outlet pressure when the compressor is stopped.

When the air consumption increases, the air receiver pressure will decrease and vice versa. This receiver pressure variation is sensed by the regulating valve (RV) which, by means of control air to the unloader assembly (UA), matches the air output to the air consumption. The air receiver pressure is maintained between the pre-selected working pressure and the corresponding unloading pressure.

When starting the compressor, the throttle valve is kept closed via receiver pressure. The compressor element (CE) takes in air and pressure builds up inside the receiver (AR). The throttle valve is closed. The air output is controlled from maximum output (100%) to no output (0%) by:

1. Speed control of the engine between maximum load speed and unloading speed (the output of a screw compressor is proportional to the rotating speed).
2. Air inlet throttling.

If the air consumption is equal to or exceeds the maximum air output, the engine speed is held at maximum load speed and the throttle valve is fully open.

If the air consumption is less than the maximum air output, air receiver pressure increases and the regulating valve supplies control air to throttle valve to reduce the air output and holds air receiver pressure between the normal working pressure and the corresponding unloading pressure. Unloading pressure = normal working pressure + 1 bar (14.5 psi).

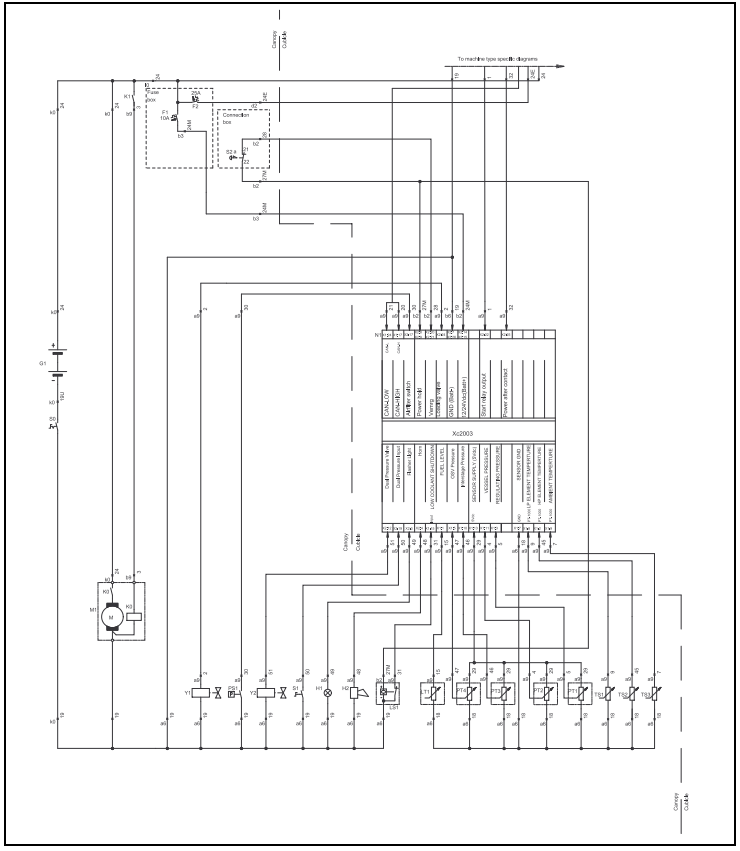
When the air consumption is resumed, the blow off valve (BOV) closes and the throttle valve gradually opens the air intake and the electronic speed regulator increases the engine speed.

The construction of the regulating valve (RV) is such that any increase (decrease) of the air receiver pressure above the pre-set valve opening pressure results in a proportional increase (decrease) of the control pressure to the throttle valve and the electronic speed regulator.

Part of the control air is vented into the atmosphere, and any condensate discharged, through the vent holes.

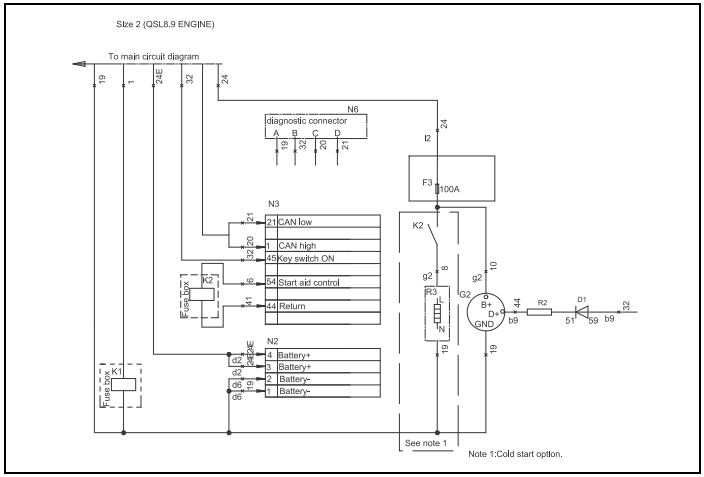
ELECTRIC SYSTEM

Circuit diagram (9829 3849 01_01) - V900

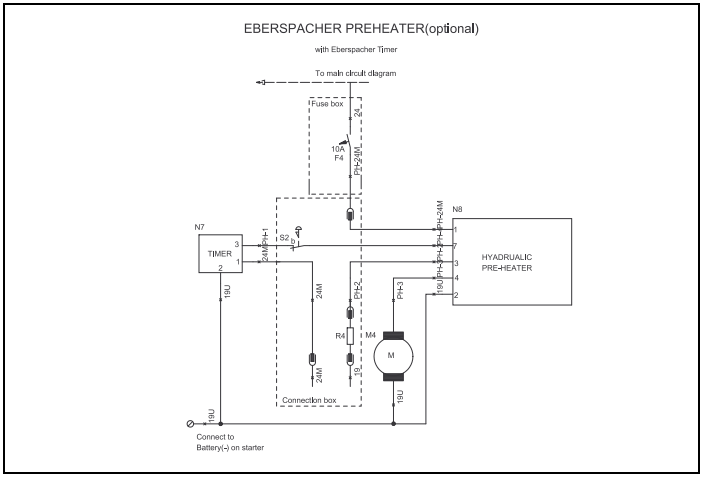


Reference	Grid	Name
F1	a2	Circuit Breaker
F2	a2	Circuit Breaker
G1	d1	Battery
K0	f2	Start Relay
LS1	f4	Level Sensor - Coolant level
LT1	f4	Fuel Level Sensor
M1	f2	Starter Motor
N1	d5-e6	Control Module - Xc2003
PS1	f3	Pressure Switch - Airfilter
PT1	f6	Pressure Sensor - Regulating Pressure
PT2	f5	Pressure Sensor - Vessel Pressure
PT3	f5	Pressure Sensor - Interstage Pressure
PT4	f5	Pressure Sensor - OSV Pressure
S0	d1	Battery Switch
S1	f4	Dual Pressure Switch
S2	b3	Emergency Stop
TS1	f6	LP Element Temperature
TS2	f6	HP Element Temperature
TS3	f6	AMBIENT Temperature
Y1	f3	Loading Valve
Y2	f3	Dual Pressure Valve
H1	f4	Flasher Light
H2	f4	Horn

Circuit diagram



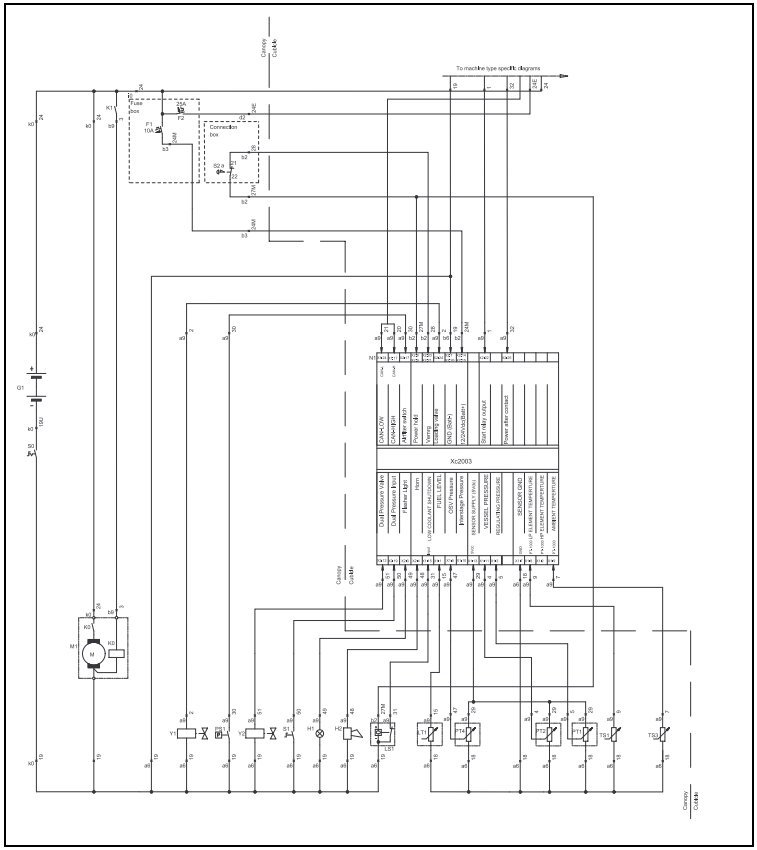
Circuit Diagram EBERSPACHER PREHEATER (optional)



Reference	Grid	Name
F3	c9	Fuse
G2	d8-d9	Alternator
K1	d8-d9	Relay - Starter motor
K2	d8-d9	K2 Glow Relay
N2	d8-d9	Electronic control unit - 4pin
N3	d8-d9	Electronic control unit - 60pin
N6	d8-d9	Caterpillar diagnostic connector
R3	d8-d9	Grid heater
R2	b9	Diagnostic connetor
D1	b10	Excitation diode

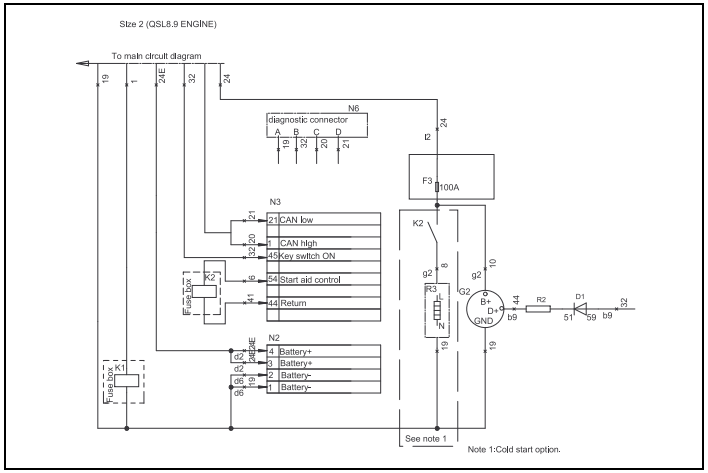
Reference	Name
F4	Fuse 10A
R4	Resistor 470 Ohm 3W
N7	Eberspacher Timer
N8	Eberspacher preheater
M4	Fuel pump
S2b	Emergency stop

Circuit diagram (9829 3849 00_01) - XAVS 1000 and XATS 1200



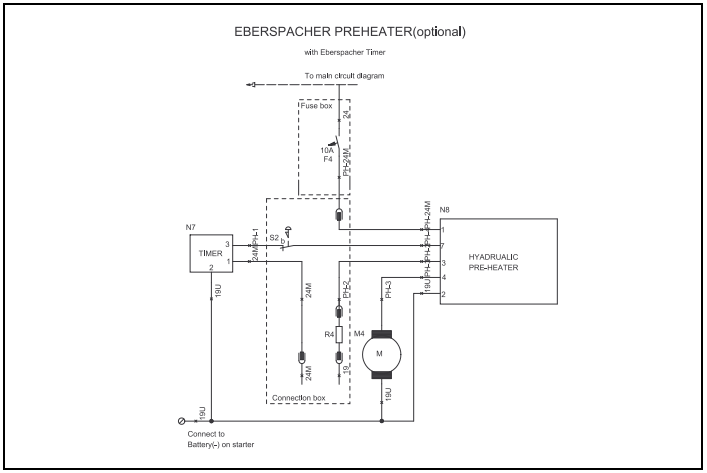
Reference	Grid	Name
F1	a2	Circuit Breaker
F2	a2	Circuit Breaker
G1	d1	Battery
K0	f2	Start Relay
LS1	f4	Level Sensor - Coolant level
LT1	f4	Fuel Level Sensor
M1	f2	Starter Motor
N1	d5-e6	Control Module - Xc2003
PS1	f3	Pressure Switch - Airfilter
PT1	f6	Pressure Sensor - Regulating Pressure
PT2	f5	Pressure Sensor - Vessel Pressure
PT4	f5	Pressure Sensor - OSV Pressure
S0	d1	Battery Switch
S1	f4	Dual Pressure Switch
S2	b3	Emergency Stop
TS1	f6	LP Element Temperature
TS3	f6	AMBIENT Temperature
Y1	f3	Loading Valve
Y2	f3	Dual Pressure Valve
H1	f4	Flasher Light
H2	f4	Horn

Circuit diagram



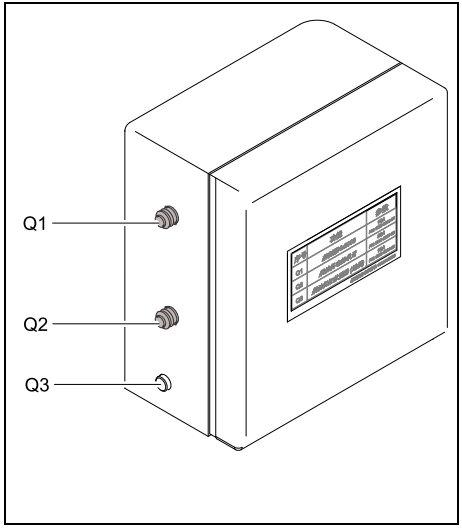
Reference	Grid	Name
F3	c9	Fuse
G2	d8-d9	Alternator
K1	d8-d9	Relay - Starter motor
K2	d8-d9	K2 Glow Relay
N2	d8-d9	Electronic control unit - 4pin
N3	d8-d9	Electronic control unit - 60pin
N6	d8-d9	Caterpillar diagnostic connector
R3	d8-d9	Grid heater
R2	b9	Diagnostic connetor
D1	b10	Excitation diode

Circuit Diagram EBERSPACHER PREHEATER (optional)



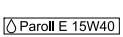
Reference	Name
F4	Fuse 10A
R4	Resistor 470 Ohm 3W
N7	Eberspacher Timer
N8	Eberspacher preheater
M4	Fuel pump
S2b	Emergency stop

Fuse box



Sr Nr	Functional Description	Data
Q1	Controller Xc2003	10A PN: 1089 9206 31
Q2	Engine Controller	25A PN: 1089 9206 21
Q3	Air Inlet Pre-heater (Optional)	10A PN: 1089 9206 09

MARKINGS AND INFORMATION LABELS

	Dangerous outlet gases.
	Danger, hot surface.
	Electrocution hazard.
	Atlas Copco synthetic compressor oil.
	Atlas Copco synthetic engine oil.
	Manual.
	Read the instruction manual before working on the battery.
	Reset fuse.
	On / off button.
	Prohibition to open air valves without connected hoses.
	Rotation direction.
	Inlet.

	Outlet.
	Compressor oil drain.
	Read the instruction manual before starting.
	Service every 24 hours.
	Warning! Part under pressure.
	Do not stand on outlet valves.
	Start-Stop indication of switch.
	Do not run the compressor with open doors.
	Lifting permitted.
	Use diesel fuel only.
7 bar (102 psi)	Tyre pressure.
	Sound power level in accordance with Directive 2000/14/EC (expressed in dB (A)).

	Fork lifting permitted.
	Don't lift here.
	Read the instruction manual before lifting.
	Filler cap coolant.
	Read the instruction manual before topping up with coolant.
	Service point.
	Circuit breaker.
	Do not run the compressor when the baffles are not in the right position.

Operating instructions

PARKING, TOWING AND LIFTING INSTRUCTIONS

Safety precautions

The operator is expected to apply all relevant Safety precautions.

Attention

Before putting the compressor in to use, check the brake system as described in section Brake adjustments.

After the first 100 km travel:

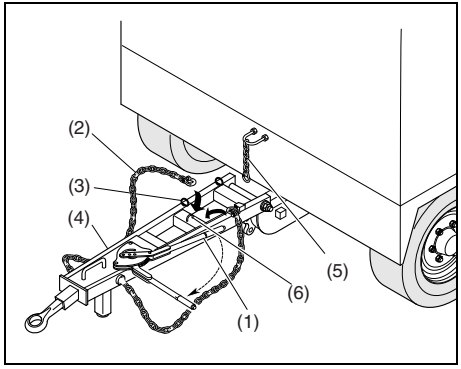
Check and retighten the wheel nuts and towbar bolts to the specified torque. See section Torque values.

Check the brake adjustment. See section Brake adjustments.

When towing, lifting or transporting the compressor in any way, the battery switch must always be in the "OFF" position.

Also switch off the preheater as this unit is directly connected to the batteries.

PARKING INSTRUCTIONS WAGON

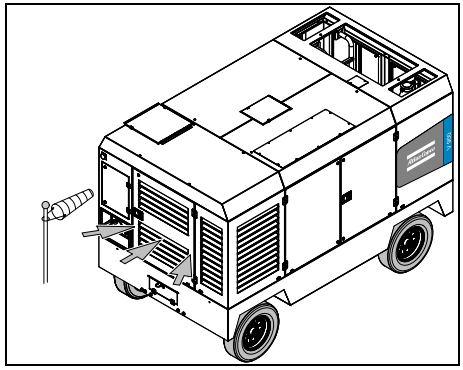


Uncouple vehicle

Apply parking brake by moving the lever (1) in the direction of the arrow.

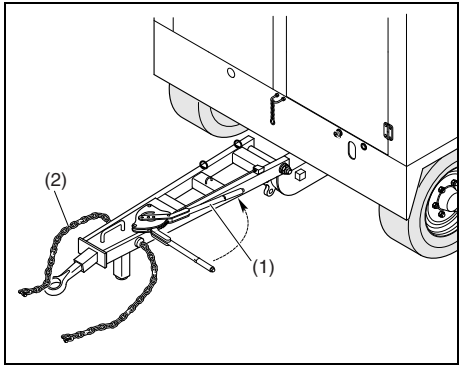
Connect the safety chain (2) to the eyes (3) on the towbar (4). You can move the towbar (4) upwards and secure it by connecting the chain (5) to the eye (6).

Place the compressor as level as possible; however, it can be operated temporarily in an out-of-level position not exceeding 15°. If the compressor is parked on sloping ground, immobilize the compressor by placing wheel chocks (available as option) in front of or behind the wheels.



Locate the rear-end of the compressor upwind, away from contaminated wind-streams and walls. Avoid recirculation of exhaust air from the engine. This can cause overheating and engine power decrease.

TOWING INSTRUCTIONS WAGON



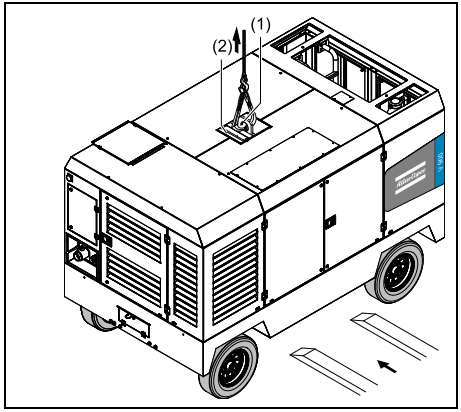
Before towing the compressor, ensure that the towing equipment of the vehicle matches the towing eye. The height of the towing device of the vehicle must be 815 - 845 mm (31.8 - 33 in)..

1. Attach the compressor to the towing vehicle.
2. Move hand brake lever (1) in the direction of the arrow till stop and connect the breakaway chain (2) to the towing vehicle.

Never move the compressor with air hoses connected to the air outlet valves.

Before moving the compressor, switch it off.

LIFTING INSTRUCTIONS



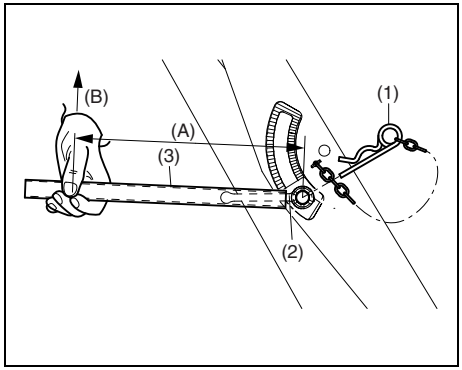
When lifting the compressor, the hoist has to be placed in such a way that the compressor, which must be placed level, is lifted vertically. Keep lifting acceleration and retardation within safe limits.

The lifting eye (1) should preferably be used after opening the small door (2).

Lifting acceleration and retardation must be kept within safe limits (max. 2xg).

Helicopter lifting is not allowed.
Lifting is not allowed when the unit is running.

HEIGHT ADJUSTMENT
(with adjustable towbar)



Before towing the compressor, make sure that the joints of the towbar are secured with maximum strength without damaging the towbar. Be sure that there is no clearance between the teeth of the joints.

- Remove spring pin (1).
- Release locking nut (2) with support tools (extension tube 3).
- Adjust required height of the towbar.
- Tighten locking nut (2) by hand first.
- Secondly tighten locking nut (2) with a tightening torque corresponding to table. With an extension tube (3) ("A" corresponding with table) and handforce ("B" corresponding with table) tightening is easy
- Fix locking nut (2) with spring pin (1).

Attention:

- Height adjustment should be undertaken on levelled ground and in coupled condition.
- When readjusting, make sure that the front point of the towbar is horizontal with the coupling point.
- Before starting a trip, ensure that the adjustment shaft is secure, so that stability and safety is guaranteed while driving. If necessary, tighten the locking nut (2) corresponding with table.

Lifting acceleration and retardation must be kept within safe limits (max. 2xg).

Helicopter lifting is not allowed.

Lifting is not allowed when the unit is running.

BEFORE STARTING

1. Before initial start-up, prepare battery for operation if not already done. See section **Recharging a battery**.
2. With the compressor standing level, check the level of the engine oil. Add oil, if necessary, up to the upper mark on the dipstick. Also check the engine coolant level. Consult the Engine Operation Manual for the type of coolant and type and viscosity grade of the engine oil.
3. Check the level of the compressor oil. The pointer of oil level gauge (OLG) should register in the green range. Add oil if necessary. See section **Engine oil** for the oil to be used.

Before removing oil filler plug (FP), ensure that pressure is released by opening an air outlet valve.

4. Check that the fuel tank contains sufficient fuel. Top up, if necessary. Consult the Engine Operation Manual for the type of fuel.
5. Drain any water and sediment from the fuel filters until clean fuel flows from the drain cock. See section **Priming instructions**.
6. Empty the dust trap of each air filter (AF). See section **Cleaning the dust trap**.
7. Clogged air filter(s) will be indicated on the display of the control panel, see section **Fault codes**. If indicated, replace the filter elements.
8. Check coolant level in engine coolant top tank. Top up, if necessary. Consult the Engine Operation Manual for coolant specifications.
9. Attach the air line(s) to the closed air outlet valve(s). Connect the safety chain.

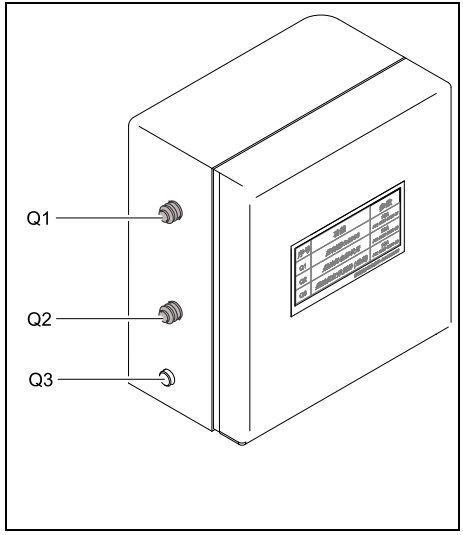
No external force may be applied to the air outlet valve(s), e.g. by pulling hoses or by connecting equipment directly to the valve(s).

Safety precautions

Do not disconnect power supply to control box in any way when the control box is switched on. This will cause memory loss.

Make sure the fuel tank is filled up.

When the compressor is put in operation for the first time and after running out of fuel or changing the fuel filter, follow the specific start procedure as described in section Priming instructions.



Do not switch off the circuit breaker when the control box is switched on. This will cause memory loss.

BATTERY SWITCH

The compressor is equipped with a battery switch.

When the compressor is not in use this switch must always be in the “OFF” position.

It is not allowed to use this switch as an emergency switch or for stopping the compressor. It will cause damage in the control unit when using this switch for stopping.

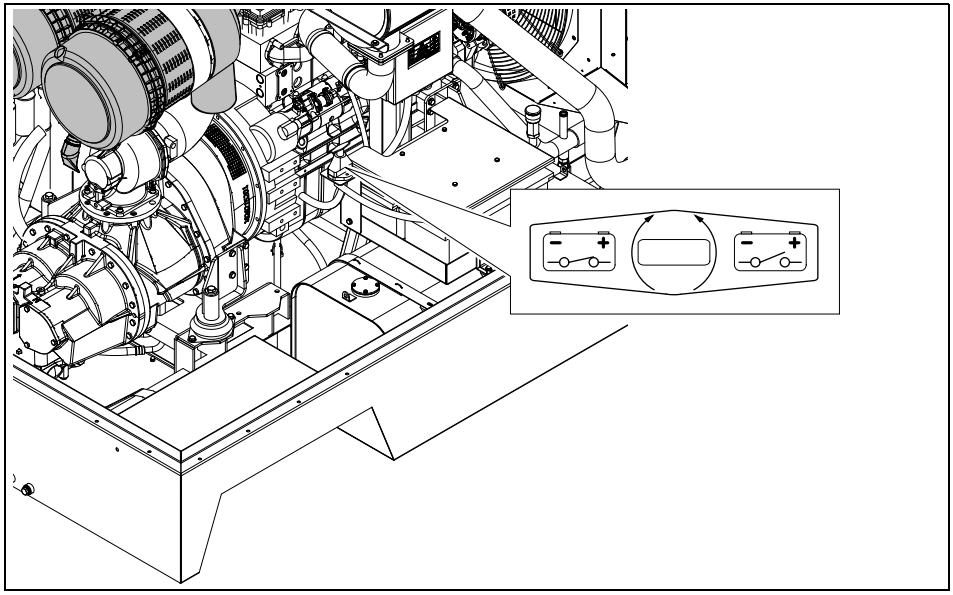
Always first shut off the control unit and wait until the display is dark before switching the battery switch to position “OFF”.

To switch the electric system “ON”, turn the handle (1) of the battery switch clockwise.

To switch the electric system “OFF”, turn the handle (1) of the battery switch counterclockwise.

Please be aware that when the electric system is switched “OFF” the batteries are still under tension.

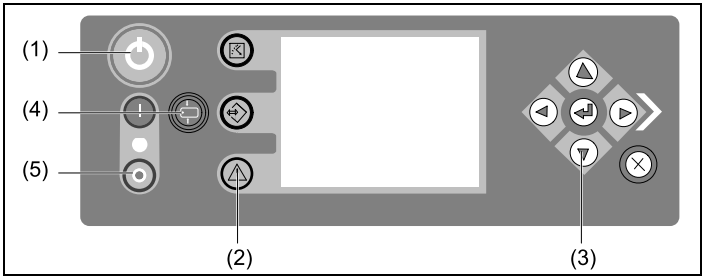
Please be aware that the (optional) preheater unit is still “live” with the battery switch in “OFF” position.



Controller Box

FASCIA LABEL

This is an idea of how the fascia label could look like (to be discussed & agreed between Atlas Copco Product Design Co-ordinator & Exertus):



DIMENSIONS

The outer dimensions of the Controller Box are:

250mm (W) x 80mm (H) x 41mm (D)

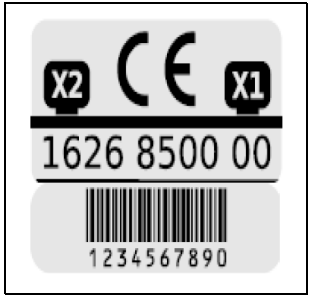
Tyco Electronics SuperSeal connectors are used, at the back side of the Xc2003 controller.

The Controller Box is an OEM, die-cast aluminium design.

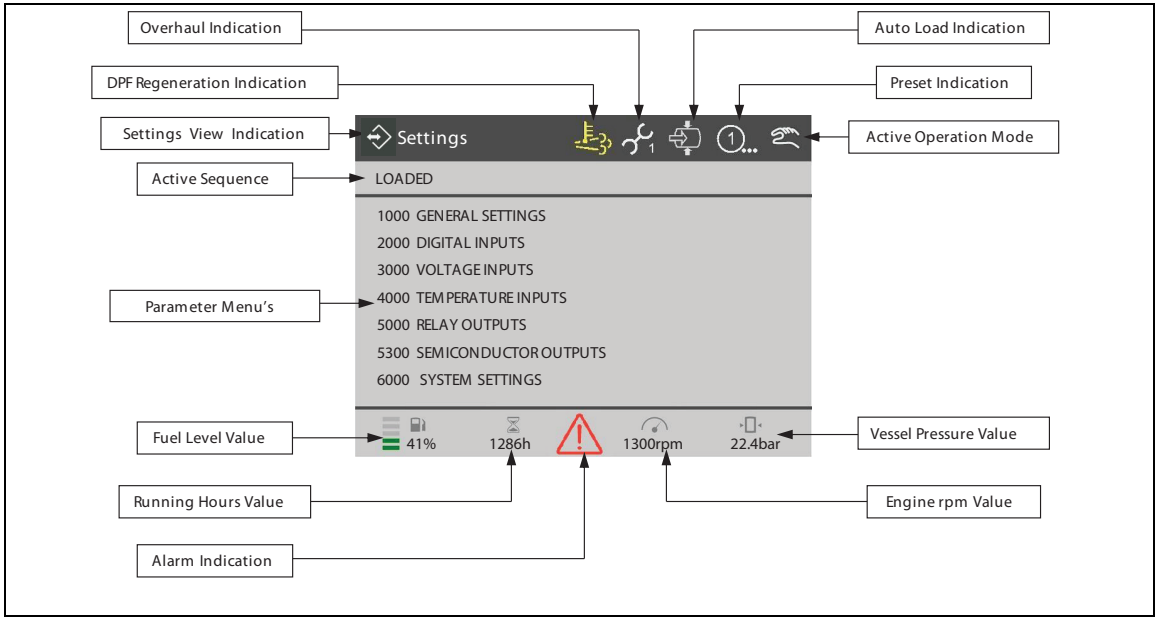
Atlas Copco will take the tooling cost for this as an additional cost on top of the quoted Xc2003 development cost

DATA LABEL

The Xc2003 will carry a data-label at the back, mentioning the Atlas Copco partnumber, the Exertus serial number, the CE-mark, the connectors identification.



SETTINGS VIEW



Use the Up and Down navigation buttons to scroll through the full list of settings.
Use the Enter button to enter the selected submenu.
Use the Back button to leave the entered (sub)menu.

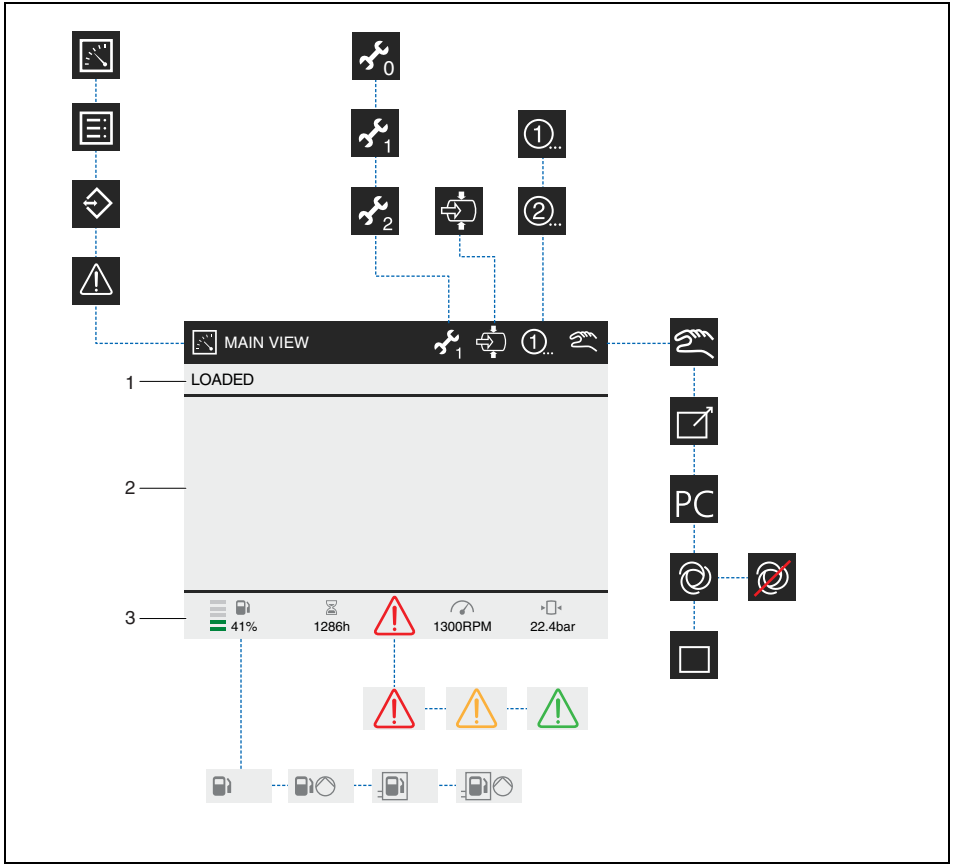
If no Vessel Pressure Sensor is configured, the Vessel Pressure Value part of the display is left blank (greyish).

Engine rpm Value is only shown at machines with J1939 link to the ECU.

If no J1939 link to the ECU, this part of the display is left blank (greyish).

Fuel Level Value is only shown if a Fuel Level Sensor is configured.
If no Fuel Level Sensor is configured, this part of the display is left blank (greyish).

OVERVIEW ICONS



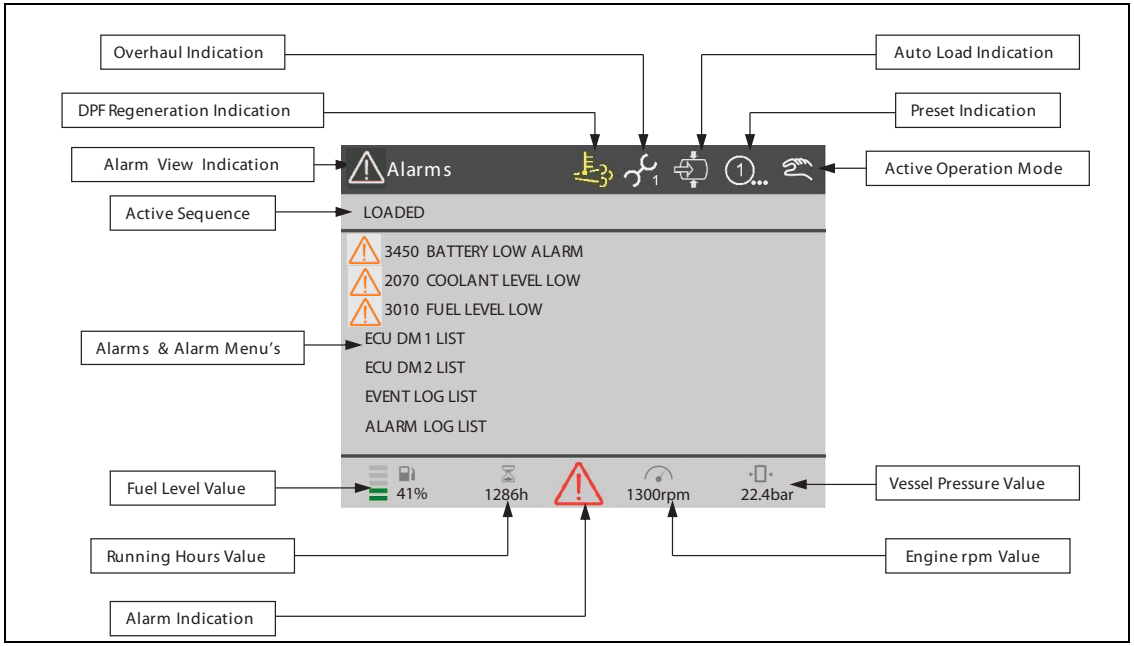
Reference	Name
1	Compressor status
2	Vessel pressure indication or info text
3	Compressor info
	Main View Indication
	Measuring View Indication
	Settings View Indication
	Alarm View Indication
	DPF REGENERATION High Exhaust System Temperature. Means that the Diesel Particle Filter is being regenerated.
	DPF REGENERATION NEEDED Diesel Particle Filter Regeneration forced. Means that the Diesel Particle Filter be regenerated as soon as all criteria to do so are met.

Reference	Name
	DPF REGENERATION Diesel Particle Filter Regeneration Inhibited. Means that the DPF regeneration is inhibited, even if all criteria to activate a regeneration are met.
	OVERHAUL Initial Overhaul required.
	OVERHAUL Minor Overhaul required.
	OVERHAUL Major Overhaul required.
	AUTO LOAD This icon will be shown if the Auto Load functionality is enabled, or by means of a parameter setting, or by means of pressing the load button before the machine is ready to be loaded.
	PRESET Depending of which Pressure (and/ or Flow) setting is active, the controller will show its dedicated icon.
	PRESET Depending of which Pressure (and/ or Flow) setting is active, the controller will show its dedicated icon.

Reference	Name
	OPERATION MODE Local
	OPERATION MODE Remote
	OPERATION MODE PC Control
	OPERATION MODE Automatic
	OPERATION MODE Automatic Mode is active, but the Auto Start and Auto Stop function are both inactive.
	OPERATION MODE Block Mode
	ALARM Active & not-acknowledged Shutdown Alarm.
	ALARM Active & not-acknowledged Non-Shutdown Alarm.
	ALARM Active & acknowledged Alarm.

Reference	Name
	FUELTANK Running at internal fueltank.
	FUELTANK Running at internal fueltank & Fuelpump is energized.
	FUELTANK Running at external fueltank, but internal fueltank level is shown.
	FUELTANK Running at external fueltank, but internal fueltank level is shown & fuelpump is energized.

ALARM VIEW



Use the Up and Down navigation buttons to scroll through the full list of alarms.

Use the Left and Right navigation buttons to scroll through the different Alarm pages:

General Alarms

Alarm Log

DM1 List

Event Log

DM2 List

If no Vessel Pressure Sensor is configured, the Vessel Pressure Value part of the display is left blank (greyish).

Engine rpm Value is only shown at machines with J1939 link to the ECU.

If no J1939 link to the ECU, this part of the display is left blank (greyish).

Fuel Level Value is only shown if a Fuel Level Sensor is configured.

If no Fuel Level Sensor is configured, this part of the display is left blank (greyish).

DPF REGENERATION INDICATIONS (IF APPLICABLE)

Reference	Name
	**HEST LAMP** is read from J1939. **DPF PASSIVE REGENERATION STATUS** is read from J1939: Means that the Diesel Particle Filter is being regenerated
	**DPF REGENERATION NEEDED** is read from J1939. Means that the DPF Soot Load has exceeded a level which indicates that a full regeneration cycle is to be performed
	**DPF REGENERATION INHIBITED** is read from J1939. Means that the Diesel Particle Filter regeneration is inhibited, even if all criteria to activate a regeneration are met. If the Xc controller has been powered down, it will automatically go to automatic DPF regeneration again and disable the DPF Regeneration Inhibit.

OVERHAUL INDICATIONS

	Initial Overhaul required.
	Minor Overhaul required.
	Major Overhaul required.

AUTO LOAD INDICATION

	**AUTO LOAD** This icon will be shown if the Auto Load functionality is enabled, or by means of a parameter setting, or by means of pressing the load button before the machine is ready to be loaded..
	**AUTO START** Means that the Auto Start functionality is active, and will not be shown if the engine is running.
	**AUTO STOP** Means that the Auto Stop functionality is active, and will not be shown if the engine is not running AND the machine is not in Loaded Sequence.

PRESET INDICATION

Depending of which Pressure (and/or Flow) setting is active, the controller will show its dedicated icon.

The shown icon(s) can be chosen from this selection:

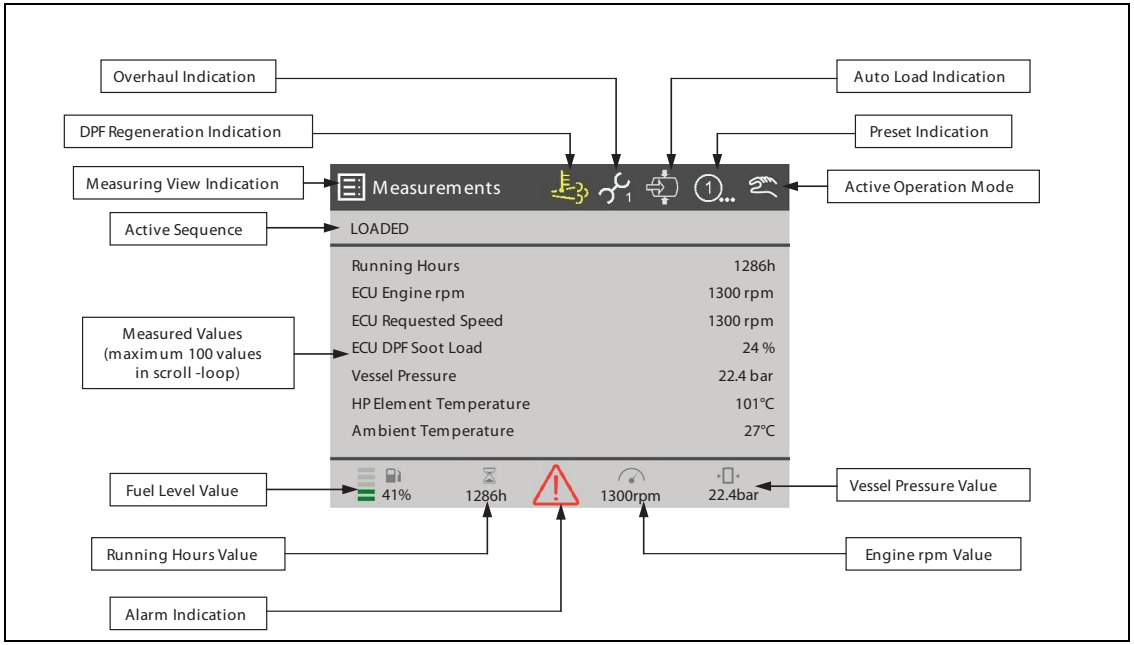
ACTIVE OPERATION MODE INDICATION

	Local/Manual Mode
	Remote Mode
	PC Control Mode
	Automatic Mode
	Block Mode
	**AUTO START** Means that the Auto Start functionality is active, and will not be shown if the engine is running.
	**AUTO STOP** Means that the Auto Stop functionality is active, and will not be shown if the engine is not running AND the machine is not in Loaded Sequence.
	OPERATION MODE Automatic Mode is active, but the Auto Start and Auto Stop function are both inactive.

OTHER INDICATIONS

Reference	Name
	Active Shutdown Alarm
	Active Non-Shutdown Alarm
	Acknowledged Alarm
	Running @ Internal Fueltank
	Running @ External Fueltank, but Internal Fueltank level is shown

Measurements View



Use the Up and Down navigation buttons to scroll through the full list of measurements.

Power On the Xc2003

Switch on the battery switch.

Switch the machine on by pressing the Xc2003 Power Button.

The instrument panel will now perform a selftest and enter the INITIALIZING SEQUENCE.

INITIALIZING SEQUENCE

When the controller gets powered up, the INITIALIZING SEQUENCE is entered.

All Output Relays (except of Power Relay), will be deactivated.

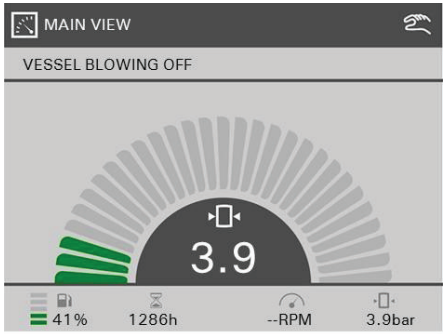
During the entire INITIALIZING SEQUENCE, the following view is shown at the Xc display:

This view shows data retrieved from the Application Software:

- the controller version (eg. ‘Xc2003’)
- the Application SoftWare version (eg. ‘v1.00.0’)

VESSEL BLOW DOWN SEQUENCE

If the VESSEL PRESSURE ≥ VESSEL PRESSURE START PREVENTION ‘PRESSURE’, the Xc display will show::



for as long as the VESSEL PRESSURE ≥ VESSEL PRESSURE START PREVENTION ‘PRESSURE’.

As soon as the VESSEL PRESSURE < VESSEL PRESSURE START PREVENTION ‘PRESSURE’ the controller will go to the next sequence and end the VESSEL PRESSURE BLOW-DOWN SEQUENCE.

Note: If the Power Switch is turned to the “OFF” position while the Xc2003 is in the Vessel Blow Down Sequence, it will not power down for as long as the Vessel Pressure is higher than, or equal to, the Vessel Pressure Start Prevention Setpoint.

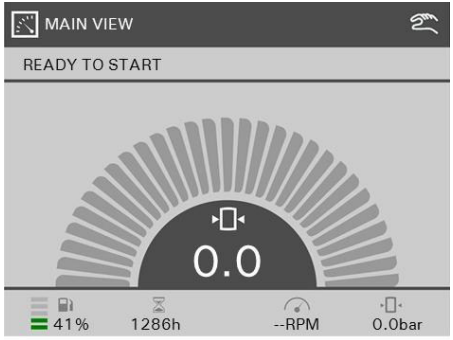
The Xc2003 will only power down when it is in a safe situation or when it is in Shutdown Sequence.

READY TO START SEQUENCE

If a LIMIT, an INDICATION, a WARNING or an INHIBIT LOAD becomes active during the READY TO START SEQUENCE, the controller continues its sequences.

If a CONTROLLED STOP or a SHUTDOWN becomes active during the READY TO START SEQUENCE, the controller will go to the SHUTDOWN SEQUENCE and end the READY TO START SEQUENCE.

In READY TO START SEQUENCE, the following view is shown at the Xc display:



If the RUN COMMAND is set to 1, then the controller will go to the next sequence and end the READY TO START SEQUENCE.

PRESTART SEQUENCE

The controller will start to broadcast the RPM SETPOINT at IDLE RPM 'SETTING' (no matter if the machine is electric or diesel (with or without ECU) driven).

Configuration of the IDLE RPM is done through following parameters:

IDLE RPM	6340
SETTING:	500rpm ⟶ 3000rpm (10rpm steps)
Access Level:	Master (fixed)

The HORN OUTPUT and the FLASHER LIGHT OUTPUT become activated for as long as the time configured in following parameters:

PRESTART HORN	6260
TIME:	0s. ⟶ 30s. (1s. steps) ⟶ default = 5s.
Access Level:	Customer ⟶ default Service Master

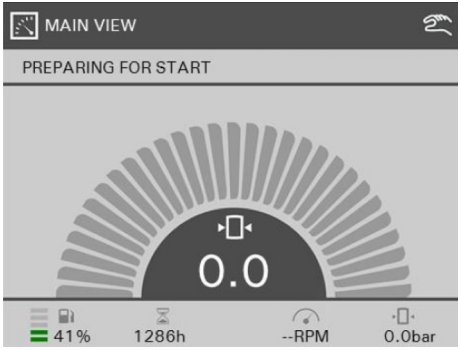
PRESTART FLASHER	6270
TIME:	0s. ⟶ 30s. (1s. steps) ⟶ default = 5s.
Access Level:	Customer ⟶ default Service Master

If the RUN COMMAND is 0, then the controller will deactivate the HORN OUTPUT, the FLASHER LIGHT OUTPUT and the PAC OUTPUT, and go to the READY TO START SEQUENCE and end the PRESTART SEQUENCE.

If a LIMIT, an INDICATION, a WARNING or an INHIBIT LOAD becomes active during the PRESTART SEQUENCE, the controller continues its sequences.

If a CONTROLLED STOP or a SHUTDOWN becomes active during the PRESTART SEQUENCE, the controller will go to the SHUTDOWN SEQUENCE and end the PRESTART SEQUENCE.

During the PRESTART SEQUENCE, the Xc display will show following:



READING ENGINE DATA SEQUENCE

If the PREHEAT 'ENABLE' is set to 'On', the PAC OUTPUT will be activated, and the PREHEAT OUTPUT will be activated for the time configured in PREHEAT 'SETTING'. If the PREHEAT 'SETTING' has elapsed, the PREHEAT OUTPUT will be deactivated.

PREHEAT	6300
ENABLE:	On ECU ⟶ default
SETTING:	0s. ⟶ 1000s. (1s. steps) ⟶ default = 12s.
Access Level:	Master ⟶ default

When BASIC PARAMETERS MASTER 'ECU' is set to 'no', then the controller will now go to the next sequence and end the READING ENGINE DATA SEQUENCE.

After activation of the PAC OUTPUT, the controller will wait for the duration of the ECU COMMUNICATION 'ESTABLISHING DELAY' before initiating J1939 canbus communication.

Communication to the engine electronics is established if a valid ENGINE RPM value is read from the J1939 canbus.

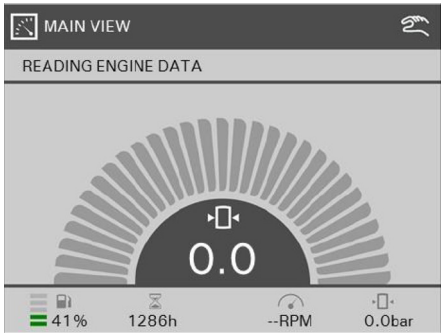
From the moment ECU communication is established, and for as long as the PAC OUTPUT is activated (not only in the READING ENGINE DATA SEQUENCE), the J1939 communication is monitored. If no ENGINE RPM value can be read from the J1939 canbus for the duration of the ECU COMMUNICATION 'COMMS FAILURE DELAY, an ECU COMMUNICATION shutdown alarm will appear.

ECU COMMUNICATION	7000
ESTABLISHING DELAY:	0s. ⟶ 10s. (0.5s. steps) ⟶ default = 2s.
COMMS FAILURE DELAY:	0s. ⟶ 10s. (0.5s. steps) ⟶ default = 5s.
CRANK DELAY:	0s. ⟶ 10s. (0.5s. steps) ⟶ default = 0.5s.
ENGINE TYPE:	Caterpillar John Deere Cummins MTU Scania Deutz „³ default
Access Level:	Master (fixed)

The ECU COMMUNICATION 'ENGINE TYPE' parameter defines the engine type the controller is expected to communicate with.

If the ECU COMMUNICATION 'ENGINE TYPE, is set to 'MTU' or 'Scania', and the ECU communication is established, the controller will wait for ECU COMMUNICATION 'CRANK DELAY' and then starts broadcasting the ENGINE START REQUEST until the CRANKING SEQUENCE has ended.

During the Reading Engine Data Sequence, the Xc display shows:



The PREHEAT ACTIVE indication is checked at the J1939 canbus.

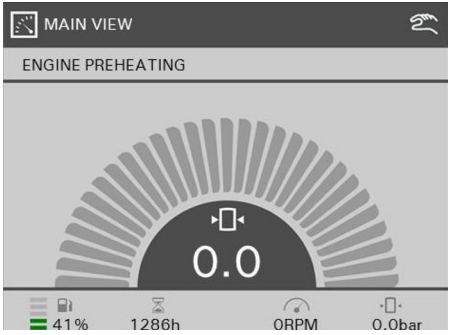
As long as or the PREHEAT ACTIVE indication is read as 'ON', the ECU is preheating.

- If the PREHEAT ACTIVE indication stays 'ON' for 70s., then an ENGINE PREHEAT FAILURE shutdown alarm will become active, the controller will go to the SHUTDOWN SEQUENCE and end the READING ENGINE DATA SEQUENCE.

- If the PREHEAT ACTIVE indication, is read as 'OFF', the controller will go to the next sequence and end the READING ENGINE DATA SEQUENCE.

If the engine is preheating, the Xc display will show (for as long as the engine is preheating):

If the RUN COMMAND is set to 0 during the READING ENGINE DATA SEQUENCE, then the controller will deactivate the PREHEAT OUTPUT and the PAC OUTPUT, go to the READY TO START SEQUENCE and end the READING ENGINE DATA SEQUENCE.



If a LIMIT, an INDICATION, a WARNING or an INHIBIT LOAD becomes active during the READING ENGINE DATA SEQUENCE, the controller continues its sequences.

If a CONTROLLED STOP or a SHUTDOWN becomes active during the READING ENGINE DATA SEQUENCE, the controller will go to the SHUTDOWN SEQUENCE and end the READING ENGINE DATA SEQUENCE.

CRANKING SEQUENCE

The following output is activated (if present):

- START OUTPUT

The MOTOR RUN request will be broadcasted, until the motor gets stopped.

When the BASIC PARAMETERS MASTER 'ECU' is set to 'no':

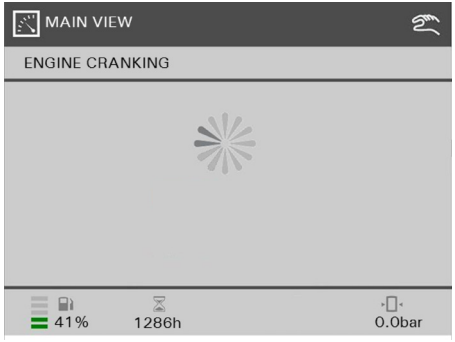
- If during the CRANKING SEQUENCE the RUNNING FEEDBACK INPUT becomes high (=Batt+) for 500ms., the START OUTPUT gets deactivated (and stays deactivated for the rest of this

CRANKING SEQUENCE), the RUNNING HOURS COUNTER will start counting every second the machine is running, the controller will go to the next sequence and the CRANKING SEQUENCE is ended.

- If the CRANK 'MAXIMUM CRANK TIME' has expired, and the RUNNING FEEDBACK INPUT did not become high, then the START OUTPUT, and the PAC OUTPUT will be deactivated, the controller will rest for the duration of the CRANK 'MAXIMUM RESTING TIME' value, end the CRANKING SEQUENCE and go to the PRESTART SEQUENCE and perform a next start attempt.

If the number of failed start attempts equals the amount configured in CRANK 'MAXIMUM START ATTEMPTS', a START FAILURE shutdown will become active and the controller will go to SHUTDOWN SEQUENCE and end the CRANKING SEQUENCE.

During cranking, the Xc display shows:



When the BASIC PARAMETERS MASTER 'ECU' is set to 'eyes':

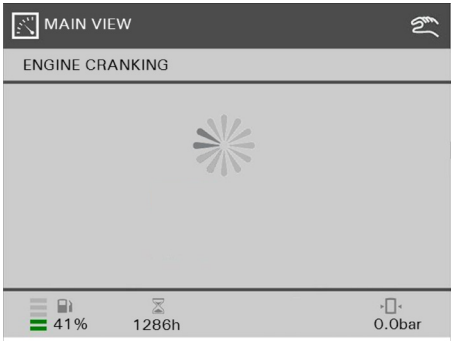
If the ECU COMMUNICATION 'ENGINE TYPE, is not set to 'MTU' or 'Scania' and 3s. after activation of the START OUTPUT the ENGINE RPM = 0rpm, the START OUTPUT will be deactivated, and after a resting time of 2s. the CRANKING SEQUENCE will be started over again (up to maximum 3 times).

After 3 failed attempts, a STARTER NOT ENGAGED shutdown will become active and the controller will go to SHUTDOWN SEQUENCE and end the CRANKING SEQUENCE.

If 30s. after activation of the START OUTPUT the ENGINE RPM < 150 rpm, a STARTER SPEED TOO LOW shutdown will become active, the controller will go to the SHUTDOWN SEQUENCE and end the CRANKING SEQUENCE.

If during the CRANKING SEQUENCE the ENGINE RPM $\geq$ CRANK 'RUN SETTING' (except for the first 500ms. of the CRANKING SEQUENCE, where the ENGINE RPM will be ignored), the START OUTPUT gets deactivated (and stays deactivated for the rest of this CRANKING SEQUENCE), the RUNNING HOURS COUNTER will start counting every second the machine is running, the controller will go to the next sequence and the CRANKING SEQUENCE is ended.

During cranking, the Xc display shows:



Configuration of the CRANK is done through following parameters:

CRANK	6320
RUN SETTING:	0rpm ⟶ 1500rpm (10rpm steps) ⟶ default = 800rpm
MAXIMUM CRANK TIME:	0s. ⟶ 100s. (1s. steps) ⟶ default = 40s.
MAXIMUM RESTING TIME:	0s. ⟶ 500s. (5s. steps) ⟶ default = 60s.
MAXIMUM START ATTEMPTS:	0 ⟶ 10 ⟶ default = 1
Access Level:	Master (fixed)

If the CRANK 'MAXIMUM CRANK TIME' has expired and the engine hasn't reached the CRANK 'RUN SETTING', then the START OUTPUT and the PAC OUTPUT will be deactivated, the controller will rest for the duration of the CRANK 'MAXIMUM

RESTING TIME' value, end the CRANKING SEQUENCE and go to the PRESTART SEQUENCE and perform a next start attempt.

If the number of failed start attempts equals the amount configured in CRANK 'MAXIMUM START ATTEMPTS' , a START FAILURE shutdown will become active and the controller will go to SHUTDOWN SEQUENCE and end the CRANKING SEQUENCE.

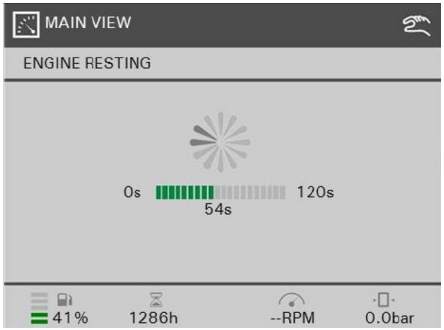
At the moment the actual cranking starts (the START OUTPUT gets energized), an internal counter starts counting up at a rate of 4 per second, but limited to the CRANK 'MAXIMUM RESTING TIME' value.

When the CRANKING SEQUENCE is ended (unit has started, shutdown active, stop command given,...), this internal counter starts counting down at a rate of 1 per second, limited to 0.

If at a next CRANKING SEQUENCE entry this internal counter > 0, the controller will block the CRANKING SEQUENCE and show that the engine is resting, and continue the CRANKING SEQUENCE as soon as this internal counter has reached 0.

This internal counter shall not be set to 0 at a power up of the controller.

During resting, the Xc display shows:



If the RUN COMMAND is set to 0 during the CRANKING SEQUENCE, then the controller will go to STOP SEQUENCE and end the CRANKING SEQUENCE.

If a LIMIT, an INDICATION, a WARNING or an INHIBIT LOAD becomes active during the CRANKING SEQUENCE, the controller continues its sequences.

If a CONTROLLED STOP, or a SHUTDOWN becomes active during the CRANKING SEQUENCE, the controller will go to the SHUTDOWN SEQUENCE and end the CRANKING SEQUENCE.

WARMING UP SEQUENCE

Configuration of the WARMING UP is done through following parameters:

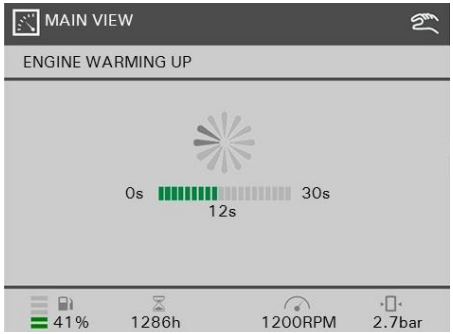
WARMING UP	6370
WARMING UP RPM:	500rpm → 3000rpm (10rpm steps) → default = 1300rpm
WARMED UP TEMPERATURE:	0¢XC → 100¢XC (1¢XC steps) → default = 40¢XC
MINIMUM WARMING UP TIME:	0s. → 100s. (1s. steps) → default = 10s.
MAXIMUM WARMING UP TIME:	0s. → 1000s. (10s. steps) → default = 300s.
WARMING UP TIME RAISE:	0,5s. → 10,0s. (0,5s. steps) → default = 6s.
Access Level:	Master → default

If the BASIC PARAMETERS MASTER 'ECU' is set to 'no':

If when the WARMING UP SEQUENCE is entered, and the LOW PRESSURE ELEMENT TEMPERATURE ≥ WARMING UP 'WARMED UP TEMPERATURE', the controller goes to the next sequence and ends the WARMING UP SEQUENCE as soon as the WARMING UP 'MINIMUM WARMING UP TIME' has elapsed (warming up time starts as soon as the WARMING UP SEQUENCE is entered).

If when the WARMING UP SEQUENCE is entered, and the LOW PRESSURE ELEMENT TEMPERATURE < WARMING UP 'WARMED UP TEMPERATURE', the controller goes to the next sequence and ends the WARMING UP SEQUENCE as soon as the WARMING UP 'MINIMUM WARMING UP TIME' + ((WARMING UP 'WARMED UP TEMPERATURE' - LOW PRESSURE ELEMENT TEMPERATURE) * WARMING UP 'WARMING UP TIME RAISE') has elapsed (warming up time starts as soon as the WARMING UP SEQUENCE is entered).

During WARMING UP SEQUENCE, the Xc display will show:

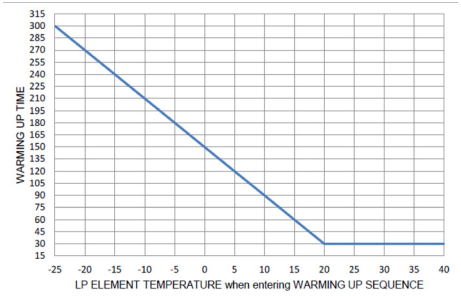


Where the shown time range goes from 0s. to WARMING UP 'MINIMUM WARMING UP TIME' ,or to WARMING UP 'MINIMUM WARMING UP TIME' + ((WARMING UP 'WARMED UP TEMPERATURE' - LOW PRESSURE ELEMENT TEMPERATURE) * WARMING UP 'WARMING UP TIME RAISE'), depending of the LOW PRESSURE ELEMENT TEMPERATURE when the WARMING UP SEQUENCE is entered.

When, for example, when following data are configured:

WARMING UP	6370
WARMED UP TEMPERATURE:	20°C
MINIMUM WARMING UP TIME:	30s.
WARMING UP TIME RAISE:	6,0s.

following Warming Up curve is created:

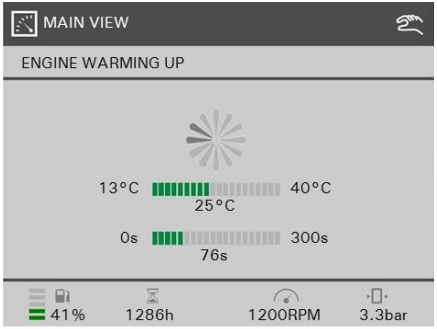


If the BASIC PARAMETERS MASTER 'ECU' is set to 'yes':

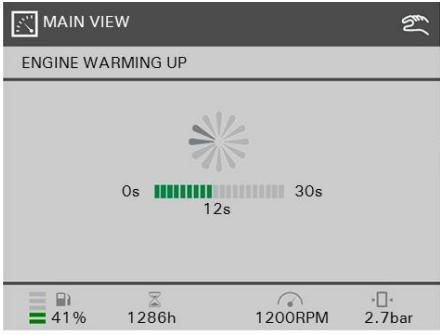
The RPM SETPOINT is set at WARMING UP 'WARMING UP RPM'.

If during the WARMING UP SEQUENCE the ENGINE COOLANT TEMPERATURE . WARMING UP 'WARMED UP TEMPERATURE' and the WARMING UP 'MINIMUM WARMING UP TIME' has elapsed, or when the WARMING UP ?eMAXIMUM WARMING UP TIME' has elapsed (warm up time starts as soon as the ENGINE RPM reaches the WARMING UP 'WARMING UP RPM' . 2%), then the controller goes to the next sequence and ends the WARMING UP SEQUENCE.

During WARMING UP SEQUENCE, when the WARMING UP 'WARMED UP TEMPERATURE' or the WARMING UP 'MAXIMUM WARMING UP TIME' are not reached, the Xc display will show:



During WARMING UP SEQUENCE, when the WARMING UP 'WARMED UP TEMPERATURE' is reached, but the WARMING UP 'MINIMUM WARMING UP TIME' isn't, the Xc display will show:



If the RUN COMMAND is set to 0 during the WARMING UP SEQUENCE, then the controller will go to STOP SEQUENCE and end the WARMING UP SEQUENCE.

If a LIMIT, an INDICATION, a WARNING, or an INHIBIT LOAD becomes active during the WARMING UP SEQUENCE, the controller continues its sequences.

If a CONTROLLED STOP or a SHUTDOWN is active, or becomes active, during the WARMING UP

SEQUENCE, the controller will go to the SHUTDOWN SEQUENCE and end the WARMING UP SEQUENCE.

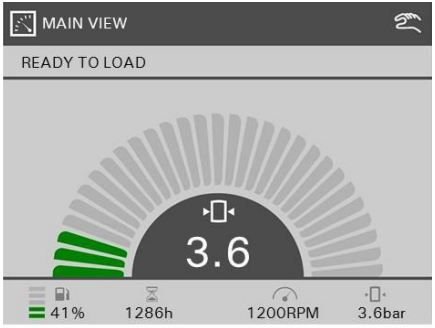
NOT LOADED SEQUENCE

When BASIC PARAMETERS MASTER 'LOAD VALVE' is set to 'no', then the controller will go to the next sequence and end the NOT LOADED SEQUENCE.

If the BASIC PARAMETERS MASTER 'ECU' is set to 'yes':

The RPM SETPOINT is set at IDLE RPM 'SETTING'.

The Xc2003 display shows:



If during the NOT LOADED SEQUENCE the LOAD COMMAND is 1, then the controller will go to the next sequence and end the NOT LOADED SEQUENCE.

If the RUN COMMAND is set to 0 during the NOT LOADED SEQUENCE, the controller will go to COOLDOWN SEQUENCE and end the NOT LOADED SEQUENCE.

If a LIMIT, an INDICATION, or a WARNING becomes active during the NOT LOADED SEQUENCE, the controller continues its sequences.

If an INHIBIT LOAD is active during the NOT LOADED SEQUENCE, the controller can only leave the NOT LOADED SEQUENCE if a CONTROLLED STOP or a SHUTDOWN becomes active, or if the RUN COMMAND is set to 0.

If a CONTROLLED STOP becomes active during the NOT LOADED SEQUENCE, the controller will go to the COOLDOWN SEQUENCE and end the NOT LOADED SEQUENCE.

If a SHUTDOWN becomes active during the NOT LOADED SEQUENCE, the controller will go to the SHUTDOWN SEQUENCE and end the NOT LOADED SEQUENCE.

Load the Machine

LOAD PREVENTION SEQUENCE

When BASIC PARAMETERS MASTER 'LOAD VALVE' is set to 'no', then the controller will go to the next sequence and end the LOAD PREVENTION SEQUENCE.

When BASIC PARAMETERS MASTER 'VESSEL PRESSURE SENSOR' is set to 'no', then the controller will go to the next sequence and end the LOAD PREVENTION SEQUENCE.

The VESSEL PRESSURE will be checked.

Configuration of the VESSEL PRESSURE LOAD PREVENTION is done through following parameters:

VESSEL PRESSURE LOAD PREVENTION	6380
SETTING:	0.0bar ⟶ 50.0bar (0.1bar steps) ⟶ default = 4.5bar
TIME:	0s. ⟶ 1000s. (1s. steps) ⟶ default = 60s.
Access Level:	Master ⟶ fixed

If, when the VESSEL PRESSURE LOAD PREVENTION SEQUENCE is started,

VESSEL PRESSURE >= VESSEL PRESSURE LOAD PREVENTION 'SETTING' the controller will go to the next sequence and end the VESSEL PRESSURE LOAD PREVENTION SEQUENCE.

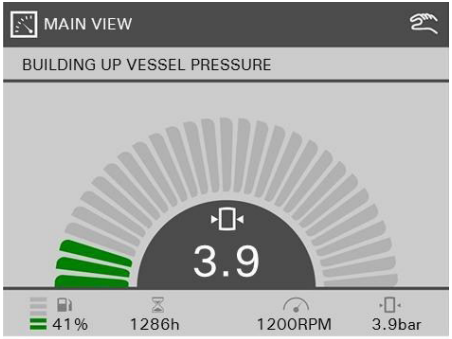
If, when the VESSEL PRESSURE LOAD PREVENTION SEQUENCE is started, VESSEL PRESSURE < VESSEL PRESSURE LOAD PREVENTION 'SETTING' the LOAD VALVE OUTPUT will be energized.

If VESSEL PRESSURE >= VESSEL PRESSURE LOAD PREVENTION 'SETTING' + 0,5bar is not reached within the VESSEL PRESSURE LOAD PREVENTION 'TIME' after energizing the LOAD VALVE OUTPUT, the controller will de-energize the LOAD VALVE OUTPUT, leave the VESSEL PRESSURE LOAD PREVENTION SEQUENCE and go to the NOT LOADED SEQUENCE, showing a VESSEL PRESSURE TOO LOW TO LOAD indication alarm for 10s..

If the AUTO LOAD 'FUNCTION' is set to 'Auto Load', the VESSEL PRESSURE TOO LOW TO LOAD indication alarm will be changed to a Controlled Stop alarm, to prevent a repetetive execution of the VESSEL PRESSURE LOAD PREVENTION SEQUENCE.

If VESSEL PRESSURE >= VESSEL PRESSURE LOAD PREVENTION 'SETTING' + 0,5bar gets reached within the VESSEL PRESSURE LOAD PREVENTION 'TIME' after energizing the LOAD VALVE OUTPUT, the controller will de-energize the LOAD VALVE OUTPUT, wait for 3s., go to the next sequence and end the VESSEL PRESSURE LOAD PREVENTION SEQUENCE.

During the VESSEL PRESSURE LOAD PREVENTION SEQUENCE, the Xc display shows:



If the RUN COMMAND is set to 0 during the VESSEL PRESSURE LOAD PREVENTION SEQUENCE, the controller will go to COOLDOWN SEQUENCE and end the VESSEL PRESSURE LOAD PREVENTION SEQUENCE.

If the LOAD COMMAND is set to 0 during the VESSEL PRESSURE LOAD PREVENTION SEQUENCE, the controller will go to NOT LOADED SEQUENCE and end the VESSEL PRESSURE LOAD PREVENTION SEQUENCE.

If a LIMIT, an INDICATION, or a WARNING becomes active during the VESSEL PRESSURE LOAD PREVENTION SEQUENCE, the controller continues its sequences.

If an INHIBIT LOAD is active, or becomes active, during the VESSEL PRESSURE LOAD PREVENTION SEQUENCE, the controller will go to the NOT LOADED SEQUENCE and end the VESSEL PRESSURE LOAD PREVENTION SEQUENCE.

If a CONTROLLED STOP becomes active during the VESSEL PRESSURE LOAD PREVENTION SEQUENCE, the controller will go to the COOLDOWN SEQUENCE and end the VESSEL PRESSURE LOAD PREVENTION SEQUENCE.

If a SHUTDOWN is active, or becomes active, during the VESSEL PRESSURE LOAD PREVENTION SEQUENCE, the controller will go to the SHUTDOWN SEQUENCE and end the VESSEL PRESSURE LOAD PREVENTION SEQUENCE.

PRELOAD SEQUENCE

When BASIC PARAMETERS MASTER 'LOAD VALVE' is set to 'no', then the controller will go to the next sequence and end the PRELOAD SEQUENCE.

If the BASIC PARAMETERS MASTER 'ECU' is set to 'no', then the controller will go to the next sequence when the PRELOAD 'TIME' has elapsed and end the PRELOAD SEQUENCE.

If the BASIC PARAMETERS MASTER 'ECU' is set to 'yes':

The RPM SETPOINT is set at PRELOAD 'RPM'.

If the ENGINE RPM . PRELOAD 'RPM' minus 2% is not reached within the configured PRELOAD 'OVERRIDE TIME' after the PRELOAD SEQUENCE has been entered, the LOAD VALVE OUTPUT is activated, the LOADED HOURS COUNTER will start counting every second the machine is loaded, and the RPM SETPOINT stays at the PRELOAD 'RPM' for the duration of the PRELOAD 'TIME'.

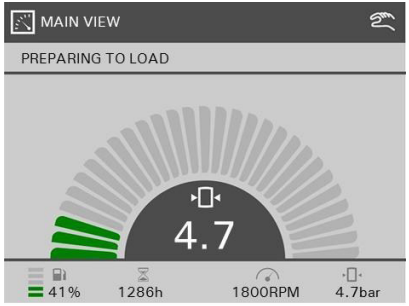
If the ENGINE RPM . PRELOAD 'RPM' minus 2%, the LOAD VALVE OUTPUT is activated, the LOADED HOURS COUNTER will start counting every second the machine is loaded, and the RPM SETPOINT stays at the PRELOAD 'RPM' for the duration of the PRELOAD 'TIME'.

If the PRELOAD 'TIME' has elapsed, the controller will go to the next sequence and end the PRELOAD SEQUENCE.

Configuration of the PRELOAD is done through following parameters:

PRELOAD	6390
RPM:	500rpm → 3000rpm (10rpm steps) → default = 1300rpm
TIME:	0s. → 100s. (1s. steps) → default = 7s.
OVERRIDE TIME:	0s. → 100s. (1s. steps) → default = 30s.
Access Level:	Master → default

During the PRELOAD SEQUENCE, the Xc display shows:



If the RUN COMMAND is set to 0 during the PRELOAD SEQUENCE, the controller will go to COOLDOWN SEQUENCE and end the PRELOAD SEQUENCE.

If the LOAD COMMAND is set to 0 during the PRELOAD SEQUENCE, then the LOAD VALVE OUTPUT is deactivated, the LOADED HOURS COUNTER will stop adding up, and the controller will go to NOT LOADED SEQUENCE and end the PRELOAD SEQUENCE.

If a LIMIT, an INDICATION, or a WARNING becomes active during the PRELOAD SEQUENCE, the controller continues its sequences.

If an INHIBIT LOAD is active, or becomes active, during the PRELOAD SEQUENCE, the controller will go to the NOT LOADED SEQUENCE and end the PRELOAD SEQUENCE.

If a CONTROLLED STOP is active, or becomes active, during the PRELOAD SEQUENCE, the controller will go to the COOLDOWN SEQUENCE and end the PRELOAD SEQUENCE.

If a SHUTDOWN is active, or becomes active, during the PRELOAD SEQUENCE, the controller will go to the SHUTDOWN SEQUENCE and end the PRELOAD SEQUENCE.

LOADED SEQUENCE

The following output is activated (if present):

- LOAD VALVE OUTPUT

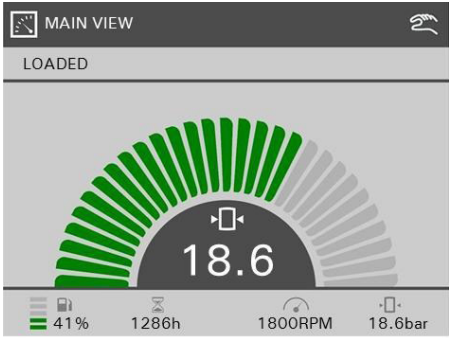
The following counter will be set to 0 (if present):

- COOLDOWN TIMER

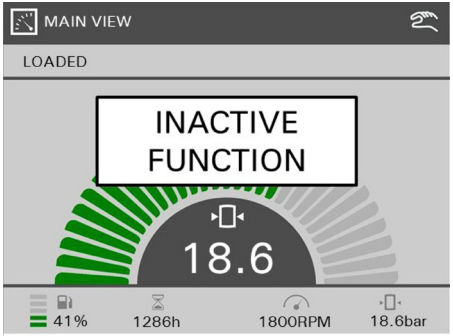
If the BASIC PARAMETERS MASTER ‘ECU’ is set to ‘yes’:

During the LOADED SEQUENCE, the RPM SETPOINT continuously follows the CALCULATED RPM value (if applicable).

During the LOADED SEQUENCE, the Xc display shows:



When BASIC PARAMETERS MASTER ‘LOAD VALVE’ is set to ‘no’, and the Load Button gets pressed, the this pop-up will be shown at the display for as long as the Load Button gets pressed + 2s.:



If the RUN COMMAND is set to 0 during the LOADED SEQUENCE, then the COOLDOWN TIMER will start counting and the controller will go to COOLDOWN SEQUENCE and end the LOADED SEQUENCE.

If the LOAD COMMAND is set to 0 during the LOADED SEQUENCE, then the COOLDOWN TIMER will start counting, the LOAD VALVE OUTPUT is deactivated, the LOADED HOURS COUNTER will stop adding up, and the controller will go to NOT LOADED SEQUENCE and end the LOADED SEQUENCE.

If a LIMIT, an INDICATION, a WARNING or an INHIBIT LOAD becomes active during the LOADED SEQUENCE, the controller continues its sequences.

If a CONTROLLED STOP becomes active during the LOADED SEQUENCE, the controller will go to the COOLDOWN SEQUENCE and end the LOADED SEQUENCE.

If a SHUTDOWN becomes active during the LOADED SEQUENCE, the controller will go to the SHUTDOWN SEQUENCE and end the LOADED SEQUENCE.

STOP THE MACHINE

COOLDOWN SEQUENCE

When BASIC PARAMETERS MASTER 'LOAD VALVE' is set to 'no', then the controller will go to the next sequence and end the COOLDOWN SEQUENCE.

The following outputs are deactivated (if present):

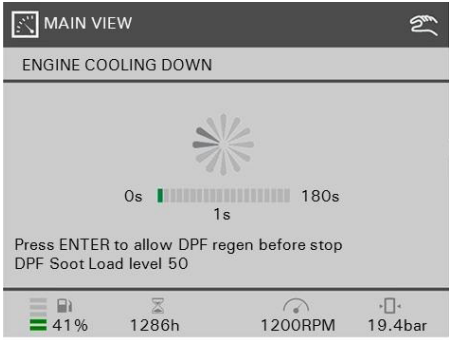
- PREHEAT OUTPUT
- START OUTPUT
- LOAD VALVE OUTPUT

The following counter will stop adding up (if present):

- LOADED HOURS TIMER

The RPM SETPOINT is set at IDLE RPM 'SETTING'.

When the COOLDOWN SEQUENCE is entered, the COOLDOWN 'ASK FOR DPF REGENERATION' is set to 'Yes', and a valid DPF SOOT LOAD >= 30% is read, and the Xc2003 is not broadcasting an INHIBIT DPF REGENERATION command to the ECU, the controller should display 'Press ENTER to allow DPF Regeneration before engine is stopped', together with the actual DPF SOOT LOAD value:



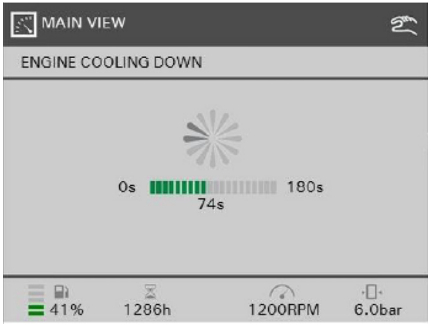
- If ENTER is not pressed within 10s. after this message is displayed, the controller will show the normal display during COOLDOWN SEQUENCE, and continue COOLDOWN SEQUENCE until the COOLDOWN TIMER . COOLDOWN 'TIME', and the controller will go to the next sequence and end the COOLDOWN SEQUENCE.

- If ENTER does get pressed within 10s. after this message is displayed, the controller will show the normal display during COOLDOWN SEQUENCE, and continue COOLDOWN SEQUENCE until the COOLDOWN TIMER . COOLDOWN 'TIME' and the HEST LAMP is not read as being 'ON', and the controller will go to the next sequence and end the COOLDOWN SEQUENCE. If in this case the HEST LAMP is read as being 'ON' during the COOLDOWN SEQUENCE, the 'DPF REGENERATING' sequence text will be shown.

If the COOLDOWN 'ASK FOR DPF REGENERATION' is set to 'No', then the controller will never display the 'Press ENTER to allow DPF Regeneration before engine is stopped', view and always perform the COOLDOWN SEQUENCE as if no valid DPF SOOT LOAD is read.

When the COOLDOWN SEQUENCE is entered, and no valid DPF SOOT LOAD is read, the controller should continue the COOLDOWN SEQUENCE until the COOLDOWN TIMER . COOLDOWN 'TIME', and the controller will go to the next sequence and end the COOLDOWN SEQUENCE.

During the COOLDOWN SEQUENCE, the Xc display shows:



Configuration of the COOLDOWN is done through following parameters:

COOLDOWN	6410
TIME:	0s. → 1000s. (10s. steps) → default = 300s.
ASK FOR DPF REGENERATION :	yes no → default
Access Level:	Master (fixed)

If the RUN COMMAND is set to 1 during the COOLDOWN SEQUENCE, the controller will go to NOT LOADED SEQUENCE and end the COOLDOWN SEQUENCE.

If a LIMIT, an INDICATION, a WARNING, an INHIBIT LOAD, or a CONTROLLED STOP becomes active during the COOLDOWN SEQUENCE, the controller continues its sequences.

If a SHUTDOWN is active, or becomes active, during the COOLDOWN SEQUENCE, the controller will go to the SHUTDOWN SEQUENCE and end the COOLDOWN SEQUENCE.

STOP SEQUENCE

The following outputs are deactivated (if present):

- PREHEAT OUTPUT
- START OUTPUT
- LOAD VALVE OUTPUT
- PAC OUTPUT
- e-XTENSION OUTPUT

The following counters will stop adding up (if present):

- LOADED HOURS TIMER
- RUNNING HOURS TIMER

If the BASIC PARAMETERS MASTER 'ELECTRIC DRIVEN' is set to 'yes', then the controller will wait for the configured STOP DETECTION 'START DELAY', and the controller will go to the next sequence and end the STOP SEQUENCE.

If the BASIC PARAMETERS MASTER ?eECU?f is set to 'yes':

When the STOP DETECTION 'ENERGIZE DELAY has elapsed (starts counting when the STOP SEQUENCE is entered) then the PAC OUTPUT is activated again, ENGINE RPM is read, and:

- if ENGINE RPM > STOP DETECTION 'STOP DETECTION RPM', a STOP FAILURE shutdown will be active, the PAC OUTPUT will be deactivated, the AIR SHUT OFF VALVE OUTPUT is activated and the controller will go to SHUTDOWN SEQUENCE and end the STOP SEQUENCE.

- if ENGINE RPM . STOP DETECTION 'STOP DETECTION RPM' the controller will wait for the configured STOP DETECTION 'START DELAY', and the controller will go to the next sequence and end the STOP SEQUENCE.

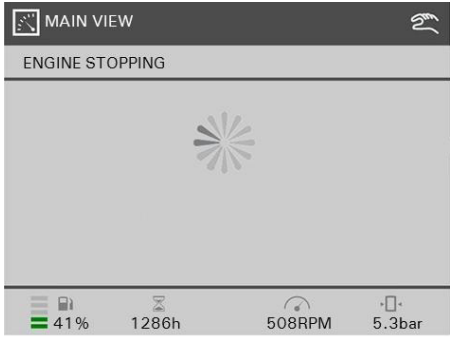
If the BASIC PARAMETERS MASTER ?eECU?f is set to 'no':

If the STOP DETECTION 'ENERGIZE DELAY has elapsed (starts counting when the STOP SEQUENCE is entered), and:

- the RUNNING FEEDBACK INPUT is still seen as being high, a STOP FAILURE shutdown will be active, the AIR SHUT OFF VALVE OUTPUT is activated and the controller will go to SHUTDOWN SEQUENCE and end the STOP SEQUENCE.

- the RUNNING FEEDBACK INPUT is seen as being low, the controller will wait for the configured STOP DETECTION 'START DELAY', and the controller will go to the next sequence and end the STOP SEQUENCE.

During the STOP SEQUENCE, the Xc display shows:



Configuration of the STOP DETECTION is done through following parameters:

STOP DETECTION	6420
ENERGIZE DELAY:	0s. ⟶ 100s. (1s. steps) ⟶ default = 5s.
STOP DETECTION RPM:	0rpm ⟶ 1000rpm (10rpm steps) ⟶ default = 50rpm
START DELAY:	0s. ⟶ 100s. (1s. steps) ⟶ default = 10s.
Access Level:	Master (fixed)

If a SHUTDOWN is active, or becomes active, during the STOP SEQUENCE, the controller will go to the SHUTDOWN SEQUENCE and end the STOP SEQUENCE.

SHUTDOWN

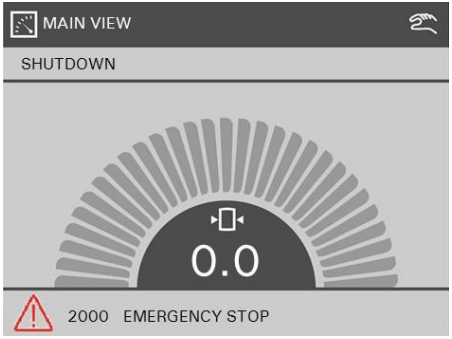
The following outputs are deactivated (if present):

- PREHEAT OUTPUT
- START OUTPUT
- LOAD VALVE OUTPUT
- PAC OUTPUT
- e-XTENSION OUTPUT

The following counters will stop adding up (if present):

- LOADED HOURS TIMER
- RUNNING HOURS TIMER

During the SHUTDOWN SEQUENCE, the Xc display shows:



If the BASIC PARAMETERS MASTER 'ELECTRIC DRIVEN' is set to 'yes', then the controller will wait for the configured STOP DETECTION 'START DELAY', and the controller will end the SHUTDOWN SEQUENCE if no CONTROLLED STOP, a SHUTDOWN AFTER STOP, or a SHUTDOWN alarms are active anymore.

If the BASIC PARAMETERS MASTER 'ECU' is set to 'yes':

If the STOP DETECTION 'ENERGIZE DELAY' has elapsed (starts counting when the SHUTDOWN SEQUENCE is entered) then the PAC OUTPUT is activated again, ENGINE RPM is read, and:

- if ENGINE RPM > STOP DETECTION 'STOP DETECTION RPM', a STOP FAILURE shutdown will be active, the PAC OUTPUT will be deactivated, the AIR SHUT OFF VALVE OUTPUT is activated, and the controller will stay in SHUTDOWN SEQUENCE.

- if ENGINE RPM. STOP DETECTION 'STOP DETECTION RPM' the controller will wait for the configured STOP DETECTION 'START DELAY', and the controller will end the SHUTDOWN SEQUENCE if no CONTROLLED STOP, a SHUTDOWN AFTER STOP, or a SHUTDOWN alarms are active anymore.

If the BASIC PARAMETERS MASTER 'ECU' is set to 'no':

If the STOP DETECTION 'ENERGIZE DELAY' has elapsed (starts counting when the SHUTDOWN SEQUENCE is entered), and:

- the RUNNING FEEDBACK INPUT is still seen as being high, a STOP FAILURE shutdown will be active, the AIR SHUT OFF VALVE OUTPUT is activated, and the controller will stay in SHUTDOWN SEQUENCE.

- the RUNNING FEEDBACK INPUT is seen as being low, the controller will wait for the configured STOP DETECTION 'START DELAY', and the controller will end the SHUTDOWN SEQUENCE if no CONTROLLED STOP, a SHUTDOWN AFTER STOP, or a SHUTDOWN alarms are active anymore.

If a CONTROLLED STOP or a SHUTDOWN is active in the SHUTDOWN SEQUENCE, the controller will stay blocked in the SHUTDOWN SEQUENCE.

POWER OFF THE Xc2003

If the compressor is equipped with a battery switch:

When the compressor is not in use this switch must always be in the "OFF" position.

It is not allowed to use this switch as an emergency switch or for stopping the compressor.

It can cause damage in the Xc2003 or the engine's Electronic Control Unit when using the battery switch for stopping.

Always first shut off the Xc2003 and wait until the display is dark before switching the battery switch to position "OFF"

Buttons

Reference	Name
	**POWER OFF / ON switch** This button will power up the controller when it is in standby, or initiate a power down when allowed.
	**START Button** This button will initiate the starting sequences when allowed, or reenter the running sequence when cooling down..
	**STOP Button** This button will initiate the cooldown/stopping sequences if the controller is in normal running sequence.

	**LOAD button**. This button will: • initiate the Auto Load function when allowed but not yet ready to be loaded.. • Initiate the loading sequences when the controller is ready to be loaded. • Initiate the not loaded sequence when loaded.
	**MEASUREMENTS VIEW button** This button will enter the Measurements View when not already in the Measurements View, or when already in the Measurements View it will enter the Main View.

	**SETTINGS VIEW button** This button will enter the Settings View when not already in the Settings View, or when already in the Settings View it will enter the Main View.
	**ALARMS VIEW button** This button will enter the Alarms View when not already in the Alarms View, or when already in the Alarms View it will enter the Main View.

	**NAVIGATION buttons** These buttons are used to navigate through the display menu's, where the Enter Button
	will confirm/store the selection/change, and where the Back Button.
	will move back one level or ignore the change.

FAULT CODES

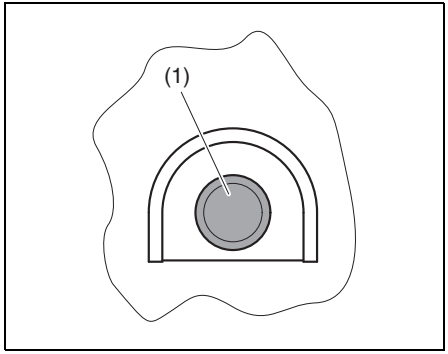
There are several parameters that are continuously watched.

When one of these parameters exceeds its specified limit the compressor will react depending the present status of the control box.

The message displayed can be a warning, a shut down or a start failure.

Display text	Warning	Shutdown	Wait to start
Engine Fault Codes (Canbus SAE J1939):			
Engine Sensor Failure	X	X	
Fuel Temperature High	X		
Fuel Pressure Low	X		
Coolant Temperature High	X	X	
Injector Failure	X		
Oil Pressure low	X	X	
Air Inlet Temperature High	X		
Turbo Boost Pressure High	X		
Xc2003 Fault Codes:			
Sensor Failure (Fuel Level, Vessel Pressure, Regulating Pressure, Element Temperature)		X	
Can SAE J1939 Communication Failure		X	
Overspeed		X	
Fuel Level Low	X	X	
Vessel pressure High		X	
Element Temperature High	X	X	
Coolant Level Low		X	
Vessel Pressure Start Prevention			X
Battery Voltage Low	X		
Battery Charge Failure	X		
Check Airfilters	X		
Start Failure		X	
Stop Failure		X	
Service Timer 1	X		
Service Timer 2	X		
Emergency Stop		X	

EMERGENCY STOP



The emergency stop button is only to be used in emergency situations; not for stopping procedures.

When an emergency stop button (1) is pressed, power to all outputs is terminated, by the emergency stop

itself (hardware) as well as by the software.

When the emergency stop button (1) is pressed the operator can unlock the emergency stop by turning it counterclockwise

Maintenance

LIABILITY

The manufacturer does not accept any liability for any damage arising from the use of non-original parts and for modifications, additions or conversions made without the manufacturer's approval in writing.

SERVICE PAKS

A Service Pak is a collection of parts to be used for a specific maintenance task, e.g. after 400 and after 1000 running hours.

It guarantees that all necessary parts are replaced at the same time keeping down time to a minimum.

The order number of the Service Paks are listed in the Atlas Copco Parts List (ASL).

Use of service paks

Service Paks include all genuine parts needed for normal maintenance of both compressor and engine.

Service Paks minimize downtime and keep your maintenance budget low.

Order Service Paks at your local Atlas Copco dealer.

SERVICE KITS

A service kit is a collection of parts to fit a specific repair or rebuilding task.

It guarantees that all necessary parts are replaced at the same time which improves the uptime of the unit.

The order numbers of the Service Kits are listed in the Atlas Copco Parts List (ASL).

Contact Atlas Copco.

STORAGE

Run the compressor regularly, e.g. twice a week, until warm.

Load and unload the compressor a few times to operate the unloading and regulating components. Close the air outlet valves after stopping.

If the compressor is going to be stored without running from time to time, protective measures must be taken.

PREVENTIVE MAINTENANCE SCHEDULE

Unauthorised modifications can lead to risk for injury or machine damage.

Always keep the machine tidy in order to prevent fire hazard.

Poor maintenance can void any warranty claims.

The schedule contains a summary of the maintenance instructions. Read the respective section before taking maintenance measures.

When servicing, replace all disengaged packings, e.g. gaskets, O-rings, washers.

For engine maintenance refer to Engine Operation Manual.

The maintenance schedule has to be seen as a guideline for compressors operating in a dusty environment typical for compressor applications. Maintenance schedule can be adapted depending on application, environment and quality of maintenance.

MAINTENANCE SCHEDULE COMPRESSOR

To determine the maintenance intervals, use of service hours, or calendar time, whichever occurs first.			
Maintenance schedule (running hours)	**Daily**	**Every 400 hours**	**Every 1000 hours**
Service parts		3002 6088 00	3002 6088 10 3020 6088 20
For the most important subassemblies, Atlas Copco has developed service kits that combine all wear parts. These service kits offer you the benefits of genuine parts, save administration costs and are offered at a reduced price, compared to individual components. Refer to the parts list for more information on the contents of the service kits.			
Drain water from fuel filter	x		
Empty air filter vacuator valves	x		
Check engine oil level (if necessary top up)	x		
Check compressor oil level (if necessary top up)	x		
Check coolant level	x		
Check/Fill fuel level (3)	x		
Check function of coolant heater (option)	x		
Check control panel	x		
Check on abnormal noise	x		
Check electrical system cables for wear	x		

(to be continued on page 60)

Maintenance schedule (running hours) *(continuation of page 59)*	**Daily**	**Every 400 hours**	**Every 1000 hours**
Check for leaks in engine-, compressor-, air-, oil-, or fuel system		x	x
Check torque on critical bolt connections		x	x
Check electrolyte level and terminals of battery		x	x
Check engine (minimum and maximum) speed		x	x
Replace compressor oil filter(s) (5)			x
Change engine oil (2) (12)		x	x
Replace engine oil filter (2)		x	x
Drain/Clean fuel tank water and sediments (1)		x	x
Hoses and clamps - Inspect/Replace		x	x
Replace fuel (pre)filters (6)		x	x
Clean flow restrictor in oil scavenge line		x	x
Clean after cooler (option) (1)		x	x
Adjust engine inlet and outlet valves (2)		x	
Clean oil cooler(s) (1)		x	x
Clean radiator (1)		x	x
Clean intercooler (1)		x	x
Check engine protective devices		x	
Check functioning of regulating valve			x
Inspect/Adjust fan belt			x
Replace bleed-off valve unloader			x
Check rubber flexibles (11)			x
Test safety valve (9)			x
Replace DD/PD/QD filter (option)			x
Clean oil stop valve			x
Change compressor oil (1) (7)			x
Replace oil separator element			x

(to be continued on page 61)

Maintenance schedule (running hours) *(continuation of page 60)*	**Daily**	**Every 400 hours**	**Every 1000 hours**
Replace air filter element (1)			x
Inspection by Atlas Copco service technician			x
Replace fan belt			
Check emergency stop			
Analyse coolant (4) (8)			
Grease hinges			
Check/Replace safety cartridge			
Inspect starter motor			
Inspect turbocharger			
Inspect waterpump			
Inspect alternator			

Notes

1. More frequently when operating in a dusty environment.
2. Refer to the engine operation manual.
3. After a day's work.
4. Yearly is only valid when using PARCOOL. Change coolant every 5 years.
5. Use Atlas Copco oil filters, with by-pass valve, as specified in the parts list.
6. Gummed or clogged filters mean fuel starvation and reduced engine performance.
7. See section **Oil specifications**.
8. The following part numbers can be ordered from Atlas Copco to check on inhibitors and freezing point:
   - 2913 0028 00 refractometer
   - 2913 0029 00 pH meter.
9. See section **Safety valve**.
10. See section **Before starting**.
11. Replace all rubber flexibles every 6 years, according to DIN 20066.
    For other specific engine and alternator requirements refer to specific manuals.
12. 250 hours is only valid when using PAROIL E or PAROIL E xtra.

Keep the bolts of the housing, the lifting beam, tow bar and axles securely tightened. For torque values see section Technical specifications.

MAINTENANCE SCHEDULE UNDERCARRIAGE

Maintenance schedule (km)	Daily	50 km after initial start-up	Every 400 km	Every 2000 km	Yearly
Check coupling head	x			x	x
Check drawbar handbrake lever spring actuator, reversing lever, linkage and all movable parts for ease of movement	x	x	x		x
Check safety cable for damage	x			x	x
Check tyre pressure		x	x		x
Check torque of wheel nuts		x		x	x
Check height of adjusting facility		x	x		x
Grease coupling head, drawbar bearings at the housing of the overrun brake		x		x	x
Check brake system (if installed) and adjust if necessary		x		x	x
Oil or grease brake lever and moving parts such as bolts and joints		x		x	x
Check tyres for uneven wear				x	x
Grease sliding points on height adjusting parts				x	x
Check Bowden cable on height adjustable connection device for damage				x	x
Lubricate torsion bar axle trailing arm				x	x
Check brake lining wear					x
Check/Adjust lateral play of wheel bearing (compact bearing)					x

It is strongly recommended to use Atlas Copco branded lubrication oils for both compressor and engine.

Only use mineral based compressor oil PAROIL S in V900, XATS 1200, XAVS 1000.

High-quality, mineral, hydraulic or synthesized hydrocarbon oil with rust and oxidation inhibitors, anti-foam and anti-wear properties is recommended.

Never mix synthetic with mineral oil.

Remark:

When changing from mineral to synthetic oil (or the other way around), you will need to do an extra rinse:

After a complete change over to synthetic oil, run the unit for a few minutes to allow proper and complete circulation of the synthetic oil.

Then drain the synthetic oil again and fill again with new synthetic oil. To set correct oil levels, follow the normal instructions.

PAROIL from Atlas Copco is the ONLY oil tested and approved for use in all engines built into Atlas Copco compressors and generators.
Extensive laboratory and field endurance tests on Atlas Copco equipment have proven PAROIL to match all lubrication demands in varied conditions. It meets stringent quality control specifications to ensure your equipment will run smoothly and reliably.
The quality lubricant additives in PAROIL allow for extended oil change intervals without any loss in performance or longevity.

PAROIL provides wear protection under extreme conditions. Powerful oxidation resistance, high chemical stability and rust- inhibiting additives help reduce corrosion, even within engines left idle for extended periods.

PAROIL contains high quality anti-oxidants to control deposits, sludge and contaminants that tend to build up under very high temperatures. PAROIL's detergent additives keep sludge forming particles in a fine suspension, instead of allowing them to clog your filter and accumulate in the valve/rocker cover area.

PAROIL releases excess heat efficiently, whilst maintaining excellent bore-polish protection to limit oil consumption.
PAROIL has an excellent Total Base Number (TBN) retention and more alkalinity to control acid formation.

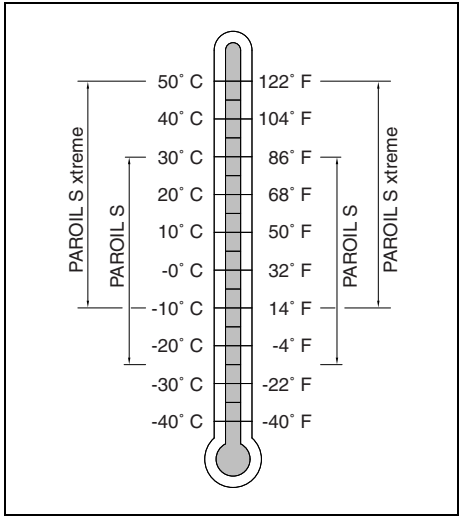
PAROIL prevents soot build-up

PAROIL is optimized for the latest low emission EURO -3 & -2, EPA TIER II & III engines running on low sulphur diesel for lower oil and fuel consumption.

PAROIL E xtra is a synthetic ultra high performance diesel engine oil with a high viscosity- index. Atlas Copco PAROIL E xtra is designed to provide excellent lubrication from start-up at temperatures as low as -25° C (-13° F).

PAROIL E is a mineral based high performance diesel engine oil with a high viscosity- index. Atlas Copco PAROIL E is designed to provide a high level of performance and protection under ‘standard’ ambient conditions from -5°C (23°F) onward.

COMPRESSOR OIL



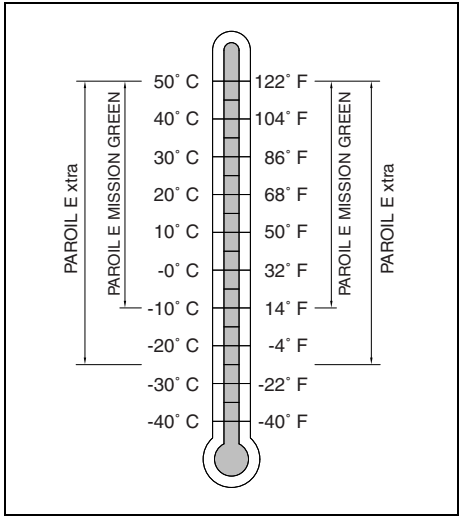
Choose your compressor oil based on the ambient temperatures in the actual operating area.

Synthetic compressor oil PAROIL S

	Liter	US gal	Order number
can	5	1.3	1630 0160 00
can	20	5.3	1630 0161 00
barrel	210	55.2	1630 0162 00
container	1000	265	1630 0163 00

Synthetic compressor oil PAROIL S Extreme

	Liter	US gal	Order number
can	5	1.3	1630 0180 00
barrel	210	55.2	1630 0181 00
container	1000	265	1630 1082 00



Choose your engine oil based on the ambient temperatures in the actual operating area.

Synthetic engine oil PAROIL E 15W40

	Liter	US gal	Order number
can	5	1.3	1615 5953 00
can	20	5.3	1615 5954 00
barrel	210	55.2	1615 5955 00

Syntheticengine oil PAROIL E 5W40

	Liter	US gal	Order number
can	5	1.3	1630 0135 01
can	20	5.3	1630 0136 01

OIL LEVEL CHECK

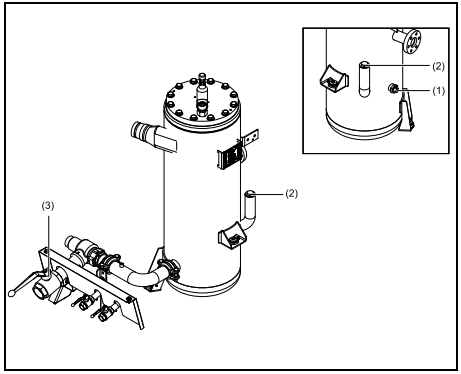
CHECK ENGINE OIL LEVEL

Also consult the Engine Operation Manual for the oil specifications, viscosity recommendations and oil change intervals.

For intervals, see **Preventive maintenance schedule**.

Check engine oil level in accordance to the instructions in the Engine Operation Manual and if necessary, top up with oil.

CHECK COMPRESSOR OIL LEVEL

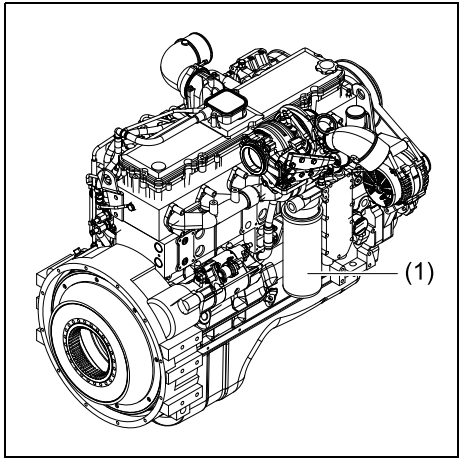


With the unit standing horizontal, check the level of the compressor oil. The pointer of the oil level gauge (1) must register in the upper extremity of the green range. Add oil if necessary.

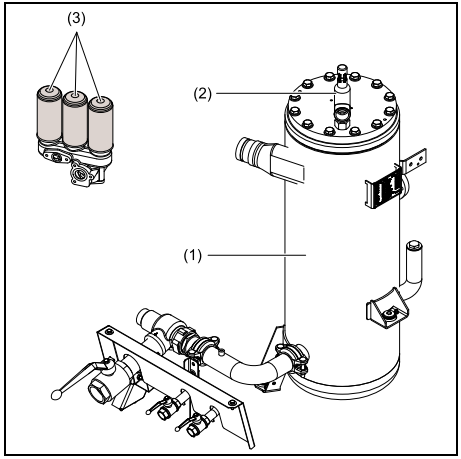
Before removing the oil filler plug (2), ensure that the pressure is released by opening an air outlet valve (3).

ENGINE OIL AND OIL FILTER CHANGE

See section **Preventive maintenance schedule**.



COMPRESSOR OIL AND OIL FILTER CHANGE



The quality and the temperature of the oil determine the oil change interval.

The prescribed interval is based on normal operating conditions and an oil temperature of up to 100 °C (212 °F) (see section **Preventive maintenance schedule**).

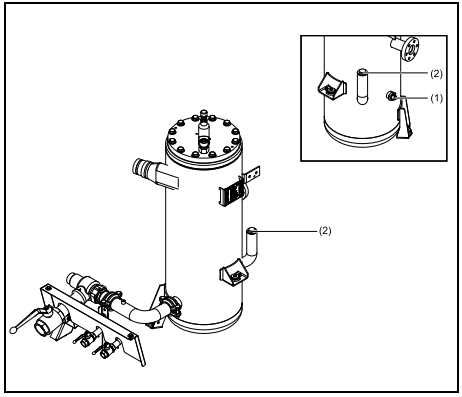
When operating in high ambient temperatures, in very dusty or high humidity conditions, it is recommended to change the oil more frequently.

In this case, contact Atlas Copco.

1. Run the compressor until warm. Close the outlet valve(s) (1) and stop the compressor. Wait until the pressure is released through the automatic blow-down valve. Unscrew the oil filler plug (2) by a single turn. This uncovers a vent hole, which permits any pressure in the system to escape.
2. Drain the compressor oil by removing all relevant drain plugs. Drain plugs are fitted at the air receiver (DPar), compressor element (DPcv, DPosv) and compressor oil cooler (DPoc). Catch the oil in a drain pan. Unscrew the filler plug (2) to speed up draining. After draining, reposition and tighten the drain plugs.
3. Remove the oil filters (3), e.g. by means of a special tool. Catch the oil in a drain pan.
4. Clean the filter seat on the manifold, taking care that no dirt drops into the system. Oil the gasket of the new filter element. Screw it into place until the gasket contacts its seat, then tighten one half turn only.
5. Fill the air receiver until the pointer of the oil level gauge is in the upper part of the green area. Be sure that no dirt gets into the system. Reinstall and tighten the filler plug (2).
6. Start the compressor and let it run unloaded for a few minutes.
7. Stop the compressor, wait a few minutes and top up with oil until the pointer of the oil level gauge is in the upper part of the green area.

Never add more oil. Overfilling results in oil consumption.

TOPPING UP THE COMPRESSOR OIL



1. Stop the compressor and be sure that all pressure has been released by opening the filler plug (2) one turn.
2. Wait a few minutes until the oil level is constant (oil level gauge (1)).
3. Remove the oil filler plug (2) and top up with oil until the pointer of the oil level gauge (1) is in the upper part of the green area.
4. Reinstall and tighten the filler plug (2).

COMPRESSOR OIL FLUSHING PROCEDURE

Not respecting compressor oil changing intervals in accordance with the maintenance schedule, can lead to serious problems, including fire hazard! The manufacturer does not accept any liability for damage arising from not following the maintenance schedule or not using genuine parts.

To avoid problems when changing over to a new type of oil (see table) a special Compressor Oil Flushing Procedure has to be followed. The table is only valid when the replaced oil has not exceeded its lifetime. For more information consult Atlas Copco Service dept.

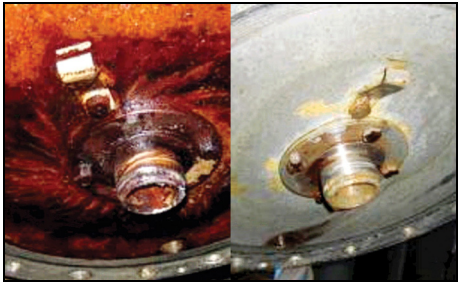
Aged oil can be recognized best by using an oil sampling analysis program. Indicators for aged oil are strong smell, or contamination such as sludge and varnish inside the oil vessel and oil stop valve or a brownish colour of the oil.

Whenever aged oil is discovered, eg. when changing the oil separator, contact Atlas Copco Service dept. to have your compressor cleaned and flushed.

1. First thoroughly drain the system when the oil is warm, leaving as little oil in the system as possible, especially in dead areas, if possible blow out remaining oil by pressurising the oil system. Check the instruction manual for detailed description.
2. Remove the compressor oil filter(s).
3. Open the oil vessel and remove the oil separator element.

Instructions on replacing the oil separator element are available from Atlas Copco Service dept.

4. Check the interior of the oil vessel (see pictures). If varnish deposits are discovered, contact Atlas Copco Service dept. and do not continue.
5. Put in a new oil separator, screw on new compressor oil filter(s) and close the oil vessel according to the instructions.
6. Fill the oil vessel with the minimum amount of replacement oil, run the compressor under light load conditions for 30 minutes.
7. Thoroughly drain the system when the oil is warm, leaving as little oil in the system as possible, especially in dead areas, if possible blow out remaining oil by pressurising the oil.
8. Fill the system with the final oil charge.
9. Run the compressor under light load conditions for 15 minutes and check for leakage.
10. Check the oil level and top up if necessary.
11. Collect all waste lubricant used during the flushing process and dispose of it in accordance with the applicable procedures for managing waste lubricant.



Vessel cover contaminated *clean*

Vessel contaminated *clean*

	PAROIL S	PAROIL S Extreme
PAROIL S	draining *	draining
PAROIL S Extreme	draining	draining *

* When changing over to the same oil within the oil changing interval, draining is sufficient
** Change over not recommended

COOLANT SPECIFICATIONS

It is strongly recommended to use Atlas Copco branded coolant.

The use of the correct coolant is important for proper heat transfer and protection of liquid-cooled engines. Coolants used in these engines must be mixtures of good quality water (distilled or de-ionised), special coolant additives and anti-freeze, if required. Coolant that is not to manufacturer's specification will result in mechanical damage of the engine.

The freezing point of the coolant must be lower than the freezing point that can occur in the area. The difference must be at least 5°C (9°F). If the coolant freezes, it may crack the cylinder block, radiator or coolant pump.

Consult the engine's operation manual and follow the manufacturer's directions.

Never mix different coolants and mix the coolant components outside the cooling system.

PARCOOL EG

PARCOOL EG is the only coolant that has been tested and approved by all manufacturers of engines currently used in Atlas Copco compressors and generators.

Atlas Copco's PARCOOL EG extended life coolant is the new range of organic coolants purpose-designed to meet the needs of modern engines. PARCOOL EG can help prevent leaks caused by corrosion. PARCOOL EG is also fully compatible with all sealants and gasket types developed to join different materials used within an engine.

PARCOOL EG is a ready to use Ethylene Glycol based coolant, premixed in an optimum 50/50 dilution ratio, for antifreeze protection guaranteed to -40°C (-40°F).

Because PARCOOL EG inhibits corrosion, deposit formation is minimized. This effectively eliminates flow restriction problems through the engine coolant ducts and the radiator, minimizing the risk of engine overheating and possible failure.

It reduces water pump seal wear and has excellent stability when subjected to sustained high operating temperatures.

PARCOOL EG is free of nitride and amines to protect your health and the environment. Longer service life reduces the amount of coolant produced and disposal requirements, which limits environmental impact.

PARCOOL EG

	Liter	US gal	Order number
can	5	1.3	1604 5308 01
can	20	5.3	1604 5307 02
barrel	210	55.2	1604 5306 01

To ensure protection against corrosion, cavitation and formation of deposits, the concentration of the additives in the coolant must be kept to certain limits, as stated by the manufacturer's guidelines. Topping up the coolant with water only, changes the concentration and is therefore not allowed.

Liquid-cooled engines are factory-filled with this type of coolant mixture.

PARCOOL EG Concentrate

	Liter	US gal	Order number
can	5	1.3	1604 8159 01

HANDLING PARCOOL EG

PARCOOL EG should be stored at ambient temperatures, while periods of exposure to temperatures above 35°C (95°F) should be minimized. PARCOOL EG can be stored for a minimum of 5 years in unopened containers without any effect on the product quality of performance.

PARCOOL EG is compatible with most other coolants based on ethylene glycol, but you only get the benefits of 5 years protection when its used on its own. Exclusive use of PARCOOL EG is recommended for optimum corrosion protection and sludge control.

For simple density-measuring of Ethylene Glycol and Propylene Glycol in general the standard available 'density' measuring devices are used to measure the concentration of EG. In case a device is used to measure EG, no PG can be measured afterwards as a result of the difference in the density. More specific measurements can be done by the use of a refractometer. This device can measure both EG and PG. A mix of both products will be show unreliable results!

Mixed EG coolants with identical glycol type can be measured by use of a refractometer as well as the 'density' system. The mixed coolants will be considered as one product.

The use of distilled water is recommended. If you have exceptionally soft water it would be acceptable, as well. Basically, the engine metals are going to corrode to some extent no matter what water you use, and hard water will encourage the resulting metal salts to precipitate.

PARCOOL EG comes as a pre-mixed coolant to safeguard the quality of the complete product.

It is recommended that topping up of the cooling system is always done with PARCOOL EG.

COOLANT CHECK

Never remove the cooling system filler cap while coolant is hot.

The system may be under pressure. Remove the cap slowly and only when coolant is at ambient temperature. A sudden release of pressure from a heated cooling system can result in personal injury from the splash of hot coolant.

In order to guarantee the lifetime and quality of the product, thus optimising engine protection, regular coolant-condition-analysis is recommended.

The quality of the product can be determined by three parameters:

Visual check

- Verify the appearance of the coolant with regard to its colour and make sure that no loose particles are floating around.

pH measurement

- Check the pH value of the coolant using a pH-measuring device.
- The pH-meter can be ordered from Atlas Copco with part number 2913 0029 00.
- Typical value for EG = 8.6.
- If the pH-level is below 7 or above 9.5, the coolant should be replaced.

Glycol concentration measurement

- To optimise the unique engine protection features of the PARCOOL EG, the concentration of the Glycol in the water should always be above 33 vol.%.
- Mixtures exceeding a 68 vol.% mix ratio in water are not recommended, as this will lead to high engine operating temperatures.
- A refractometer can be ordered from Atlas Copco with part number 2913 0028 00.

In case of a mix of different coolant products this type of measuring might provide incorrect values.

TOPPING UP/REPLACING COOLANT

- Verify whether the engine cooling system is in a good condition (no leaks, clean,...).
- Check the condition of the coolant.
- If the condition of the coolant is no longer up to standard, the complete coolant should be replaced (see section **Replacing the coolant**).
- Always top-up with PARCOOL EG Concentrate / PARCOOL EG.
- Topping up the coolant with water only, changes the concentration of additives and is therefore not allowed.

TOPPING UP WITHOUT DRAINING FROM THE COOLING SYSTEM

The quantity of PARCOOL EG Concentrate to be topped up can be estimated with the following formula and/or graph:

Corrections concentrate in measured system towards 50% volume by using PARCOOL EG Concentrate

PN: 1604 8159 00

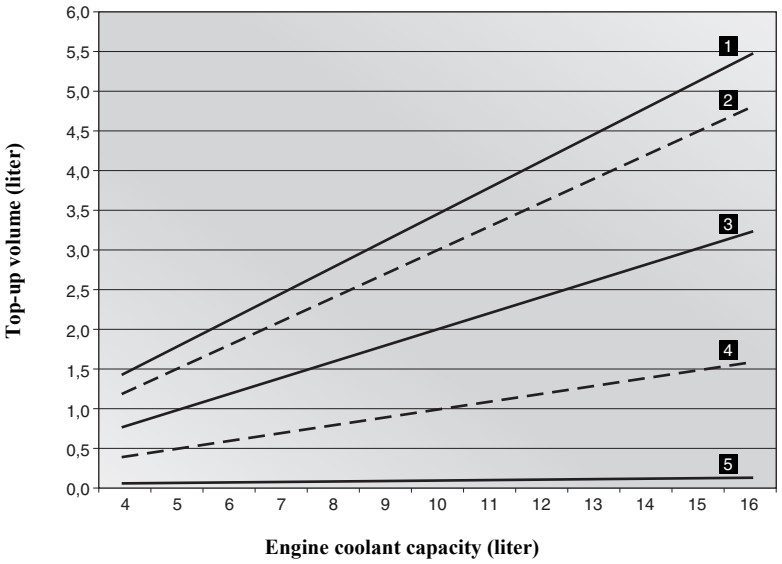
Example:

Total volume coolant = 14 Liter

Measured concentration = 33 Vol.%

50- 33 = 17 * 14 / 50 = 4,8 Liter PARCOOL EG Concentrate

Top-up volume PARCOOL EG Concentrate without drainage



In case of expansion tank at low level, this quantity is to be filled without draining from the cooling system.

1 Refractometer indication -20° C (-4° F) (33%)
2 Refractometer indication -22° C (-7.6° F)
3 Refractometer indication -25° C (-13° F)
4 Refractometer indication -30° C (-22° F)
5 Refractometer indication -36° C (-32.8° F)

TOPPING UP AFTER LIMITED QUANTITY DRAINING FROM THE COOLING SYSTEM

The quantity of PARCOOL EG Concentrate to be topped up after draining a calculated volume from the cooling system, can be estimated with the following formula and/or graph:

Corrections concentrate in measured system towards 50% volume by using PARCOOL EG Concentrate

PN: 1604 8159 00

Example:

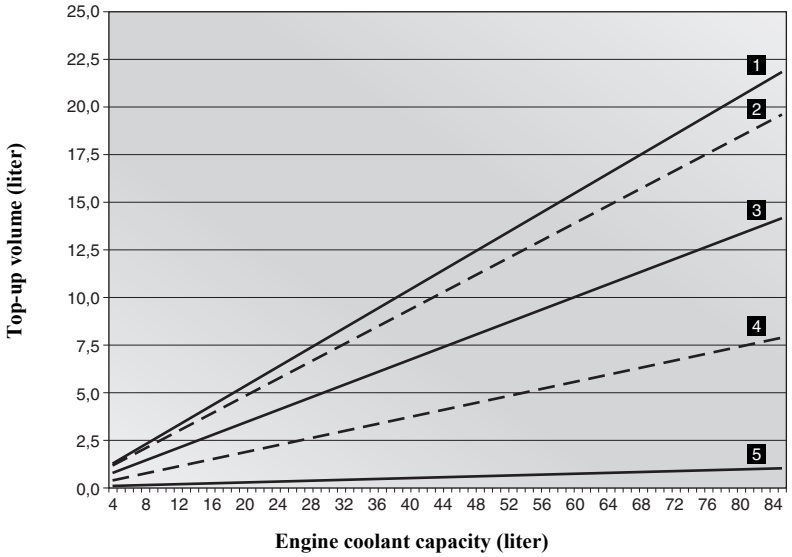
Total volume coolant = 80 Liter

Measured concentration = 33 Vol %

50- 33 = 17 * 80 / 67 = 20 Liter PARCOOL EG Concentrate

100- 33 = 67

Top-up volume PARCOOL EG Concentrate with drainage



In case of expansion tank at normal level, this quantity is to be drained from the cooling system.

1 Refractometer indication -20° C (-4° F) (33%)
2 Refractometer indication -22° C (-7.6° F)
3 Refractometer indication -25° C (-13° F)
4 Refractometer indication -30° C (-22° F)
5 Refractometer indication -36° C (-32.8° F)

REPLACING THE COOLANT

Drain

- Completely drain the entire cooling system.
- Used coolant must be disposed of or recycled in accordance with legislation and local regulations.

Flush

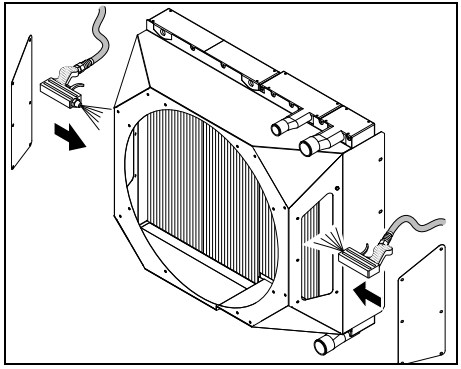
- Flush twice with clean water. Used coolant must be disposed or recycled in accordance with laws and local regulations.
- Using the Atlas Copco Instruction book, determine the amount of PARCOOL EG required and pour into the radiator top tank.
- It should be clearly understood that proper cleaning reduces contamination risks.
- In case of "other" coolant residues inside the system, the coolant with the lowest properties influences the quality of the 'mixed' coolant.

Fill

- To assure proper operation and the release of trapped air, run the engine until normal engine operation temperature is reached. Turn off the engine and allow to cool.
- From the Atlas Copco Instruction book, determine the amount of PARCOOL EG required.
- Mix concentrate and water before filling.
- Fill with a maximum rate of 10 l/min (0.35 cu.ft/min).
- Recheck coolant level and add coolant mixture if necessary.

Caution: do not top up when the engine is hot.

CLEANING COOLERS



Keep the compressor oil cooler and engine liquid cooler clean to maintain the cooling efficiency.

Remove any dirt from the coolers with a fibre brush. Never use a wire brush or metal objects.

Clean by air jet in the direction of the arrow.

Steam cleaning in combination with a cleansing agent may be applied (do not use jet at max. power).

To avoid damaging the coolers, angle between jet and coolers should be approx. 90 °.

Close the service door(s).

Protect the electrical and controlling equipment, air filters, etc. against penetration of moisture.

Never leave spilled liquids such as fuel, oil, coolant and cleansing agents in or around the compressor.

BATTERY CARE

Before handling batteries, read the relevant safety precautions and act accordingly.

If the battery is still dry, it must be activated as described in section **Activating a dry-charged battery**.

The battery must be in operation within 2 months from being activated; if not, it needs to be recharged first.

ELECTROLYTE

Read the safety instructions carefully.

Electrolyte in batteries is a sulphuric acid solution in distilled water.

The solution must be made up before being introduced into the battery.

ACTIVATING A DRY-CHARGED BATTERY

- Take out the battery.
- Battery and electrolyte must be at equal temperature above 10 °C (50 °F).
- Remove cover and/or plug from each cell.
- Fill each cell with electrolyte until the level reaches 10 mm (0.4 in) to 15 mm (0.6 in) above the plates, or to the level marked on the battery.
- Rock the battery a few times so that possible air bubbles can escape; wait 10 minutes and check the level in each cell once more; if required, add electrolyte.
- Refit plugs and/or cover.
- Place the battery in the compressor.

RECHARGING A BATTERY

Before and after charging a battery, always check the electrolyte level in each cell; if required, top up with distilled water only. When charging batteries, each cell must be open, i.e. plugs and/or cover removed.

Use a commercial automatic battery charger according to its manufacturer's instructions.

Preferably use the slow charging method and adjust the charge current according to the following rule of thumb: battery capacity in Ah divided by 20 gives safe charging current in Amp.

MAKE-UP DISTILLED WATER

The amount of water evaporating from batteries is largely dependant on the operating conditions, i.e. temperatures, number of starts, running time between start and stop, etc...

If a battery starts to need excessive make-up water, this points to overcharging. Most common causes are high temperatures or a too high voltage regulator setting.

If a battery does not need any make-up water at all over a considerable time of operation, an undercharged battery condition may be caused by poor cable connections or a too low voltage regulator setting.

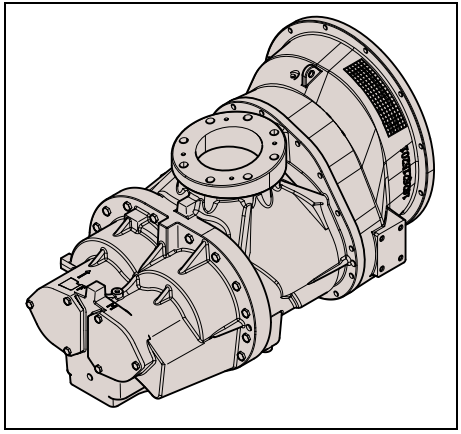
PERIODIC BATTERY SERVICE

- Keep the battery clean and dry.
- Keep the electrolyte level at 10 to 15 mm above the plates or at the indicated level; top up with distilled water only. Never overfill, as this will cause poor performance and excessive corrosion.
- Record the quantity of distilled water added.
- Keep the terminals and clamps tight, clean, and lightely covered with petroleum jelly.
- Carry out periodic condition tests. Test intervals of 1 to 3 months, depending on climate and operating conditions, are recommended.

If doubtful conditions are noticed or malfunctions arise, keep in mind that the cause may be in the electical system, e.g.loose terminals, voltage regulator maladjusted, poor performance of compressor, etc...

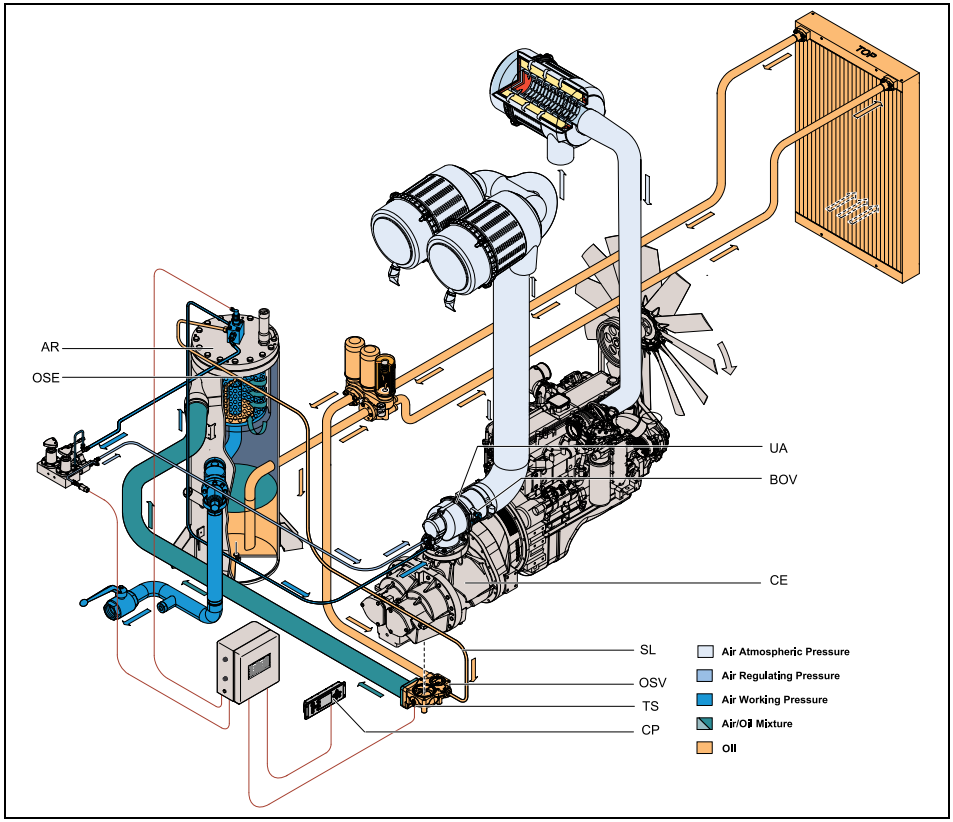
COMPRESSOR ELEMENT OVERHAUL

When a compressor element is due for overhaul, it needs to be done by Atlas Copco. This guarantees the use of genuine parts and correct tools with care and precision.



Adjustments and servicing procedures

ADJUSTMENT OF THE CONTINUOUS PNEUMATIC REGULATING SYSTEM



The working pressure is determined by the tension of the spring in the regulating valve (RV). This tension can be increased to raise the pressure and decreased by turning the adjusting wheel clockwise and anti-clockwise respectively.

To adjust the normal working pressure, proceed as follows:

Be aware not to touch hot parts when the door is open.

1. Loosen the lock nut of the regulating valve.
2. Release Regulating Valve (turn out).
3. With the outlet valves (AOV) closed, adjust the regulating valve (RV), until a pressure is reached of nominal pressure + 1.5 bar (+ 22 psi).
4. Lock the regulating valve (RV) by fixing the lock nut.

AIR FILTER ENGINE/COMPRESSOR

The Atlas Copco air filters are specially designed for the application. The use of non-originals air filters may lead to severe damage of engine and/or compressor element.

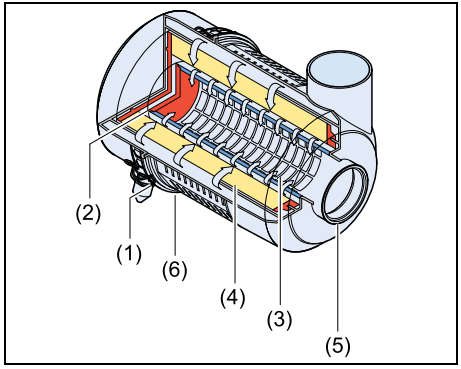
Never run the compressor without air filter element.

SERVICING

Always select the service point according to the vacuum indicator or display message. A regular inspection or cleaning as it is sometimes practiced in the field is more likely to be damaging than useful as there is a risk that the element will be damaged and dust will gain access to the engine.

Atlas Copco always recommends exchanging rather than cleaning the filter element in order to avoid damage and ensure maximum engine protection.

MAIN PARTS



1. Snap clips
2. Dust trap cover
3. Safety cartridge (option)
4. Filter element
5. Filter housing
6. Vacuator valve

CLEANING THE DUST TRAP

Remove dust daily.

To remove dust from the dust trap squeeze the vacuator valve (6) several times.

CLEANING INSTRUCTIONS FILTER ELEMENT

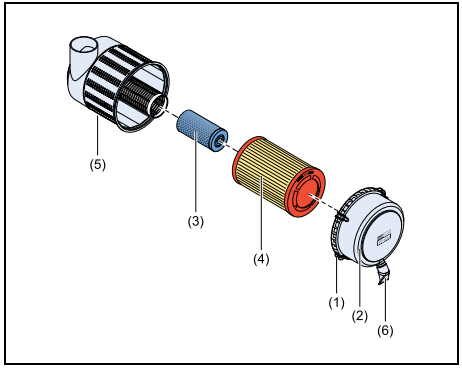
If element cleaning can not be avoided, care should be taken that the filter element (4) is not washed out. Please note that engine damage can cause considerable costs, which makes the cost of a new filter element seam insignificant.

Safety cartridges (3) can not be cleaned but must be exchanged.

Please note that a cleaned element will never match the service life and performance of a new element.

Take the element from the air filter housing (5) (see section **Replacing the air filter element**).

REPLACING THE AIR FILTER ELEMENT



In order to clean, position a pipe with an end bent by approx. 90° on the end of a compressed-air pistol. The pipe must be long enough to reach the bottom of the filter element. Carefully blow out the filter element with dry compressed air (max. 5 bar (72.5 psi)) from the inside to the outside until there is no more development of dust. The end of the pipe must not touch the element.

Next carefully examine the element for possible damage. Never beat or knock the element as this will damage it and there will be a danger of damage to the engine.

Carefully clean the inside of the housing and put the element in the housing (see section **Replacing the air filter element**).

New elements must also be inspected for tears or punctures before installation.

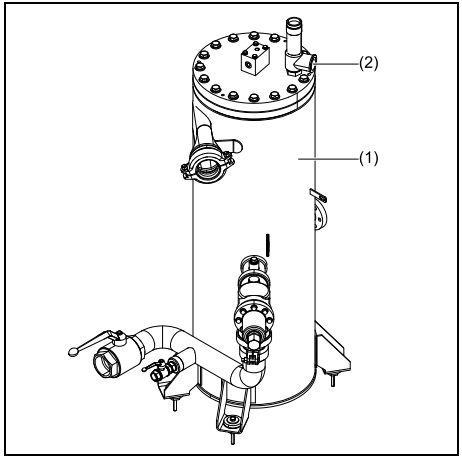
Discard the element (4) when damaged.

A dirty safety cartridge (3) is an indication of a malfunctioning air filter element. In that case replace the element and safety cartridge.

The safety cartridge cannot be cleaned.

1. Release the snap clips (1) and remove the dust trap (2). Clean the trap.
2. Remove the element (4) and the safety cartridge.
3. Reassemble in reverse order of dismantling. Make sure the vacuator valve (5) points down.
4. Inspect and tighten all air intake connections.

AIR RECEIVER



The air receiver (1) is tested according to official standards. Carry out regular inspections in conformity with local regulations.

Daily drain condensate.

SAFETY VALVE

All adjustments or repairs are to be done by an authorized representative of the valve supplier, see section Specific safety precautions.

Following checks must be carried out on the safety valve (2):

- A check of the opening of the lifting gear, twice a year.
  This can be done by screwing the cap of the valve anti-clockwise.
- an annual check of the set pressure according to local regulations. This check cannot be done on the machine and must be carried out on a proper test bench.

FUEL SYSTEM

PRIMING INSTRUCTIONS

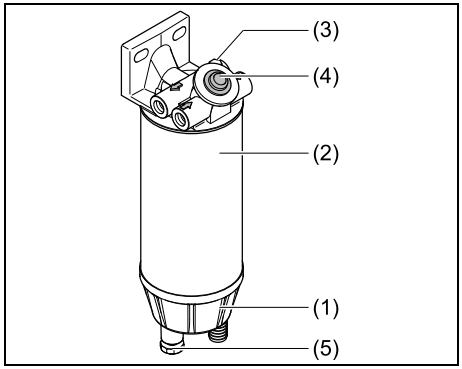
Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire. To help prevent possible injury, turn the "ON/OFF" switch in position "OFF" when changing fuel filters or water separator elements. Clean up fuel spills immediately.

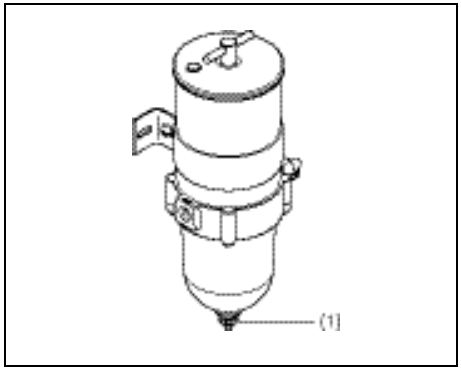
Prime the fuel system in order to fill the fuel filter. Prime the fuel system in order to purge trapped air. The fuel system should be primed under the following conditions:

- Compressor is put in operation for the first time
- Running out of fuel
- Storage
- Replacement of the fuel filter

Do not loosen the fuel lines at the fuel manifold. The fittings may be damaged and/or a loss of priming pressure may occur when the fuel lines are loosened.

DRAINING INSTRUCTIONS





1. Open bowl drain valve (1), operate pump (5) and pump water out.
2. Close drain valve (1).

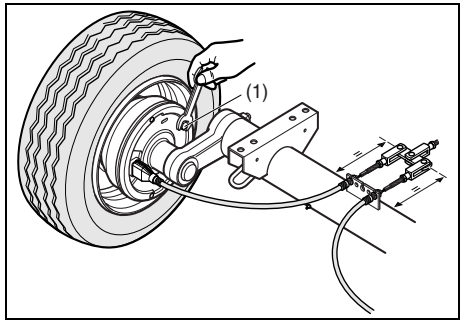
Replacing the filter elements:

Installation instructions:

1. Drain fuel from the bowl.
2. Remove filter (2, 3), filterelement (4) and separate bowl (2) from element (3).
3. Apply film of gas oil to new bowl seat.
4. Screw bowl (2) to new element (3) tightly by hand.
5. Apply film of gas oil to new element seals.
6. Screw on filter (2, 3) and filterelement (4) tightly by hand.
7. Open head vent and operate pump (5). Close vent when fuel begins to purge.
8. Check for leaks, retighten if necessary.

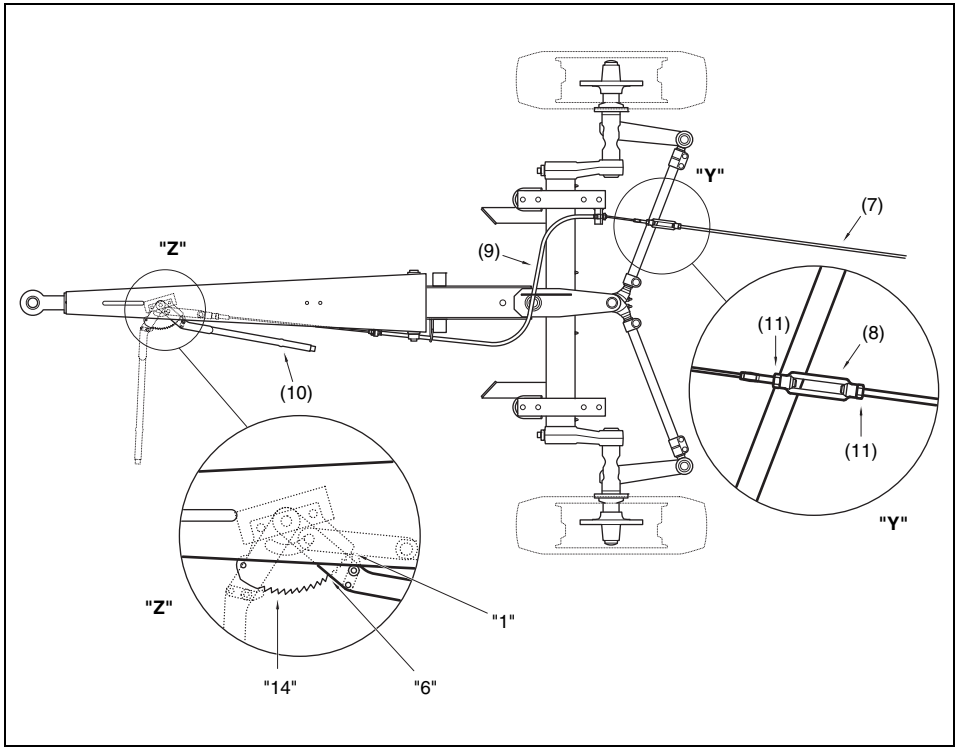
BRAKE ADJUSTMENT

BRAKE SHOE ADJUSTMENT WAGON



- Tighten the adjustment nut (1) on the wheel brake with a spanner until the wheel will not rotate in the direction of travel.
- Centre the brake shoes by applying the parking brake several times.
- Turn back the adjustment bolt (1) by approximately one turn, until no braking effect can be felt when the wheel is turned in a forward direction.
- Check the position of the brake equalizer compensators with the parking brake applied.
- Positioned at right angles to the brake rods = even play on both wheel brakes.
- Re-adjust brakes if necessary.
- As a check, apply the parking brake slightly and check that the braking effect on the wheels (in the direction of travel) is the same on the right and on the left.

BRAKE ADJUSTMENT WAGON



Adjusting the linkage

- The parking brake is adjusted by using the turnbuckle (8). Adjust till the play in the linkage is 1-3 mm (max. 3mm is allowed).
- Apply the parking brake lever several times by hand with a force of 200 to 300 N and put it back into the -not engaged- tooth “1” position. Adjust the turnbuckle (8) as described above.

Tighten all lock nuts (11) (Torque: 24 Nm).

Testing the parking brake

- For testing the parking brake, apply the parking brake lever. Brake power must be reached between the 6th and 14th tooth of the toothed segment (“Z”).

Problem solving

It is assumed that the engine is in good condition and that there is adequate fuel flow to the filter and injection equipment.

An electrical fault must be traced by an electrician.

Make sure that the wires are not damaged and that they are clamped tight to their terminals.

For denomination of switches, relays, etc., see **Electric system**.

See also section **Control panel**.

Problem: Compressor capacity or pressure below normal.

Possible faults	Corrective actions
Air consumption exceeds capacity of compressor.	Check equipment connected.
Choked air filter elements (AF).	Remove and inspect elements. Clean or replace, if necessary.
Regulating valve (RV) defective.	Have regulating valve removed and inspected by an Atlas Copco Service representative.
Blow down valve stuck in open position.	Check and correct as necessary.
Loading valve (LV) leaking past O-ring.	With compressor running at max. load speed, disconnect hose leading to unloader. If air leaks from the hose, remove and inspect loading valve. Replace damaged or worn O-rings.
Oil separator element clogged.	Have element removed and inspected by an Atlas Copco Service representative.
Air intake throttle valve remains partially closed.	Remove air filters, air intake manifold and throttle valve spring seat. Withdraw the valve and inspect. Replace parts where necessary. Caution: the spring seat is fixed with 4 short and 2 long setscrews: first remove the short screws, then release the spring tension unscrewing the long ones.
Safety valve (SV) leaking.	Remove and inspect. Replace if not airtight after reinstallation.
Blow-off valve leaking.	Remove and inspect. Replace if necessary.

Problem: Pressure in air receiver rises above maximum and causes safety valve to blow.

Possible faults	Corrective actions
Regulating valve (RV) opens too late or its ball valve spring is broken.	Have regulating valve removed and inspected by an Atlas Copco Service representative.
Air leaks in regulating system.	Check hoses and their fittings. Stop leaks; replace leaking hoses.
Air intake throttle valve does not close for some reason.	Remove air filters, air intake manifold and throttle valve spring seat. Withdraw the valve and inspect. Replace parts where necessary. Caution: the spring seat is fixed with 4 short and 2 long setscrews: first remove the short screws, then release the spring tension unscrewing the long ones.
Minimum pressure valve malfunctioning.	Remove and inspect valve.
Blow-off valve malfunctioning.	Remove and inspect valve.

Problem: After working some time, the unit stops through a shutdown switch.

Possible faults	Corrective actions
Engine oil pressure too low.	Refer to the engine instruction manual.
Compressor or engine overheating.	See corrective actions “Compressor overheating”.
Fuel tank contains insufficient fuel.	Fill fuel tank.
Low coolant level.	Top up cooling system.

Problem: Air and oil mist expelles from air filters immediately after stopping.

Possible faults	Corrective actions
Check valve at element outlet.	Remove and inspect. Replace if necessary. Replace air filter elements and safety cartridges. Check the oil level and add oil if necessary. Run the compressor for a few minutes, stop and recheck oil level.
Plunger of oil stop valve jammed.	Remove and inspect. Replace if necessary. Replace air filter elements and safety cartridges. Check the oil level and add oil if necessary. Run the compressor for a few minutes, stop and recheck oil level.

Problem: Compressor overheating.

Possible faults	Corrective actions
Insufficient compressor cooling.	Locate compressor away from walls; when banked with other compressors, leave space between them.
Oil cooler clogged externally.	Clean oil cooler. Refer to section **Cleaning coolers**.
Oil cooler clogged internally.	Consult Atlas Copco.
Oil filters clogged.	Replace oil filters.
Oil level too low.	Check oil level. Top up with recommended oil if necessary.
Thermostatic by-pass valve remains stuck in opened position.	Remove valve and check for proper opening and closing. Replace if out of order.
Fan blade(s) broken.	Check and correct if necessary.
Oil stop valve malfunctioning.	Remove and inspect valve.
Oil separator element (OS) clogged.	Have element removed and inspected by an Atlas Copco Service representative.

Alternator precautions

1. Never reverse the polarity of the battery or the alternator.
2. Never break any alternator or battery connections while the engine is running.
3. When recharging the battery, disconnect it from the alternator. Before using booster cables to start the engine, be sure of the polarity and connect the batteries correctly.
4. Never operate the engine without the main or voltage sensing cables connected in the circuit.

Available options

Support

A rigid support mounted version for rough construction conditions with the possibility to be mounted on a truck. The installation allows the unit to be put on and taken off the truck daily. It is possible to handle the unit with a forklift.

Fix height towbar with brakes

A fix towbar with integrated parking brake.

Adjustable height towbar with brakes

A dual-hinged articulating towbar assembly, with integrated parking brake.

DIN/NATO/ITA eye

Towing eye according to DIN, NATO or ITA specification.

Road signalization

A road signalisation option compliant with European regulations. The rear lights are protected by the canopy or the bumper bar against external damage.

Cold weather package (-10°C (14°F) to -25°C (-13°F))

The cold weather package consist of a heater plug, installed in the air-inlet to the engine, a dual approved vessel (EC/ASME) for which the material is approved and certified up to -29 °C (-20 °F), and a blow-off valve on the vessel to minimise the resistance from the oil in the vessel when starting at extreme cold-temperatures. Also synthetic compressor oil is used to improve viscosity at low temperatures.

The installation works on battery voltage and comes together with a timer function. A 5000 Watt (6.7 hp) heater will heat up the engine coolant by means of consuming the onboard fuel. (fuel consumption: 0.62 l/h (0.16 US gal/h) in operation, water pump capacity: +/- 900 l/h (237.8 US gal/h)).

Customer colour canopy (1 colour)

Special colour will apply on all external canopy parts or all internal parts visible from the outside, and wheel rims. The undercarriage, towbar and frame will be painted in black.

Customer colour canopy (2 colours)

Same to Customer colour (1) option, but with two (2) colours for which the customer will provide details.

Customer colour frame (1 colour)

Customer colour for undercarriage, towbar and frame.

FuelXpert

The FuelXpert optimizes the fuel consumption during operation at partial load conditions.

Technical specifications

TORQUE VALUES

GENERAL TORQUE VALUES

The following tables list the recommended torques applied for general applications during assembly of the compressor.

For hexagon screws and nuts with strength grade 8.8

Thread size	Torque value (Nm / lbf.ft)
M6	8 (6) +/-25 %
M8	20 (15) +/-25 %
M10	41 (30) +/-25 %
M12	73 (54) +/-25 %
M14	115 (85) +/-25 %
M16	185 (137) +/-25 %

For hexagon screws and nuts with strength grade 12.9

Thread size	Torque value (Nm / lbf.ft)
M6	14 (10) +/-21 %
M8	34 (25) +/-23 %
M10	70 (52) +/-24 %
M12	120 (89) +/-25 %
M14	195 (144) +/-23 %
M16	315 (233) +/-23 %

CRITICAL TORQUE VALUES

Assemblies	Torque value (Nm / lbf.ft)
Axles to frame:	
Wheel nuts	270 (199.26)
Bolts, front axle/frame	205 (151.29)
Bolts, rear axle/frame	205 (151.29)
Compressor to frame:	
Bolts, elements/gear casing	46 (33.95)
Bolts, elements/support	80 (59.04)
Bolts, support/buffer	205 (151.29)
Bolts, buffer/frame	80 (59.04)
Engine to frame:	
Bolts, engine/support	205 (151.29)
Bolts, support/buffer	46 (33.95)
Bolts, buffer/frame	23 (16.97)
Lifting beams to frame:	
Bolts, lifting beams/yoke (M12)	125 (92.25)
Bolts, lifting beams/yoke (M16)	205 (151.29)
Bolts, lifting beams/A-Frames	205 (151.29)
Bolts, A-Frames/frame	205 (151.29)
Hose clamps:	
Pebra hose clamps on all IC/radiator hoses	12 (8.85)

Secure the drain cock and tank cap of the fuel tank handtight.

REFERENCE CONDITIONS

Designation		V900		XATS 1200		XAVS 1000	
		20 bar	25 bar	8.6 bar	10.3 bar	12 bar	14 bar
1. Absolute inlet pressure	bar	1	1	1	1	1	1
	psi	14.5	14.5	14.5	14.5	14.5	14.5
2. Relative air humidity	%	0	0	0	0	0	0
3. Air inlet temperature	°C	20	20	20	20	20	20
	°F	68	68	68	68	68	68
4. Normal effective working pressure	bar	20	25	8.6	10.3	11.9	13.9
	psi	290	362.5	124.7	149.35	174	203

The inlet conditions are specified at the air inlet grating outside the canopy.

LIMITATIONS

Designation		V900		XATS 1200		XAVS 1000	
		20 bar	**25 bar**	**8.6 bar**	**10.3 bar**	**12 bar**	**14 bar**
1. Minimum effective receiver pressure	bar	15	15	4	4	4	4
	psi	217.55	217.55	58	58	58	58
2. Maximum effective receiver pressure, compressor unloaded	bar	20	25	10	11.7	13.49	15.49
	psi	290.07	362.59	145	169.65	195.75	224.75
3. Maximum ambient temperature at sea level	°C	50	50	10	10	10	10
	°F	122	122	50	50	50	50
4. Max. ambient temperature at sea level..with aftercooler	°C	45	45	7.22	7.22	7.22	7.22
	°F	113	113	45	45	45	45
5. Minimum starting temperature	°C	-10	-10	-10	-10	-10	-10
	°F	14	14	14	14	14	14
6. Minimum starting temperature, with coldstart equipment .5)	°C	-25	-25	-25	-25	-25	-25
	°F	-13	-13	-13	-13	-13	-13
7. Altitude capability	m	See saperate curve					

PERFORMANCE DATA

LIMITATIONS

Designation		V900		XATS 1200		XAVS 1000	
		20 bar	25 bar	8.6 bar	10.3 bar	12 bar	14 bar
1. Engine shaft speed, normal and maximum	r/min	1900	1700	1900	1700	1900	1700
2. Engine shaft speed, compressor unloaded	r/min	1200	1200	1200	1200	1200	1200
3a).Free air delivery 2)	l/s	423.8	380.4	577.4	520.6	481.86	426.17
	cfm	898	806	1223	1103	1021	903
3b). Free air delivery 2) with aftercooler	l/s	NA	NA	NA	NA	NA	NA
	cfm	NA	NA	NA	NA	NA	NA

4. Fuel consumption		V900				XATS 1200				XAVS 1000			
		No fuel expert	Fuel expert	No fuel expert	Fuel expert	No fuel expert	Fuel expert	No fuel expert	Fuel expert	No fuel expert	Fuel expert	No fuel expert	Fuel expert
- at 100% FAD	kg/h	51.02	51.02	48.44	48.44	NA	NA	NA	NA	47.89	47.89	45.28	45.28
	lb/h	112.48	112.48	106.79	106.79	NA	NA	NA	NA	105.60	105.60	99.83	99.83
- at 75% FAD	kg/h	42.50	40.92	44.30	36.68	NA	NA	NA	NA	41.59	37.08	42.91	34.44
	lb/h	93.70	90.21	97.66	80.87	NA	NA	NA	NA	91.71	81.75	94.62	75.93
- at 50% FAD	kg/h	36.84	27.66	37.96	29.64	NA	NA	NA	NA	37.49	27.16	38.91	28.79
	lb/h	81.22	60.98	83.68	65.34	NA	NA	NA	NA	82.67	59.88	85.80	63.49
- at 25% FAD	kg/h	23.88	24.32	26.88	26.74	NA	NA	NA	NA	24.97	24.66	26.24	26.49
	lb/h	52.65	53.62	59.26	58.95	NA	NA	NA	NA	55.05	54.37	57.85	58.42
- at 25% FAD	kg/h	18.60	18.68	21.36	21.58	NA	NA	NA	NA	21.06	21.15	23.40	23.49
	lb/h	41.01	41.84	47.09	47.58	NA	NA	NA	NA	46.43	46.63	51.59	51.79

Designation		V900		XATS 1200		XAVS 1000	
		20 bar	**25 bar**	**8.6 bar**	**10.3 bar**	**12 bar**	**14 bar**
5a).Specific fuel consumption at 100%	g/m³	34.05	36.42	NA	NA	1.66	1.79
	lb/1000cu ft	2.13	2.27	NA	NA	26.63	28.68
5b) Specific fuel consumption at 100% FAD with aftercoole	g/m³	NA	NA	NA	NA	NA	NA
	lb/1000cu ft	NA	NA	NA	NA	NA	NA
6. Typical oil content of compressed air	ppm	< 5		< 5		< 5	
7. Engine oil consumption	oz/h	3.99	3.99	3.99	3.99	3.99	3.99
	g/h	113.2	113.2	113.2	113.2	113.2	113.2
8a).Compressed air temperature at outlet valves	°C	100	100	90	90	90	90
	°F	212	212	194	194	194	194
8b).Compressed air temp. at outlet valves with aftercooler	°C	NA	NA	NA	NA	NA	NA
	°F	NA	NA	NA	NA	NA	NA
9. Noise level							
- Sound pressure level (Lp), measured according to under free field conditions at 7 m distance	dB(A)	ISO 2151		ISO 2151		ISO 2151	
- Sound power level (Lw) complies with	dB(A)	NA	NA	NA	NA	NA	NA
2000/14/EC	dB(A)	NA	NA	NA	NA	NA	NA
84/533/EEC and 85/406/EEC limits	dB(A)	NA	NA	NA	NA	NA	NA

DESIGN DATA

Compressor

Designation		V900, XATS 1200 and XAVS 1000
1. Number of compression stages		2

Engine

1. Make		DCEC
2. Type		QSL8.9-C360-30
3. Coolant		Coolant
4. Number of cylinders		6
5. Bore	mm	114
	in	4.49
6. Stroke	mm	145
	in	5.71
7. Swept volume	l	8.9
	cu.in	543.11
8. Output according to SAE J 1995 at normal shaft speed	kW	264
	BHP	354.02
- Load factor	%	100
9. Capacity of oil sump		
-Initial fill	l	21
	us gallon	5.55
10. Capacity of cooling system	l	58
	us gallon	15.32

Unit

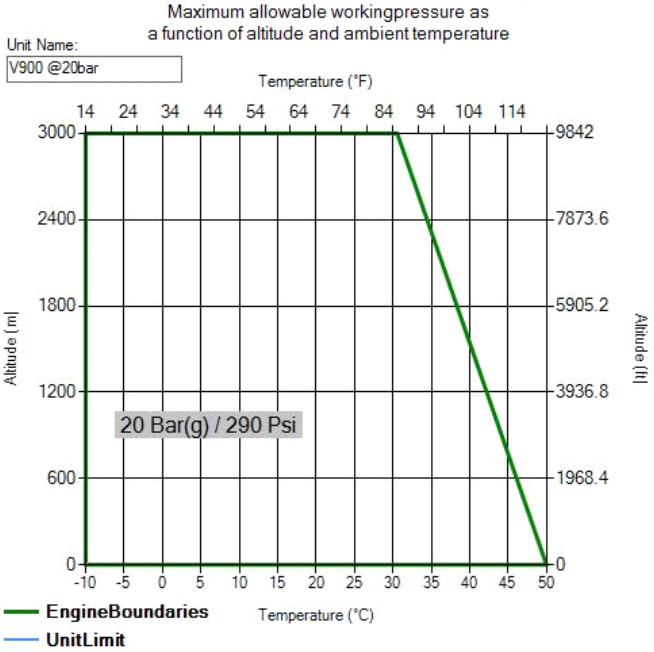
Designation		V900, XATS 1200 and XAVS 1000
1. Capacity of compressor oil system	l	89
	us gallon	23.51
2. Net capacity of air receiver	l	143
	us gallon	37.78
3. Capacity of fuel tanks	l	420
	us gallon	110.62
4. Air volume at inlet grating (approx;) 3)	m^3/s	13.1
	cu ft/s	462.62

1. At reference conditions, if applicable, and at normal shaft speed unless otherwise stated
2. Free air delivery is measured according to ISO 1217 ed.3 1996 annex D

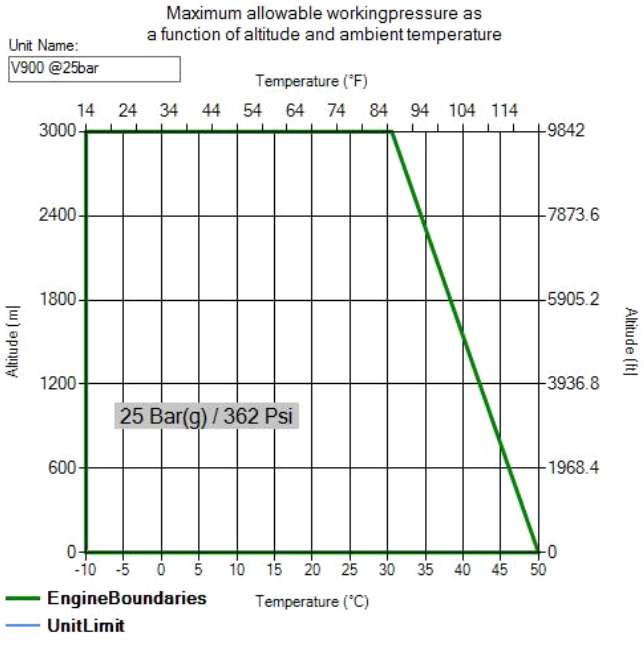
Tolerance:	+/- 5% 53cfm<FAD<530 cfm +/- 4% 530cfm <FAD
The international standard ISO 1217 corresponds to following national standards:	British BSI 1571 part 1 German DIN 1945 Part 1 Swedish SS-ISO 1217 American ANSI PTC9

3. Air required for engine and compressor cooling, combustion and for compression.
4. With filter change.
5. Tandem USA: 198 us gallon
6. Optional large fueltanks with skid or support mounted: 409 us gallon

ALTITUDE UNIT PERFORMANCE CURVE



Graph represents working conditions,
for starting conditions pls contact your
Atlas Copco contact



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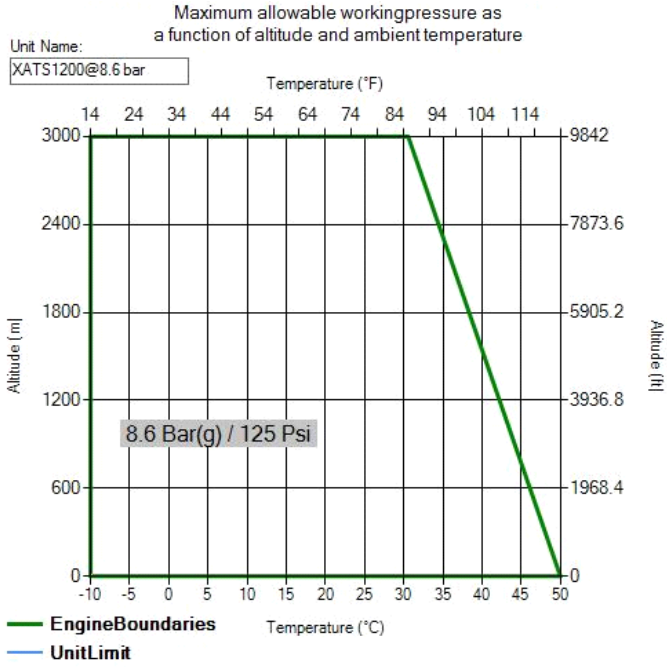

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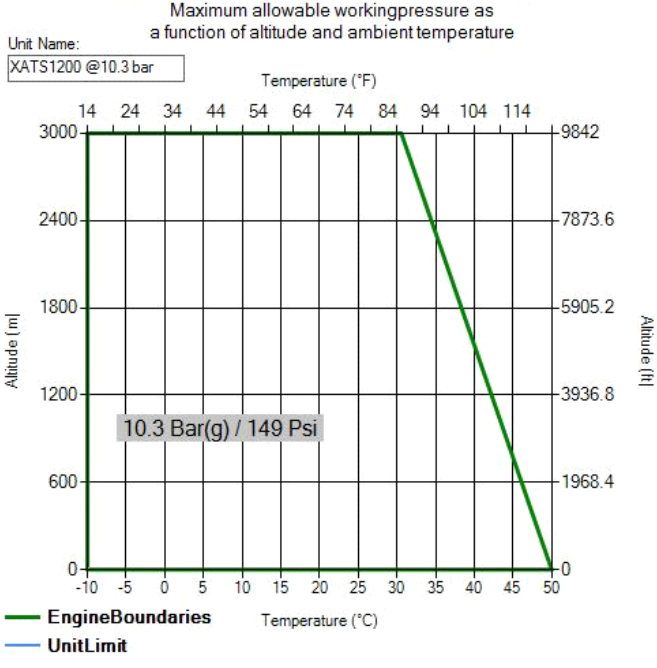

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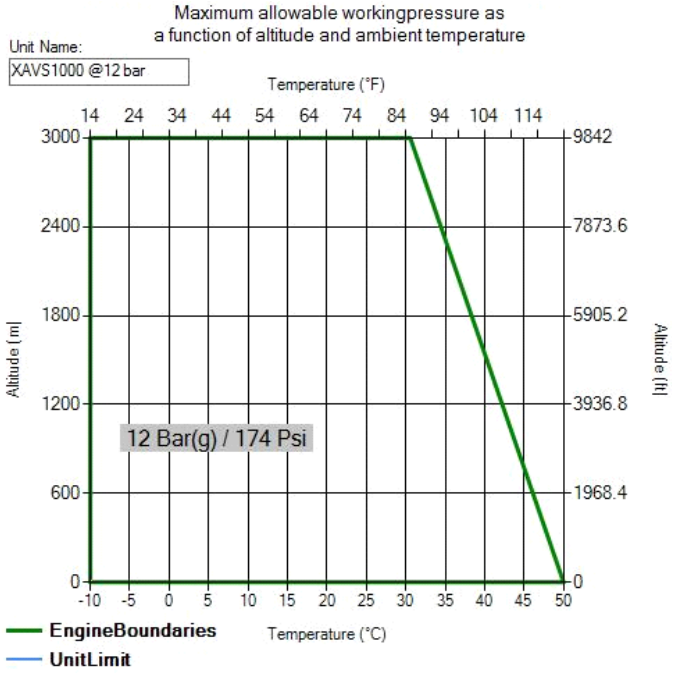

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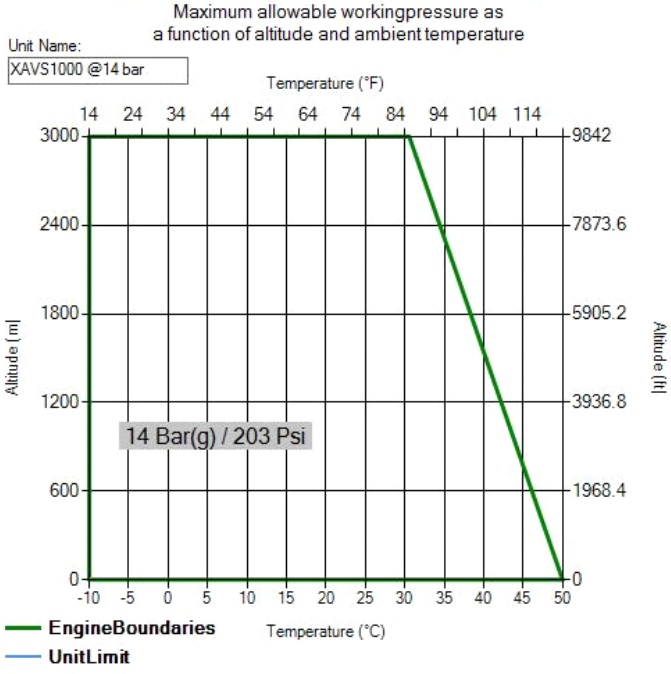

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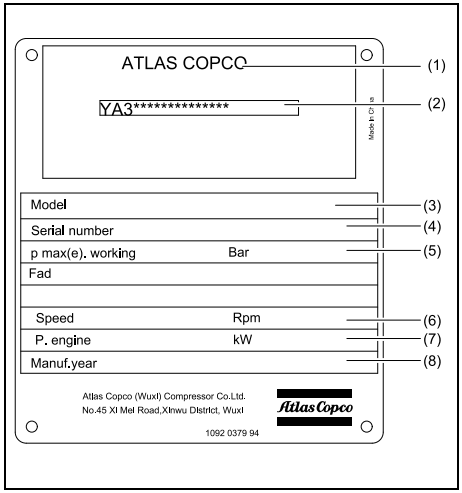
Atlas Copco contact

Data plate



1 Company code
2 Product code
3 Unit serial number
4 Name of the manufacturer
5 EEC or national type approval number
6 Vehicle identification number
7 Wagon undercarriage
  A Maximum permitted total weight of the vehicle
  B Maximum permitted front axle load
  C Maximum permitted rear axle load
  Tandem undercarriage
  A Maximum permitted total weight of the vehicle
  B Maximum permitted axle load
  C Maximum permitted load on the towing eye
8 Model
9 Working pressure
10 Speed
11 Engine power
12 Manufacturing year
13 CE mark in accordance with Machine Directive 89/392 EC
14 Register number or number of notified body

Legislation

PARTS, SUBJECTED TO PRESSURE EQUIPMENT DIRECTIVE 97/23/EC, CAT. II AND ABOVE

Safety valve: cat. IV

		V900	XATS 1200	XAVS 1000
Set pressure	bar(e)	25	25	25
	psi	362.5	362.5	362.5
Design temperature	°C	130	130	130
	°F	266	266	266

PARTS, SUBJECTED TO SIMPLE PRESSURE VESSEL DIRECTIVE 87/404/EC

Air Oil separator

		V900		XATS 1200		XAVS 1000	
		Standard	Cold start equipment	Standard	Cold start equipment	Standard	Cold start equipment
Design pressure	bar(e)	26	26	26	26	26	26
	psi	377	377	377	377	377	377
Design temperature max.	°C	130	130	130	130	130	130
	°F	266	266	266	266	266	266
Design temperature min.	°C	-19	-25	-19	-25	-19	-25
	°F	-2.2	-13	-2.2	-13	-2.2	-13
Volume	l	92	92	92	92	92	92
	US gal	24.3	24.3	24.3	24.3	24.3	24.3

PARTS, SUBJECTED TO CAT. I AND COVERED BY THE MACHINE DIRECTIVE 89/392/EC

All other parts

PARTS, SUBJECTED TO ART. I, PARAGRAPH 3.3

All other parts

Disposal

GENERAL

When developing products and services, Atlas Copco tries to understand, address, and minimize the negative environmental effects that the products and services may have, when being manufactured, distributed, used and disposed.

Recycling and disposal policy are part of the development of all Atlas Copco products. Atlas Copco company standards determine strict requirements.

Material selection, substantial recyclability, disassembly possibilities and separability of materials and assemblies are considered, as well as environmental perils and dangers to health during the recycling and disposal of the unavoidable rates of non-recyclable materials.

Your Atlas Copco compressor consists for the most part of metallic materials, that can be remelted in steelworks and smelting works and are therefore almost infinitely recyclable. The plastic used is labelled; sorting and fractioning of the materials for recycling in the future is foreseen.

This concept can only succeed with your help. Support us by disposing professionally. By assuring correct disposal of the product you help prevent possible negative consequences for environment and health as a result of inappropriate waste handling.

Recycling and re-usage of material help preserve natural resources.

DISPOSAL OF MATERIALS

Dispose of contaminated substances and material separately, in accordance with locally applicable environmental legislation.

Before dismantling a machine at the end of its operating lifetime drain and dispose of all fluids of according the applicable local disposal regulations.

Remove the batteries. Do not throw batteries into the fire (explosion risk) or residual waste. Separate the machine into metal, electronics, wiring, hoses, insulation and plastic parts.

Dispose of all components in accordance with applicable disposal regulations.

Remove spilled fluid mechanically; pick up the rest with absorbing agent (for example sand, sawdust) and dispose of it in accordance with applicable local disposal regulations. Do not drain into the sewage system or surface water.

Maintenance Log

Compressor ..... **Customer** .....

Serial number..... .....

Service hours	Maintenance action	Date	By: initials

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