

Atlas Copco Portable Compressors

XAS96

Instruction Book

1310 3011 08 Ed. 0 1998-06

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No. 1310 3011 08 Ed. 0
1998-06

Atlas Copco

OWNERSHIP DATA

Unit model: _____

Owner's machine no.: _____

Engine type: _____

Unit service no.: _____

Delivery date: _____

Engine serial no.: _____

Service plan: _____

First start-up date: _____

Selected Lubricants

Compressor: _____

Capacity: _____

Bearing grease type, electric motor: _____

Printed Matter Nos.

Atlas Copco instruction book / rev: _____

Atlas Copco logbook: _____

Atlas Copco parts list / rev: _____

Engine parts list: _____

Local Atlas Copco Representative

Name: _____

Address: _____

Telephone: _____

Contact persons: Service: _____

Telefax: _____

Parts: _____

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1 Safety Precautions for Portable Compressors

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

1.1 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.

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

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

This brochure applies to machinery processing or consuming air or inert gas. Processing of any other gas requires additional safety precaution typical to the application and are not included herein.

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

If any statement does not comply with local legislation, the stricter of the two shall be applied. Statements in this manual should not be interpreted as suggestions; recommendations or inducements that it should be used in violation of any applicable laws or regulations.

1.2 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 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.
- 3 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, including the entire compression or vacuum system with pipes, valves, connectors, hoses, etc., as well as the consuming devices, are in good repair, free of abnormal wear or abuse, and are not tampered with.
- 4 Maintenance, overhaul and repair work shall only be carried out by adequately trained personnel; if required, under supervision of someone qualified for the job.
- 5 Whenever there is an indication or any suspicion that an internal part of a machine is overheated, the machine shall be stopped. No inspection covers shall be opened before sufficient cooling time has elapsed; this is to avoid the risk of spontaneous ignition of the oil vapor when air is admitted.
- 6 Maintenance work, other than routine attention, shall only be undertaken when the machine is standing still.
- 7 Before dismantling any pressurized component, the compressor or the equipment shall be effectively isolated from all sources of pressure and be completely vented to atmosphere. In addition, a warning sign bearing a legend such as "work in progress; do not open" shall be attached to each of the isolating valves.
- 8 Before a machine is being repaired, 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. The battery shall be disconnected and removed or the terminals covered by insulating caps.
- 9 Normal ratings (pressures, temperatures, speeds, etc.) shall be durably marked.
- 10 Never operate a machine or equipment beyond its rated limits (pressure, temperature, speed, etc.).
- 11 Maintenance and repair work should be recorded in an operators logbook for all machinery. Frequency and nature of repairs can reveal unsafe conditions.
- 12 The machinery and pneumatic equipment shall be kept clean, i.e. as free as possible from oil, dust or other deposits.
- 13 To prevent an increase in working temperature, inspect and clean heat transfer surfaces (cooler fins, intercoolers, water jackets, etc.) regularly. For every machine establish a suitable time interval for cleaning operations.

- 14 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.
- 15 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.
- 16 Pressure and temperature gauges shall be checked regularly with regard to their accuracy. They shall be replaced whenever outside acceptable tolerances.
- 17 Parts shall only be replaced by genuine Atlas Copco replacement parts.
- 18 Safety devices shall be tested as described in the maintenance schedule of the instruction book(s) to determine that they are in good operating condition.
- 19 Never use flammable solvents or carbon tetrachloride for cleaning pans. Take safety precautions against toxic vapors when cleaning parts in or with cleaning products.
- 20 Observe scrupulous cleanliness during maintenance and repair. Keep away dirt by covering the parts and exposed openings with clean cloth, paper or tape.
- 21 Protect the engine, alternator, air intake filter, electrical and regulating components, etc. to prevent moisture ingress, e.g. when steam-cleaning.
- 22 When performing any operation involving heat, flames or sparks on a machine, the surrounding components shall first be screened with non-flammable material.
- 23 Never use a light source with open flame for inspecting the interior of a machine, pressure vessel, etc.
- 24 On portable units, support the drawbar and axle(s) securely if working underneath the units or when removing a wheel. Do not rely on jacks.
- 25 Prior to stripping a compressor, engine or other machine or undertaking major overhaul on it, prevent all movable parts with a mass exceeding 15 kg (30 lbs) from rolling over or moving.
- 26 When repair has been completed, make sure that no tools, loose parts or rags are left in, or on, the machine, the prime mover or the driving gear. The machine shall be barred several revolutions to ensure that there is no mechanical interference within the machine or driver.

1.3 Safety during use and operation

To lift a unit, all loose or pivoting parts, e.g. doors 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 rules.

Helicopter lifting using the lifting eye is forbidden.

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 drawbar, the brake system and the towing eye. Also check the coupling of the towing vehicle,
 - check that the pivot 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 tires are in good condition and inflated correctly,
 - connect the signal cable, check all lights and connect the pneumatic brake couplers,
 - attach the safety break-away cable to the towing vehicle,
 - remove wheel chocks, if applied, and disengage the parking brake.
 - Apply safety chains to tow vehicle.
- 2 If the unit is to be backed up by the towing vehicle, disengage the overrun brake mechanism (if equipped).
- 3 Never exceed the maximum towing speed of the unit.
- 4 Place the unit on level ground and chock the wheels before disconnecting the unit from the towing vehicle. Unclip the safety break-away cable
- 5 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.
- 6 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 (min. 4 inches); do this in such a way that no extra back pressure is created for the engine. If necessary, install an extractor.
- 7 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.
- 8 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.
- 9 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.
- 10 Distribution pipework and air hoses must be of correct size and suitable for the working pressure. Never use frayed, damaged or deteriorated hoses. Replace hoses and flexibles of which the lifetime expired. Use only the correct type and size of hose end fittings and connections.

A hose connected to a 2 inch (50 mm) valve must be provided with a safety wire (8 mm) fixed to the hose for effective pressures as from 10 bar (145 psi) up, although it is recommended to apply such safeguard already from 4 bar (60 psi) up. The safety wire ends have to be attached, one to the eye provided next to the compressor air outlet valve, the other one to a point near to the air inlet of the applied equipment.

Finally a wire mesh hose can be fixed over the hose ends to dampen the blast in case a connection starts leaking or should become undone.

Close the compressor air outlet valve before connecting or disconnecting a hose. Ascertain that a hose is fully depressurized before disconnecting it.

When blowing through a hose or air line, ensure that the open end is held securely. A free end will whip and may cause injury.

Never play with compressed air. Never apply it to your skin or direct an air stream at people. Never use it to clean dirt from your clothes. When using it to clean down equipment, do so with extreme caution and use eye protection.

- 11 Never move a unit when external lines or hoses are connected to the outlet valves, to avoid damage to valves and/or manifold and hoses.
- 12 Never refill fuel while the unit is running. Keep fuel away from hot parts such as air outlet pipes or the engine exhaust. Do not smoke when fueling. When fueling from an automatic pump, a ground 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.

1.4 Safety During Maintenance and Repair

Maintenance 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.
- 2 Use only genuine spare parts.
- 3 All maintenance work, other than routine attention, shall only be undertaken when the unit is stopped. Ensure that the unit cannot be started inadvertently.
- 4 Before removing any pressurized component, effectively isolate the compressor from all sources of pressure and relieve the entire system of pressure. Do not rely on non-return valves (check valves) to isolate pressure systems.
- 5 Never use flammable solvents or carbon tetrachloride for cleaning parts. Take safety precautions against toxic vapors of cleaning liquids.

- 13 Never operate the unit in surroundings where there is a possibility of taking in flammable or toxic fumes.
- 14 Never operate the unit at pressures or speeds below or in excess of the limit ratings stated on the Principal Data sheet.
- 15 On water-cooled engines with closed cooling circuit: allow the unit to cool before removing a pressure cap.
- 16 All doors shall be shut during operation so as not to disturb the cooling air flow inside the body-work and/or render the silencing less effective. A door should be kept open for a short period only, e.g. for inspection or adjustment
- 17 Wear ear protectors when environmental noise can reach or exceed 90 dB(A). Beware of long-time exposure to noise.
- 18 Periodically check that:
 - all safety equipment is in good working order,
 - all guards and air conducting baffles are in place and securely fastened,
 - all hoses and/or pipes inside the unit are in good condition, secure and not rubbing,
 - there are no fuel, oil or coolant leaks,
 - all fasteners are tight
 - all electrical leads are secure and in good order,
 - the engine exhaust system is in good condition,
 - air outlet valves and manifold, hoses, couplings, etc. are in good repair, free of wear or abuse,
 - the wheel nuts are tightened to the proper torque.

When more than one compressor is connected to a common header, be sure each compressor has a non-return valve (check valve) to prevent reverse rotation when stopping.

- 6 Scrupulously observe cleanliness during maintenance and when performing repairs. Keep dirt away by covering the parts and exposed openings with a clean cloth, paper or tape.
- 7 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.
- 8 Support the drawbar and the axle securely if working underneath the unit or when removing a wheel. Do not rely on jacks.
- 9 Make sure that no tools, loose parts or rags are left in or on the unit.
- 10 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.
- 11 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.

- 12 Protect the electrical and regulating components, the air filter, etc. to prevent moisture from entering them, e.g. when steam-cleaning.

1.5 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.

- 1 Use only wrenches or sockets whose size fits the fastener.
- 2 Apply an open-end wrench only in the place of the fastener head, square to the thread axis.
- 3 Do not use a pipe or other improvised leverage extensions on handles.
- 4 Do not hammer on wrenches or other tools which are not specially designed for it.
- 5 Always support the ratchet head when using socket extensions.
- 6 Discard any wrench with broken or battered points or edges.
- 7 Never use hand type sockets on power or impact tools.
- 8 Select only heavy-duty impact sockets for use with pneumatic or electric impact tools.
- 9 Replace sockets showing cracks or wear; keep sockets clean.
- 10 Never use screwdrivers for prying, punching, chiseling, scoring or scraping.
- 11 Use the correct type and size of screwdriver for the job. The bit must match the fastener.
- 12 A screwdriver with rounded edges will slip; it needs to be redressed or discarded.
- 13 Never use a screwdriver or any other tool near a live wire or electrical component. Plastic covering of handles is for comfort and grip only. They are not intended to act as insulation if such is not clearly marked by the manufacturer.
- 14 Never strike a hammer against a hardened object; use a soft drift against the object and strike against the drift.
- 15 Strike the object with the full face of the hammer.
- 16 Never use a hammer with a loose head.
- 17 Discard a hammer with chipped or mushroomed face.
- 18 Never use a chisel or punch with a chipped or mushroomed striking face.
- 19 Always pull on a wrench or socket handle, if possible, and adjust your stance to prevent a fall if something lets go.
- 20 Wear approved eye protection when using percussion tools or when scraping, chipping, shaving or grinding.
- 21 Wear protective gloves when holding a chisel or punch.

1.6 Batteries

- 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.

1.7 Ether fuel Systems

Ether fuel systems are used for diesel cold starting.

- 1 This type of fuel is extremely flammable, toxic and poisonous. Avoid contact with eyes or skin and breathing the fumes. If accidentally swallowed, do not induce vomiting but call a physician immediately.
- 2 If fuel enters or fumes irritate the eyes, flush the latter with large quantities of clean water and call for medical aid.
- 3 Before operating ether cold starting aids, read the instructions and the container label.
- 4 Never operate ether cold starting aids while the engine is running as this can cause severe damage.
- 5 When maintenance, tests or repair has to be performed, do so in a well-ventilated area only, away from heat, open flame or sparks. Ascertain that the area is clearly marked out with signs prohibiting fire, open flame and smoking.
- 6 Wear eye protection when testing a system. Make sure that openings of a spray container, valve, tube or atomizer are pointed away from yourself and others while testing.
- 7 Do not store ether containers in temperatures above 70 °C (160 °F),

- 8 Do not incinerate, puncture or attempt to remove the center core valve, side safety valve or any other part of an ether container.

1.8 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 in psi,
- 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 regularly 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.

1.9 Safety valve

All adjustments or repairs are to be done by an authorized representative of the valve supplier.

Following checks must be carried out:

- 1 A check of the opening of the lifting gear, 1 or 2 times a year. This can be done by lifting the ring.
- 2 A check of the set pressure once a year according to the local regulations, if required. This check may not be done with the compressor supplying the air pressure and must be carried out on a proper test bench.

1.10 Injury Prevention

- 1 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.

- 2 Do not open electrical cabinets, cubicles or other equipment while voltage is supplied. If such cannot be avoided, e.g. for measurements, tests or adjustments, have the action carried out by a qualified electrician only, with appropriate tools, and ascertain that the required bodily protection against electrical hazards is applied.

- 3 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.

- 4 Insulation or safety guards of parts the temperature of which can be in excess of 80 °C (175 °F) and which may be accidentally touched by personnel shall not be removed before the parts have cooled to room temperature.
- 5 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.
- 6 If the working process produces fumes, dust or vibration hazards, etc., take the necessary steps to eliminate the risk of personnel injury.
- 7 Before lifting machines, all loose parts which could be liable to fall down shall be removed or secured; pivoting parts such as doors, etc. shall be safely immobilized.
- 8 To lift heavy parts, a hoist of ample capacity, tested and approved according to local safety regulations, shall be used.
- 9 When lifting machinery, only hooks or shackles meeting local safety regulations shall be applied. Never shall cables, chains or ropes be applied directly on or through lifting eyes. Never allow sharp bends in lifting cables, chains or ropes.
- 10 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.

- 11 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.
- 12 When heavy pans are being lifted with a hoist, it is strictly forbidden to dwell or pass under the load or in the space which is liable to be hit if the load or part of it should topple over or come loose. Never leave a load hanging on a hoist. Lifting acceleration and retardation shall be kept within safe limits.
- 13 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 30deg from the vertical.
- 14 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.
- 15 Before blowing compressed air or inert gas through a hose, ensure that the open end is held securely, so that it cannot whip and cause injury.
- 16 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.
- 17 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.
- 18 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.
19. 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.
- 20 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.

2 Leading Particulars

2.1 Description of Safety Pictograms Used in this Manual

▲ This symbol draws your attention to dangerous situations. The operation concerned may endanger persons and cause injuries.

☞ This symbol is followed by supplementary information.

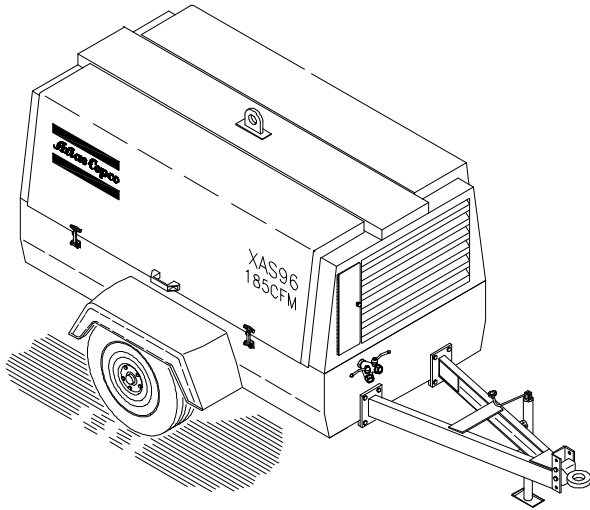


Fig. 2.1 General view of XAS 96 JD

2.2 General Description

The XAS 96 JD is a silenced, single-stage, oil-injected screw compressor, built for a normal effective working pressure of 7 bar (102 psi).

— Engine

The compressor is driven by a water-cooled diesel engine. The engine's power is transmitted to the compressor through a flexible coupling and gear drive.

— 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 male rotor has four lobes and the female rotor has six flutes. Thus, the male rotor revolves at 1 1/2 times the speed of the female rotor. The element 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, second through the oil separator element. The vessel is provided with an oil level indicator.

— Regulation

The compressor is provided with a continuous regulating system and a blow-down valve which is integrated in the unloader assembly. The valve is closed during operation by outlet pressure of the compressor element and opens by air receiver 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 which, by means of control air to the unloader and 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

Engine and compressor are provided with a radiator and oil cooler. The cooling air is generated by a fan, driven by the engine.

— Safety Devices

A thermal shut-down switch 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 switches and an alternator V-belt protection.

— Frame and Axle

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

The standard XAS 96 JD has an adjustable drawbar with a towing eye.

— Bodywork

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

— Lifting Eye

A lifting eye is accessible through the roof panel at the top of the unit.

— Control Panel

The control panel grouping the air pressure gauge, control switch etc., is placed behind a door at the front of the unit.

— Data Plate

The compressor is furnished with a data plate located on the cooler plate showing the type, serial number, maximum final pressure and normal working pressure.

2.3 Main Parts

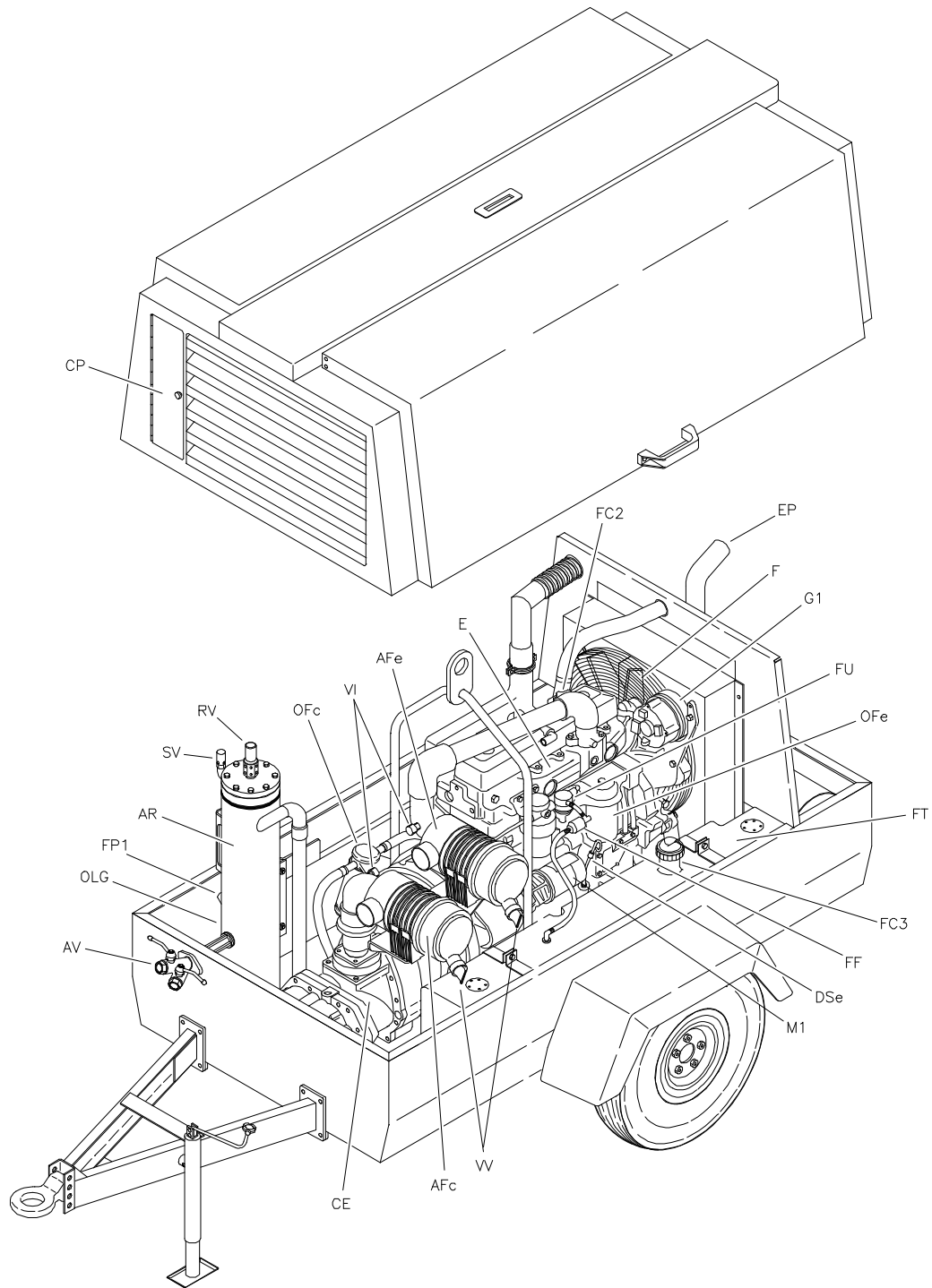


Fig 2.2 Main parts of XAS96 JD

AF	Air Filter	F	Fan	RV	Regulating Valve
AR	Air Receiver	FN	Flow Nozzle	SL	Scavenge Line
AV	Air Outlet Valves	FP	Filling Plug	SR	Speed Regulator
BDV	Blow Down Valve	FR	Flow Restrictor	SV	Safety Valve
CE	Compressor Element	OC	Oil Cooler	TS	Temperature Switch
CV	Check Valve	OF	Oil Filter	UA	Unloader Assembly
DB	Drive Belt	OLG	Oil Level Gauge	UV	Unloader Valve
DP	Drain Plug	OS	Oil Separator	VH	Vent Hole
E	Engine	PG	Pressure Gauge	VI	Vacuum Indicator

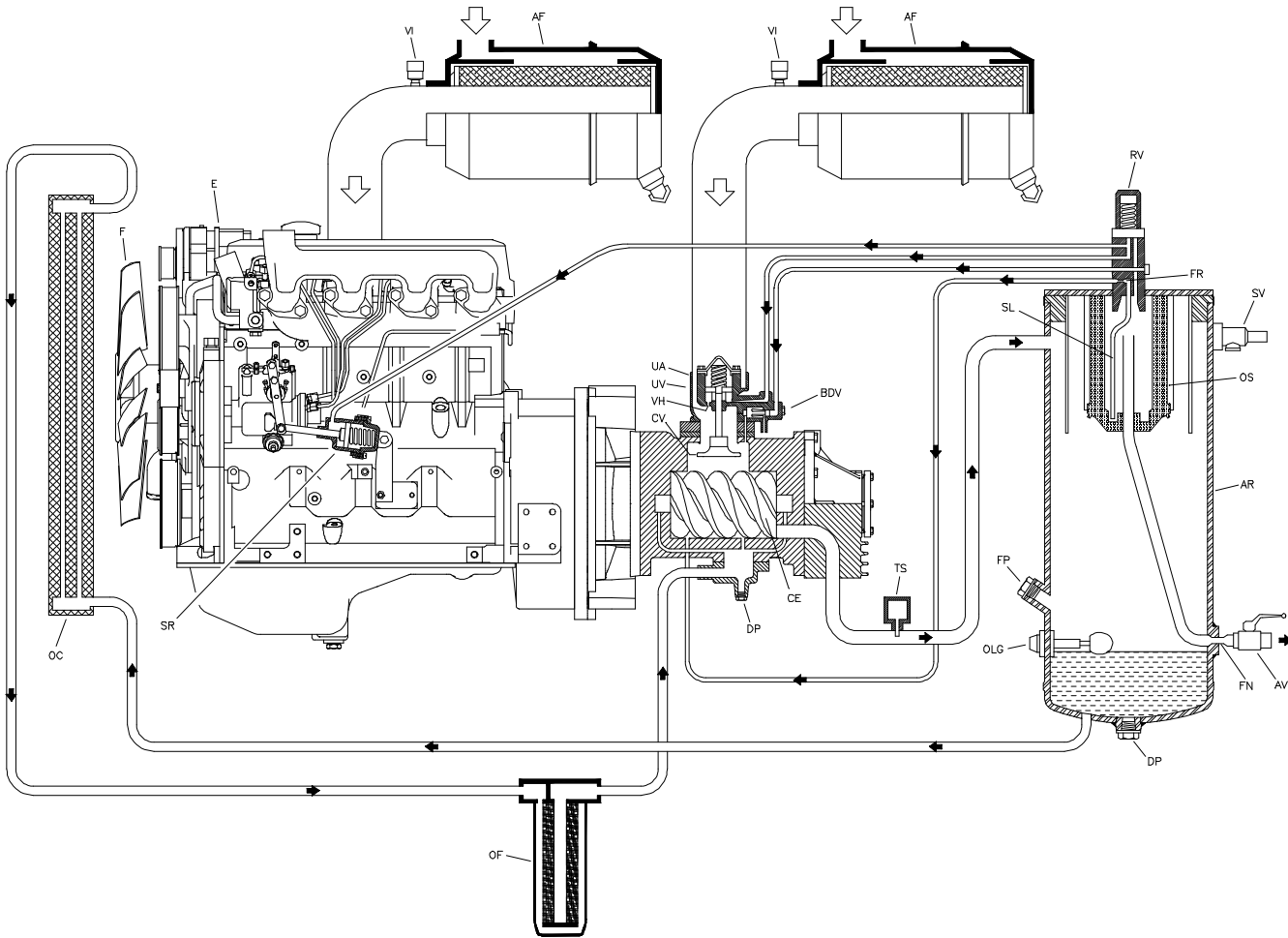


Fig. 2.3 Compressor Regulating System

AF	Air Filter	DP	Drain Plug	OF	Oil Filter	SV	Safety Valve
AR	Air Receiver	E	Engine	OLG	Oil Level Gauge	TS	Temperature Switch
AV	Air Outlet Valves	F	Fan	OS	Oil Separator	UA	Unloader Assembly
BDV	Blow Down Valve	FN	Flow Nozzle	PG	Pressure Gauge	UV	Unloader Valve
CE	Compressor Element	FP	Filling Plug	RV	Regulating Valve	VH	Vent Hole
CV	Check Valve	FR	Flow Restrictor	SL	Scavenge Line	VI	Vacuum Indicator
DB	Drive Belt	OC	Oil Cooler	SR	Speed Regulator		

2.4 Air Flow (See Fig. 2.3)

The system comprises:

AF	Air filter
AR/OS	Air receiver/oil separator
CE	Compressor element
UA/UV	Unloader assembly with unloader valve
BDV	Blow-down valve
FN	Flow nozzle

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

The check valve 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 remaining oil is removed by the separator element.

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

The air leaves the receiver via a flow nozzle (FN) which prevents the receiver pressure from dropping below the minimum working pressure, even when the air outlet valves are open. This ensures adequate oil injection and prevents oil consumption.

A temperature switch (TS) and a working pressure gauge (PG) are comprised in the system.

A blow-down valve (BDV) is fitted in the unloader assembly to automatically depressurize the air receiver (AR) when the compressor is stopped.

2.5 Oil system (see Fig. 2.3)

The system comprises:

AR/OS Air receiver/oil separator

RV UA

OC Oil cooler

OF Oil filter

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

Air pressure forces the oil from the air receiver/oil separator (AR/OS) through the oil cooler (OC) and oil filter (OF) to the compressor element (CE).

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 2.4. The oil that collects in the bottom of the oil separator element is returned to the system through scavenging line (SL), which is provided with a flow restrictor (FR).

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 4.2).

2.6 Continuous regulating system (see Fig. 2.3)

The system comprises:

RV Regulating valve

UA Unloader assembly

SR Speed regulator

The compressor is provided with a continuous regulating system. This system is provided with a blow-down valve which is integrated in the unloader assembly (UA). The valve is closed during operation by outlet pressure of the compressor element and opens by air receiver 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 which, by means of control air to the unloader, 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 unloader valve (UV) is kept open by spring force, the engine runs at maximum speed. The compressor element (CE) takes in air and pressure builds up in the receiver.

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 unloading valve is fully open.

If the air consumption is less than the maximum air output, the regulating valve supplies control air to unloader valve (UV) to reduce the air output and holds air receiver pressure between the normal working pressure and the corresponding unloading pressure of approx. 1.5 bar (21.75 psi) above the normal working pressure.

When the air consumption is resumed, the unloader valve gradually opens the air intake and the speed regulator increases the engine speed.

The construction of the regulating valve 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 unloading valve.

Part of the control air is vented to atmosphere, and any condensate discharged, through the vent holes (VH).

2.7 Electrical System

2.7.1 Circuit Diagram

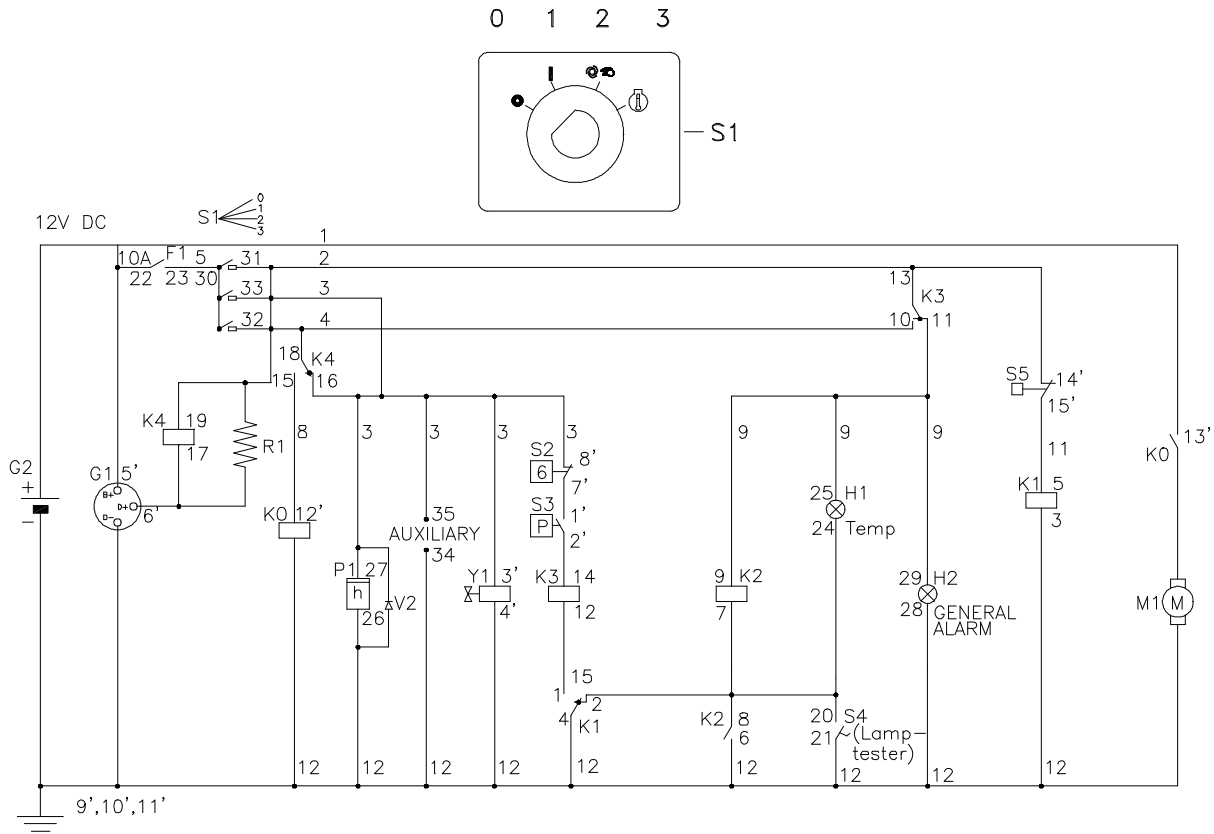


Figure 2.4 Circuit diagram

- | | | | |
|----|-------------------------------|----|--|
| F1 | Circuit breaker (10A) | M1 | Starter motor |
| G1 | Alternator | P1 | Hour meter |
| G2 | Battery | S1 | Contact switch (Off-On-Override-start) |
| H1 | Temperature alarm | S2 | Temperature switch engine |
| H2 | General alarm | S3 | Oil pressure switch engine |
| K0 | Starter solenoid (part of M1) | S4 | Temperature Lamp test switch |
| K1 | Relay | S5 | Temperature switch compressor |
| K2 | Relay | Y1 | Fuel solenoid valve |
| K3 | Relay | R1 | Resistor |
| K4 | Relay | V2 | Diode |

2.7.2 Description

Operation of the electric circuit In detail

Start button S1 position 1:

Line 2 on 12V contact K3 closed (13-11), lamp H2 is on. K4 excites contact K4 (18-15). Thermocontact element S5 normally closed, K1 excites contact K1 (1-4).

Use of lamp test:

Start button S1 position 1 press lamp test S4, across K3 and line 9 lamp H1 and relay K2 are excited. After releasing lamp test button S4, lamp H1 remains on, S4 taken over by contact K2.

Start button S1 position 2:

Line 3 on 12V (override function) hourmeter P1 and fuel solenoid Y1 excited. Thermocontact engine S2 normally closed, oil pressure contact S3 open.

Start button S1 position 3:

Start relay K0 is excited and starter motor is running, engine builds up oil pressure and oil pressure contact S3 closes. K3 excited and contact K3 changes over to (13-10). Relay K2 no longer excited, contact K2 opens, lamp H1 goes out. Alternator also commences supplying voltage and K4 is no longer excited and contact K4 changes over to (18-16). Lamp H2 goes out, one can release start button S1 and it returns to position 1. Exciting the safety devices occurs no longer across line 3 but across line 2 to line 4 and this way to line 3.

Explanation of shutdowns:

Oil pressure contact S3 opens, K3 no longer excited. K3 changes over (13-11), engine cuts out because fuel solenoid Y1 no longer excited and lamp H2 goes on simultaneously.

Thermocontact S2 opens, K3 no longer excited. K3 changes over (13-11), engine cuts out because fuel solenoid Y1 no longer excited and lamp H2 goes on simultaneously.

Thermocontact S5 opens, K1 no longer excited. Contact K1 changes over (4-2). K3 no longer excited. K3 changes over (13-11), engine cuts out because fuel solenoid Y1 no longer excited and lamp H2 and H1 go on simultaneously. Take-over relay K2 is excited simultaneously with H1 and contact K2 closes (8-6).

Thermocontact S5 cools off and closes, K1 excited again and contact K1 changes over (4-1). However, lamp H1 remains on across line 9 and contact K2 (6-8).

A fault in the alternator part causes terminal D+ to go to 0V and K4 to be excited. Contact K4 changes over to (18-15), engine cuts Out because fuel solenoid Y1 no longer excited and lamp H2 goes on simultaneously.

3 Operating Instructions

3.1 Parking, Towing And Lifting Instructions

Safety Precautions

The operator is expected to apply all relevant safety precautions, including those mentioned on the Inside of the cover of this book.

Attention:

- Check and retighten the wheel nuts and drawbar bolts to the specified torque. See section 7.

3.1.1 Parking Instructions

When parking a compressor, secure prop (1) or nose wheel to support the compressor in a level position. 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 in front of or behind the wheels. Locate the compressor upwind, away from contaminated wind-streams and walls. Avoid recirculation of exhaust air from the engine. This causes overheating and engine power decrease.

3.1.2 Towing Instructions

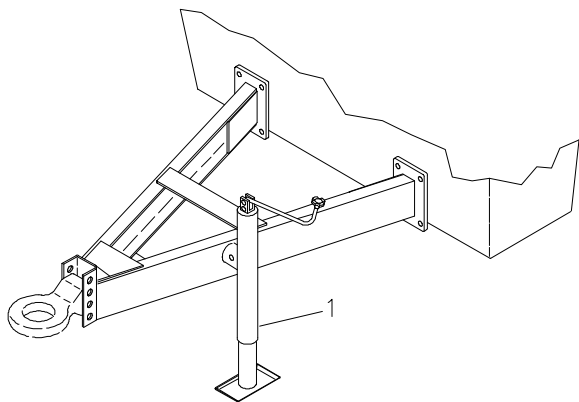


Fig. 3.1 Drawbar

Before towing the compressor, make sure that the towing equipment of the vehicle matches the towing eye or ball connector

The drawbar should be as level as possible and the compressor and towing eye end in a level position. Secure nose prop (1) in the highest position.

3.1.3 Lifting Instructions

When lifting the compressor, the hoist has to be placed in such a way that the compressor, which must be placed level, will be lifted vertically.

Preferably use the lifting bale.

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

Helicopter lifting is not allowed.

3.2 Before Starting

- ▲ **If the compressor is to be connected to a common compressed air system, fit an appropriate check valve between compressor outlet and air system. Observe the right mounting position/direction!**

1. Before initial start-up, prepare battery for operation if not already done. See section 4.7.
2. With the compressor standing level, check the level of the engine oil. Add oil, if necessary, to the upper mark on dipstick. Consult the Engine Operation Manual for the type and viscosity grade of the engine oil.
3. Check the level of the compressor oil. The pointer of oil level gauge (OLG- Fig. 2.3) should register in the green range. Add oil if necessary. See section 4.3 for the oil to be used.
- ▲ **Before removing oil filler plug (FP1- Fig. 2.3), ensure that the 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 filter until clean fuel flows from the drain cock.
6. Press vacuator valve (VV- Fig. 2.2) of the air filter to remove dust.
7. Check the air filter service indicator (VI- Fig. 2.2). If the red part shows completely, service or replace the filter element. Reset the indicator.
8. Open an air outlet valve (AV-fig. 2.2) to allow air flow to the atmosphere.

3.3 Starting/Stopping

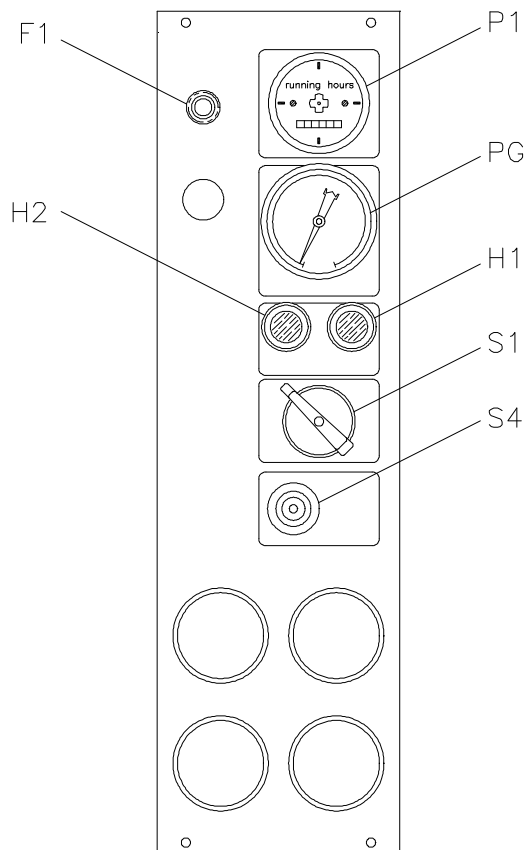


Fig. 3.2 Control panel

- F1 Fuse reset
- PG Working pressure gauge
- H1 Temperature alarm (red)
- H2 General alarm (red)
- P1 Hourmeter
- S1 Contact switch
- S4 Lamp test

Before starting, first operate the circuit breaker button (F1) at the left of the control panel.

To start, the start button is turned clockwise to position 1, lamp H2 (general alarm) will go on. When the button is turned further to position 3, the starter motor will set the engine in motion. Lamp H2 will go out as soon as the engine has been started. The start button automatically springs back to position 1. Lamp H1 only produces a signal when the compressor outlet temperature is too high. Correct operation of the lamp itself can be checked by operating the lamp test button S4 located on the control panel.

When the start button is in position 1 and the engine is not running, the lamp test can be used. Lamp H1 will go on and will automatically go out when the unit is started. Shutting-down is simply done by turning the start button counter-clockwise to position 0 (with valves closed).

The control panel in addition indicates receiver pressure (PG) and accumulated operating hours (P1).

Fault situations and protective devices:

- The starter motor is protected against prolonged starting or against attempts to start when the unit is already running.
- A fault which occurs with the engine, either: oil pressure (too low), oil temperature (too high), engine coolant (too high) or alternator voltage (too low) will always and immediately cause the engine to cut out and the control lamp H2 will go on. By doing some simple checks, it can be determined what it was that caused the engine to fail: low oil level, clogged-up cooler, slack alternator belt tension or broken belt.
- When the outlet temperature of the element becomes too high, a thermocontact will also switch off the unit immediately. Both control lamp H1 and H2 will go on. Both control lamps will remain on until the unit has been restarted (start button to position 3) or the contact is turned off (start button to position 0): also when, due to cooling off, the thermocontact has closed again (= memory function).

3.4 During Operation

- ▲ **The doors must be closed during operation and may be opened for short periods only.**

4 Maintenance

4.1 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.

4.2 Preventive Maintenance Schedule For The Compressor

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 units operating in a duty environment typical to compressor applications. Maintenance schedule can be adapted depending on application environment and quality of maintenance.

MAINTENANCE SCHEDULE	Daily	Initially Around 50 hours	Normal Or every 200 hours	Yearly Or every 1000 hours	Remarks
SERVICE PAK		Supplied with units			
Engine oil level	Check				
Compressor oil level	Check				
Air filter dust valve	Empty				
Fuel filter water drain	Drain				
Air intake vacuum indicator	Check				
Electrolyte level and terminals of battery		Check	Check	Check	
Tire pressure		Check	Check	Check	
Leaks in air-, oil- or fuel system		Check	Check	Check	
Oil cooler package			Clean	Clean	
Engine minimum and maximum speeds		Check	Check	Check	
Torque of wheel nuts		Check	Check	Check	
Brake system (if installed)		Check/Adjust	Check/Adjust	Check/Adjust	
Safety valve				Test	
Door Hinges			Grease	Grease	
Towing eye shaft or ball coupling and its shaft			Grease	Grease	
Shut-down switches				Check	
Pressure drop over separator element (2)			Measure	Replace	
Fan v-belt (3)		Adjust	Adjust	Adjust	
Fuel tank			Clean	Clean	
Compressor oil				Change	
Compressor oil filter		Replace		Replace	
Air filter element (1)				Replace	
Engine oil (3)		Change	Change	Change	
Engine oil filter (3)		Replace	Replace	Replace	
Fuel filter (3)		Replace	Replace	Replace	
Engine intake and exhaust valves (3)				Adjust	
Inspection by Atlas Copco Service technician					▲

(1) More frequently when operating in a dusty environment.

(2) Replace the element when the pressure drop exceeds 11.5 psi.

(3) Refer to the John Deere instruction manual.

▲ **Keep the bolts of the housing, the lifting eye, the towbar and the axle securely tightened. A Refer to 'Technical specifications for the torque values.**

4.3 Lubrication oils

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

Compressor oil **PAROIL**:

5 gallon pail	order number 1310 0334 30
Skid (24) 5 gallon pails	order number 1310 0334 32
Skid (4) 55 gallon drums	order number 1310 0334 33



If you want to use another brand of oil, consult Atlas Copco for more information concerning the recommended oil and service intervals.

4.4 Oil Level Check

▲ **Never mix oils of different brands or types**

4.4.1 Check Engine Oil Level

Consult also the Engine Operation Manual for the oil specifications, viscosity recommendations and oil change intervals.

See schedule.

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

4.4.2 Check Compressor Oil Level

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

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

4.5 Oil And Oil Filter Change

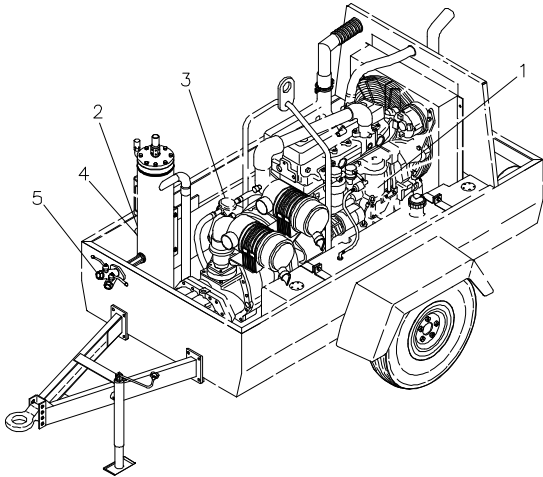


Fig. 4.2 Oil filters

4.5.1 Engine Oil And Oil Filter Change


Consult also the Engine Operators Manual for oil and oil filter (1) change intervals.

4.5.2 Compressor Oil And Oil Filter Change

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

The prescribed interval (See section 4.2) is based on an oil temperature of up to 100 °C (212 °F) and normal operating conditions.

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) and stop the compressor. Wait until the pressure is released through the automatic blow-down valve. Unscrew the oil filler plug (2) one turn. This uncovers a vent hole, which permits any pressure in the system to escape.
- 2 Drain the oil by removing all drain plugs. Drain plugs are located at the oil tank, discharge manifold, and oil injection manifold. Catch the oil in a drain pan. Screw out the filler plug to speed up draining. Tighten the plugs after draining.
- 3 Remove the oil filter (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 (4) registers in the upper extremity of the green range. Take care that no dirt drops into the system. Reinstall and tighten the filler plug.
- 6 Run the unit at no load for a few minutes to circulate the oil and to evacuate the air trapped in the oil system.
- 7 Stop the compressor. Let the oil settle for a few minutes. Check that the pressure is released by opening an air outlet valve (5). Screw out filler plug (2) and add oil until the pointer of the oil level gauge (4) again registers in the upper extremity of the green range. Reinstall and tighten the filler plug.

▲ **Never add more oil. Overfilling results in oil consumption.**

4.6 Cleaning Coolers

Keep the coolers clean to maintain the cooling efficiency. The fan side surface of compressor and engine cooler is accessible by opening cooler access doors.

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

Then clean by air jet in reverse direction of normal flow.

If the dirt is oily, wash the coolers with degreaser or a cleansing agent.

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

A spray gun should preferably be used to apply the solvent to the fins. Rinse the blocks by means of a water jet max. 100 psi at 2 inch distance after a soaking-in period. Steam cleaning may also be applied.

▲ **To avoid damaging the coolers, angle between waterjet and coolers should be approx. 90°.**

Close the service door(s).

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

4.7 Battery Care

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

An ASB (Service Bulletin) dealing elaborately with batteries and due care is available on request.

If the battery is still dry, it must be activated as described in point 4.7.1.

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

4.7.1 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.

4.7.2 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 manufacturers instructions.

Apply with preference 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.

4.7.3 Battery Maintenance


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.
- Keep the terminals and clamps tight, clean, and lightly covered petroleum jelly.

4.8 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 as described In a separate Service Bulletin (ASB), which may be obtained on request. Consult Atlas Copco.**

4.9 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.**

5 Adjustments and Servicing Procedures

5.1 Adjustment of the Continuous Regulating System

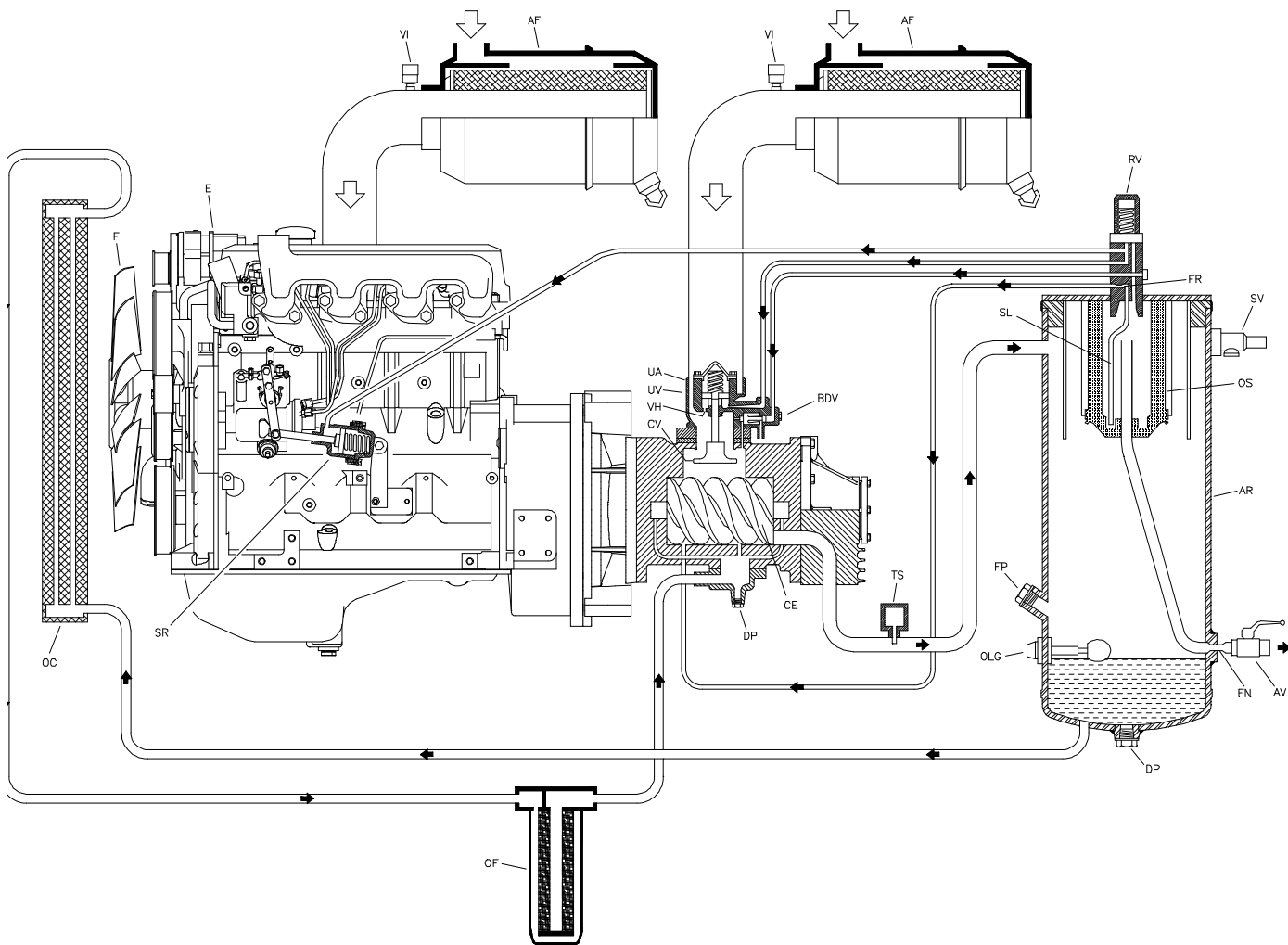


Fig. 5.1 Compressor Regulating System

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

To adjust the normal working pressure, proceed as follows:

1. Start and warm up the engine (see section 3.3).
2. With the outlet valves (AV) closed, pull out the knob, adjust the regulating valve (RV) until a pressure of 8.5 bar(s) (123 psig) is reached.
3. Check the minimum speed of the engine. Adjust minimum speed stop screw if necessary.
4. Open an outlet valve just enough to let the engine run at maximum speed. The working pressure must be 7 bar(e) (102 psig); adjust if necessary with regulating valve (RV).
5. Check the engine maximum speed. Adjust the maximum speed by means of adjusting eccentric nut on top of speed regulator (SR).
6. Close the outlet valves, check that the pressure is between 8.3 and 8.7 bar(e) (120 and 126 psig). Lock the regulating valve by pushing the knob down.

5.2 Air Filter Engine/Compressor

5.2.1 Main Parts

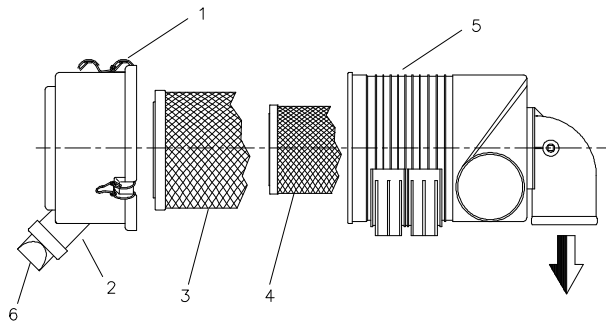


Fig. 5.2 Air filter

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

5.2.2 Recommendations

- ▲ **The Atlas Copco air filters are specially designed for the application. The use of non-genuine air filters may lead to severe damage of engine and/or compressor element. Never run the compressor without air filter element.**

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

Discard the element (3) when damaged.

In heavy duty applications it is recommended to install a safety cartridge.

A dirty safety cartridge (4) is an indication of a malfunctioning air filter element. Replace the element and the safety cartridge in this case.

Replace the safety cartridge together with the filter element. The safety cartridge cannot be cleaned.

5.2.3 Cleaning The Dust Trap

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

5.2.4 Replacing The Air Filter Element

1. Release the snap clips (1) and remove the dust trap (2). Clean the trap.

2. Remove the element (3) from the housing (5). If the element is to be serviced for immediate re-use, reinstall the dust trap to protect the air intake system while cleaning the element.
3. Reassemble in reverse order of dismantling.
4. Inspect and tighten all air intake connections.
5. Reset the vacuum indicator by pushing the reset button (8-Fig. 5.3).

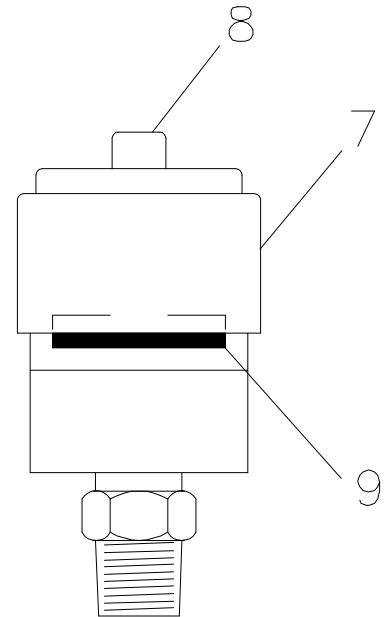


Fig. 5.3 Vacuum indicator

- 7 Air filter contamination indicator
- 8 Reset button
- 9 Red indicator

5.3 Air Receiver

The air receiver is tested according to official standards. Regularly have inspections carried out in conformity with local regulations.

5.4 Safety Valve

- ▲ **All adjustments or repairs are to be done by an authorized representative of the valve supplier.**

Following checks must be carried out:

- a check of the opening of the lifting gear, twice a year. This can be done by lifting the ring.
- a check of the set pressure once a year according to the local regulations. This check cannot be done on the machine and must be carried out on a proper test bench.

5.5 Fuel System

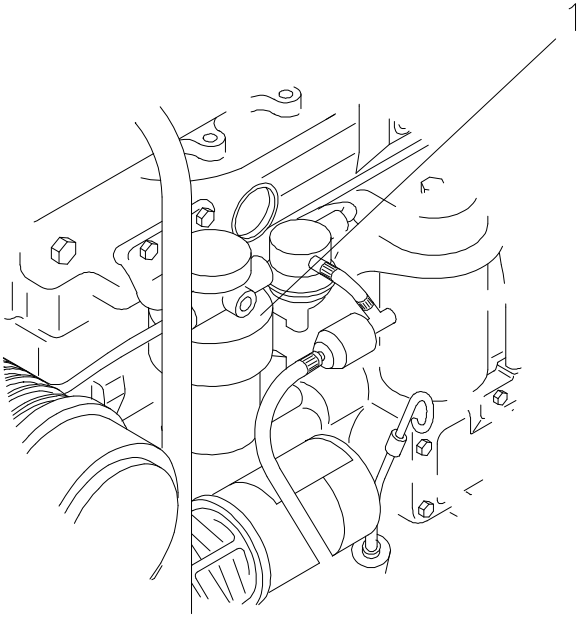


Fig. 5.4 Fuel filter

Replacing the filter element

1. Unscrew the filter element (1) from the adapter head.
2. Clean the adapter head sealing surface. Lightly oil the gasket of the new element and screw the latter onto the header until the gasket is properly seated, then tighten with both hands.
3. Prime fuel system with manual prime lever on fuel pump.
4. Check for fuel leaks once the engine has been restarted.

6 Problem Solving

6.1 Problem Solving Chart

The chart helps to solve mechanical problems.

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.

6.2 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 positive to positive, negative to negative.
4. Never operate the engine without the main or voltage sensing cables connected in the circuit.

Problem	Possible faults	Corrective actions
1. Lamps (H1, H2) do not light up when switching (S1) to "I" and applying lamp test.	<ol style="list-style-type: none"> a. Discharged or defective battery. b. Loose battery cable(s) or oxidized terminals. c. Loose connection or damaged wiring. d. Contact switch (S1) defective. e. Circuit breaker defective. 	<ol style="list-style-type: none"> a. Check electrolyte level and charge battery. If no cells are shorted and battery is discharged, trace cause and correct. b. Check and correct as necessary. c. Check wiring and connections, correct as necessary. d. With (S1) switched in "I", check voltage between ground and respectively each of the terminals of (S1). Voltage must register at each of the terminals; if not, replace (S1). e. Replace circuit breaker.
2. General alarm lamp (H2) does not light up when switching (S1) to "I"; lamp (H1) lights up when applying lamp test.	<ol style="list-style-type: none"> a. Lamp (H2) blown, b. Alternator/regulator defective. 	<ol style="list-style-type: none"> a. Replace lamp. b. Disconnect the wire from alternator terminal D+ and connect it to terminal D-. If (H1) lights up, replace the alternator; if not, test (S1); see remedy 1d.
3. Temperature alarm lamp (H1) does not light up when switching (S1) to "I" and applying lamp test.	<ol style="list-style-type: none"> a. Lamp (H1) blown, b. See fault 1d. 	<ol style="list-style-type: none"> a. Replace lamp. b. See 1d.
4. Starter motor does not crank engine after switching (S1) to "I"	<ol style="list-style-type: none"> a. Low battery output. b. Start button (S1) defective. c. Alternator output inlay (K4) defective. d. Start solenoid (KO) or starter motor defective 	<ol style="list-style-type: none"> a. See remedy 1 a. b. With (S1) in check voltage between earth and respectively each of the terminals of (S1). Voltage must register at each of the terminals; if not, replace (S1). c. Replace (K4). d. Check start solenoid (K0). Have starter motor repaired.
5. Starter motor cranks engine when Switching S1 to "I" but engine does not fire.	<ol style="list-style-type: none"> a. Switch (S1) defective, b. Fuel solenoid (Y1) defective. c. Low battery output. 	<ol style="list-style-type: none"> a. See remedy 4b. b. Check solenoid and its valve; correct or replace as necessary. c. see 1a

Problem	Possible faults	Corrective actions
6. Engine fires but general alarm lamp (H2) remains alight; compressor stops when releasing (S1).	<ul style="list-style-type: none"> a. Alternator drive belt broken or slipping, b. Alternator/regulator defective. 	<ul style="list-style-type: none"> a. Check and correct as necessary. b. Have assembly repaired.
7. Engine is running but shuts down immediately after S1 has been released.	<ul style="list-style-type: none"> a. Override switch released too soon. b. Insufficient engine oil pressure. c. Fuel tank contains insufficient fuel. d. Engine oil pressure shut-down switch, engine temperature switch or compressor temperature switch defective. 	<ul style="list-style-type: none"> a. Release switch after engine oil pressure has built up to above the minimum allowed value. b. Stop at once, consult the engine Instruction manual. c. Fill fuel tank. d. Remove and test switches. Replace if out of order.
8. General alarm lamp (H2) remains alight for over 5 seconds after starting.	<ul style="list-style-type: none"> a. Insufficient engine oil pressure or too high engine coolant temperature. b. Engine oil pressure switch (S3), or compressor temperature switch (S5) defective. c. Relay (K1) defective. 	<ul style="list-style-type: none"> a. Stop at once, consult Engine Operation Manual. b. Stop at once, test switches, replace as necessary. c. Replace (K1).
9. Hourmeter does not count running time.	<ul style="list-style-type: none"> a. Hourmeter defective, 	<ul style="list-style-type: none"> a. Replace.
10. Compressor does not unload and engine keeps running at maximum speed when closing the air outlet valves; safety valve blows.	<ul style="list-style-type: none"> a. Air leaks in regulating system. b. Regulating valve (RV) incorrectly set or defective. c. Unloading valve (UV) or its actuating piston stuck. 	<ul style="list-style-type: none"> a. Check and repair. b. Adjust or repair regulating valve; see section 5.1. c. Repair unloading valve assembly.
11. Compressor capacity or pressure below normal,	<ul style="list-style-type: none"> a. Air consumption exceeds capacity of compressor. b. Choked air filter element (AF). c. Unloading valve (UV) not completely open. d. Engine does not run at maximum speed. e. Oil separator element (OS) clogged. 	<ul style="list-style-type: none"> a. Check equipment connected. b. Service air filter element (AF). c. Speed regulation cable maladjusted; see section 5.1. d. Check the maximum speed, service the fuel filter. e. Have element removed and inspected by an Atlas Copco Service representative.
12. No air output.	<ul style="list-style-type: none"> a. Drive coupling broken. 	<ul style="list-style-type: none"> a. Consult Atlas Copco.
13. Working pressure rises during operation and causes safety valve to blow.	<ul style="list-style-type: none"> a. See faults 10. b. Safety valve (SV) opens too soon. 	<ul style="list-style-type: none"> a. See remedies 10. b. Replace safety valve; Consult Atlas Copco
14. Excessive compressor oil consumption. Oil mist being discharged from air outlet valve (5-fig. 4.2).	<ul style="list-style-type: none"> a. Restrictor in oil scavenging line clogged, b. Oil separator element (OS) defective. c. Oil level too high. 	<ul style="list-style-type: none"> a. Dismount, clean and refit restrictor; b. Replace element. c. Check for overfilling. Release pressure and drain oil to correct level.

Problem	Possible faults	Corrective actions
15. Compressor shuts down through a shut-down switch.	<ul style="list-style-type: none"> a. Alternator V-belt broken or slipping, b. Compressor overheating. c. Engine oil pressure too low. d. Engine temperature too high 	<ul style="list-style-type: none"> a. Re-tense or replace V-belt. b. See condition 17. c. Check engine lubricating system. d. Check engine cooling; see engine operation manual
16. Air and oil expelled from air filter after stopping.	<ul style="list-style-type: none"> a. Unloader valve defective, b. Wrong oil type with no foam-retarding additives. 	<ul style="list-style-type: none"> a. Repair valve. b. Consult Atlas Copco.
17. Compressor overheating,	<ul style="list-style-type: none"> a. Insufficient compressor cooling, b. Oil cooler (OC) clogged externally. c. Oil system clogged internally. d. Oil level too low. e. Cooling fan (F) defective. f. Oil separator element clogged. g. Oil filter clogged. 	<ul style="list-style-type: none"> a. Relocate compressor for adequate ventilation. b. Clean cooler; see section 4.6. c. Consult Atlas Copco. d. See section 4.4. e. Replace fan. f. Replace oil separator. g. Replace oil filter.

7 Principal Data

Compressor

XAS96 JD

Maximum effective pressure	bar	8.5
(Maximum unloading pressure).....	psig	123
Normal effective	bar	7
working pressure	psig	100
Minimum effective	bar	4
working pressure	psig	58
Temperature safety	°C	120
switch trip point.....	°F	248
Safety valve effective.....	bar	11
opening pressure.....	psig	160
(check stamping on valve)		
Free air delivery at.....	l/s	87
normal working pressures	cfm	185
and maximum loading speed 1)		

Engine

Make	John Deere	
Model	4045D	
Type	4CYL	
Maximum operating speed.....	rpm	2100±20
Minimum operating speed.....	rpm	1600±20
Battery (One, BCI Group size 31).....		12V-625CCA

Capacities

Compressor oil system.....	liter	10
.....	US gals	2.5
Engine lube oil system with filter.....	liter	8.5
(approximately)	US gals	2.3
Fuel tank	liter	98.5
.....	US gals	26
Engine cooling system	liter	9.5
(approximately)	US qts	10

1) At following conditions:

- Air intake pressure (absolute) 1 bar (14.5 psi)
- Air intake temperature 20°C (68°F)
- Relative air humidity 0%

Unit	XAS96JD
Maximum allowed	°C 52
ambient temperature.....	°F 125
Sound pressure level	dB(A) 76
at 7m (23 ft). approximately	
Maximum towing speed	km/h 80
MPH.....	50
Tire size (Load Rating)	F78-14
Effective tire pressure	Inflate to manufacturers recommended
.....	pressure as embossed on tire
Overall length, approximately	mm 3200
.....	in 126
Overall width, approximately	mm 1626
.....	in 64
Overall height, approximately	mm 1397
.....	in 55
Gross weight (wet), approximately	kg 1205
.....	lb 2650
Gross weight (dry), approximately.....	kg 1091
.....	lb 2400
Wheel nut(s) torque.....	ft.-lb. 94
Towbar bolt torque.....	ft.-lb. 70