

Atlas Copco

Instruction Manual



Instruction Manual
for Portable Compressors
English

PTS 1600 Cud S3A/T3 APP | QSX15



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Instruction Manual for Portable Compressors

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Congratulations on the purchase of your AC 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. Please read the following instructions carefully before starting to use your machine.

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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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,
- 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, easily 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.

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 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 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.
- 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 neat. Lack of order will increase the risk of accidents.
- 14 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 jewellery.
- 15 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.

1.3 Safety during transport and installation

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 In case of transporting a non-trailer unit on a truck, fasten it to the truck by attaching straps via fork lift holes, via the holes in the frame at the front and back or via the lifting beam. To prevent damage, never put straps on the roof surface of the unit.
- 5 Never exceed the maximum towing speed of the unit (mind the local regulations).
- 6 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.
- 7 To lift heavy parts, a hoist of ample capacity, tested and approved according to local safety regulations, shall be used.
- 8 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.
- 9 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.

- 10 Never leave a load hanging on a hoist.
- 11 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.
- 12 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.

1.4 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 coolant 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 of which the temperature can be in excess of 80 °C (176 °F), and which may be accidentally touched by personnel when opening the machine during or just after operation. Insulation or safety guards protecting these parts shall not be removed before the parts have cooled down sufficiently, and must be re-installed before operating the machine. As it is not possible to insulate or protect all hot parts by guards (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 personnel 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 When operating the compressor in Remote or Auto mode, observe all relevant local legislation.

1.5 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 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.
- 19 Maintenance and repair work should be recorded in an operator's logbook for all machinery. Frequency and nature of repairs can reveal unsafe conditions.
- 20 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.
- 21 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.
- 22 Make sure that oil, solvents and other substances likely to pollute the environment are properly disposed of.
- 23 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.

1.6 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.

1.7 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.

Piping and coolers (according to directive 97/23)

Safety valves

All adjustments or repairs are to be done by an authorized representative of the valve supplier (see "Maintenance schedule").

2 About this manual

2.1 Description of safety pictograms



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



This symbol is followed by supplementary information.

2.2 Abbreviations

AC	Atlas Copco
AIB	Atlas Copco Instruction Book
ASB	Service Bulletin
ASL	Atlas Copco List
CAC	Charge Air Cooler
CAN	Controller Area Network Interface
CCM	Compressor Control Module
DDR	Diagnostic Data Reader
ECM	Engine Control Module
EOM	Engine Operation Manual
LP	Low-pressure
MAX	Maximum
MIN	Minimum
MP	Medium-pressure
PAR	Portable Energy Division
PC	Personal Computer
RPM	Revolves Per Minute
UI	User Interface

2.3 Definitions

Control panel	This is the panel on the unit where the User Interface, power switch, DDR connector, PC connector, remote control connector, heater switch, light switch and pressure setpoint buttons are situated.
Technician	AC personnel allowed to change settings of the control and safety system.
Operator	AC personnel or user allowed to operate the compressor unit with the push-buttons.
Load	Operating condition with inlet compressor open and engine speed regulated between minimum and maximum.
Not loaded	Operating condition with inlet compressor forced to closed position by operator command. The engine speed is held at minimum.
Unload	Operating condition with inlet compressor forced to closed position by working pressure command. The engine speed is held at minimum.
DDR	Diagnostic Data Reader. This is a tool that can be connected to the ECM to read and calibrate engine parameters.

ECM	Engine Control Module. This is the basic engine control module used by DDC for the engine controls (emissions, safeties, fuel injection, ...).
CCM	Compressor Control Module. This module is linked with the ECM and is used for speed regulation and for the compressor controls (unloading system, safeties, ...). It can be operated via PC or User Interface.
User Interface setpoint	Max. working pressure setpoint calibrated in the CCM. At this max. setpoint the engine speed will be regulated between max. and min. speed when running in manual or automatic operation.

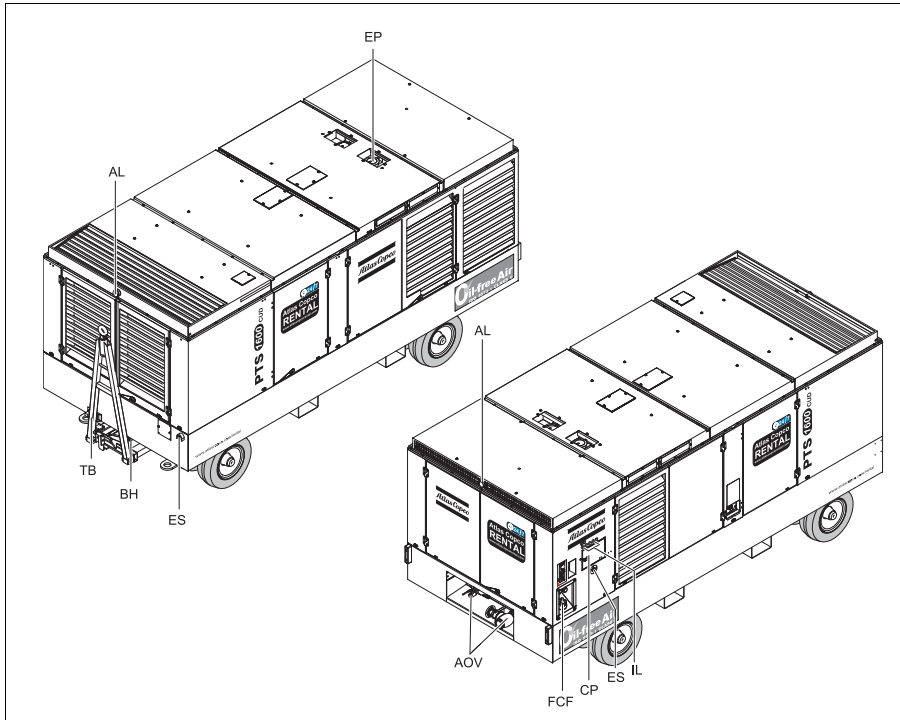
2.4 Directions

The driving direction has always been originated with, when the sides of the unit are denoted. E.g. the towbar is at the front and the User Interface is at the rear right-hand side of the unit.

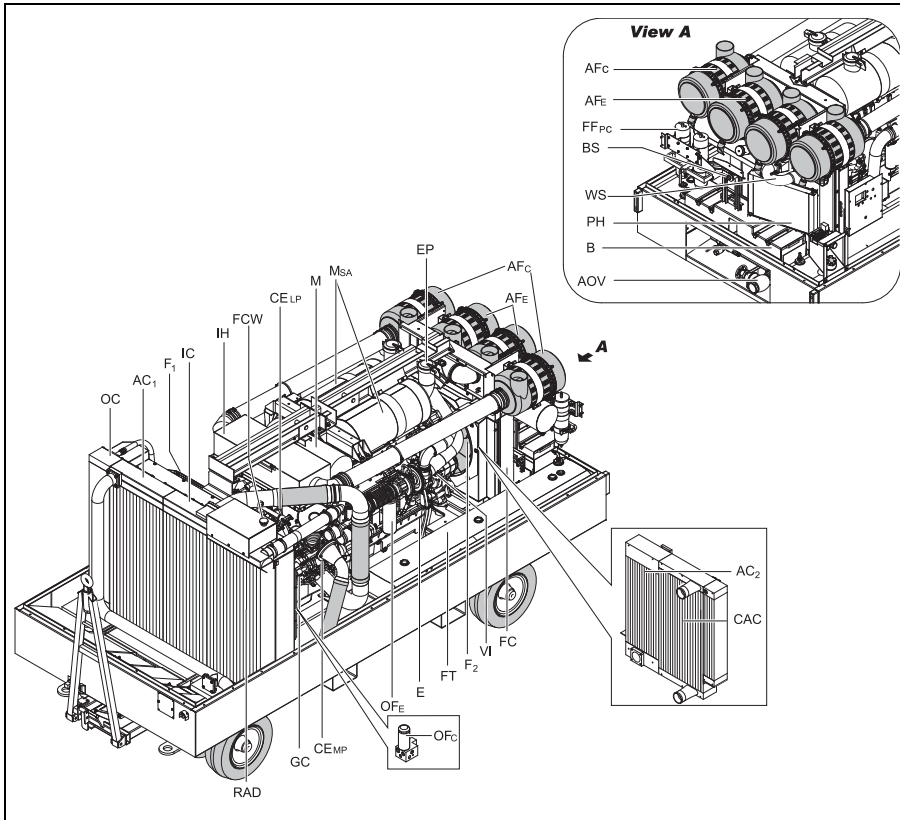
3 Main parts

3.1 General description

The PTS 1600 Cud is a portable, two-stage screw compressor unit, which delivers oil-free air. The PTS 1600 Cud is built for a nominal effective working pressure of 0.5-10.3 bar (7-150 psi) at 1650 rpm, 0.5-9.3 bar (7-135 psi) at 1750 rpm and 0.5-6.9 bar (7-100 psi) at 1850 rpm. An overview of the main parts is given in the diagram below.








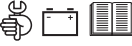



AL	Alarm lamp
AOV	Air outlet valve
BH	Brake handle
CP	Control panel
EP	Exhaust pipe
ES	Emergency stop
FCF	Filler cap fuel
IL	Indicator lamps
TB	Towbar















- AC₁ Aftercooler 1
- AC₂ Aftercooler 2
- AF_C Air intake filter (compressor)
- AF_E Air intake filter (engine)
- AOV Air outlet valve
- B Battery
- BS Battery Switch
- CAC Charge air cooler
- CE_{LP} LP compressor element
- CE_{MP} MP compressor element
- E Engine
- EP Exhaust pipe
- F₁ Cooling fan 1
- F₂ Cooling fan 2
- FCW Filler cap cooling water
- FC Fuel cooler
- FF_{PC} Primary coarse fuel filter / Water separator
- FT Fuel tank
- GC Gear casing
- IC Intercooler
- IH Air inlet housing (compressor)
- M Muffler
- MSA Muffler (Integrated Spark Arrestor)
- OC Oil cooler
- OF_C Oil filters (compressor)
- OF_E Oil filter (engine)
- PH Pre-heater (optional)
- RAD Radiator
- VI Vacuum indicator
- WS Water separator

3.2 Markings

A brief description of all markings provided on the compressor is given hereafter.

	Dangerous outlet
	Danger, heat flat
	Electrocution hazard
	Atlas Copco engine oil
	Manual
	Read the instruction manual before working on the battery
	On/Off button
	Prohibition to open air valves without connected hoses
	Airfilter

	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 motor with open doors

	Use diesel fuel only
	Sound power level in accordance with Directive 84/533/EC (expressed in dB (A))

3.3 Mechanical features

3.3.1 Engine

The compressor is driven by a liquid-cooled diesel engine, manufactured by Cummins. This engine has the following characteristics: direct fuel injection, electronic unit injection that is mechanically actuated, turbocharged, and air-to-air aftercooled.

For general description, see Engine Operation Manual (EOM).

3.3.2 Compressor

The compressor has one low-pressure and one medium-pressure compressor element, individually bolted to the housing of a common step up gear. The step up gear is bolted directly to the engine flywheel housing. The power from the engine is transmitted to the step up gear shaft through a flexible coupling.

3.3.3 Compressor elements

Each compressor element houses two screw-type rotors, mounted on ball and roller bearings. The male rotor, driven by the step up gear, and the female rotor are synchronized through timing gears, which maintain the slight clearance between the rotors.

The male rotors have four lobes and the female rotors six flutes. Thus, the male rotors revolve at 1 1/2 times the speed of the female rotors. The absence of contact between the rotors and between the rotor crests and the compressor casings eliminates wear and power loss. The elements deliver pulsation-free air.

Air and oil sealing rings are fitted on the rotor shafts. The air seals are located next to the compression space, the oil seals next to the rotor bearings. The leak air from the air seals is evacuated to the atmosphere through vent-holes. Any oil that might gather between the oil and air seals is prevented from entering the compression space, as it is drained through the same vent holes.

3.3.4 Cooling and lubrication

The radiator, intercoolers, aftercooler and oil cooler are installed side by side in the front of the unit. These coolers are air-cooled by an axial fan, which is belt-driven from the compressor main-shaft.

The unit is provided with a second aftercooler, with water separator, CAC (= charge air cooler) / fuel cooler placed in the back of the unit. The cooling air is generated by an axial fan, which is belt-driven from the engine fan shaft.

Water condensate from the water separator is drained through a nipple in the bottom of the frame in the back of the unit.

Oil is used for jacket-cooling of the compressor elements, as well as for lubricating the rotor bearings, timing and drive gears. The system includes an oil pump and an oil filter.

3.3.5 Speed regulation and unloading system

The regulation of the unit is governed by the Engine Control Module (ECM) and the Compressor Control Module (CCM), which will vary engine speed and operate the compressor throttle valve and unloading valve through a 3-way loading valve.

3.3.6 Safety devices

Two relief valves and a MP safety valve protect the LP and MP sides of the compressor respectively.

A check valve prevents blow-back of compressed air when the compressor is unloaded or stopped.

Pressure and thermal shutdown switches protect the compressor against abnormal operating conditions.

3.3.7 Frame and axles

The compressor/engine unit is supported on a frame which also carries the compressor cooling block.

The front axle is provided with a steering gear and a hinged towbar with towing eye. The towbar can be locked in the raised position.

The unit is equipped with a parking brake, operated by a handle close to the towbar.

3.3.8 Bodywork

The bodywork has openings for the intake, cooling and exhaust air and specially hinged doors for maintenance and service operations. The bodywork is internally lined with sound-absorbing material. The air outlet valves are in the frame, at the back.

3.3.9 Fuel tanks

The unit has two interconnected fuel tanks, but can also be connected to an external fuel tank.

3.3.10 Control panel

The control panel is located behind a small door at the rear right-hand side of the unit.

3.3.11 Data plate

The compressor is furnished with a data plate showing among others type, serial number and nominal working pressure.

3.3.12 Automatic fire suppression system

The PTS 1600 is fitted with an automatic fire suppression system. This installation will respond automatically to a fire in the engine compartment by switching of the engine and spreading extinguishing powder throughout the engine compartment.

In case of an extinguishing powder release by the fire suppression system, please be careful when opening the doors of the compressor. Although this fire suppression system is designed and tested to extinguish most common compressor fires, there is always a chance that not all flames are extinguished.

After activation of the system always contact Atlas Copco immediately to investigate and repair the machine.

For more detailed information on the Automatic fire suppression system, refer to “Operating the automatic fire suppression system” on page 51.



Repairs and maintenance must be done by authorized personnel only. Please contact Atlas Copco if the fire suppression system shows any irregularities.

Disconnecting the system from the compressor batteries will result in a battery and detection fault.



To avoid battery drainage during long-term storage, please disconnect the batteries and remove the internal battery from the Ansul controller. After restoring the power supply, push the reset button to reactivate the system.

3.4 Electrical features

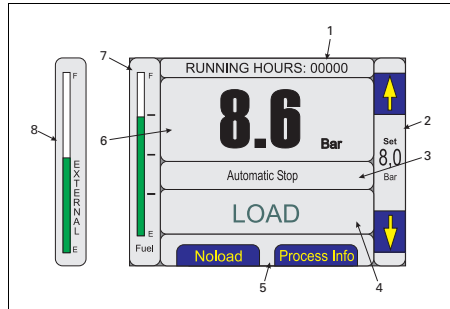
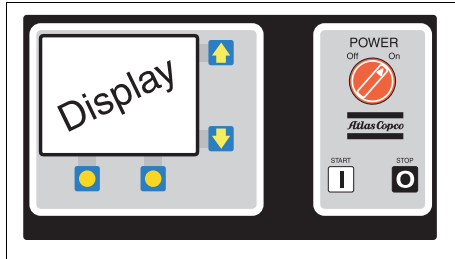
The electrical features described in this chapter are standard provided on this compressor.

3.4.1 User Interface and Compressor Control Module

General description of the User Interface

The User Interface consists of a color LCD display which gives the user the essential process information feedback.

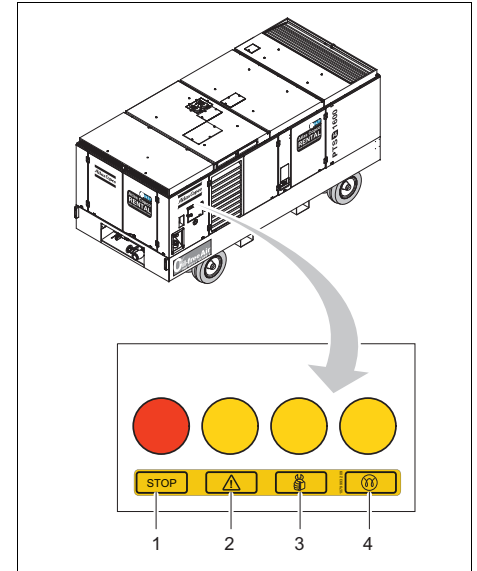
Any mix-up of buttons and button functions is reduced to an absolute minimum thanks to an ergonomic design, which has as few buttons as possible.



- 1 Running hours and warning bar. When warnings occur, they swap with the running hours on this bar, showing the next message every 3 seconds.
- 2 Setpressure bar
- 3 Additional information bar
- 4 Compressor status bar
- 5 Button function bar
- 6 Air discharge pressure and shutdown information bar
- 7 Fuel bar
- 8 This is what the fuel level bar would look like if you hook up external fuel supply.

The User Interface is built in into the side of the rear right corner panel, with an emergency stop button directly underneath, for maximum safety during the cranking procedure.

3.4.2 Indicator lamps



- 1 Stop lamp
- 2 Warning lamp
- 3 Maintenance lamp
- 4 Wait-to-Start lamp

3.4.2.1 Stop lamp

The Stop lamp (1) provides critical operator messages. These messages require immediate and decisive operator response. The Stop lamp is also used to flash out Diagnostics fault codes.

This lamp is used by the following features:

- Diagnostic Fault Code Flashout
- Engine Protection

3.4.2.2 Warning lamp

The Warning lamp (2) provides important operator messages. These messages require timely operator attention. The Warning lamp is also used to delineate Diagnostics fault codes.

3.4.2.3 Maintenance Lamp

The Maintenance lamp (3) indicates that routine engine maintenance should be performed.

The lamp is used by the following features.

- Maintenance Monitor
- Real Time Clock (RTC)

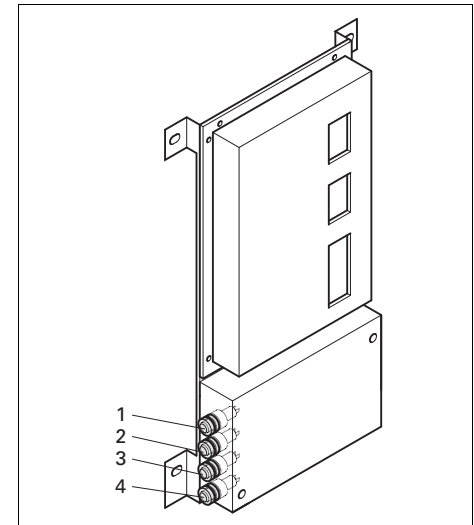
3.4.2.4 Wait-to-Start Lamp

The Wait-to-Start lamp (4) indicates that the pre-start intake manifold heater warm-up sequence is active. An OEM-supplied grid heater will automatically heat the intake manifold when needed prior to engine starting. Intake manifold heating improves engine starting in cold temperatures and reduces white smoke. The operator should delay engine starting until after the lamp has extinguished.

This lamp is used by the following feature:

- Air Intake (Grid) Heaters

3.4.3 Fuses



The Compressor Control Module (CCM) is equipped with the following four fuses:

- | | |
|---|-------------------------|
| 1 | Fuse ECM: 20 A |
| 2 | Fuse CCM: 20 A |
| 3 | Fuse UI: 10 A |
| 4 | Overspeed shutdown: 3 A |

3.5 Operation flows

3.5.1 Air flow system

Description

Air drawn through the air intake filters (AF_C), and unloader (UA) into LP compressor element (CE_{LP}) is compressed and discharged to the intercooler (IC) where the heat of first-stage compression is removed by the cooling air flow.

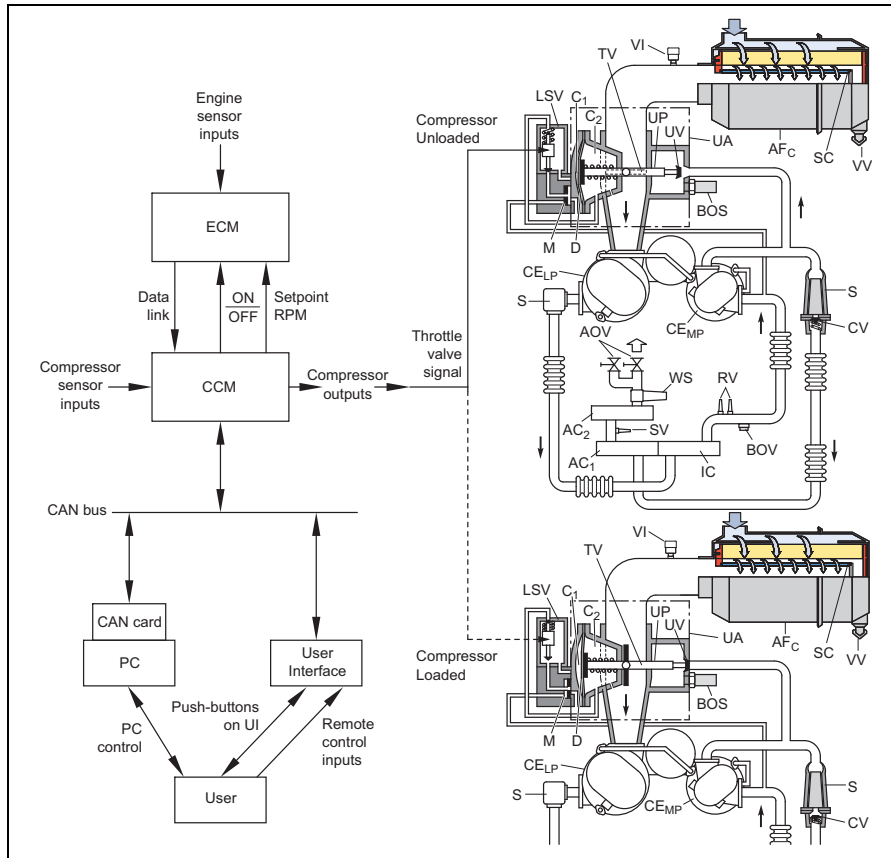
The cooled air then enters MP compressor element (CE_{MP}) where it is further compressed and discharged through check valve (CV), aftercooler 1 (AC₁), aftercooler 2 (AC₂) and water separator (WS) to air outlet valves (AOV).

During loaded operation air inlet throttle valve (TV) is open and unloading valve (UV) closed. These valves are simultaneously closed and opened respectively by loading solenoid valve (LSV) through unloader piston (UP) when the working pressure reaches its preset maximum. The pressure of the MP compressor element is then released to the atmosphere through the unloading valve and the blow-off silencers (BOS), resulting in closing of the check valve. The throttle valve leaves an air passage in the closed position. Thus air remains drawn into the compressor to maintain a reasonable pressure ratio over the elements.

An air-operated balancing piston is fitted behind the male rotor rear thrust bearing of MP compressor element. The piston decreases the load on the male rotor front thrust bearing during loaded operation. During loading the MP compressor element balancing piston is actuated by working pressure, while during unloading the pressure on the piston equals the atmospheric pressure.

Two intercooler relief valves (RV), an electric blow-off valve (BOV) and a MP safety valve (SV) are comprised in the system.

Overview



- AC₁ Aftercooler 1
- AC₂ Aftercooler 2
- AF_C Air intake filter (compressor)
- AOV Air outlet valve
- BOS Blow-off silencer
- BOV Blow-off valve
- BV By-pass valve
- C₁ Chamber (unloader assembly)
- C₂ Chamber (unloader assembly)
- CE_{LP} LP compressor element
- CE_{MP} MP compressor element
- CV Check valve
- D Diaphragm (unloader assembly)
- IC Intercooler
- LSV Loading solenoid valve
- M Membrane (unloader assembly)
- RV Intercooler relief valve
- S Air outlet silencer (compressor element)
- SC Safety cartridge
- SV MP safety valve
- TV Throttle valve (unloader assembly)
- UA Unloader assembly
- UP Unloader piston (unloader assembly)
- UV Unloading valve (unloader assembly)
- VI Vacuum indicator
- VV Vacuator valve (dust ejector)
- WS Water separator

3.5.2 Cooling and lubricating oil system

Description

Oil from the oil sump (OS) of gear casing (GC) is circulated by an oil pump (OP), mounted on the front of the gear casing. The pump is driven from the main drive shaft. The oil is pumped to the cooling jacket of the MP compressor element (CE_{MP}) and to the cooling jacket of the LP compressor element (CE_{LP}) and from there through the air-cooled oil cooler (OC). From the LP element cooling jacket the oil passes through oil filter (OF_C) on gear casing before entering the LP and MP element oil pipes and ducts to lubricate the rotor bearings, driving and timing gears. The oil then flows back to the oil sump.

The gear casing is vented to the atmosphere through a breather pot assembly.

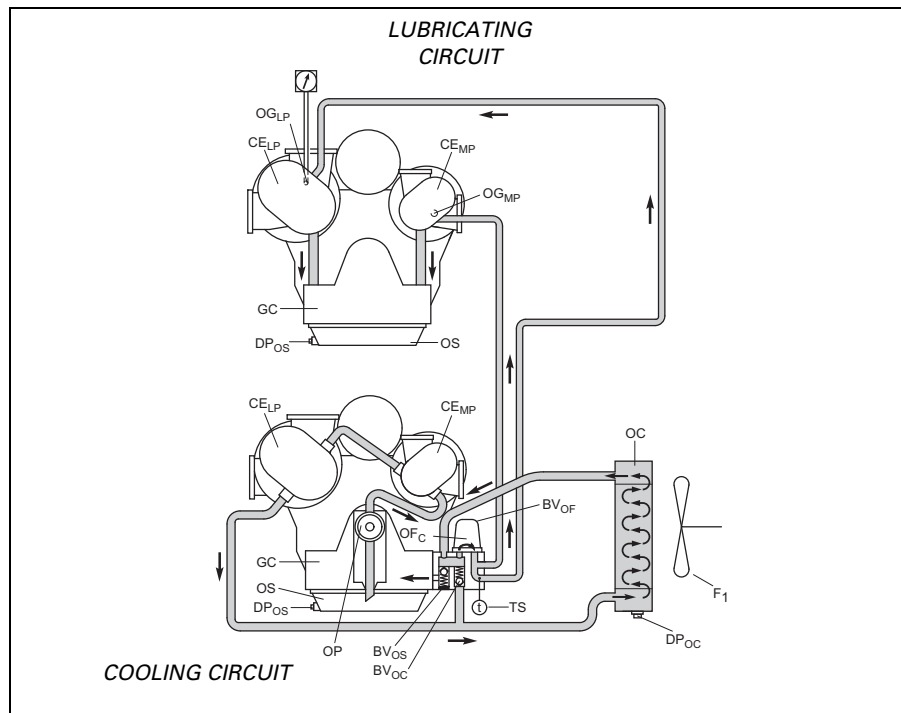
The bypass valve (BV_{OF}) of the oil filter opens when the pressure drop over the filter is above normal due to clogging of the element. The oil is then circulated without being filtered. For this reason, it is imperative to replace the oil filter at regular intervals.

Bypass valve (BV_{OS}) opens when the pressure drop over the filter and lubricating circuit is above normal. The oil is then returned to the oil sump.

Bypass valve (BV_{OC}) opens when the pressure rise over the oil cooler is above normal. This will happen mainly when starting the compressor from cold in low ambient temperatures. The bypassing of the oil cooler will ensure rapid warming of the oil to the normal working temperature.

A pressure shutdown sensor and a temperature reading sensor (TS) are comprised in the system.

Overview



BV _{OC}	Bypass valve (oil cooler)
BV _{OF}	Bypass valve (oil filter)
BV _{OS}	Bypass valve (oil sump)
CE _{LP}	LP compressor element
CE _{MP}	MP compressor element
DP _{OC}	Drain plug (oil cooler)
DP _{OS}	Drain plug (oil sump)
F ₁	Cooling fan 1 (RAD, IC, AC ₁ , OC)
GC	Gear casing
OC	Oil cooler
OF _C	Compressor oil filter (with bypass valve)
OG _{LP}	Oil gallery (LP compressor element)
OG _{MP}	Oil gallery (MP compressor element)
OP	Oil pump
OS	Oil sump
TS	Temperature sensor

3.5.3 Fuel system

Description

In case of internal fuel supply, fuel from the fuel tanks (FT) is circulated by the engine fuel pump (FP_E). The fuel is pumped through a 3-way valve (TWV) to two primary coarse fuel filters (FF_{PC}).

The fuel then passes through the secondary fuel filters (FF_{SE}) and enters the engine (E).

The fuel, which is not used by the engine to combust, returns via the air-cooled fuel cooler (FC) and the 3-way valve to the fuel tanks.

Normally the primary fuel filters are in parallel. By means of the fuel shut-off cock (FSC), seated on the housing of the filters, one of the filters can be shut off when it has to be serviced. This can even be done while the engine is running.



Do not put the fuel shut-off cock in the lowered position (the handle pointer points up) when the engine is running, because both filters will be shut off and no fuel will flow to the engine.

An electrical priming pump (EPP) is comprised in the system to fill up filters and fuellines after maintenance and servicing. A description of this procedure can be found on page 64.

Instead of internal fuel supply via the fuel tanks, external fuel supply is possible.



The unit must be stopped before switching from the internal to an external fuel source.

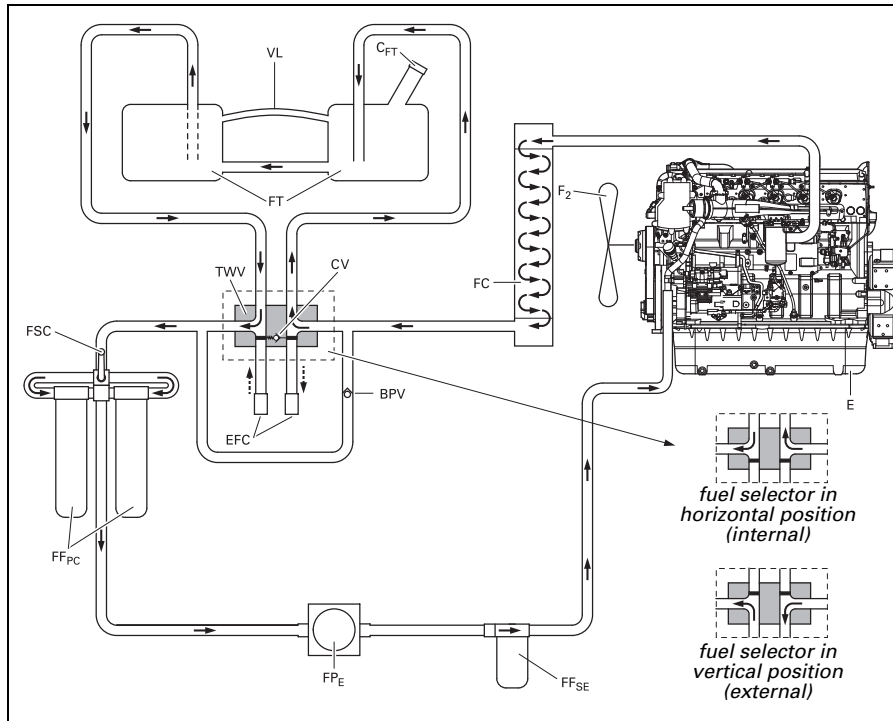
When using external fuel, both the supply and the return hose must be connected to the external fuel supply couplings (EFC).

No restrictions are allowed in those hoses.

Take the necessary precautions to keep the fuel return hose opened and connected, while the unit is running. Check that the primary fuel filters are not both shut off.

Restart the unit.

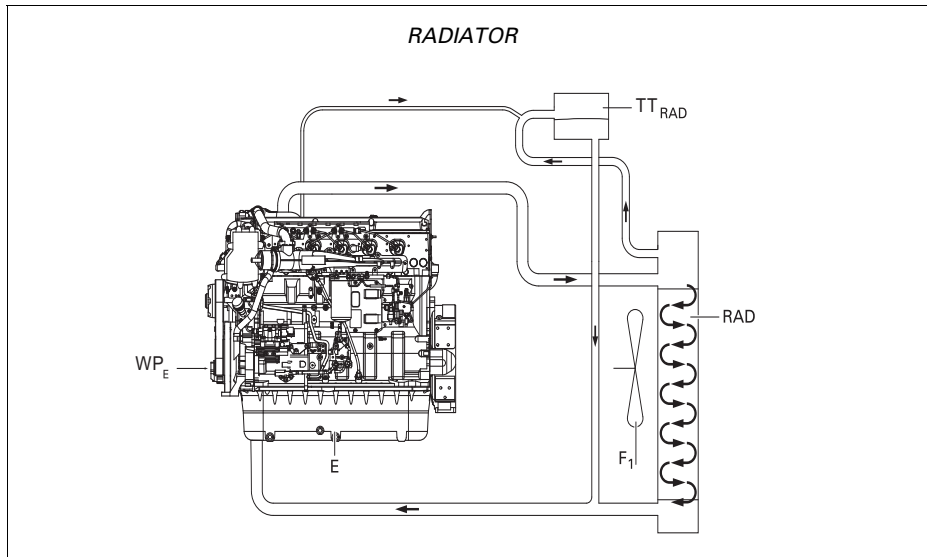
Overview



BPV	Bypass valve
C _{FT}	Filler cap (fuel tank)
CV	Check valve
E	Engine
EFC	External fuel supply coupling
F ₂	Cooling fan 2 (AC ₂ , CAC/FC)
FC	Fuel cooler
FF _{PC}	Primary coarse fuel filter / water separator
FF _{SE}	Secondary engine fuel filter
FP _E	Engine fuel pump
FSC	Fuel shut-off cock
FT	Fuel tank
TWV	3-way valve
VL	Venting line

3.5.4 Water system

Overview



E	Engine
F ₁	Cooling fan 1 (RAD, IC, AC ₁ , OC)
RAD	Radiator
TT _{RAD}	Top tank (radiator)
WP _E	Engine water pump (radiator)

Description

The water system contains a coolant flow to cool the engine's cylinders.

The coolant is circulated by the engine water pump (WP_E), seated on the back of the engine (E). When the coolant returns from the engine, it passes through the radiator (RAD), which is air-cooled by the cooler fan (F₁).

The radiator top tank (TT_{RAD}) supplies the coolant to the system and gives the coolant in the system room to expand.

4 Installation



The operator is expected to apply all relevant safety precautions, including those mentioned on pages 7-10 of this book.

4.1 Transporting and lifting

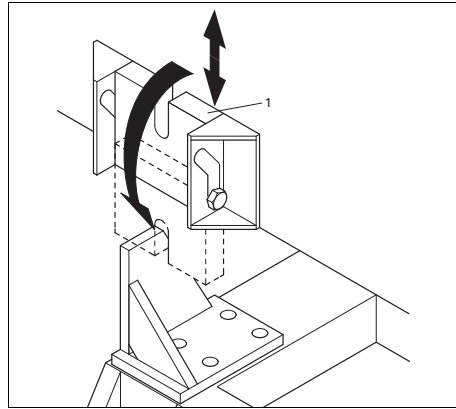
4.1.1 Transporting

Road transport is only allowed on a trailer, with sufficient capacity (wet weight of unit is 8560 kg (18875 lbs)).

Before towing the unit on the trailer, block the towbar by locking the blocking device (1) in downward position. The blocking device has to be pulled up first, before it can be turned over.



Release brake before towing.



- Leave the towbar in blocked position on the trailer and secure the unit (see section 4.2).
- Lock blockage device in upward position when unit is manoeuvred to its working location.
- Lock all service doors.

4.1.2 Lifting

To lift the unit, use a lift truck or crane with sufficient capacity (wet weight of unit is 8560 kg (18875 lbs)).

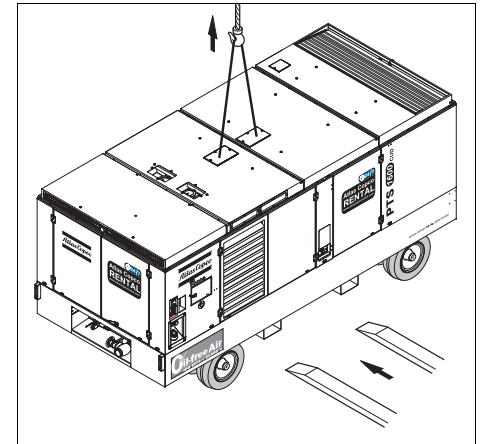
Use the lifting positions of the unit as shown in the figure below.

See to it that the unit will be lifted vertically and remains level.



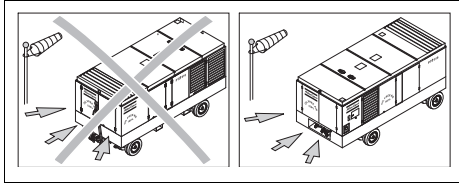
Lifting acceleration and retardation must be kept within safe limits (max. 4g).

Helicopter lifting is not allowed.



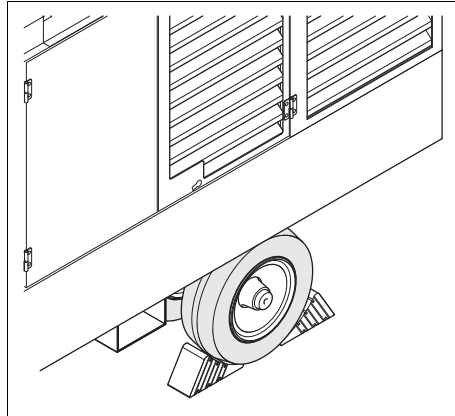
4.2 Parking

- Locate the wind direction and place the rear end of the unit upwind, away from contaminated wind streams and walls. Avoid recirculation of exhaust air from the engine. This causes overheating and engine power decrease.

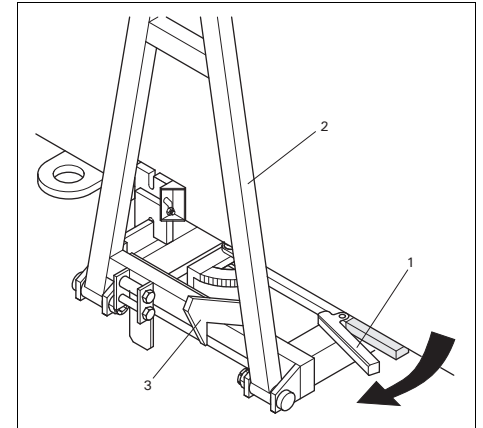


- Park the unit on solid level ground.
- Engage the parking brake by pulling parking brake handle (1).

- Place wheel chocks in front of and behind the wheels before the unit is disconnected from the towing or lifting vehicle.



- Lock the towbar (2) in the raised position with catcher (3).



5 Operating instructions

5.1 Before starting

- With the unit standing level, check the engine and compressor oil levels (see section 6.2.1 and 6.3.1). Add oil if necessary. See section 6.5 for the types of oil to be used. Normally, there is no need to add oil between two oil changes; if there is, check the source of oil consumption.
- Attach the air line(s) to the closed air outlet valve(s) (AOV).



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

No external force may be applied to the air outlet valves, e.g. by pulling hoses or by connecting equipment directly to the valves (e.g. a water separator, a lubricator, pipe extensions, etc.).

- Select fuel source (internal/external) and lock the selector valve.
- Turn ON the battery switch (BS).

- Move the power switch on the control panel (CP) to the ON position and read the fuel level on the display. Top up the fuel tanks (FT), if necessary. Consult the Engine Operation Manual for the type of fuel. Move the control panel power switch to OFF again after filling.
- Check the level of the coolant in the engine radiator (RAD). See section 6.4.1.1. Add coolant if necessary. Consult the Engine Operation Manual for the coolant solutions to be used.
- Press the vacuator valves of the air filters (AF_C and AF_E) to remove dust. See section 6.4.2.2.
- Check the air filter vacuum indicators (VI). If the yellow piston reaches the red marked service range (see section 6.4.2.3), clean or replace the filter elements (see sections 6.4.2.3 and 6.4.2.4). Reset the indicator by pushing the reset button.
- Check the electrolyte level in the batteries (B). Top up if necessary, with distilled water (see section 6.4.8.1).
- Put the fuel shut-off cock, which is seated on the primary fuel filter housing in the back of the unit, in the raised position (the handle pointer points down/filter selection "ALL ON").
- Drain any water and sediment from the primary coarse fuel filters (FF_{PC}).



Make sure that nobody is in the unit and all doors are closed prior to starting the unit.



In cold ambient conditions (temperature below -5°C (23°F)), the engine must be preheated before starting.

In auto mode, connect the engine and compressor block heater and the battery charger to the 220 Volt/110 Volt receptacle.

5.2 Operating

5.2.1 Starting

- Move the control panel power switch to ON. The display of the User Interface will light up. See also chapter 5.3.
- Use the arrow keys to set the working pressure.



Make sure that nobody is in the unit and all doors are closed prior to starting the unit.

- Push the start button on the panel. The horn will sound.

The compressor can be loaded after the warmup period.

- Manual: push the button below the indication LOAD, in the display.
- Automatic: the compressor will load automatically when the button below the indication AUTO LOAD, in the display, is pushed during the warmup period.

The unit will LOAD/UNLOAD according to the air demand.

- Open the air outlet valve(s).



The start/stop instructions are available in different languages on request.

When the unit is in the standby status for a long time, the following action should be performed:

- Without application: turn OFF the battery switch.
- Running: supply power to the battery conditioner.

5.2.2 During operation

Regularly carry out following checks:

- Check alarm lamp at the front and alarm lamp and horn at the back of the unit.

When starting up the unit and also when a shutdown occurs, the alarm lamps and the horn will be activated. But when a warning occurs, only the lamps will be activated.

- Check the air filter service indicator.
If the yellow signal shows in the window of the indicator (see section 6.4.2.3), clean or replace the filter elements.
- Check the air outlet temperature of the MP compressor element.

5.2.3 Stopping

- Close the air outlet valve(s).
- On the User Interface, push the function button below the indication Noload.
- Push the Stop button.



The pressure is not immediately relieved from the unit, when the Stop button is pushed.

- Once the engine has stopped, switch the control panel power switch to the OFF position.
- Turn OFF the battery switch

5.3 Setting the compressor control module

5.3.1 Control

5.3.1.1 Arrow buttons

The arrow buttons are generally used to increase or decrease the setpressure.

In the Process Info status however, they are used to scroll the text up and down the screen, and in the Options status they are used to change the user parameters.

5.3.1.2 Control modes

The CCM can be controlled via three different control modes:

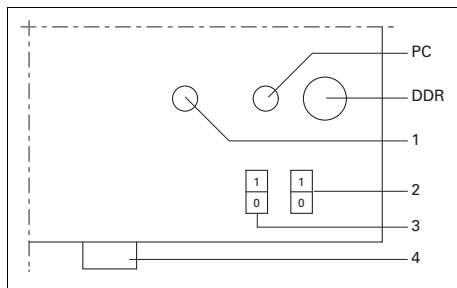
Local control mode

The CCM is controlled by means of the UI. The Control Mode parameter is Local when the Remote parameter is disable or disable lock. The Local control mode is the default mode.

Remote control mode

The CCM is controlled by means of the remote inputs; the remote control connector is located at the back of the UI.

The Control Mode parameter is Remote when the Remote parameter is enable or enable lock.



- | | |
|---|-------------------|
| 1 | Remote |
| 2 | Internal lights |
| 3 | Heaters |
| 4 | Harness connector |

When this control mode is active, monitoring the operation on the UI stays possible. Further, the UI can only be used for looking at the System information and the Process information, and for changing parameters in the Options status.

PC control mode

The CCM is controlled by means of a PC. This control mode can only be selected with the Connect button on the PC. When the button is clicked, the Control Mode parameter becomes remote PC, regardless of the state of the Remote parameter. Changing the Remote parameter will not effect the Control Mode parameter until the Disconnect button is clicked.

When the PC mode is active, monitoring the operation on the UI stays possible. Further, the UI can only be used for looking at the System information and the Process information.

5.3.1.3 Control commands

Start command

- Local: Pressing the Start button on the UI.
Remote: Activating the Remote Start input.
PC: Clicking the Start button on the PC.

Stop command

- Local: Pressing the Stop button on the UI.
Remote: Activating the Remote Stop input.
PC: Clicking the Stop button on the PC.

Load command

- Local: Pressing the Load button on the UI.
Remote: Activating the Remote Load input (when not loaded).
PC: Clicking the Load button with the mouse.

Noload command

- Local: Pressing the Noload button on the UI.
Remote: Activating the Remote Load input (when loaded).
PC: Clicking the Noload button with the mouse.

5.3.1.4 Enable parameters

There are six enable parameters with four possible conditions.

The lock extension gives the Rental companies the possibility to prohibit the operator from changing the parameters via the UI, thus restricting the operator to one condition

Parameter	E/D	Lock	CCM operation
Autostart	enable	x	Automatic start
	disable	x	Manual start
Autostop	enable	x	Automatic stop
	disable	x	Manual stop
Remote	enable	x	Remote Control Mode
	disable	x	Local Control Mode
Air Discharge Temperature Regulation	enable	x	Air Disch. Temp. Control activated
	disable	x	Air Disch. Temp. Control not active
Re/Unload Control	enable	-	Re/Unload press. adjustable with UI
	disable	-	Re/Unload press. not adjustable with UI
Unload RPM Control	enable	-	Unload RPM adjustable with UI
	disable	-	Unload RPM not adjustable with UI

5.3.2 Functionality

The start and stop function can be set to manual or automatic operation.

It is possible to combine these two into a semi-automatic operation.

5.3.2.1 Manual start/manual stop

When switching on the power, the compressor goes to the Ready for Start status.

From this status more information about all system configuration settings can be got, or the engine can be started immediately by pressing the Start button.

When the Start button is pressed, the CCM checks all sensor inputs and parameters. The engine cranking procedure begins.

The engine starts, and the warmup procedure begins.

When the compressor is ready to be loaded, it goes into the Not Loaded status.

The operator can now load the compressor at any time by pressing the Load button.

When loaded, the compressor's regulating system becomes active.

Actual pressure and setpressure are displayed, as well as the condition of the regulating system (load or unload).

The operator can put the compressor back to the Not Loaded status, by pressing the Noload button.

When the operator presses the Stop button in any status from Warmup to Load, the compressor immediately goes to the Cooldown status.

When the cooldown time has elapsed, the stopping procedure begins. The engine stops and the compressor will automatically return to the Ready for Start status.

5.3.2.2 Automatic start/automatic stop

When switching on the power, the compressor goes to the Ready for Start status.

From this status more information about all system configuration settings can be got, or the automatic start can be immediately activated, by pressing the OK button.

When the automatic start is activated, the air discharge pressure is constantly displayed.

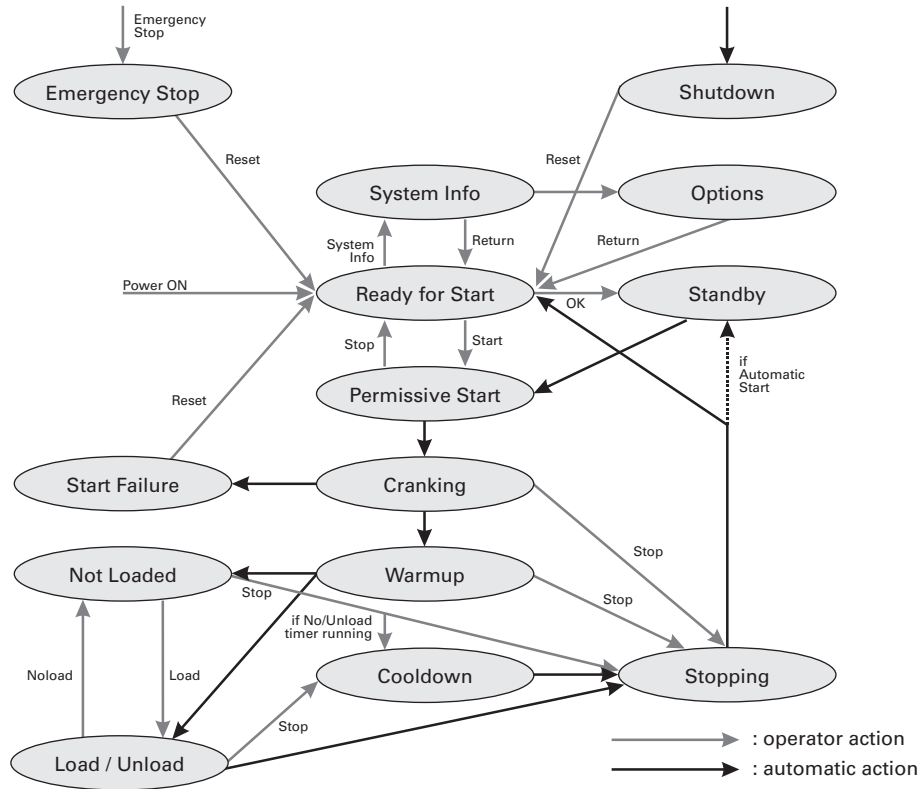
When more air is needed, the pressure drops, and the compressor starts the cranking procedure.

When the engine starts, the compressor still runs through the Warmup status, but the Not Loaded status is skipped, and the regulating system immediately becomes active.

When the compressor runs in the Unload status for a preset time, the stopping procedure begins. The engine stops and the compressor returns to the Standby status, with the automatic start already activated.



The automatic operation can always be interrupted by pressing the Stop button.



5.3.3 A closer look at some operating procedure blocks

5.3.3.1 Process information

While the compressor is running, the operator can take a brief look at all the incoming compressor and engine data, by pressing the Process Info button.

This can be very useful for troubleshooting over the phone.

5.3.3.2 System information

When in the Ready for Start status the System Info button is pressed, all the system configuration settings are displayed, such as: unit type, max. and min. set pressure, active control mode, max. set RPM, battery voltage.

From here the operator can enter the Options status, where he can configure all the parameters he has access to.

5.3.3.3 Options

Here the screen shows all the parameters the operator can edit. With the arrow buttons, one scrolls to an object, and toggles or selects it with the right function button.

Selected values can be changed with the arrow buttons, and the new value is confirmed with the OK button.

At any time the operator can leave the Options status and go to the Ready for Start status by pressing the Return button.

5.3.3.4 Cranking procedure

When a start request is made, either by the operator or automatically, all the compressor parameters are checked.

When one of these parameters is out of its limits, the operator is prompted to the Start failure status, and must return to the Ready for Start status or to the System Info status.

When all the parameters are within limits, the engine starts cranking.

The starter motor runs for a preset time, and then the engine rests for some time, before trying to start again.

This cycle is repeated for a number of times.

When the engine does not start, the starting procedure is ended, and the operator is prompted to the Start Failure status after several failed attempts.

When during the cranking procedure the operator presses the Stop button, a stopping procedure will be executed, and the compressor will return to the Ready for Start status.

5.3.3.5 Warming up

When the engine starts, the compressor enters the Warmup status. This means the engine is going to run idle until the engine coolant temperature has reached a specific value.

If this coolant temperature setting is already reached, there is no warmup, and loading can immediately commence.

When after a specified maximum time the coolant temperature setting is not reached, the compressor will proceed anyway.

When starting manually, the operator can press the Auto Load button. This will result in a skipping of the Not Loaded status, and loading directly after the Warmup status.

5.3.3.6 Pressure regulating system

A PID regulating system is implemented in the CCM and becomes active in the Load/Unload status. This PID regulates the air discharge pressure by adjusting the engine RPM between RPM Min. and RPM Max.

When the air discharge pressure, which is monitored, drops below the Reload pressure, the loading valve is opened and the PID becomes active (load condition).

When less air is needed, the pressure rises and the PID will decrease the engine RPM.

When the engine RPM is at its minimum, and the air flow needed is still smaller than the compressor's output, the pressure will rise until it reaches the Unload pressure. Then the PID will become inactive and the loading valve will close. The engine runs at RPM Min. (unload condition).

When the air discharge pressure drops again, below the Reload pressure, the loading valve is opened and the PID becomes active.

5.3.3.7 Cooling down

When the Stop button is pressed, the engine runs idle for a specified time. If the engine already ran unloaded for some time, before pressing the Stop button, this time is subtracted from the cooldown time because the engine conditions in these cases are the same. This is also why the engine stops without cooldown in automatic stop operation.

When a unit goes to cooldown due to "Engine coolant temperature too high" (see "Engine warnings"). The unit will shut down and on the screen appears "ready for start". When pressing the start button "start request denied" will be displayed. After resetting, this message is cleared and a start attempt can be made. Cooldown Time: default 3 minutes.

5.3.3.8 Shutdowns

There are several parameters which are continuously watched. When one of these parameters exceeds the specified limits, the compressor will shutdown immediately.

The parameters appear on the screen.

The operator can leave the Shutdown status at any time, and go to the Ready for Start status or to the Process Info status by pressing the reset button.

Restarting before the parameter is back within its limits is impossible, because of the parameter check in the cranking procedure.

5.3.3.9 Emergency stop

When an emergency stop button is hit, this message appears on the screen.

Until the emergency stop button is reset, the operator cannot do anything.

When the emergency stop button is reset, the operator can proceed to the Ready for Start status or to the Process Info status.

5.3.3.10 Unload RPM Control

It allows compensation of engine power at high altitude applications.

In the Unload condition the engine will run at the Unload RPM.

In the Load condition the engine will not run slower than the Unload RPM. If the Unload RPM parameter is enable, it is possible for the user to change the Unload RPM with the UI.

5.3.3.11 Loading Valve Control

When the compressor is going to the load condition, and the engine RPM setpoint is above 1420 RPM the loading valve is opened when the engine reaches 1400 RPM.

If the engine RPM setpoint is below 1400 RPM, the loading valve is opened at the engine RPM setpoint - 20 RPM.

5.3.3.12 Pressure Calibration

To compensate the offset error of the Air Discharge Pressure sensor, a Pressure Calibration parameter is implemented.

The offset error is measured by comparing the sensor value with that of a verified and stamped pressure gauge.

This parameter is programmed with the value that compensates the error.

Ex. Pressure gauge value: 7.8 bar

Sensor value: 8.1 bar

Parameter value: - 0.3 bar

5.3.3.13 Poweroff

When the power is switched on, a Wrong Poweroff flag is set.

When the power is switched off when the engine is not running, the Wrong Poweroff flag is reset.

When pressing the emergency stop, the programs of the CCM and the UI keep on running, but the power to the outputs is cut off, so the engine will stop immediately.

When the power is switched off then, the Wrong Poweroff flag is reset.

When the power is switched off while the engine is running, the programs of the CCM and the UI will keep on running and the CCM will stop in a controlled manner (cooldown - stopping procedure), before it will Powerdown and reset the Wrong Poweroff flag.

When the power is switched off as well as the emergency stop is pressed, no power supply to the CCM is left and the engine cannot be shut down properly. The Wrong Poweroff flag is not reset.

When the power is then switched on again, the Wrong Poweroff counter will add 1.

Executing a wrong poweroff can result in memory damage.

5.3.3.14 Powerdown

To save the batteries, the CCM and UI are equipped with a Powerdown function.

When the compressor is not running and the Automatic start is not activated, the CCM and UI will go to Powerdown mode if there has not been any action during the Powerdown time.

In Powerdown mode the CCM and UI will perform as little as possible to reduce the power consumption. The screen of the UI will therefore be shut down.

Local control mode

When a button is pressed on the UI, the CCM will return to its previous status.

Remote control mode

When the compressor is in the Ready for Start status and the Remote start button is pressed, the CCM will come out of Powerdown and go directly to the Permissive Start or Standby status. Pressing any other Remote control button (except Remote ON), will only result in deactivating the Powerdown, also when the CCM is in any other status.

When the Remote ON input is not active, none of the Remote inputs can deactivate the Powerdown.

When a button on the UI is pressed, the CCM will come out of Powerdown.

When there has not been any action during three minutes, the CCM will return to Powerdown.

PC control mode

When an action is performed via the PC, demanding a response from the CCM or UI (Start signal, changing settings, ...), the CCM will come out of Powerdown.

When a button on the UI is pressed, the CCM will come out of Powerdown as well.

When there has not been any action during three minutes, the CCM will return to Powerdown.

5.3.3.15 Air Discharge Temperature Control (optional)

By changing the temperature of the cooling air going through the aftercooler it is possible to heat the discharge air to a certain setting.

This is done with a proportional valve controlled with a PWM signal, and mounted on a cooler.

The Air Discharge Temperature Control becomes active after the Warmup status, and stays active for as long as the engine is running. The operation of the Air Discharge Temperature Control depends on the Air Discharge Temperature Control Parameter.

Air Discharge Temperature Control parameter "Disable"

When the parameter is disable or disable lock, the PID will regulate the Air Discharge Temperature to a fixed value of 4°C to prevent freezing.

The CCM will run through the standard Warmup procedure, with the valve closed.

Air Discharge Temperature Control parameter "Enable"

When the parameter is enable or enable lock, the PID will regulate the Air Discharge Temperature to the Air Discharge Temperature Setting.

After starting the compressor, the CCM will first run through the Temperature Control Warmup procedure in the Warmup status. This procedure will override the standard Warmup procedure and settings.

When the engine started, the CCM executes following Warmup procedure if the Air Discharge Control Parameter is Enable (lock);

If the Coolant Water Temperature is at 50°C or above, the Warmup procedure is ended.

When the Warmup procedure has ended, the CCM can go to the Not Loaded status, or to the Load/Unload status.

5.3.3.16 Barometric Calibration

For applications running in low barometric pressure environments (high altitude), Cummins compensates the diesel injection.

5.4 Operation via User Interface

5.4.1 General

In this section an overview is given of all statuses of the CCM.

The reactions of the compressor to actions of the operator and to signals from the compressor itself, are also shown.



A: action (carried out by operator)

S: signal (generated by compressor)

R: reaction

5.4.2 Ready for Start status

5.4.2.1 Manual start



S	Warnings	R	Are shown on the screen
A	Emergency stop button	R	To emergency stop status (see section 5.4.13)
A	↓-button, press once	R	Set pressure - 0.1 bar
A	↑-button, press once	R	Set pressure + 0.1 bar
A	↓-button, press continuously	R	Set pressure - 0.1 bar/second
A	↑-button, press continuously	R	Set pressure + 0.1 bar/second
A	Power OFF switch	R	End of operation
A	System info button	R	To system info status (see section 5.4.14)
A	Start command	R	To permissive start status (see section 5.4.4)

Other actions and signals have no effect in this status.

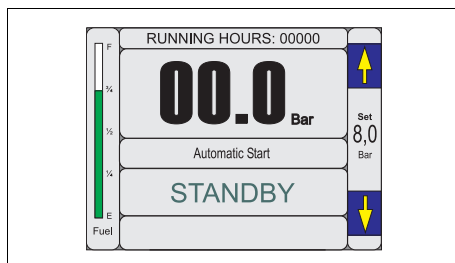
5.4.2.2 Automatic start



S Warnings	R Are shown on the screen
A Emergency stop button	R To emergency stop status (see section 5.4.13)
A ↓-button, press once	R Set pressure - 0.1 bar
A ↑-button, press once	R Set pressure + 0.1 bar
A ↓-button, press continuously	R Set pressure - 0.1 bar/second
A ↑-button, press continuously	R Set pressure + 0.1 bar/second
A Power OFF switch	R End of operation
A System info button	R To system info status (see section 5.4.14)
A OK button or Remote start input (if Remote control mode)	R To standby status (see section 5.4.3)

Other actions and signals have no effect in this status.

5.4.3 Standby status



S Warnings	R Are shown on the screen
A Emergency stop button	R To emergency stop status (see section 5.4.13)
A ↓-button, press once	R Set pressure - 0.1 bar
A ↑-button, press once	R Set pressure + 0.1 bar
A ↓-button, press continuously	R Set pressure - 0.1 bar/second
A ↑-button, press continuously	R Set pressure + 0.1 bar/second
A Stop command	R Automatic start deactivated. To Ready for Start status, automatic start (see section 5.4.2)
A Autostart pressure reached	R To permissive start status (see section 5.4.4)
A Power OFF switch	R Automatic start deactivated. End of operation

Other actions and signals have no effect in this status.

5.4.4 Permissive start status

In this status the CCM checks if the parameters are out of range and checks all sensor inputs for sensor faults.

This status does not require any action from the operator, and is therefore not visible on the screen.

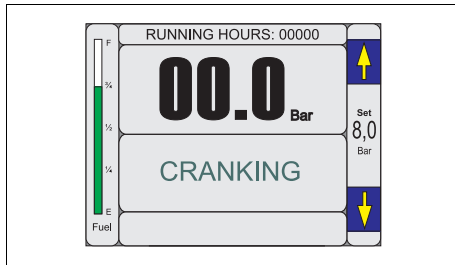
Yet, some buttons and signals do have a function.

S Warnings	R Are shown on the screen
A Shutdowns	R To start failure status (see section 5.4.11)
A Emergency stop button	R To emergency stop status (see section 5.4.13)
A ↓-button, press once	R Set pressure - 0.1 bar
A ↑-button, press once	R Set pressure + 0.1 bar
A ↓-button, press continuously	R Set pressure - 0.1 bar/second
A ↑-button, press continuously	R Set pressure + 0.1 bar/second
A Stop command	R To ready for start status (see section 5.4.2)
A Power OFF switch	R Automatic start deactivated. End of operation

Other actions and signals have no effect in this status.

If all parameters are within the defined limits, cranking will begin, the CCM will go to the Cranking status.

5.4.5 Cranking status



S Warnings	R Are shown on the screen
A Shutdowns	R To start failure status (see section 5.4.11)
A Crank counter = Max. crank attempts	R To start failure status (see section 5.4.11)
A Starter lockout activation RPM reached	R The starter motor output is activated; to Warmup status (see section 5.4.6)
A Emergency stop button	R To emergency stop status
A ↓-button, press once	R Set pressure - 0.1 bar
A ↑-button, press once	R Set pressure + 0.1 bar
A ↓-button, press continuously	R Set pressure - 0.1 bar/second
A ↑-button, press continuously	R Set pressure + 0.1 bar/second
A Power OFF switch	R To stopping status (see section 5.4.10)
A Stop command	To stopping status (see section 5.4.10)

If cranking:

S Crank time elapsed

S The starter motor output is deactivated for the duration of the crank time (resting).
Crank counter +1

The starter motor output is activated when the CCM enters this status.

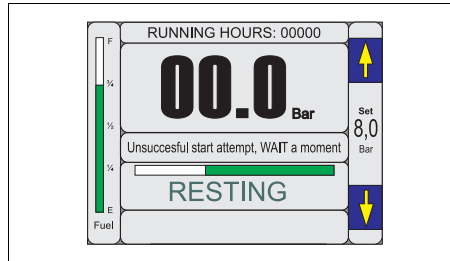
The Crank counter is reset to 0.

If resting:

S Crank time elapsed

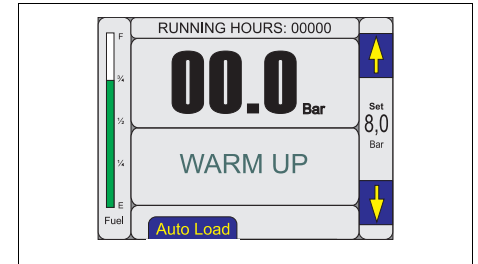
S The starter motor is reactivated, the screen shows “Crank attempt X”, with X being the Crank counter.

Other actions and signals have no effect in this status.



5.4.6 Warmup status

5.4.6.1 Manual start



S Warnings	R Are shown on the screen
A Shutdowns	R To start failure status (see section 5.4.11)
A Max. warmup time elapsed	R Not Loaded status or Load/Unload status (see section 5.4.7)
A Emergency stop button	R To emergency stop status (see section 5.4.13)
A ↓-button, press once	R Set pressure - 0.1 bar
A ↑-button, press once	R Set pressure + 0.1 bar
A ↓-button, press continuously	R Set pressure - 0.1 bar/second
A ↑-button, press continuously	R Set pressure + 0.1 bar/second
A Stop command	R To stopping status (see section 5.4.10)
A Power OFF switch	R To stopping status (see section 5.4.10)

A Auto load button or Remote Load input if Remote control mode | R After the Warmup status, the CCM will skip the Not Loaded status and go directly to the Load/Unload status (see section 5.4.8) “Automatic load” will appear on the screen

If min. Warmup time is elapsed:

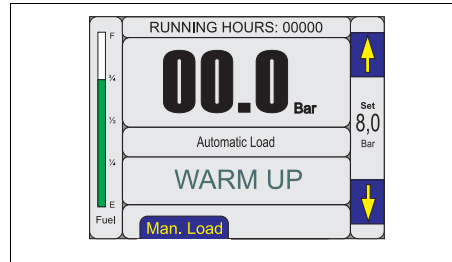
S Coolant = Warmup temperature | R To Not Loaded status (see section 5.4.7) or Load/Unload status (see section 5.4.8)

If Auto Load button was pressed:

A Manual load button or Remote Load input if Remote control mode | R Auto Load condition is canceled

Other actions and signals have no effect in this status.

5.4.6.2 Automatic start



S Warnings	R Are shown on the screen
A Shutdowns	R To shutdown status (see section 5.4.12)
A Max. warmup time elapsed	R To Not Loaded status (see section 5.4.7) or Load/Unload status (see section 5.4.8)
A Emergency stop button	R To emergency stop status (see section 5.4.13)
A ↓-button, press once	R Set pressure - 0.1 bar
A ↑-button, press once	R Set pressure + 0.1 bar
A ↓-button, press continuously	R Set pressure - 0.1 bar/second
A ↑-button, press continuously	R Set pressure + 0.1 bar/second
A Stop command	R To stopping status (see section 5.4.10)
A Power OFF switch	R To stopping status (see section 5.4.10)

A Manual load button or Remote Load input if Remote control mode | R After the Warmup status, the CCM will go to the Not Loaded status (see section 5.4.7) before going to the Load/Unload status (see section 5.4.8) “Automatic load” will disappear from the display

If min. Warmup time is elapsed:

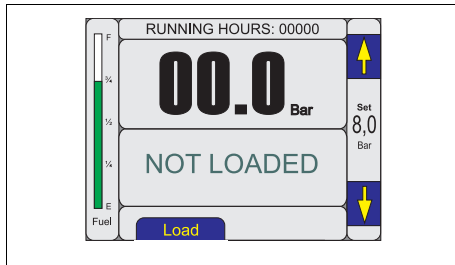
S Coolant = Warmup temp. | R To Load/Unload status (see section 5.4.8) or Not Loaded status (see section 5.4.7)

If Manual Load button was pressed:

A Auto load button or Remote Load input if Remote control mode | R Manual Load condition is canceled

Other actions and signals have no effect in this status.

5.4.7 Not Loaded status

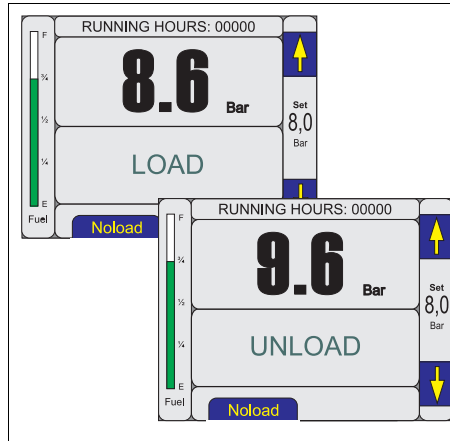


S Warnings	R Are shown on the screen
S Shutdowns	R To Shutdown status (see section 5.4.12)
A Emergency stop button	R To emergency stop status (see section 5.4.13)
A ↓-button, press once	R Set pressure - 0.1 bar
A ↑-button, press once	R Set pressure + 0.1 bar
A ↓-button, press continuously	R Set pressure - 0.1 bar/second
A ↑-button, press continuously	R Set pressure + 0.1 bar/second
A Stop command	R To Stopping status (see section 5.4.10)
A Power OFF switch	R To Stopping status (see section 5.4.10)
A Load command	R To Load/Unload status (see section 5.4.8)

Other actions and signals have no effect in this status.

5.4.8 Load/Unload status

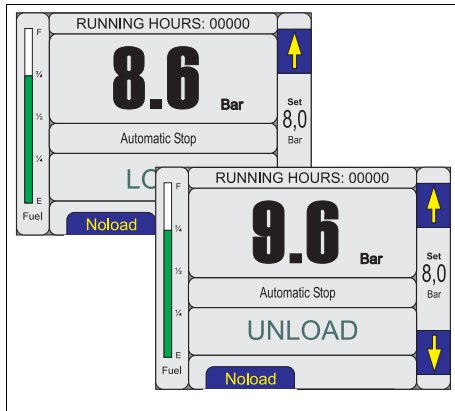
5.4.8.1 Manual stop



S Warnings	R Are shown on the screen
A Shutdowns	R To Shutdown status (see section 5.4.12)
A Emergency stop button	R To emergency stop status (see section 5.4.13)
A ↓-button, press once	R Set pressure - 0.1 bar
A ↑-button, press once	R Set pressure + 0.1 bar
A ↓-button, press continuously	R Set pressure - 0.1 bar/second
A ↑-button, press continuously	R Set pressure + 0.1 bar/second
A Stop command	R To Cooldown status (see section 5.4.9)
A Power OFF switch	R To Cooldown status (see section 5.4.9)

A Noload command	R To Not Loaded status (see section 5.4.7)
If Loaded:	
S Unload pressure reached	R "Unload" appears on the screen
If Unloaded:	
A Reload pressure reached	R "Load" appears on the screen
Other actions and signals have no effect in this status.	

5.4.8.2 Automatic stop



S Warnings	R Are shown on the screen
A Shutdowns	R To Shutdown status (see section 5.4.12)
A Emergency stop button	R To emergency stop status (see section 5.4.13)
A ↓-button, press once	R Set pressure - 0.1 bar
A ↑-button, press once	R Set pressure + 0.1 bar
A ↓-button, press continuously	R Set pressure - 0.1 bar/second
A ↑-button, press continuously	R Set pressure + 0.1 bar/second
A Stop command	R To Cooldown status (see section 5.4.9)
A Power OFF switch	R To Cooldown status (see section 5.4.9)
A Noload command	R To Not Loaded status (see section 5.4.7)

If Loaded:

S Unload pressure reached | R “Unload” appears on the screen
Autostop timer activated

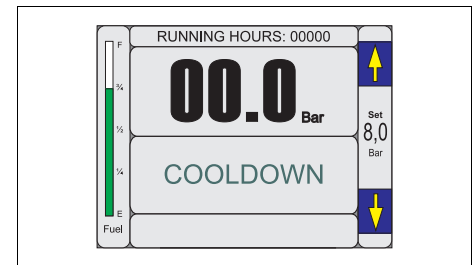
If Unloaded:

A Reload pressure reached | R “Load” appears on the screen
Autostop timer reset

S Autostop time elapsed | R To stopping status (see section 5.4.10)

Other actions and signals have no effect in this status.

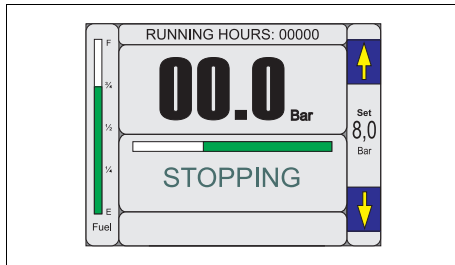
5.4.9 Cooldown status



S Warnings	R Are shown on the screen
A Shutdowns	R To shutdown status (see section 5.4.12)
A Cooldown time elapsed	R Stopping status (see section 5.4.10)
A ↓-button, press once	R Set pressure - 0.1 bar
A ↑-button, press once	R Set pressure + 0.1 bar
A ↓-button, press continuously	R Set pressure - 0.1 bar/second
A ↑-button, press continuously	R Set pressure + 0.1 bar/second
A Emergency Stop button	R To emergency Stop status (see section 5.4.13)

Other actions and signals have no effect in this status.

5.4.10 Stopping status

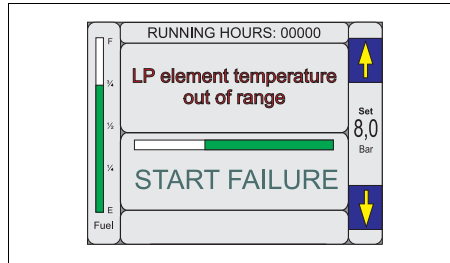


S Warnings	R Are shown on the screen
A Shutdowns	R To shutdown status (see section 5.4.12)
A Stopping procedure has ended	R If manual start: To Ready for Start status (see section 5.4.2) If automatic start: To Standby status (see section 5.4.3) If Power OFF: End of operation
A Emergency Stop button	R To emergency Stop status (see section 5.4.13)
A ↓-button, press once	R Set pressure - 0.1 bar
A ↑-button, press once	R Set pressure + 0.1 bar
A ↓-button, press continuously	R Set pressure - 0.1 bar/second
A ↑-button, press continuously	R Set pressure + 0.1 bar/second

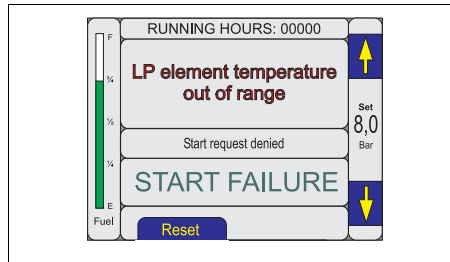
Other actions and signals have no effect in this status.

5.4.11 Start failure status

First a stopping procedure is executed, and the operator has to wait.



Sreen A: Start failure, origin in Permissive start status.



Sreen B: Start failure, origin in Cranking status.

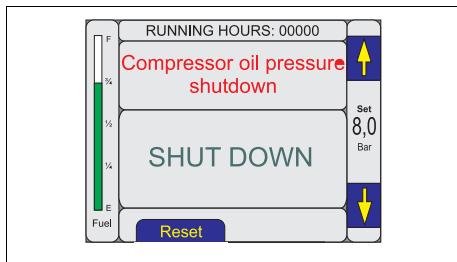
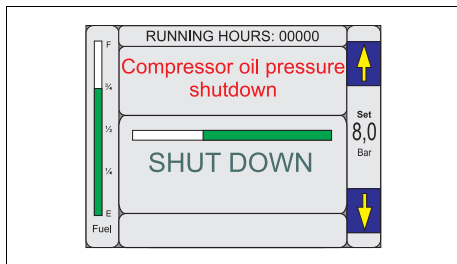


S Warnings	R Are shown on the screen
A Emergency Stop button	R To emergency Stop status (see section 5.4.13)
A ↓-button, press once	R Set pressure - 0.1 bar
A ↑-button, press once	R Set pressure + 0.1 bar
A ↓-button, press continuously	R Set pressure - 0.1 bar/second
A ↑-button, press continuously	R Set pressure + 0.1 bar/second
A Power OFF switch	R End of operation
A Reset button	R To Ready for Start status (see section 5.4.2)

Other actions and signals have no effect in this status.

5.4.12 Shutdown status

First a stopping procedure is executed.

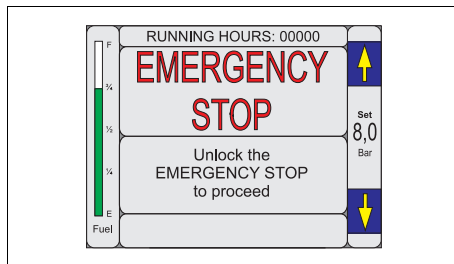


S Warnings	R Are shown on the screen
A Emergency Stop button	R To emergency Stop status (see section 5.4.13)
A ↓-button, press once	R Set pressure - 0.1 bar
A ↑-button, press once	R Set pressure + 0.1 bar
A ↓-button, press continuously	R Set pressure - 0.1 bar/second
A ↑-button, press continuously	R Set pressure + 0.1 bar/second
A Power OFF switch	R End of operation
A Reset button	R To Ready for Start status (see section 5.4.2)

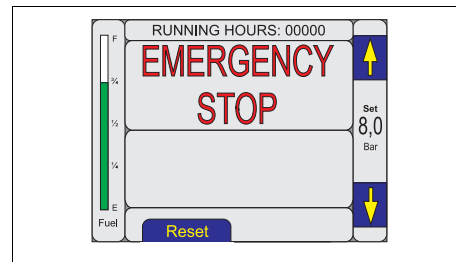
Other actions and signals have no effect in this status.

5.4.13 Emergency stop status

Screen A: Emergency Stop is pressed.



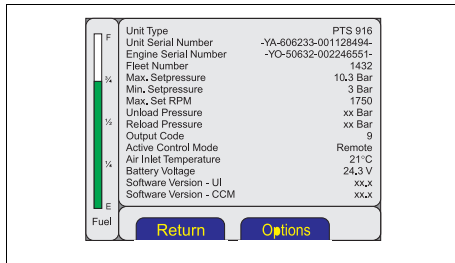
Screen B: Emergency Stop is unlocked.



S Warnings	R Are shown on the screen
A ↓-button, press once	R Set pressure - 0.1 bar
A ↑-button, press once	R Set pressure + 0.1 bar
A ↓-button, press continuously	R Set pressure - 0.1 bar/second
A ↑-button, press continuously	R Set pressure + 0.1 bar/second
A Power OFF switch	R End of operation
If Emergency Stop is locked:	
A Unlock Emergency Stop	R To screen B
If Emergency Stop is unlocked:	
A Lock Emergency Stop	R To screen A
A Reset button	R To Ready for Start status (see section 5.4.2)

Other actions and signals have no effect in this status.

5.4.14 System info status



This status gives a summary of the following parameters:

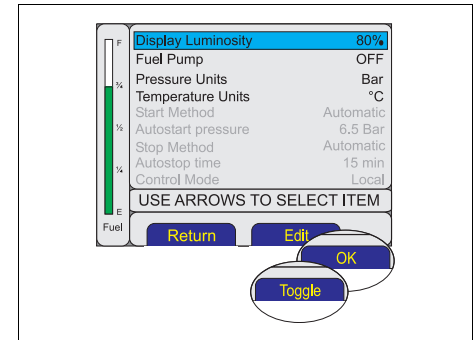
- Unit Type
- Unit Serial Number
- Engine Serial Number
- Fleet Number
- Maximum Setpressure
- Minimum Setpressure
- Maximum Set RPM
- Unload pressure
- Reload pressure
- Output Code: This code is directly proportional to the Maximum set RPM, and gives a rough indication of the maximum Free Air Delivery (FAD) with the current setting.
- Active Control Mode: Local control; Remote control; PC control.
- Air Inlet Temperature

- Battery Voltage
- Software version UI
- Software version CCM

A ↓-button, press once	R Set pressure - 0.1 bar
A ↑-button, press once	R Set pressure + 0.1 bar
A Return button	R To Ready for Start status (see section 5.4.2)
A Options button	R To options status (see section 5.4.15)
A Emergency stop button	R To emergency stop status (see section 5.4.13)
A Power OFF switch	R End of operation

Other actions and signals have no effect in this status.

5.4.15 Options status



In this status, the operator can change the parameters for which he has clearance.

The Rental companies can deny access to the gray parameters for the operator.

In that case, the parameters are not shown on the screen.

With the arrow buttons, a parameter is selected.

Parameters which toggle between different settings (e.g.: Pressure Units), can be changed by pressing the Toggle button.

Other parameters (e.g.: Display Luminosity) can be changed by pressing the Edit button.

After changing the value with the arrow buttons, the new value needs to be confirmed with the OK button.

A Return button	R To Ready for Start status (see section 5.4.2)
-----------------	---

The parameters the operator can change are:

- Display Luminosity
 - Pressure Units (Metric/Imperial)
 - Temperature Units (Metric/Imperial)
 - Flow Units (Metric/Imperial)
 - Start method (if Autostart = enable or disable)
 - Autostart pressure (if Autostart = enable or enable lock)
 - Stop method (if Autostop = enable or disable)
 - Autostop time (if Autostop = enable or enable lock)
 - Control mode (if Remote = enable or disable) (Local/Remote)
 - Air discharge temperature control (if Air Discharge Temperature Control Parameter = enable or disable)
 - Air discharge temperature setpoint (if Air Discharge Temperature Control Parameter = enable or enable lock)
 - Reload/Unload pressure (if enabled)
- Other actions and signals have no effect in this status.

5.4.16 Process Info status

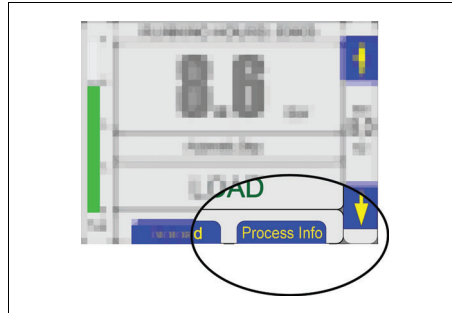
5.4.16.1 Two key access

Depending on the setting of the Infobutton parameter, the operator has access to the Process Info status by pressing a single named function key, the Process Info button. In that case the Infobutton parameter is enable.

When the Infobutton parameter is disable, the access to the Process Info status is made by a two button function.

While pressing the unnamed function button, which otherwise would be the Process Info button, the other function button has to be pressed.

The Infobutton parameter can be changed with the PC, Rental companies clearance.



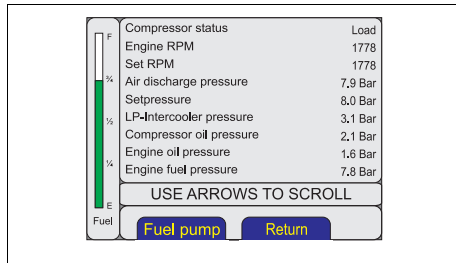
5.4.16.2 Process Info status function

This status is not an active status, but can be entered from the following statuses:

- Standby status
- Permissive Start status
- Cranking status
- Warmup status
- Noload status
- Load/Unload status
- Cooldown status
- Shutdown status
- Start Failure status
- Emergency Stop status

The Process Info status gives a summary of all parameters measured by the CCM, and those taken from the ECM's dataline.

These parameters are:



- Compressor status
- Engine RPM
- Set RPM
- Air discharge pressure
- Set pressure
- LP intercooler pressure
- MP intercooler pressure
- Compressor oil pressure
- Engine oil pressure
- Engine fuel pressure
- Ambient temperature
- LP element temperature
- MP element temperature

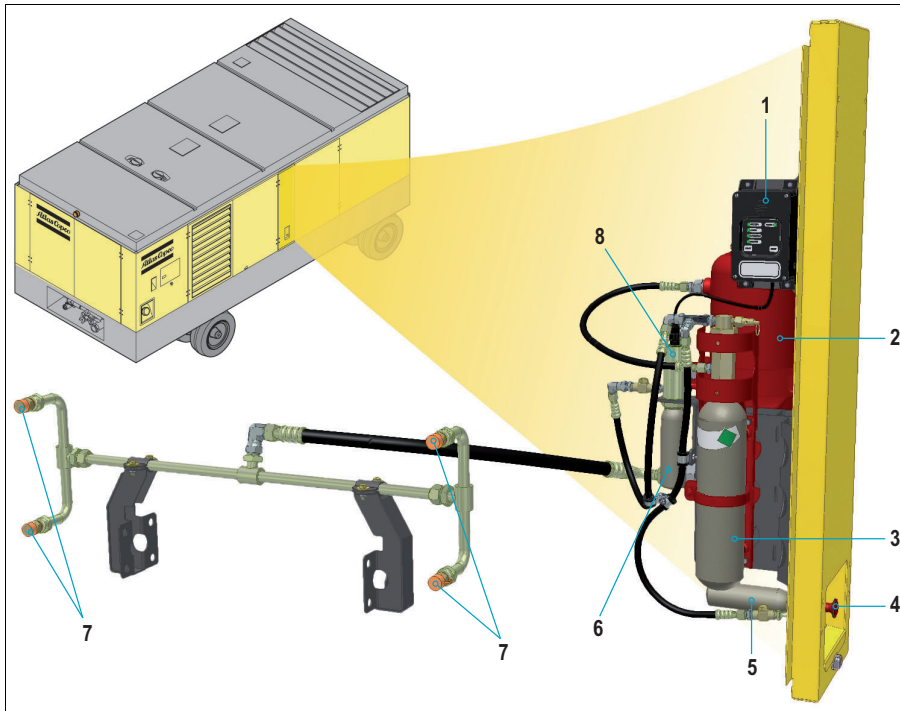
- Compressor oil temperature
- Air discharge temperature
- Air discharge temp. setting
- Air disch. temp. valve pos.
- Coolant temperature
- Fuel temperature
- Fuel level
- Engine fuel consumption
- Battery voltage
- Loading valve status
- Engine power contact
- Starter engine status
- Oiler valve status
- Blow-off valve status
- Flap lock solenoid
- Engine load
- Engine boost pressure
- Air inlet temperature

S	Shutdowns	R	To Shutdown status (see section 5.4.12)
A	Time-out	R	Back to active compressor status
A	Emergency Stop button	R	To Emergency Stop status (see section 5.4.13)
A	↓-button	R	Scroll text down
A	↑-button	R	Scroll text up
A	Return button	R	Back to active compressor status
A	Stop command	R	Same function as in the active compressor status

Other actions and signals have no effect in this status.

5.5 Operating the automatic fire suppression system

5.5.1 Main components



- 1 Control module
- 2 Cylinder with extinguishing powder
- 3 Large nitrogen cylinder
- 4 Manual actuator
- 5 Small nitrogen cylinder
- 6 Small nitrogen cylinder
- 7 Nozzles
- 8 Automatic actuator

5.5.2 Operation

The fire suppression system is equipped with a manual and automatic activation.

The automatic activation detects a fire via a heat sensitive wire. As soon as a fire is detected, the control module (1) shuts down the compressor. After a delay of 30 seconds the automatic actuator (8) releases a small nitrogen cartridge (6), by which the larger nitrogen bottle (3) is released. The compressed gas will blow the extinguishing powder from cylinder (2) through the nozzles (7) into the engine compartment.

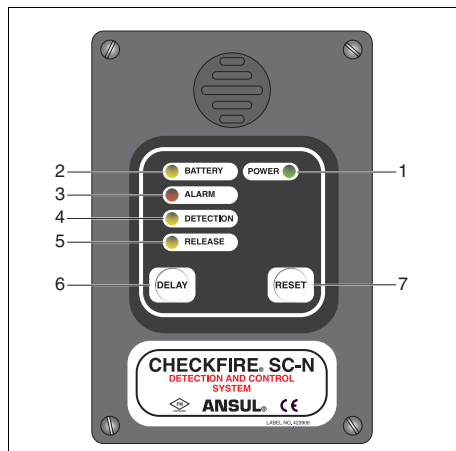
The manual activation is a push button (4) on the outside of the compressor. Removing the lock pin and pushing the button releases a separate nitrogen cartridge (5) which activates the powder release and shuts down the machine.

The automatic fire suppression system is directly powered by the compressor batteries. This means that the system remains powered when the battery switch is switched off.

5.5.3 Control module

The automatic fire suppression installation is constantly monitored by a control module. It is powered by the machine's batteries but also fitted with an internal battery guaranteeing power supply should the batteries fail.

A number of LED's indicate the system status.



1	Power	5	Release
2	Battery	6	Delay
3	Alarm	7	Reset
4	Detection		



Staff that are not familiar with this system are not allowed to run checks on the system. Wrong handling may lead to an inactive system or release of extinguishing powder. All repairs have to be done by authorized personnel.

5.5.3.1 Indicators

1. POWER

LED pulses every three seconds when indicating normal power. If the power drops below an acceptable level of either the internal or external power source, the green POWER LED will be extinguished.

2. BATTERY

LED pulses every 10 seconds when low power condition is detected from either the internal or external power source. Please check the system and restore power supply.

3. ALARM

The alarm LED will flash in case of an alarm condition. An alarm condition is caused by detection circuit activation.

4. DETECTION

The detection LED and the audio pulse once every 10 seconds when the control module detects a problem in the detection circuit. Please check the integrity of the detection wire.

5. RELEASE

The release LED and the audio pulse once every 10 seconds when the control module detects a problem in the release circuit. Please check the connection with the automatic actuator.

5.5.3.2 Buttons

6. DELAY

This button is used during programming and can be used for maintenance checks.

7. RESET

Pressing this button for more than 1 second will reset the controller after a fault detection or activates the system after restoring power e.g. after replacing the internal battery.

5.5.4 Daily check

The LED's status on the ANSUL control module should be checked daily prior to starting up the compressor. The green Power LED (1) should flash every three seconds, no other LED may flash and no audio alarm should be sounding! It is not allowed to start up the compressor when there are any deviations.

6 Maintenance

6.1 Maintenance schedule

Maintenance schedule	Daily	50 hrs	every 250 hrs	every 1000 hrs	every 1500hrs	every 6000 hrs	every 10000 hrs
Service pak	-	2912 4580 04	2912 4581 05	2912 4582 06	-	-	-
Check engine oil level	x		x	x	x	x	x
Check compressor oil level	x		x	x	x	x	x
Check coolant levels (radiator)	x		x	x	x	x	x
Check coolant additive and antifreeze concentration			x	x	x	x	x
Check routing and condition of flexible hoses	x		x	x	x	x	x
Drain prefilters (water separators) 30μ	x		x	x	x	x	x
Change fuel prefilter 30μ		x	x	x	x	x	x
Check fan cooling	x		x	x	x	x	x
Check on abnormal noise and smoke	x		x	x	x	x	x
Change engine fuel filter		x	x	x	x	x	x
Add engine oil	x	x					
Change engine oil			x(2)	x	x	x	x
Replace engine oil filters			x	x	x	x	x
Change coolant filter				x		x	
Coolant fan belt tensioner					x		
Check engine compressor drive belt			x	x	x	x	x
Check engine fan drive belt			x	x	x	x	x

Maintenance schedule	Daily	50 hrs	every 250 hrs	every 1000 hrs	every 1500hrs	every 6000 hrs	every 10000 hrs
Service pak	-	2912 4580 04	2912 4581 05	2912 4582 06	-	-	-
Clean service filter water separator			x	x	x	x	x
Grease turntable			x	x	x	x	x
Check tension and condition of poly V-belts	x		x		x	x	
Check electrolyte and terminals on batteries				x	x	x	x
Drain water and sediment in fuel tanks			x		x	x	
Clean air filters elements (1)	x		x		x	x	x
Replace air filter elements (1)				x		x	x
Replace air filter safety cartridge				x		x	x
Change engine air filter and cartridge				x		x	x
Check air intake piping	x						
Check charge air piping	x						
Test safety / relief valves					x	x	
Check coolant condition				x	x	x	
Drain air tanks and reservoirs	x		x		x	x	x
Check crankcase breather tube						x	
Replace the crancase breather internal						Only Cummins	
Clean gear casing breather pot					x	x	
Replace compressor oil filter				x		x	
Inspect / Adjust engine valve clearance						x	
Grease engine fan drive						x	

Maintenance schedule	Daily	50 hrs	every 250 hrs	every 1000 hrs	every 1500hrs	every 6000 hrs	every 10000 hrs
Service pak	-	2912 4580 04	2912 4581 05	2912 4582 06	-	-	-
Grease fan drive						X	
Replace cooler system water temperature regulator						X	
Change compressor oil				X		X	
Replace silencers glasswool and insert (every 2 years)						X	
Replace roller diaphragm of unloader cylinder						X	
Replace parts of unloader cylinder						X	
Replace diaphragm of the balancing pistons						X	
Replace check valve in compressed-air sytem						X	
Replace coolant							X

Notes:

- The initial service pak, which has been supplied with the unit, should be performed after the first 50 hours.
 - For grey-marked service activity intervals, new parts are included in the service pak mentioned on top of the column.
- (1) More frequently when operating in a dusty environment.
 - (2) Engine oil change interval can be increased until 500 hrs depending on fuel consumption over that period of time.



Contact your local Cummins support for more information and make sure to have their agreement to increase oil change interval.



Keep the bolts of the housing, the lifting eye, the towbar and the axle securely tightened. Refer to “Technical specifications” on page 84 and to “Torque values” on page 84.

6.1.1 Use of preventive maintenance schedule

The maintenance 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.

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

6.1.2 Service paks and kits

6.1.2.1 Service paks

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

Service paks minimise downtime and keep your maintenance budget low.

Order service paks at your local Atlas Copco dealer.

6.1.2.2 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.

Atlas Copco service kits offer you all the benefits of genuine Atlas Copco parts, save on administration costs and are offered at a reduced price compared to the loose components.

The order numbers of the service paks and kits are listed in the Atlas Copco Parts List (ASL).



Contact Atlas Copco.

6.2 Engine maintenance procedures

Refer to the engine's operator manual for full maintenance schedule.

6.2.1 Engine oil level check

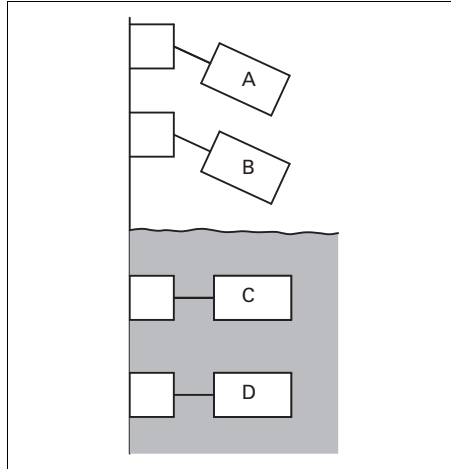
Check the engine oil level via the dipstick on the engine and via the transparent tube on the engine oil tank.

Add correct oil (see section 6.5), if necessary.

The unit has been equipped with an automatic oil level control.

The oil level maintainer valve controls the oil level in the oil sump of the engine. This valve is seated underneath the oil tank in the back of the unit.

A small oil tank with three level switches is mounted on the engine and is functioning as a communicating vessel with the oil sump of the engine. These level switches (overflow - full - warning - shutdown) are connected to the CCM and control the oil level maintainer valve.



- A | Oil level switch 'overflow'
- B | Oil level switch 'full'
- C | Oil level switch 'warning'
- D | Oil level switch 'shutdown'

When the engine is running, the oil level diminishes. When the oil reaches the warning level, the CCM generates an Engine Oil Level warning. This warning is not immediately displayed on the screen of the User Interface, but is held back for the duration of the Engine Oil Level Warning Time.

When the warning is generated, the oil level maintainer valve is opened. Oil flows from the oil tank into the oil sump of the engine and into the small oil tank. The warning condition will disappear. The oil level rises until the oil reaches the full level. Then the oil level maintainer valve is closed.

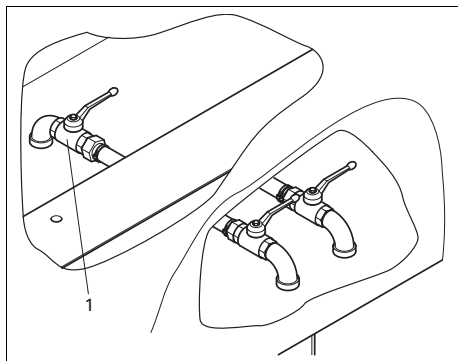
When the warning does not disappear, because the oil tank is empty, the warning will be displayed on the screen of the User Interface.

When the oil reaches the shutdown level, the CCM generates an Engine Oil Level shutdown and the unit will deactivate.

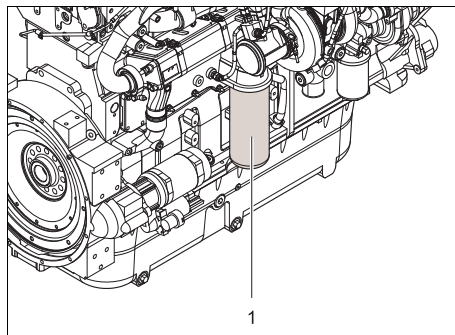
When the oil level maintainer valve would not close after the oil level has reached the full level, the oil will start to overflow the engine.

When the oil reaches the overflow shutdown level, the CCM generates an Engine Oil Level shutdown and the unit will deactivate.

6.2.2 Engine oil and oil filter change



- Consult, besides the maintenance schedule, the Engine Operation Manual as well for oil and oil filter change intervals.
- To drain oil from system, open the oil filler cap, remove the drain plug, located at the right-hand side under the unit and open the drain cock (1).
- Use a proper drain pan.

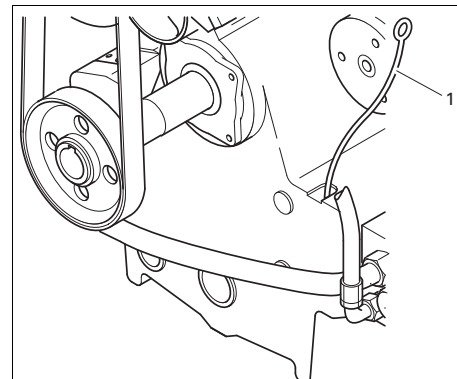


The engine oil filters (1) are located at the unit's left-hand side.

- Put a proper drain pan under the engine oil filters and replace the oil filters.
- Close the drain cock and tighten all drain plugs before filling the system with fresh oil.
- Reinstall the oil filler cap.
- Check on leakages.

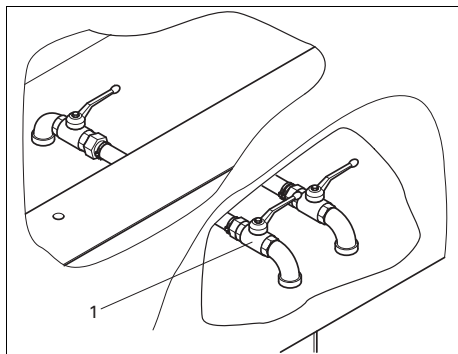
6.3 Compressor maintenance procedures

6.3.1 Compressor oil level check

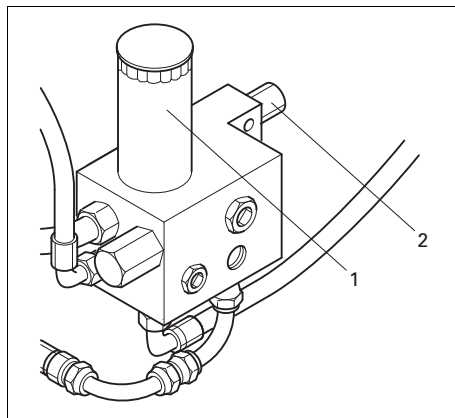


- Close the outlet valve(s) and stop the unit. Before checking the compressor oil level, wait approx. 10 minutes to allow oil to return to the oil sump.
- Check the oil level with the dipstick (1).
- Add correct oil (see section 6.5), if necessary.

6.3.2 Compressor oil and oil filter change



- Run the compressor until warm. Close the outlet valve(s) and stop the compressor.
- Drain the oil by removing the drain plug and opening the drain cock (1). The drain plug is located at the left-hand side under the unit. Catch the oil in a drain pan. Screw out the filler plug to speed up draining. Close the drain cock and tighten the plugs after draining.



- Loosen the bypass plug (2) (bypass to the oil sump) to allow the oil in the oil filter (1) to be drained.
- Remove the oil filter, e.g. by means of the handle of a spanner in the slot at the top.
- Clean the filter seat on the manifold, see to it that no dirt drops into the system. Oil the gasket of the new filter element. Screw the element into place until the gasket contacts its seat, then tighten one half turn only.

- Run the unit at Not Loaded for a few minutes to circulate the oil. Stop and depressurize the unit. Screw out the filler plug, add oil, if necessary, until the oil level registers between markings A and B (see section 6.5). Reinstall and tighten the filler plug. Never add more oil. Overfilling results in oil consumption.

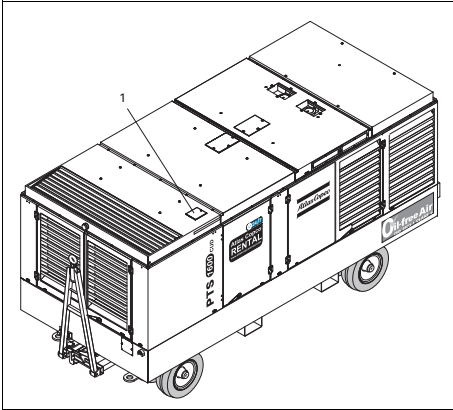
6.3.3 Compressor element overhaul

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

6.4 Adjustment and servicing procedures

6.4.1 Coolant

6.4.1.1 Coolant level check

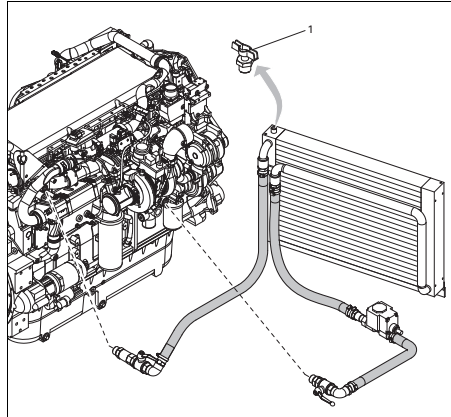


- Check the levels of the coolant in the radiator cooler. The levels show in transparent tubes fitted at the radiator top tank. The levels should normally be at the bottom of the filler pipes as they go into the tanks.
- Add coolant, if necessary. The location of the radiator filler cap (1) is shown in figure above.
- Use PARCOOL EG as coolant.

6.4.1.2 Adding coolant for units with optional preheater



This instruction is only applicable for units equipped with an optional "Preheater".



Open the preheater drain point (1) during filling of the coolant. This way air can be vented out of the cooler.

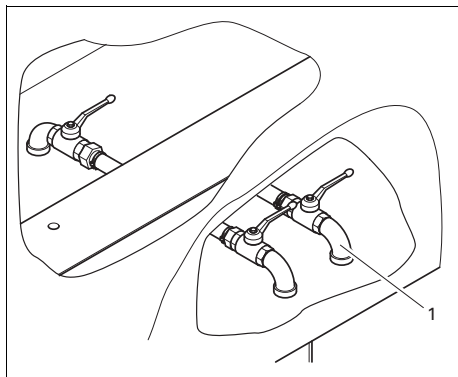
6.4.1.3 Testing coolant inhibitor level

Use coolant test strips to measure, chloride nitrite and glycol concentrations. Cavitation/corrosion protection is indicated on the strip by the level of nitrite concentration. Freeze/boilover protection is determined by glycol concentration. Use the test strips as follows:

- Dip the strip into coolant for one second. Remove and shake briskly to eliminate excess fluid.
- Immediately compare end pad (% glycol) to the color chart.
- Sixty seconds (one minute) after dipping, compare the nitrite pad.

For the best results make the tests while the coolant is between 10°C - 60°C (50°F - 140°F). Wait at least 60 seconds, but not longer than 75 seconds, before reading the nitrite level.

6.4.1.4 Replacing the coolant

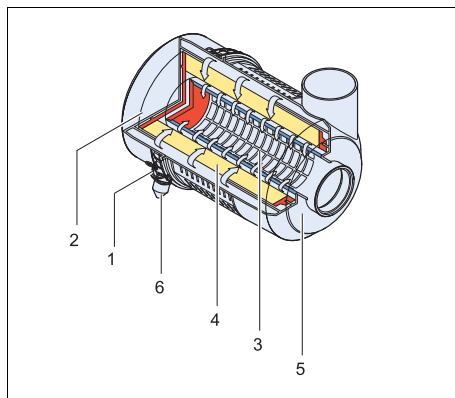


Consult the Engine Operation Manual and section 6.4.1.3 for coolant specifications.

- To drain coolant from system, remove drain plugs. Drain plugs are located at the right- and left-hand side under the unit and open the drain cocks (1).
- Use a proper drain pan.
- Before filling the system, close the drain cocks and tighten all plugs.

6.4.2 Air filter

6.4.2.1 Main parts



- | | |
|---|-------------------------------|
| 1 | Snap clips (4x) |
| 2 | Dust trap cover |
| 3 | Safety cartridge |
| 4 | Filter element |
| 5 | Filter housing |
| 6 | Vacuator valve (dust ejector) |



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 elements.

6.4.2.2 Cleaning the dust trap

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

6.4.2.3 Replacing the air filter element and the safety cartridge

The instructions that apply to one air filter should be repeated for both air filters engine and air filters compressor.

- Release the snap clips (1) and remove the dust trap cover (2). Clean the inside of the cover.
- Withdraw the filter element (4) and safety cartridge (3) from the housing (5).

Discard the filter element when damaged.

A dirty safety cartridge is an indication of a malfunctioning filter element.

Replace the filter element and the safety cartridge at the same time.

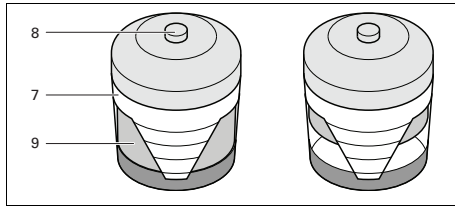


New elements should be inspected for tears and punctures before installation.



The safety cartridge cannot be cleaned.

- Reassemble in reverse order of dismantling.
- Inspect and tighten all air intake connections.
- Reset the air filter vacuum indicator by pushing the reset button (8).



- 7 | Air filter contamination indicator
- 8 | Reset button
- 9 | Yellow indicator

6.4.2.4 Cleaning the filter element

- Withdraw the filter element (see section 6.4.2.3). Reinstall the dust trap cover to protect the air intake system while cleaning the element.

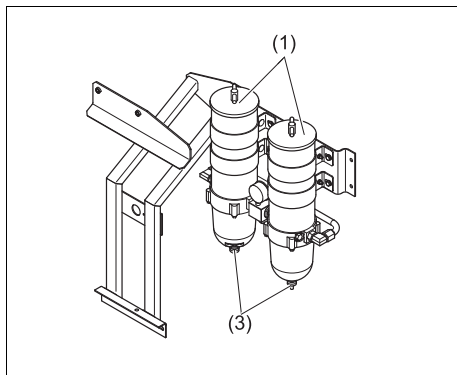


Never run the compressor without air filter element.

- Carefully knock the end faces of the filter element on a flat surface to remove the dry contaminant. Never strike on a hard surface. Then blow dry air up and down the pleats in the reverse direction of normal flow; subsequently blow up and down the pleats on both sides of the element. The air pressure may not exceed 5 bar (73 psi) and a reasonable distance must be maintained between the hose nozzle and the pleats.
- If the contaminant is oily, soak the element for 10 minutes in luke-warm water in which a non-foaming detergent is dissolved. Then, move the element to and fro in the solution for 5 minutes.
- Rinse with soft water until the drain water is clear. Let the element dry. Never use compressed air to hasten drying.
- Inspect the element by placing a light inside it. Spots or ruptures of the paper render the element unfit for further use.
- Reassemble in reverse order of dismantling.
- Reset the air filter service indicator by pushing the reset button (8).

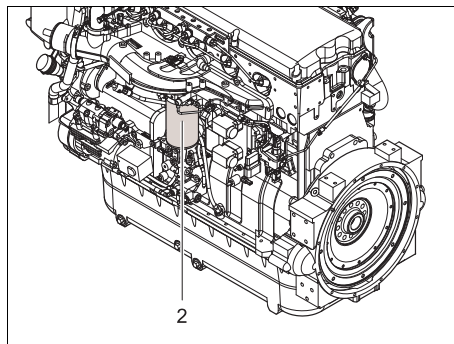
6.4.3 Fuel system

6.4.3.1 Draining primary fuel filters



The fuel system comprises:

- | | |
|---|--|
| 1 | Two primary coarse fuel filters / water separators |
| 2 | One secondary engine fuel filter |



Drain condensate from the primary coarse fuel filters (water separators) regularly by loosening the drain plugs (3). Catch the condensate in a drain pan. Tighten the plugs after draining.

6.4.3.2 Priming the system

- Check to make sure the drain valve at the base of the fuel filter is closed.
- Remove the vent cap from the top of the clear cover. Fill the fuel filter full of clean fuel. Reinstall the vent cap and **tighten by hand only**.
- Start the engine. When the lubrication system reaches its normal operating pressure, increase engine speed to high idle for one or two minutes.

After the air is purged, loosen the vent cap until the fuel level lowers to just above the bottom of the collar. **Tighten the vent cap by hand only**.



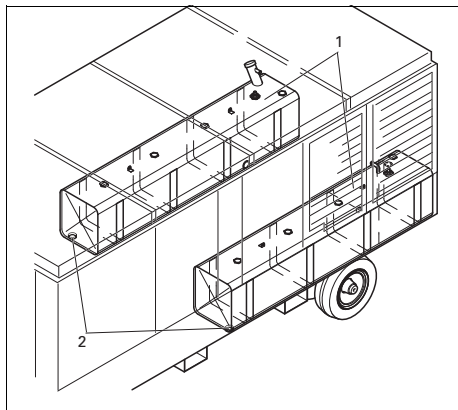
The clear filter cover will not fill completely during engine operation. It will gradually fill over time and the fuel level will rise as the filter becomes clogged.

- Hand tighten the collar again while the engine is running. **To avoid damage, do not use tools to tighten the collar.**



To avoid damaging the aluminium fuel processor body, do not overtighten fuel lines or fuel line fittings.

6.4.3.3 Cleaning fuel tanks



To drain sediment and water from the fuel tanks (1), remove the drain plug (2) of both fuel tanks and frame.

For a better drainage slightly slope the unit.

Use water to clean the inside of the fuel tanks, use a high-pressure purifier if necessary. Spurt the sediment and water to the drain side of the tank.



After cleaning or heavy rains, drain the spillage-free frame.

6.4.4 Cleaning coolers

Keep all coolers clean to maintain the cooling efficiency.

The fan side surface of the radiator, intercooler, aftercooler 1 and oil cooler is accessible by opening the service doors.

The CAC/Charge air cooler and aftercooler 2 are located at the rear end of the unit, under the air filters.

- Remove any dirt from the coolers with a fibre 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 fuel or a cleansing agent.



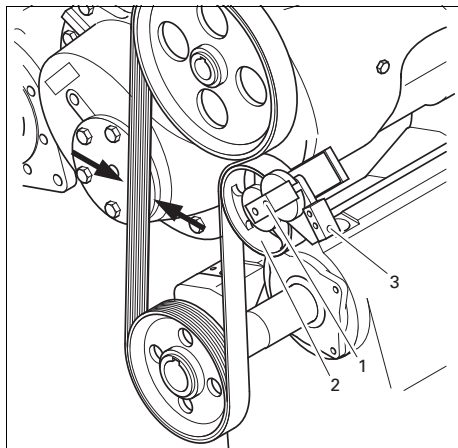
Protect the electrical and controlling equipment, air filters, etc. against penetration of moisture.

- A spray gun should preferably be used to apply the solvent to the cooler block. Rinse the block by means of a water jet after a soaking-in period. Steam-cleaning may also be applied.
- Close the service doors.
- Do not leave liquids behind.

6.4.5 Poly V-belt tension adjustment

To check the cooler fan poly V-belt tension, measure the belt frequency. Use tensioning tool 2913 0022 00. The arrows show where the frequency should be measured.

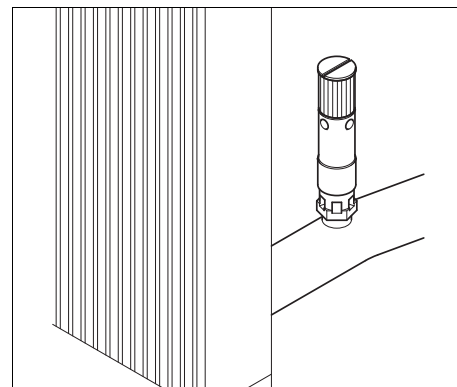
The correct belt frequency is 50 Hz \pm 2.5 Hz.



Correct the V-belt tension by loosening the fixing screw (1) of V-belt tensioner (2). Loosen the lock nut on the adjusting screw (3). Turn the adjusting screw clockwise to increase V-belt tension or counter-clockwise to decrease V-belt tension.

After adjusting the V-belt tension, retighten the adjusting screw lock nut and the fixing screw.

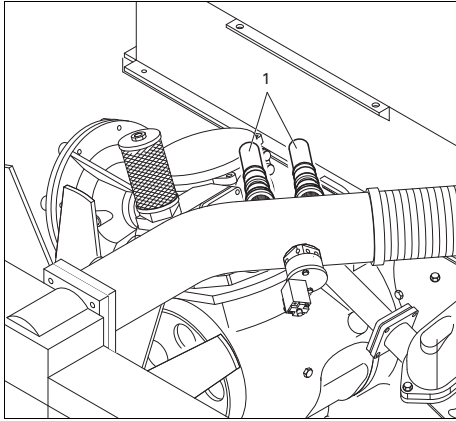
6.4.6 MP safety valve adjustment



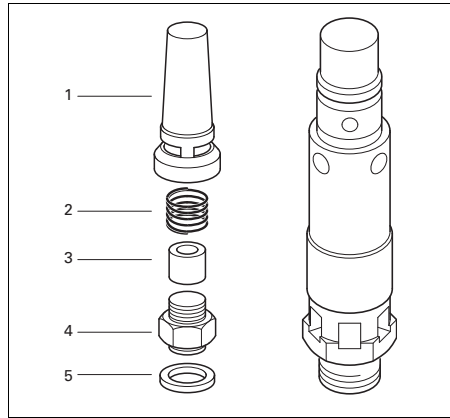
All adjustments and repairs and following checks must be done by an authorized representative of the valve supplier.

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

6.4.7 Checking intercooler relief valves



Test the two intercooler relief valves (1), which are fitted on the MP air inlet pipe, statically on a compressed air line at least once a year.



- | | | |
|---|--|----------------|
| 1 | | Valve housing |
| 2 | | Spring |
| 3 | | Valve |
| 4 | | Valve seat |
| 5 | | Washer, copper |

The valves should open at a pressure as specified in the chapter Technical specifications.

If the valves open too soon: remove a washer, if installed, between valve seat (4) and housing (1) or add a washer between spring (2) and housing.

If the valves open too late: remove a washer, if installed, between spring and housing or add a washer between valve seat and housing.

6.4.8 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 6.4.8.2.

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

6.4.8.1 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.

6.4.8.2 Activating a dry-charged battery

- Take out the battery.
- Battery and electrolyte must be at equal temperature above 10°C.
- Remove cover and/or plug from each cell.
- Fill each cell with electrolyte until the level reaches 10 to 15 mm above the plates, or reaches 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.

6.4.8.3 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.

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.

To keep a battery charged, use the unit's battery charger.

Do not use this battery charger to charge an empty battery.

6.4.8.4 Maintaining the battery voltage

To maintain the battery voltage, use the unit's automatic battery charger.

- Battery charger EEC/AUS: 240 VAC / 24 VDC - 100 VA
- Battery charger USA: 120 VAC / 24 VDC - 100 VA

When power is supplied to the charger, the battery voltage will be kept within preset limits.

Three LEDs on top of the battery charger show the charging condition:

- Green: AC supply voltage present
- Yellow: Battery voltage high
- Red: DC voltage present / unit charging



Do not use the unit's automatic battery charger to charge an empty battery. In this case use a commercial automatic battery charger (see section 6.4.8.3).

6.4.8.5 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 with petroleum jelly.

6.4.9 Servicing air inlet shut-down valve

The air shut-off valve is part of the refinery equipment and is mounted on the piping between the engine inlet and the motor charge air cooler outlet. The valve prevents combustion air to enter the engine. When an overspeed is detected, the engine will shutdown (emergency stop) and the air shut-off valve will close.

To reset the air shut-off valve, pull the handle of the valve up until a click is heard.

6.4.10 Servicing water separator

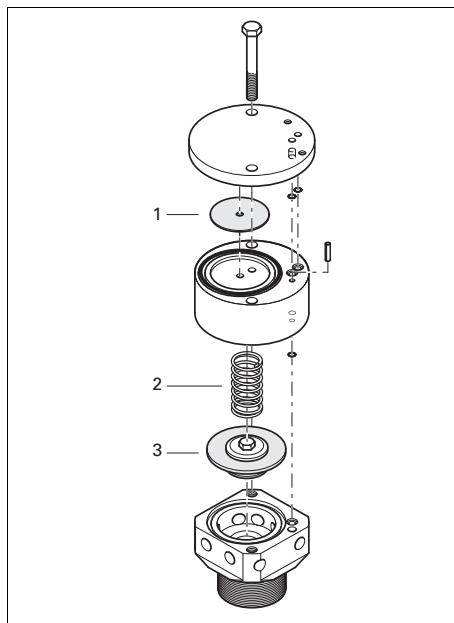
The water separator in the back of the unit filters water condensate out of the compressed air, before the air is discharged through the outlet valves.

Water condensate from the water separator is drained through a nipple in the bottom of the frame. Connect a drain hose to the nipple and make sure that the condensate is properly disposed of.

Service the filter of the water separator every 500 hours.

6.4.11 Servicing electric blow-off valve

The blow-off valve, fitted on the MP air inlet pipe, is opened to release air when the air inlet throttle valve is closed; it closes when the throttle valve is opened.



Replace the membrane, the diaphragm valve assembly (1) and the spring every 2000 hours (kit 2906 0568 00).

6.4.12 Servicing automatic fire suppression system



Do not use a high pressure cleaner to clean the fire suppressing system or parts of it.

Preventive maintenance

To prevent the nozzles from getting dirty, ensure that the nozzles are covered by caps.

Check the heat sensitive detection wire for actual damage. A damaged detection wire can lead to a false release of the fire suppression system.

Periodic maintenance

To give maximum assurance that the system will operate as intended, maintenance must be performed every six months or sooner, depending on the operating and/or environment conditions. Maintenance must be performed by authorized personnel only. Please contact Atlas Copco.

All maintenance activities are to be recorded in a logbook.

6.5 Engine consumable specifications

6.5.1 Engine fuel specifications

For fuel specifications, please contact your Atlas Copco Customer Center.

6.5.2 Engine oil specifications



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

High-quality, mineral, hydraulic or synthesized hydrocarbon oil with rust and oxidation inhibitors, anti-foam and anti-wear properties is recommended. The viscosity grade should correspond to the ambient temperature and ISO 3448, as follows.

Ambient temperature range	Type of lubricant
between -10°C and 50°C	PAROIL E Mission Green



Never mix synthetic with mineral oil.



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

Specifications PAROIL

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 & IV engines running on low sulphur diesel for lower oil and fuel consumption.

PAROIL E Mission Green

PAROIL E Mission Green is a mineral based high performance diesel engine oil with a high viscosity-index. Atlas Copco PAROIL E Mission Green is designed to provide a high level of performance and protection in standard ambient conditions as from -10°C.

	Liter	US gal	Imp gal	cu.ft	Order number
can	5	1.3	1.1	0.175	1630 0471 00
can	20	5.3	4.4	0.7	1630 0472 00
barrel	209	55.2	46	7.32	1630 0473 00

6.5.3 Engine coolant specifications



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. It is strongly recommended to use Atlas Copco branded coolant.

The use of the correct coolant is important for good 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 if necessary freeze protection. 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. 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.

Specifications PARCOOL EG

PARCOOL EG is the only coolant that has been tested and approved by all engine manufacturers currently in use 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.

Because PARCOOL EG inhibits corrosion, deposit formation is minimized. This effectively eliminates the problem of restricted flow through the engine coolant ducts and the radiator, minimizing the risk for 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 needing disposal to minimise environmental impact.

	Liter	US gal	Imp gal	cu.ft	Order number
can	5	1.3	1.1	0.175	1604 5308 00
can	20	5.3	4.4	0.7	1604 5307 01
barrel	210	55.2	46	7.35	1604 5306 00

To ensure protection against corrosion, cavitation and formation of deposits, the concentration of the additives in the coolant must be kept between 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.

7 Checks and trouble shooting

7.1 Problem solving chart

The chart helps to solve mechanical and electrical 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.

7.2 Battery and alternator precautions

- Never reverse the polarity of the battery or the alternator.
- Never break any alternator or battery connections while the engine is running.
- 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.
- Never operate the engine without the main or voltage sensing cables connected in the circuit.

7.3 Trouble shooting

<i>Symptom</i>	<i>Possible cause</i>	<i>Corrective action</i>
<i>Compressor loaded automatically to full capacity after starting</i>	Loading solenoid valve stuck in loaded position.	Remove and check loading solenoid valve. Replace valve if necessary.
	Air intake throttle valve in open position.	Check position throttle valve. Disconnect loading solenoid valve from throttle valve housing and connect independent compressed-air line to throttle valve housing. Repeatedly admit air and listen for opening and closing sound of throttle valve. If sound is not evident, remove unloader valve assembly, dismantle and inspect. Replace parts where necessary.
<i>Compressor does not deliver air or not immediatly after loading solenoid valve has been energized.</i>	Diaphragm of unloader piston cracked.	If air blows from venting device, open unloader piston cover and replace diaphragm.
	Air intake throttle valve stuck in closed position.	Disconnect loading solenoid valve from throttle valve housing and connect independent compressed-air line to throttle valve housing. Repeatedly admit air and listen for opening and closing sound of throttle valve. If sound is not evident, remove unloader valve assembly, dismantle and inspect. Replace parts where necessary.
	Air leaks in regulating system.	Same action as above.
	Loading solenoid valve out of order.	Check loading solenoid valve and electric wiring. Replace valve, if necessary.

<i>Symptom</i>	<i>Possible cause</i>	<i>Corrective action</i>
<i>Compressor capacity or pressure below normal</i>	Air consumption exceeds capacity of compressor.	Check equipment connected.
	Choked air filter element.	Remove and inspect air filter element. Clean or replace element, if necessary.
	Working pressure setpoint incorrect.	Adjust setting.
	Engine not up to max. load speed.	Check engine and correct if necessary.
	Electric blow-off valve malfunctioning.	Check interstage pressure. Check functioning of loading solenoid valve. Replace diaphragm of blow-off valve if necessary.
	Loading solenoid valve leakage.	With unit running at max. load speed, disconnect pipe from loading solenoid valve. If air leaks, remove and inspect loading solenoid valve. Replace valve, if necessary.
	Compressor element(s) not in order.	Check interstage pressure and have compressor element(s) inspected by Atlas Copco.
Air intake throttle valve remains partially closed.	Disconnect loading solenoid valve from throttle valve housing and connect independent compressed-air line to throttle valve housing. Repeatedly admit air and listen for opening and closing sound of throttle valve. If sound is not evident, remove unloader valve assembly, dismantle and inspect. Replace parts where necessary.	
<i>Compressor capacity or pressure below normal</i>	Safety valve or relief valve(s) leaking.	Remove and inspect safety valve or relief valve(s). Replace valve(s) if not airtight after reinstallation.
	Unloading valve leaking.	Remove and inspect unloading valve. Replace valve, if necessary.
	Pipe connections leaking.	Check connections and repair if necessary.

<i>Symptom</i>	<i>Possible cause</i>	<i>Corrective action</i>
<i>Air pressure rises above maximum and causes safety valve to blow off</i>	Working pressure setpoint incorrect.	Adjust setting.
	Air intake throttle valve does not close for some reason.	Check position throttle valve. Disconnect loading solenoid valve from throttle valve housing and connect independent compressed-air line to throttle valve housing. Repeatedly admit air and listen for opening and closing sound of throttle valve. If sound is not evident, remove unloader valve assembly, dismantle and inspect. Replace parts where necessary.
	Unloading valve malfunctioning.	Remove and inspect unloading valve and blow-off silencers.
<i>Compressor overheating</i>	Insufficient compressor cooling.	Move unit away from walls; when banked with other units, leave space between them.
	Oil cooler clogged externally.	Clean oil cooler.
	Oil cooler clogged internally.	Consult Atlas Copco.
	Compressor oil filter clogged.	Replace oil filter.
	Compressor oil level too low.	Before checking compressor oil level, wait approx. 10 minutes after unit has stopped. Add correct oil, if necessary. Never overfill.
	Fan blade broken or fan drive defective.	Check and correct, if necessary.
	Working pressure too high.	Adjust setting.
	Pressure ratio over compressor element(s) too high.	Consult Atlas Copco.
	Electric blow-off valve malfunctioning.	Check interstage pressure. Check functioning of loading solenoid valve. Replace diaphragm of blow-off valve if necessary.
	Bypass valve of oil cooler remains stuck in open position.	Remove bypass valve, clean and inspect.

<i>Symptom</i>	<i>Possible cause</i>	<i>Corrective action</i>
<i>Engine running but compressor does not load when 'Load' button is pressed</i>	Loading solenoid valve inoperative.	Check loading solenoid valve and electric wiring. Replace valve, if necessary.
	Diaphragm of unloader piston perforated or throttle valve remains closed for some reason.	Remove unloader piston cover and inspect rolling diaphragm. If in order, check piston for free axial movement by hand. If jammed, remove throttle valve housing, dismantle and replace defective parts.
	Control panel 'Load' button inoperative.	Consult Atlas Copco.
<i>Compressor oil pressure too low</i>	Compressor oil level too low.	Before checking compressor oil level, wait approx. 10 minutes after unit has stopped. Add correct oil, if necessary. Never overfill.
	Compressor oil filter clogged.	Replace compressor oil filter.
	Bypass valve in oil pump stuck in open position.	Remove bypass valve, clean and inspect.
	Oil pump failure.	Remove oil pump and inspect parts for wear.
	Bypass valve of oil sump stuck in open position.	Remove bypass valve, clean and inspect.
	Ambient temperature too low.	Use heaters, check oil viscosity.
Compressor oil pressure sensor disconnected.	Connect wiring.	

<i>Symptom</i>	<i>Possible cause</i>	<i>Corrective action</i>
<i>Engine does not start</i>	Engine oil pressure does not build up.	See Engine Operation Manual.
	Compressor oil pressure does not build up.	See problem “Compressor oil pressure too low”.
	Faulty compressor oil pressure shutdown switch.	Remove and test switch. Replace, if out of order.
	ECM fault.	Consult Atlas Copco.
	Coolant level(s) too low.	Check and adjust coolant level(s), if necessary.
	Crank time too short.	Adjust crank time on User Interface.
	Ambient temperature too low.	Connect engine heaters.
	Speed sensor inoperative.	Check speed sensor and electric wiring.
	Insufficient fuel supply.	Check fuel lines or bleed.
<i>After working for some time, the unit keeps shutting down</i>	Temperature or pressure sensor missing or malfunctioning.	Check via the User Interface display and replace sensor.
	Restriction in fuel supply to engine.	Check fuel lines and fuel filters.
	Air leak in fuel suction line or fuel filters.	Check suction side of electric fuel pump and fuel filters for air leaks.
	Compressor oil pressure too low.	See problem “Compressor oil pressure too low”.
	Engine oil pressure too low.	See Engine Operation Manual.
	Compressor overheating.	See “Compressor overheating”
<i>Excessive oil fumes or air flow coming from breather pot assembly on gear casing.</i>	Engine overheating.	See Engine Operation Manual.
	Compressor element(s) seals defective.	Have compressor element(s) inspected by Atlas Copco.

<i>Symptom</i>	<i>Possible cause</i>	<i>Corrective action</i>
<i>Intercooler pressure below normal</i>	Choked air filter elements.	Remove and inspect air filter elements. Clean or replace elements, if necessary.
	Intercooler relief valve(s) leaking.	Remove valve(s), clean and inspect.
	Electric blow-off valve malfunctioning.	Check interstage pressure. Check functioning of loading solenoid valve. Replace diaphragm of blow-off valve if necessary.
	Air leak between LP and MP compressor element.	Inspect pipe connections and intercooler. Replace leaking O-rings, gaskets or intercooler, if necessary.
	LP compressor element not in order. Intercooler clogged internally.	Have LP compressor element inspected by Atlas Copco. Consult Atlas Copco.
<i>Intercooler pressure above normal</i>	Aftercooler clogged internally.	Consult Atlas Copco.
	MP compressor element not in order.	Have MP compressor element inspected by Atlas Copco.
	MP silencer and/or check valve give restriction.	Check and take corrective action.

7.4 Compressor control module trouble shooting

7.4.1 Process information

While the compressor is running, the operator can take a brief look at all the incoming compressor and engine data, by pressing the Process Info button.

This can be very useful for trouble shooting over the phone.

7.4.2 Warnings

When a warning is generated, the warning will appear on the screen of the UI, and the user is prompted to a malfunction or a potential shutdown.

There are two kinds of warnings: Process warnings and Apparatus warnings.

- Process warnings do not have any effect on the CCM's operation. They are generated when a measured value has exceeded its limits. These Process warnings are: fuel level warning, engine oil level warning, compressor oil level warning and discharge temperature warning.
- During operation, all sensors, some outputs and the communication lines are continuously checked for failures. When such a failure occurs, the CCM will generate an Apparatus warning. Some errors can cause the CCM to go to the Shutdown status (if running) or to the Start Failure status (if in Permissive Start status).

Apparatus warnings	Effect
Fuel Level Sensor	Shutdown
Air Discharge Pressure Sensor	Shutdown
Compressor Oil Pressure Sensor	Shutdown
LP Element Temperature Sensor	Shutdown
MP Element Temperature Sensor	Shutdown
Loading Valve Output	Shutdown
ECM Communication Link	Shutdown
CAN Communication Link	Shutdown
Starter Relay	Shutdown
Compressor Intercooler Pressure 1 Sensor	Warning
Compressor Intercooler Pressure 2 Sensor	Warning
Compressor Oil Temperature Sensor	Warning
Air Discharge Temperature Sensor	Warning
Air Inlet Temperature Sensor	Warning
Oil Level Maintainer Valve Output	Warning
Flasher Lights Output	Warning
Horn Output	Warning
Blow-off Valve Output	Warning
EEPROM	Warning
Default Mode	Warning

Process warnings	Effect
Fuel Level	Shutdown
Engine Oil Level Too Low	Shutdown
Engine Oil Overfill	Shutdown
LP Element Temperature	Shutdown
MP Element Temperature	Shutdown

Process warnings	Effect
Fuel Level	Warning
Engine Oil Level Low	Warning
Air Discharge Temperature	Warning
Autostart Pressure higher than Setpressure	Warning
Battery Voltage Low	Warning
Battery Not Charging	Warning

Engine warnings	Effect
Engine Coolant Level Sensor Failure	Shutdown
Engine Coolant Temp. Sensor Failure	Shutdown
Engine Oil Temperature Sensor Failure	Warning
Engine Fuel Temperature Sensor Failure	Shutdown
Engine Air Inlet Temp. Sensor Failure	Warning
Engine Turbo Boost Press. Sensor Failure	Warning
Engine Oil Pressure Sensor Failure	Shutdown
Engine Fuel Pressure Sensor Failure	Shutdown
Engine Coolant Level Low	Shutdown
Engine Coolant Temperature Too High	Cooldown*
Engine Air Inlet Temperature High	Warning
Engine Oil Pressure Too Low	Shutdown
Turbo Boost Pressure High	Warning
Engine Fuel Pressure Too Low	Shutdown
Engine Injector X Failure	Shutdown
Fuel Temperature Too High	Shutdown
Engine RPM Sensor Failure	Shutdown

*NOTE: See "Cooling down" on page 38.

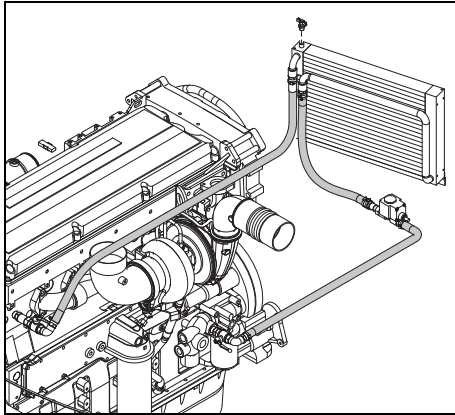
7.4.3 Shutdowns

The unit comprises several shutdown sensors:

- Engine shutdowns (by ECM):
 - Engine Coolant Level Sensor Failure
 - Engine Coolant Temp. Sensor Failure
 - Engine Oil Temperature Sensor Failure
 - Engine Fuel Temperature Sensor Failure
 - Engine Air Inlet Temp. Sensor Failure
 - Engine Turbo Boost Press. Sensor Failure
 - Engine Oil Pressure Sensor Failure
 - Engine Fuel Pressure Sensor Failure
 - Engine Coolant Level Low
 - Engine Coolant Temperature Too High
 - Engine Air Inlet Temperature High
 - Engine Oil Pressure Too Low
 - Turbo Boost Pressure High
 - Engine Fuel Pressure Too Low
 - Engine Injector X Failure
 - Fuel Temperature Too High
 - Engine RPM Sensor Failure
- Fuel level shutdown
- Engine oil level shutdown (switch)
- Engine oil level overfill shutdown (switch)
- LP element temperature shutdown
- MP element temperature shutdown
- Compressor oil pressure shutdown
- Apparatus shutdown:
 - Air discharge pressure sensor
 - LP element temperature sensor
 - MP element temperature sensor
 - Loaded solenoid valve output
 - ECM communication link
 - CAN communication link

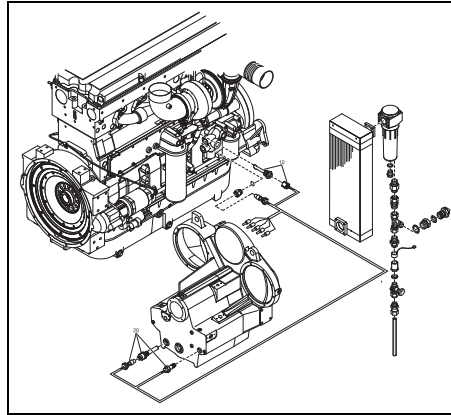
8 Available options

8.1 Preheater



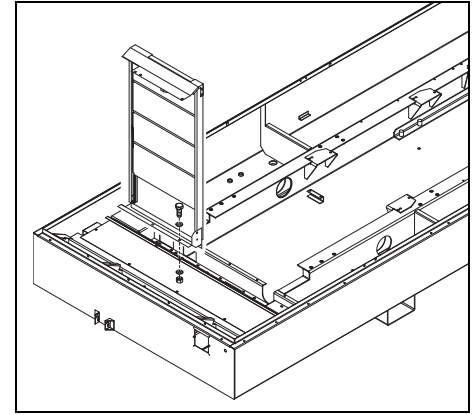
The preheater option allows setting a higher outlet temperature of the compressed air via the compressor controller.

8.2 Heating kit



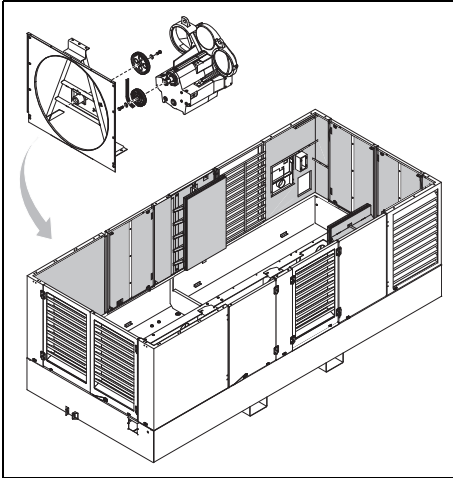
The heating kit is a cold start option. It consists of heater plugs that are to be installed in engine and gearbox, making sure that the engine starts at temperatures as low as -25°C (-13°F).

8.3 Anti-frost device



The anti-frost device is a kind of cover plate that makes the first aftercooler to cool down the compressed air less and prevents the formed condensate from freezing.

8.4 Hot weather pack



The hot weather pack option allows the compressor to run in ambient conditions up to 50°C (122°F) (45°C (113°F) is standard).

8.5 Cold climate fuel

Cold climate diesel fuel can be used in ambient conditions as low as -25°C (-13°F).

9 Storage of the compressor

9.1 Storage instructions

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 unit is going to be stored without running from time to time, protective measures must be taken.

10 Disposal

10.1 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, and used, as well as at their disposal.

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

Selecting materials the substantial recyclability, the disassembly possibilities and the separability of materials and assemblies are considered as well as the environmental perils and dangers to health during the recycling and disposal of the unavoidable rates of not recyclable materials.

Your Atlas Copco compressor consists for the most part of metallic materials, that can be remelted in steelworks and smelting works and that is therefore almost infinite 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 a correct disposal of the product you help to prevent possible negative consequences for environment and health, that can occur with an inappropriate waste handling.

Recycling and re-usage of material helps to preserve natural resources.

10.2 Disposal of materials

Dispose contaminated substances and material separately, according to local applicable environmental legislations.

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

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

Dispose all components according to the applicable disposal regulations.

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

11 Technical specifications

11.1 Torque values

11.1.1 For general applications

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

For hexagon screws and nuts with strength grade 8.8:

Thread size	M6	M8	M10	M12	M14	M16
Nm	9	23	46	80	125	205

For hexagon screws and nuts with strength grade 12.9:

Thread size	M6	M8	M10	M12	M14	M16
Nm	15	39	78	135	210	345

11.1.2 For important assemblies

Assemblies	Unit	Torque values
Axles to frame:		
Wheel nuts	Nm	80 +10/-0
Bolts, towing eye/towbar	Nm	80 ± 10
Bolts, towbar/turntable	Nm	80 ± 10
Bolts, front axle/frame	Nm	80 ± 10
Bolts, rear axle/frame	Nm	205 ± 20
Compressor to frame:		
Bolts, elements/gear casing	Nm	80 ± 10
Bolts, gear casing/support	Nm	205 ± 20
Bolts, support/buffer	Nm	205 ± 20
Bolts, buffer/frame	Nm	80 ± 10
Engine to frame:		
Bolts, engine/support	Nm	205 ± 20
Bolts, support/buffer	Nm	205 ± 20
Bolts, buffer/frame	Nm	80 ± 10
Lifting beam to frame:		
Bolts, lifting beams/yoke (M12)	Nm	80 ± 10
Bolts, lifting beams/yoke (M16)	Nm	205 ± 20
Bolts, yoke/lifting supports	Nm	205 ± 20
Bolts, lifting supports/frame	Nm	205 ± 20

11.2 Settings of shutdowns and safety valves

Designation	Value
Engine shutdowns (see EOM)	
Fuel level	5%
LP element temperature	250°C
MP element temperature	250°C
Compressor oil pressure	1.2 bar(e)
MP safety valve opening pressure	
EEC type	15 bar(e)
USA/AUS type	220 psi
Relief valves opening pressure	3.7 bar(e)

11.3 Compressor/engine specifications

<i>Designation</i>	<i>Unit</i>	<i>Value</i>		
<i>Reference conditions</i>				
Absolute inlet pressure	bar(e)		1	
Relative air humidity	%		1	
Air inlet temperature	°C		20	
Normal effective working pressure	bar(e)	6.9	9.3	10.3
The inlet conditions are specified at the air inlet grating outside the canopy				
<i>Limitations</i>				
Minimum effective receiver pressure	bar(e)	3	3	3
Maximum effective receiver pressure, compressor unloaded	bar(e)	8.0	10.3	11.3
Maximum ambient temperature (standard environment)	°C	45	45	45
Maximum ambient temperature (hot environment)	°C	50	50	50
Minimum starting temperature	°C	-25	-25	-25
<i>Performance data</i> ¹⁾				
Engine shaft speed, normal and maximum	r/min	1850	1750	1650
Engine shaft speed, compressor unloaded	r/min	1200	1200	1200
Free air delivery ²⁾	l/s	762	718	663
Fuel consumption at full load	kg/h	75	74.4	73.2
Fuel consumption at unload	kg/h	12.6	12.6	12.6
Specific fuel consumption	g/m ³	27.34	28.78	30.67
Typical oil content of compressed air	mg/m ³		0	
	free air			
Engine oil consumption (maximum)	g/h	NA	NA	NA
Compressed air temperature at outlet valves	°C	30	30	30
Noise level				
Sound pressure level (LP), measured according to EPA with a tolerance of ± 3dB(A) under free field conditions at 7 m distance	dB(A)		TBD	
Sound power level (LW) complies with 84/532/533/EEC and 85/406/EEC limits	dB(A)		TBD	

Design data

Compressor

Number of compressor stages 2 in serial

Engine

Make Cummins

Type QSX15

Coolant Liquid

Number of cylinders 6

Bore mm 137

Stroke mm 169

Swept volume l 15.0

Output according to SAEJ1995 at normal shaft speed kW 395

Load factor % 100

Capacity of oil sump:

Initial fill l 84

Refill (max.)⁴⁾ l TBD

Capacity of cooling system (intercooler)

Capacity of cooling system (engine jackets) l 120

Unit

Capacity of compressor oil system l 84

Capacity of fuel tanks l 900

Air volume at inlet grating (approx.)³⁾ m³/s 15

Unit dimensions

Length mm 5240

(with towbar in towing position) mm 6770

Width mm 2210

Height mm 2350

Weight (ready to operate) kg 8560

Weight (without fuel) kg 7760

Notes

1) At reference conditions, if applicable, and in normal shaft speed, unless otherwise stated.

2) Data	Measured according to	Tolerance
Free air delivery	ISO 1217 ed. 3 1996 annex D	$\pm 5\%$ 25 l/s <FAD<250 l/s $\pm 4\%$ 250 l/s <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

11.4 Conversion list of SI units into British units

1 bar	=	14.504 psi
1 g	=	0.035 oz
1 kg	=	2.205 lbs
1 km/h	=	0.621 mile/h
1 kW	=	1.341 hp (UK and US)
1 l	=	0.264 US gal
1 l	=	0.220 imp gal (UK)
1 l	=	0.035 cu.ft
1 m	=	3.281 ft
1 mm	=	0.039 in
1 m ³ /min	=	35.315 cfm
1 mbar	=	0.401 in wc
1 N	=	0.225 lbf
1 Nm	=	0.738 lbf.ft
$t_{°F}$	=	$32 + (1.8 \times t_{°C})$
$t_{°C}$	=	$(t_{°F} - 32)/1.8$

A temperature difference of 1°C = a temperature difference of 1.8°F.

11.5 Dataplate

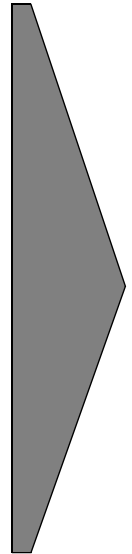
The diagram shows a rectangular dataplate with the following fields and features:

- 1**: Points to the company name "ATLAS COPCO AIRPOWER n.v."
- 2**: Points to the first part of the identification code "YA3"
- 3**: Points to the second part of the identification code "00"
- 4**: Points to the manufacturer name "ATLAS COPCO AIRPOWER n.v."
- 5**: Points to the first asterisk in the identification code "*****"
- 6**: Points to the second asterisk in the identification code "*****"
- 7**: Points to the weight specification table:

****	kg	A
1- ****	kg	B
2- ****	kg	C
- 8**: Points to the working pressure field "p max(e) . working/betrieb/service bar **"
- 9**: Points to the speed field "Speed/Drehzahl/Regime rpm ****"
- 10**: Points to the engine power field "p engine/motor/moteur kw ****"
- 11**: Points to the manufacturing year field "Manuf. year/Baujahr/Ann 'e de fabrication ****"
- 12**: Points to the CE mark and the text "MADE BY ATLAS COPCO AIRPOWER n.v. WILRIJK, BELGIUM" and "1615 6945 00".

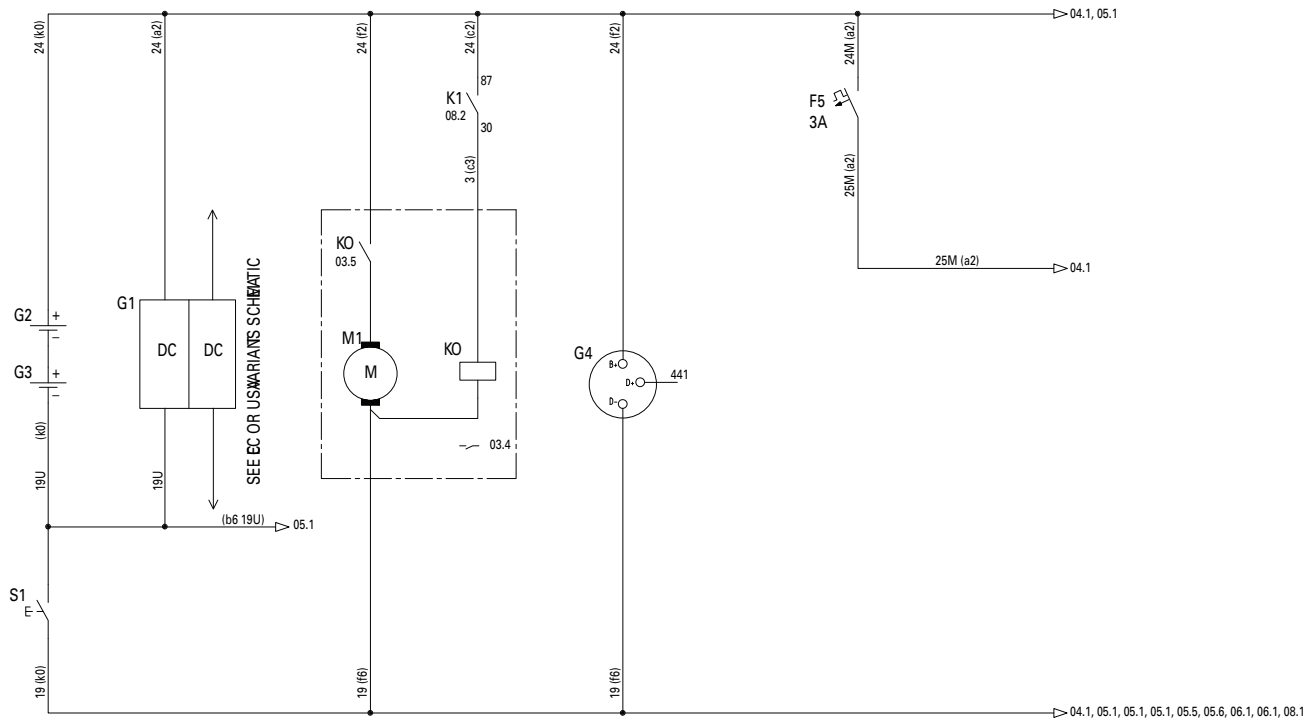
- 1 Company code
- 2 Product code
- 3 Unit serial number
- 4 Name of manufacturer
- 5 EEC or national type approved number
- 6 Vehicle identification number
- 7 A. Maximum permitted laden weight of the vehicle
B. Maximum permitted road weight of the front axle
C. Maximum permitted road weight of the rear axle
- 8 Working pressure
- 9 Speed
- 10 Engine power
- 11 Manufacturing year
- 12 EC mark in accordance with Machine Directive 89/392 EEC

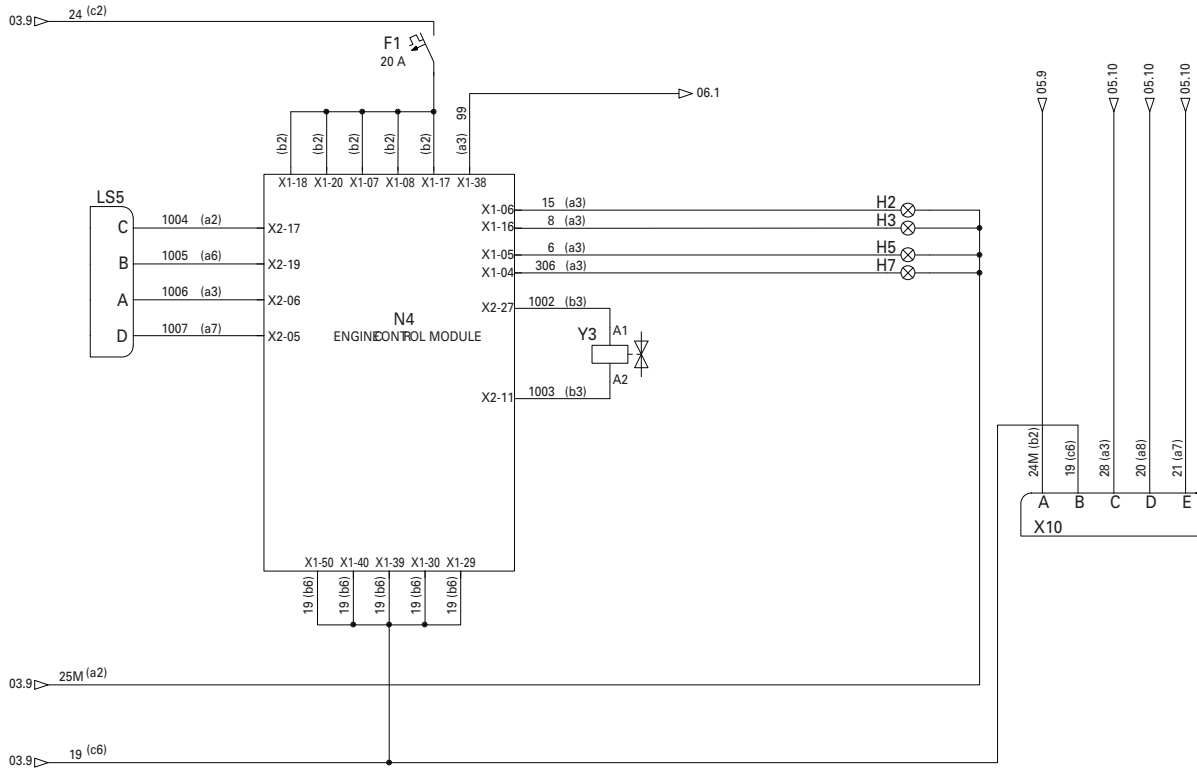
Circuit diagrams

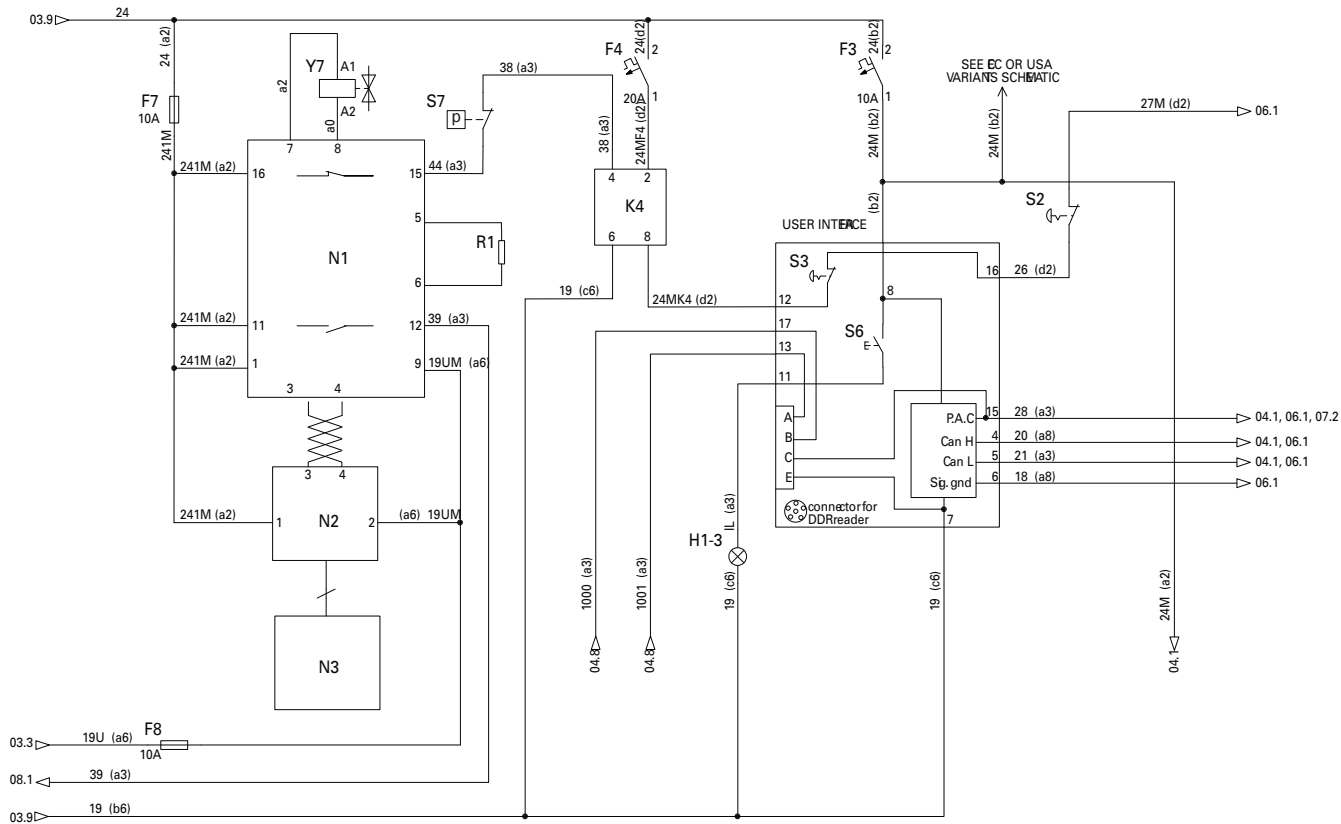


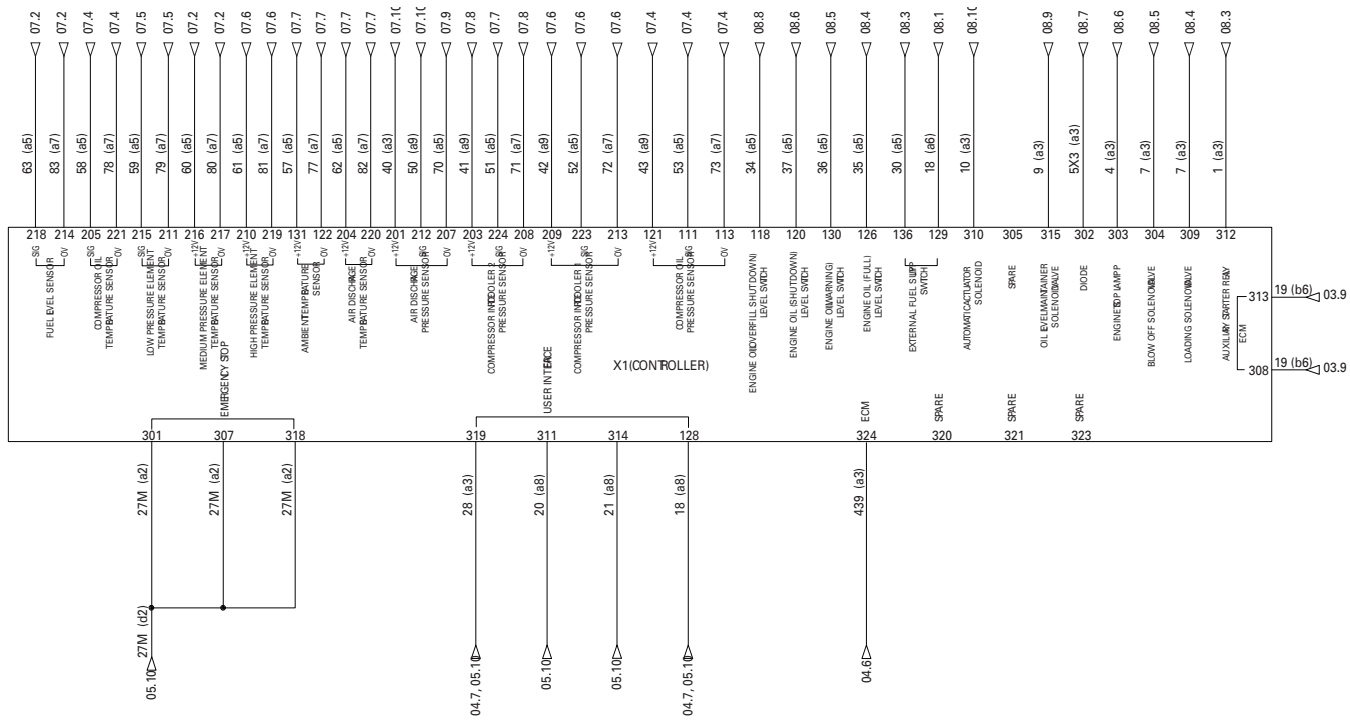
9822 0900 20/00

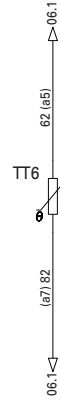
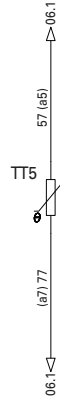
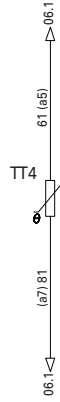
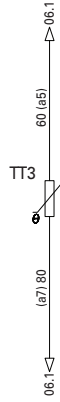
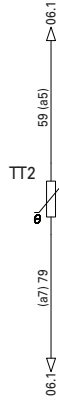
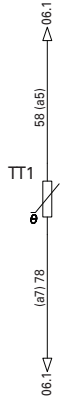
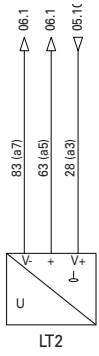
Applicable for PTS 1600 T3, Circuit diagram Engine and Controller

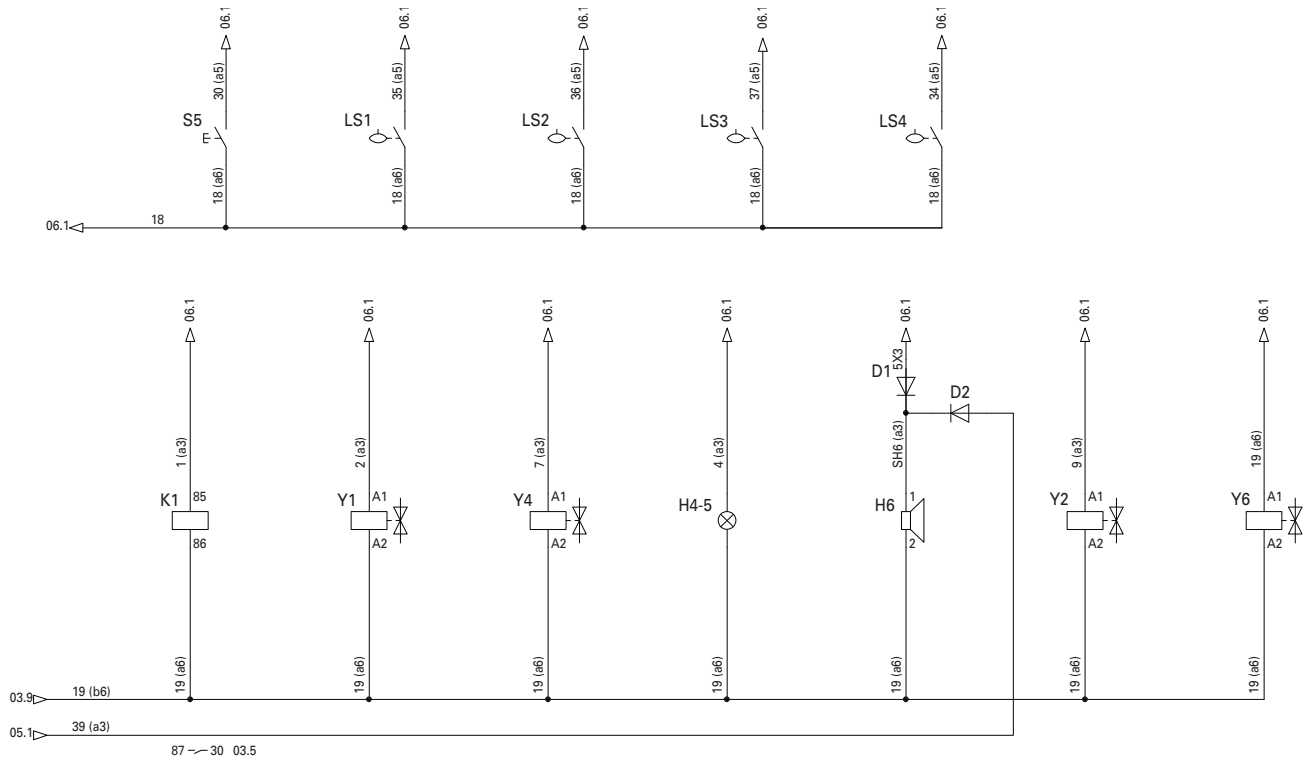








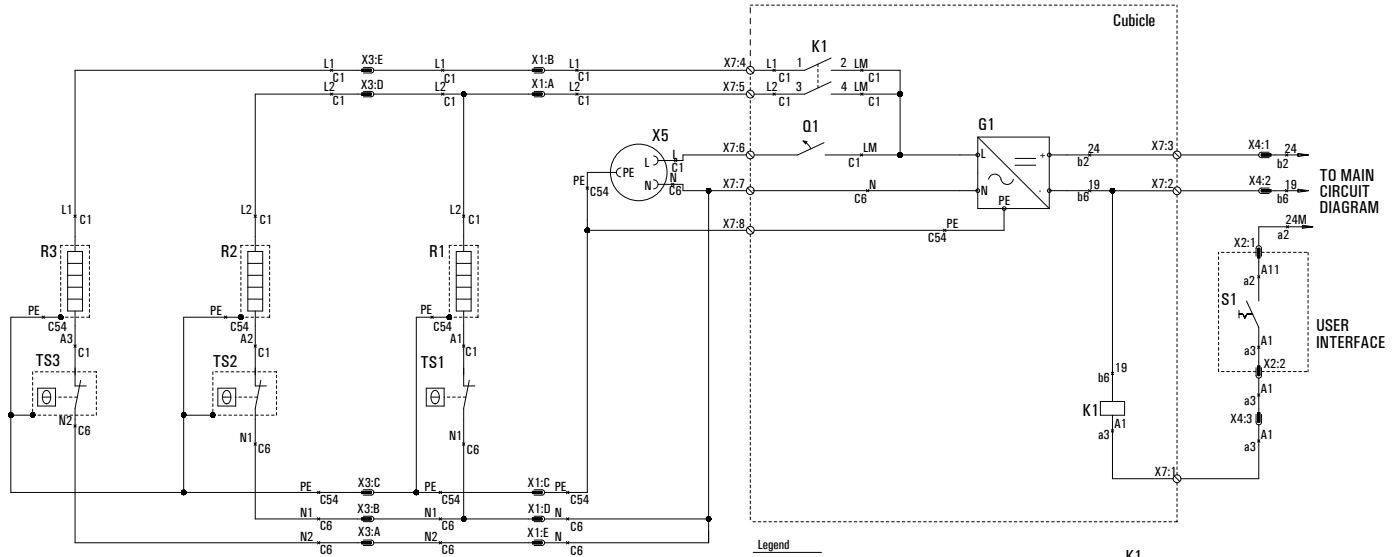




D1	Diode	LS4	Level Switch - Engine Oil Level Overfill Shutdown	TT1	Temperature Sensor - Compressor Oil Temperature
D2	Diode				
F1	Fuse ECM	LS5	Level Switch - Coolant	TT2	Temperature Sensor - Low Pressure Element Temperature
F3	Fuse User Interface	LT2	Level Sensor - Fuel Level		
F4	Fuse Controller	M1	Starter Motor	TT3	Temperature Sensor - Medium Pressure Element Temperature
F5	Fuse Flap Lock Solenoid	N1	Detection module		
F7	Fuse Fire Extinguisher	N2	IR interface module	TT4	Temperature Sensor - High Pressure Element Temperature
F8	Fuse Fire Extinguisher	N3	Flame detector		
G2	Battery	N4	Engine control module	TT5	Temperature Sensor - Ambient Temperature
G3	Battery	PT1	Pressure Sensor - Air Discharge Pressure		
H1-3	Lamp Internal Lights	PT2	Pressure Sensor - Compressor Intercooler Pressure 2	TT6	Temperature Sensor - Air Discharge Temperature
H2	Lamp Engine Stop				
H3	Lamp Engine Warning	PT3	Pressure Sensor - Compressor Intercooler Pressure 1	Y1	Solenoid Loading Valve
H4-5	Lamp Engine Warning			Y2	Solenoid Oil Level Maintainer Valve
H5	Lamp Maintenance	PT4	Pressure Sensor - Compressor Oil Pressure	Y3	Refinery Equipment - Air Shut-off Valve
H6	Horn	R1	Resistor 4K7	Y4	Solenoid Blow-off Valve
H7	Lamp Wait-to-start	S1	Battery Switch	Y6	Solenoid Automatic Actuator
K0	Starter Motor Relay	S2	Emergency Stop	Y7	Solenoid Automatic Actuator
K1	Auxiliary Starter Relay	S3	Emergency Stop		
K4	Solid State Relay	S5	External Fuel Supply Switch		
LS1	Level Switch - Engine Oil Level Full	S6	Internal Lights On/Off Switch		
LS2	Level Switch - Engine Oil Level Warning	S7	Pressure Switch		
LS3	Level Switch - Engine Oil Level Shutdown		(for manual actuator)		

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Applicable for PTS 1600 T3 - Circuit diagram (EC)



Legend

Wire size :

- aaa = 0.35mm²
- aa = 0.5mm²
- ab = 0.75 mm²
- a = 1 mm²
- b = 1.5mm²
- c = 2.5mm²
- d = 4 mm²
- e = 6 mm²
- f = 10 mm²
- h = 16 mm²
- j = 50 mm²
- k = 95 mm²

Colour code :

- 0 = black
- 1 = brown
- 2 = red
- 3 = orange
- 4 = yellow
- 5 = green
- 6 = blue
- 7 = purple
- 8 = grey
- 9 = white
- 54 = green/yellow

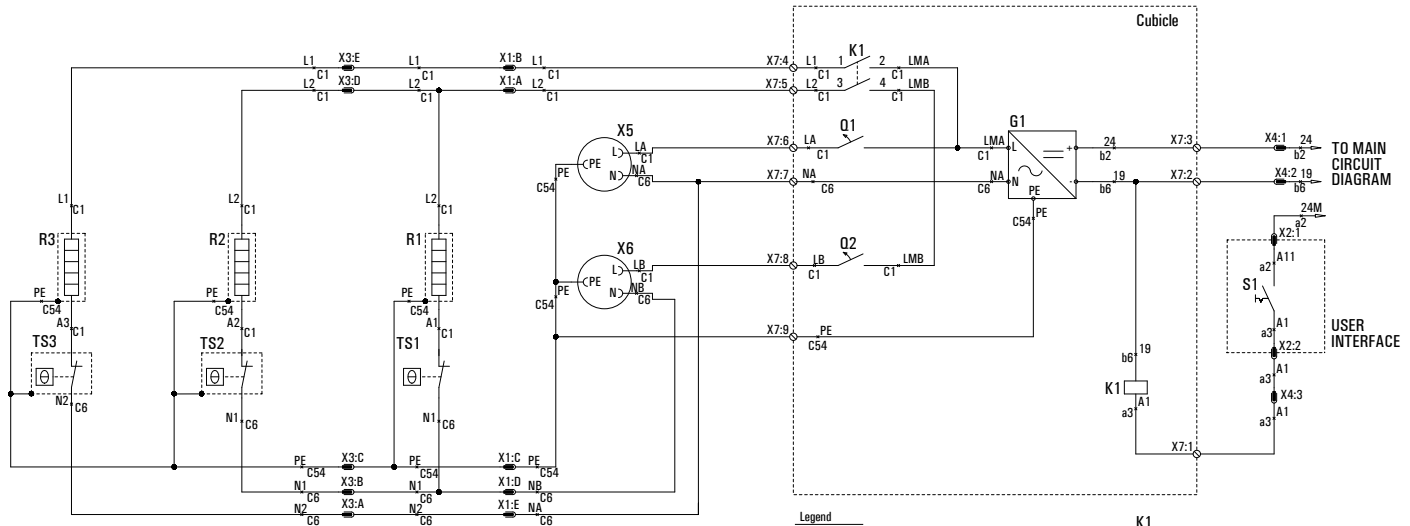
K1



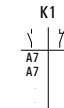
G1	Battery charger
K1	Relay
Q1	Circuit breaker
R1	Water separator drain nozzle heater
R2	Engine oil heater
R3	Compressor oil heater
S1	Heater switch
TS1	Temperature switch
TS2	Temperature switch
TS3	Temperature switch
X1	Connector rear mains wiring
X2	Connector user interface
X3	Connector main mains wiring
X4	Connector rear wiring
X5	Power socket
X7	Terminal strip

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Applicable for PTS 1600 T3 - Circuit diagram (USA)



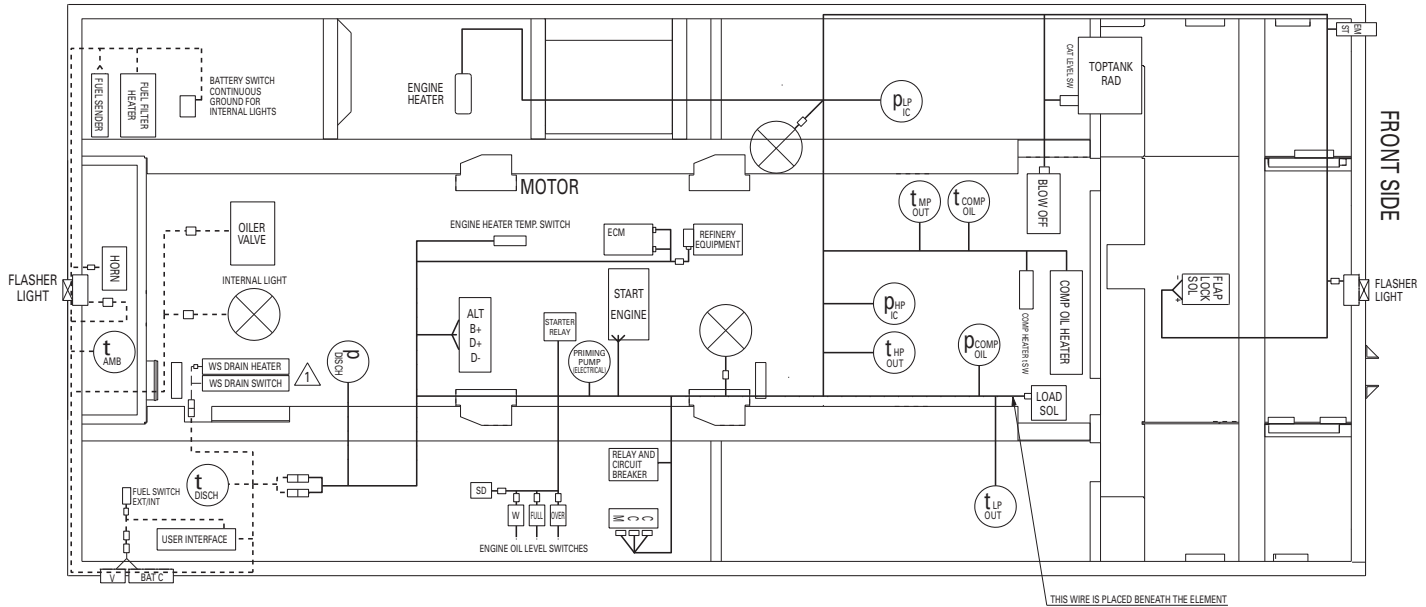
Wire size :	Colour code :
aaa = 0.35mm ²	0 = black
aa = 0.5mm ²	1 = brown
ab = 0.75 mm ²	2 = red
a = 1 mm ²	3 = orange
b = 1.5mm ²	4 = yellow
c = 2.5mm ²	5 = green
d = 4 mm ²	6 = blue
e = 6 mm ²	7 = purple
f = 10 mm ²	8 = grey
h = 16 mm ²	9 = white
j = 50 mm ²	54 = green/yellow
k = 95 mm ²	



G1	Battery charger
K1	Relay
Q1	Circuit breaker
Q2	Circuit breaker
R1	Water separator drain nozzle heater
R2	Engine oil heater
R3	Compressor oil heater
S1	Heater switch
TS1	Temperature switch
TS2	Temperature switch
TS3	Temperature switch
X1	Connector rear mains wiring
X2	Connector user interface
X3	Connector main mains wiring
X4	Connector rear wiring
X5	Power socket
X6	Power socket
X7	Terminal strip

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Applicable for PTS 1600 T3 - Circuit wiring



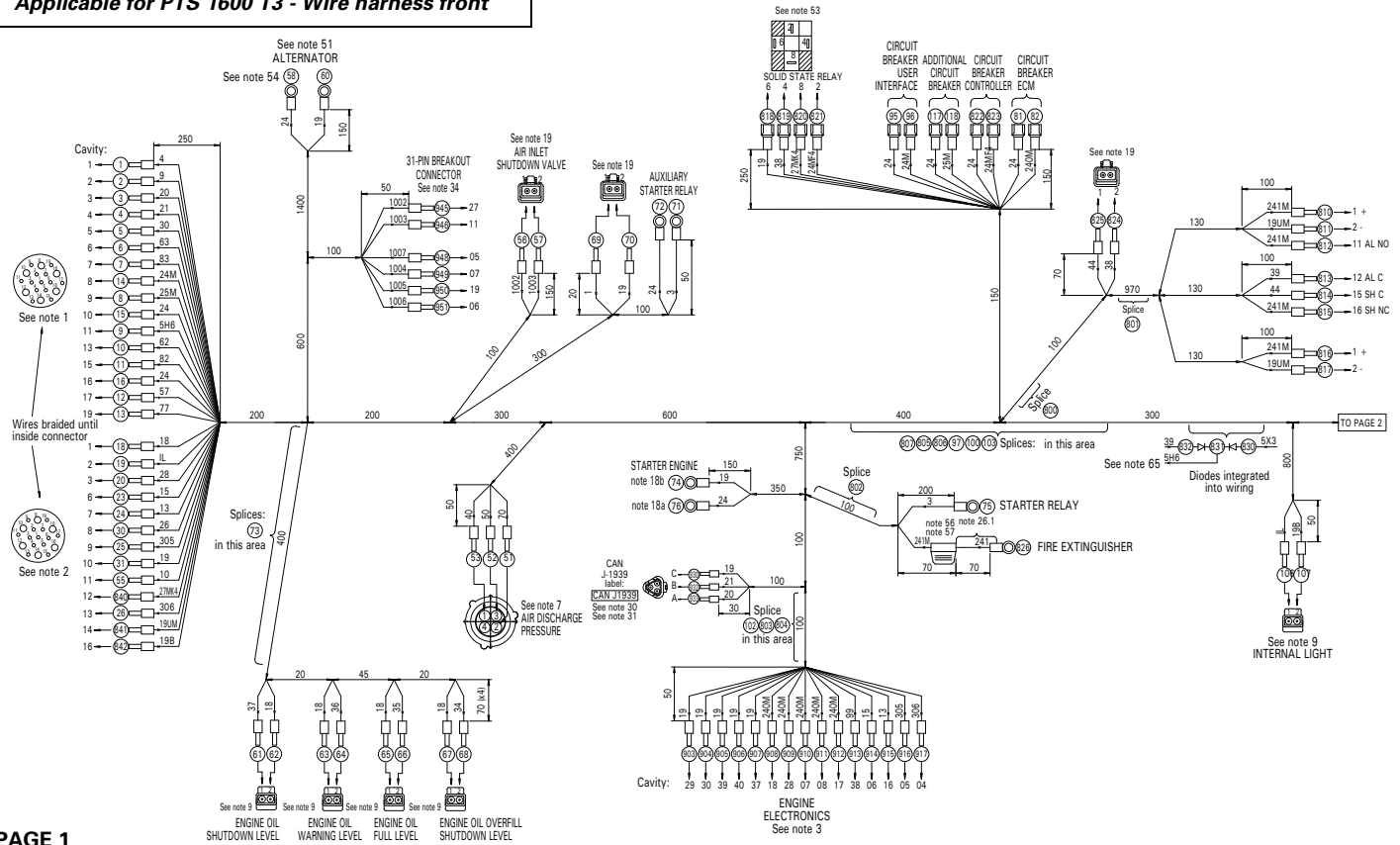
— 1604 7429 02

- - - 1604 7781 01

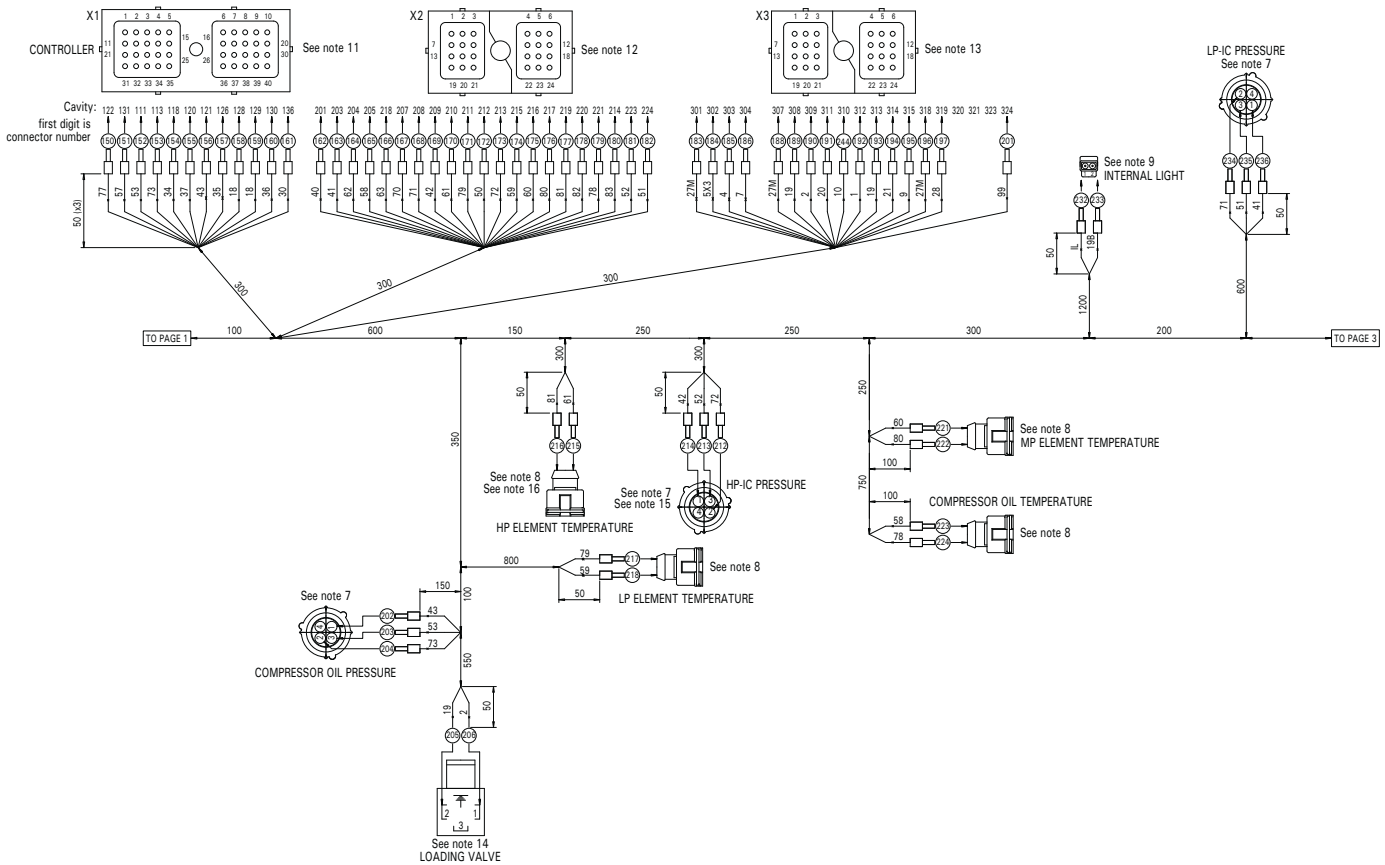
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— 9822 0899 98 USA

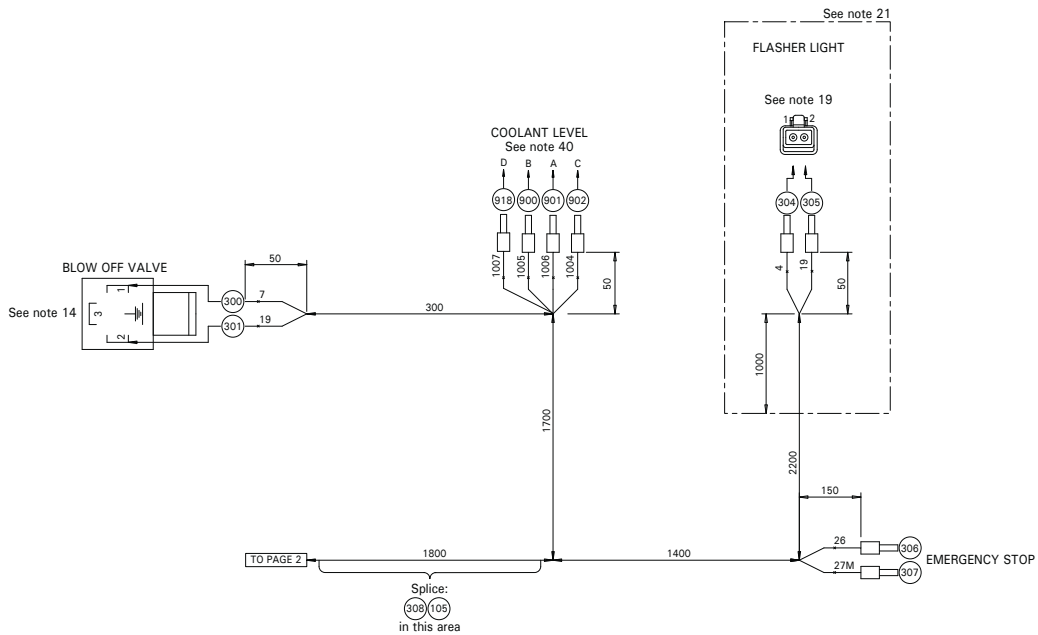
- - - 1604 2050 00

1626 8282 00/00 (page 1/2/3)
Applicable for PTS 1600 T3 - Wire harness front



PAGE 1





TERMINAL END A		TERMINAL END B		WIRE		
NR.	TERMINAL	NR.	TERMINAL	NR.	MM ²	COLOR
69	see note 19	192	see note 13	1	1	orange
190	see note 13	206	see note 14	2	1	orange
71	AMP 342145-1	75	AMP 130090-0	3	2.5	orange
185	see note 13	97	splice	4	1	orange
304	see note 19			4	1	orange
1	see note 1			4	1	orange
186	see note 13			300	see note 14	7
2	see note 1	195	see note 13	9	1	orange
55	see note 2	244	see note 13	10	1	orange
915	see note 3	24	see note 2	13	1	orange
914	see note 3	23	see note 2	15	1	orange
62	see note 9	73	splice	18	1	blue
63	see note 9			18	1	blue
65	see note 9			18	1	blue
67	see note 9			18	1	blue
159	see note 11			18	1	blue
158	see note 11			18	1	grey
18	see note 2			18	1	grey
31	see note 2	74	see note 18	19	4	blue
60	AMP 165034-0	74	see note 18	19	10	blue
189	see note 13	74	see note 18	19	1.5	blue
193	see note 13	74	see note 18	19	1.5	blue
205	see note 14	74	see note 18	19	1	blue
803	Splice	903	see note 3	19	1.5	blue
		904	see note 3	19	1.5	blue
		930	See note 30	19	1	blue
		74	see note 18	19	2.5	blue
		905	see note 3	19	1.5	blue
804	Splice	906	see note 3	19	1.5	blue
		907	see note 3	19	1.5	blue
		74	see note 18	19	2.5	blue
		74	see note 18	19	2.5	blue

TERMINAL END A		TERMINAL END B		WIRE		
NR.	TERMINAL	NR.	TERMINAL	NR.	MM ²	COLOR
807	Splice	818	faston AMP 5-160446-2	19	1	blue
		70	see note 19	19	1	blue
		74	see note 18	19	1	blue
308	Splice	74	see note 18	19	2.5	blue
		301	see note 14	19	1	blue
		305	see note 19	19	1	blue
842	see note 2	103	splice	19B	1	blue
107	see note 9			19B	1	blue
233	see note 9			19B	1	blue
841	pin Deutsch 1060-12-0166	800	splice	19UM	1	blue
811	uninsulated wire ferrule AMP 0-925856-1			19UM	1	blue
817	uninsulated wire ferrule AMP 0-925856-1			19UM	1	blue
818	faston AMP 5-160446-2			19UM	1	blue
3	see note 1, 31	805	splice	20	1	grey
191	see note 13, 31			20	1	grey
933	see note 30, 31			20	1	grey
4	see note 1, 31	806	splice	21	1	purple
194	see note 13, 31			21	1	purple
932	see note 30, 31			21	1	purple
19	see note 2	100	splice	IL	1	orange
106	see note 9			IL	1	orange
232	see note 9			IL	1	orange
15	see note 1	76	see note 18	24	4	red
16	see note 1	76	see note 18	24	4	red
58	AMP 33466, see note 54	76	see note 18	24	10	red
117	AMP 3-520117-2	76	see note 18	24	2.5	red
95	AMP 3-520117-2	76	see note 18	24	1.5	red
72	AMP 342145-1	76	see note 18	24	2.5	red
822	insulated faston 6,3x0,8	76	see note 18	24	4	red
81	AMP 3-520117-2	76	see note 18	24	2.5	red

TERMINAL END A		TERMINAL END B		WIRE				
NR.	TERMINAL	NR.	TERMINAL	NR.	MM ²	COLOR		
908	see note 3	102	Splice	240M	1.5	red		
909	see note 3			240M	1.5	red		
82	AMP 3-520117-2			240M	2.5	red		
910	see note 3			240M	1.5	purple		
911	see note 3			240M	1.5	purple		
912	see note 3			240M	1.5	purple		
826	eye M12	802	splice	241	inline fuse; see notes 56. 57	red		
801	splice			241M	1	red		
				810	uninsulated wire ferrule AMP 0-925856-1	241M	1	red
				812	uninsulated wire ferrule AMP 0-925856-1	241M	1	red
				815	uninsulated wire ferrule AMP 0-925856-1	241M	1	red
		816	uninsulated wire ferrule AMP 0-925856-1	241M	1	red		
14	see note 1	96	AMP 3-520117-2	24M	1.5	red		
118	AMP 3-520117-2	8	see note 1	25M	1.5	red		
30	see note 2	306	terminal end	26	4	red		
307	terminal end	105	splice	27M	4	red		
188	see note 13			27M	1.5	red		
183	see note 13			27M	1	red		
196	see note 13			27M	1.5	red		
823	insulated faston 6,3x0,8			821	faston AMP 160913-4	24MF4	4	red
820	faston AMP 160913-4	840	see note 2	27MK4	4	red		
20	see note 2	197	see note 13	28	1	orange		
5	see note 1	161	see note 11	30	1	green		
68	see note 9	154	see note 11	34	1	green		
66	see note 9	157	see note 11	35	1	green		
64	see note 9	160	see note 11	36	1	green		
61	see note 9	155	see note 11	37	1	blue		
819	faston AMP 5-160446-2	824	socket Deutsch 0462-201-16141	38	1	orange		

TERMINAL END A		TERMINAL END B		WIRE			
NR.	TERMINAL	NR.	TERMINAL	NR.	MM ²	COLOR	
813	uninsulated wire ferrule AMP 0-925856-1	832	splice	39	1	orange	
831	splice			diode 1N5402 (3A, 100V)			
				5H6	1	orange	
184	see note 13	830	splice	diode 1N5402 (3A, 100V)		orange	
53	see note 7	162	see note 12	40	1	orange	
163	see note 12	236	see note 7	41	1	white	
169	see note 12	214	see note 7	42	1	white	
156	see note 11	202	see note 7	43	1	white	
814	uninsulated wire ferrule AMP 0-925856-1	825	socket Deutsch 0462-201-16141	44	1	orange	
52	see note 7	172	see note 12	50	1	white	
182	see note 12	235	see note 7	51	1	green	
181	see note 12	213	see note 7	52	1	green	
152	see note 11	203	see note 7	53	1	green	
12	see note 1	151	see note 11	57	1	green	
165	see note 12	223	see note 8	58	1	green	
174	see note 12	218	see note 8	59	1	green	
175	see note 12	221	see note 8	60	1	green	
170	see note 12	215	see note 8	61	1	green	
10	see note 1	164	see note 12	62	1	green	
6	see note 1	166	see note 12	63	1	green	
51	see note 7	167	see note 12	70	1	green	
168	see note 12	234	see note 7	71	1	purple	
173	see note 12	212	see note 7	72	1	purple	
153	see note 11	204	see note 7	73	1	purple	
13	see note 1	150	see note 11	77	1	purple	
179	see note 12	224	see note 8	78	1	purple	
171	see note 12	217	see note 8	79	1	purple	
176	see note 12	222	see note 8	80	1	purple	
177	see note 12	216	see note 8	81	1	purple	
11	see note 1	178	see note 12	82	1	purple	
7	see note 1	180	see note 12	83	1	purple	

TERMINAL END A		TERMINAL END B		WIRE		
NR.	TERMINAL	NR.	TERMINAL	NR.	MM ²	COLOR
913	see note 3	201	see note 13	99	1	orange
916	see note 3	25	see note 2	305	1	orange
917	see note 3	26	See note 2	306	1	orange
56	see note 19	945	see note 34	1002	1.5	orange
57	see note 19	946	see note 34	1003	1.5	orange
949	see note 34	902	see note 40	1004	1	red
950	see note 34	900	see note 40	1005	1	blue
951	see note 34	901	see note 40	1006	1	orange
918	see note 40	948	see note 34	1007	1	purple

NOTES

Note 1: Connector: Deutsch HD N 36 - 24-19 SN
- 059

Terminals: Size 12 (large): Deutsch
0462-203-12141
Size 16 (small): Deutsch
0462-201-16141

Unused cavities to be sealed with:
Deutsch 114017

Note 2: Connector: Deutsch HD N 34 - 24-19 PN
- 059

Terminals: Size 12 (large): Deutsch
0460-202-12141
Size 16 (small): Deutsch
0460-202-16141

Nut: Deutsch 112263-90

Lockwasher: Deutsch 112264

Unused cavities shall be sealed with:
Deutsch 114017

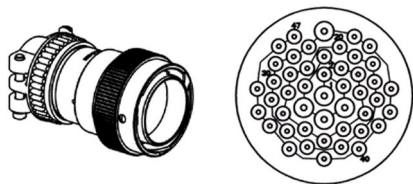
Note 3: Connector: Deutsch HD36-24-47SE
Terminals 1.5 mm²:

Deutsch 1062-16-0122

Terminals 1 mm²:

Deutsch 1062-20-0122

Unused cavities shall be sealed with:
Deutsch 114017 (1 mm²)
Deutsch 0413-204-2005
(1.5 mm²)



Note 7: Connector: G&H 17984.000.001
(DIN 72585 - 4 pins)

Terminals: G&H 26570.201.184

Wire seal: G&H 14414.627.626

Unused cavities to be sealed with:
G&H 14416.627.646

Wiring braided until connector, and
attached to strain relief with nylon strap.

Note 8: Connector: AMP 0-963040-3

Terminals: AMP 0-929939-1

Wire seal: AMP 828904-1

Seal grommet: Bosch 1280 703 26026

Note 9: Connector: Deutsch DTM 06-2S

Terminals: Deutsch 1062-20-01221

Wedge: Deutsch WM 2S

Note 11: Connector: Deutsch DRC 16-40S

Terminals: Deutsch 0462-201-16141

Unused cavities to be sealed with:
Deutsch 11407

Note 12: Connector: Deutsch DRC 16-24S

Terminals: Deutsch 0462-201-16141

Unused cavities to be sealed with:
Deutsch 11407

Note 13: Connector: Deutsch DRC 16-24SB

Terminals: Deutsch 0462-201-16141

Unused cavities to be sealed with:
Deutsch 11407

Note 14: Connector: Hirschmann GDM-2009J

Seal: Hirschmann GDM3-16

Note 15: Connector: G&H 14730.598.696

Use this connector for sealing the
G&H 17984.000.002

Note 16: Connector: AMP 106462-1

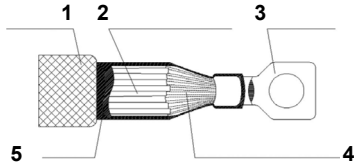
Use this connector for sealing the
AMP 0-963040-3

Note 18: AMP 133544-4

Shrinkable sleeve to be attached as in drawing.

Wall thickness: min. 1 mm.

Wires may be divided over two terminals if necessary.



1: Braiding

2: Insulated wires

3: Terminal

4: Non-insulated wires

5: Sleeve

Note 18a: The colour of the shrinkable sleeve should be red

Note 18b: The colour of the shrinkable sleeve should be blue

Note 19: Connector: Deutsch DT 06-2S

Terminals: Deutsch 0460-201-16141

Wedge: Deutsch W 2S

Note 20: Connector: Deutsch DT 04-2P

Terminals: Deutsch 0460-202-16141

Wedge: Deutsch W 2P

Note 21: This part of the harness should be resistant to temperatures up to 105 °C.

Note 22: Wire insulation should be resistant to oil, fuel and coolant.

Note 27: All wire type H05V-K/H07V-K according to AC standard 0995 2000 00 unless specified otherwise

Note 30: connector: Deutsch DT 06-3S

terminals: Deutsch 0462-201-16141

secondary lock :Deutsch W3S-1939

Note 31: Twisted cables 3 turns each 100mm

Note 34: Connector: Deutsch HD36-24-31SE-059

Terminals: Deutsch 1062-16-0122

Unused cavities to be sealed with:
Deutsch HD10-114017

Note 40: Connector body:

Packard Electric 12110293

Terminals: Packard Electric 12048074

Wire Seals: Packard Electric 12048087

Secondary lock :
Packard Electric 12052845

Note 41: Relay socket

Housing : E-T-A R20-4B5-0 + BS-01

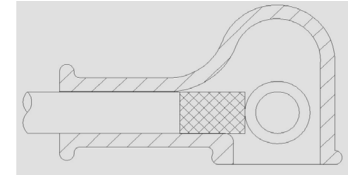
Faston : 6,3 x 0,8

Note 51: Protection cap: 1612 0846 00 (or equal)

ORIENTATION AS STATED BELOW
Harness to be fixed on the protection cap.

Note 52: Rubber cap mounted over eye terminal.

Use nylon strap to prevent rubber cap from falling off



Note 53: Relay socket

Housing: Bosch 3 334 485 008

Faston: AMP 5-160446-2

Faston: AMP 160913-4

Note 54: Terminal provided with a red shrinkable sleeve

Note 55: Deutsch DT Series

housing Deutsch DT 06-2S

socket Deutsch 0462-201-16141

wedge Deutsch W2S

Note 56: Fuse holder Multicomp MCCQ-211CN (or equal)

Note 57: Fuse (10A) Littelfuse 0257010 (or equal)
or
Multicomp MCATQ 10A

Fuse holder's wires to be cut to appropriate length

Note 60: Wire harness shall be provided with a marking label with AC part number and edition

Note 61: Scan test to be performed on every conductor

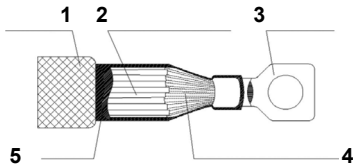
Note 62: Marking to be printed on each end of all wires

Note 63: All plugs seen from wire connecting side

Note 64: Wire harness finishing: black braiding, unless stated otherwise

Note 65: Diodes positioned as on drawing

Note 66: Terminal and shrinkable sleeve to be mounted as in drawing
Wire number printed on shrinkable sleeve



- 1: Braiding
- 2: Insulated wires
- 3: Terminal
- 4: Non-insulated wires
- 5: Sleeve

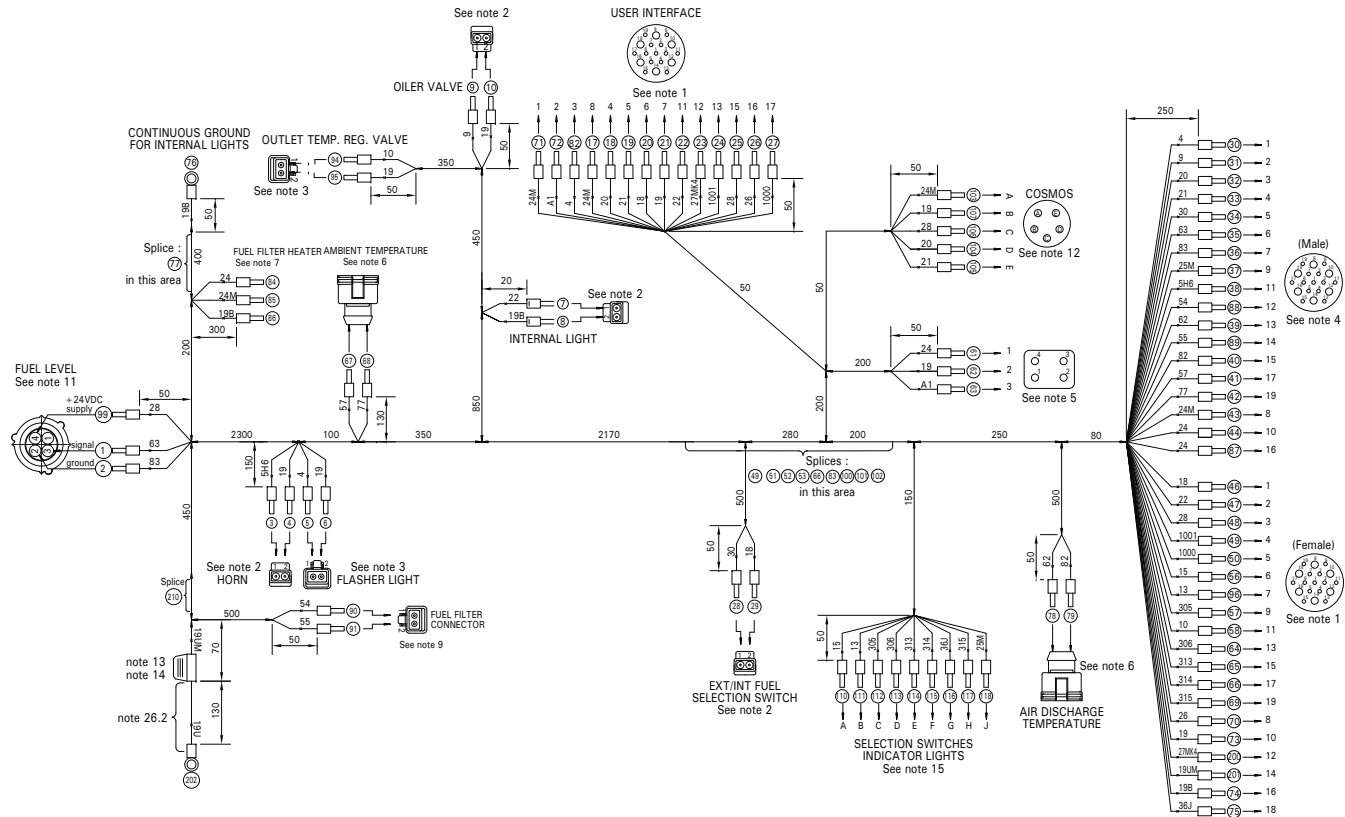
Note 66.1 shrinkable sleeve color = red

Note 66.2 shrinkable sleeve color = blue

Note 67: Label indicating AC part. Nr. and edition, testing and/or production date, supplier reference
Black text on white background

1626 9916 00/02

Applicable for PTS 1600 T3 - Wire harness rear



TERMINAL END A		TERMINAL END B		WIRE				
nr.	terminal	nr.	terminal	nr.	mm ²	color		
1	See note 11	35	See note 11	63	1	Green		
2	See note 11	36	See note 11	63	1	Purple		
3	See note 2	38	See note 4	5H6	1	Orange		
30	See note 4	83	Splice	4	1	Orange		
82	See note 1			4	1	Orange		
5	See note 3			4	1	Orange		
96	See note 1			111	See note 15	13	1	Orange
56	See note 1	110	See note 15	15	1	Orange		
4	See note 2	49	Splice	19	1	Blue		
6	See note 3			19	1	Blue		
10	See note 2			19	1	Blue		
21	See note 1			19	1.5	Blue		
73	See note 1			19	4	Blue		
95	See note 3			19	1	Blue		
107	See note 12			19	1	Blue		
202	eye M10			210	splice	19U	inline fuse; see note 2	
201	socket Deutsch 1062-12-0166					19UM	1	blue
7	See note 2	52	Splice	22	1	Orange		
47	See note 1			22	1	Orange		
22	See note 1			22	1.5	Orange		
9	See note 2	31	See note 4	9	1	Orange		
84	See note 7	87	See note 4	24	4	Red		
44	See note 4	61	See note 5	24	4	Red		
17	See note 1	51	Splice	24M	1.5	Red		
43	See note 4			24M	1.5	Red		
85	See note 7			24M	1	Red		
103	See note 12			24M	1.5	Red		
71	See note 1			24M	1	Red		
37	See note 1			118	See note 35	25M	1	Red

TERMINAL END A		TERMINAL END B		WIRE		
nr.	terminal	nr.	terminal	nr.	mm ²	color
18	See note 1	101	Splice	20	1	Grey
32	See note 4			20	1	Grey
104	See note 12			20	1	Grey
19	See note 1	102	Splice	21	1	Grey
33	See note 4			21	1	Grey
105	See note 12			21	1	Grey
20	See note 1	53	Splice	18	1	Blue
29	See note 2			18	1	Blue
46	See note 1			18	1	Blue
23	See note 1	200	See note 4	27MK4	4	Red
26	See note 1	70	See note 1	26	4	Red
28	See note 2	34	See note 4	30	1	Green
67	See note 6	41	See note 4	57	1	Green
68	See note 6	42	See note 4	77	1	Purple
76	AMP 160136-0	77	Splice	See note		
8	See note 2			19B	1.5	Blue
74	See note 1			19B	1.5	Blue
62	See note 5			19B	1.5	Blue
86	See note 7			19B	4	Blue
78	See note 6	39	See note 4	62	1	Green
79	See note 6	40	See note 4	82	1	Purple
94	See note 3	58	See note 1	10	1	Orange
72	See note 1	63	See note 5	A1	1	Orange
24	See note 1	49	See note 1	1001	1	Orange
27	See note 1	50	See note 1	1000	1	Orange
99	See note 11	100	Splice	28	1	Orange
25	See note 1			28	1	Orange
48	See note 1			28	1	Orange
106	See note 12			28	1	Orange

TERMINAL END A		TERMINAL END B		WIRE		
nr.	terminal	nr.	terminal	nr.	mm ²	color
75	See note 1	116	See note 15	36J	1.5	Orange
57	See note 1	112	See note 15	305	1	Orange
64	See note 1	113	See note 15	306	1	Orange
65	See note 1	114	See note 15	313	1	Orange
66	See note 1	115	See note 15	314	1	Orange
69	See note 1	117	See note 15	315	1	Orange
90	See note 9	88	See note 4	54	1	Orange
91	See note 9	89	See note 4	55	1	Orange

NOTES

Note 1: Connector: Deutsch HD 36 - 24-19 SN - 059
 Terminals: Size 12 (large): Deutsch 0462-203-12141
 Size 16 (small): Deutsch 0462-201-16141
 Unused Cavities to be sealed with: Deutsch 114017
 Wiring braided until connector, and attached to strain relief with nylon strap.

Note 2: Connector: Deutsch DTM 06-2S
 Terminals: Deutsch 1062-20-0122
 Secondary Lock: Deutsch W 2S

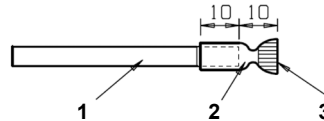
Note 3: Connector: Deutsch DT 06-2S
 Terminals: Deutsch 0460-201-16141
 Secondary Lock: Deutsch W 2S

Note 4: Connector: Deutsch HD 34 - 24-19 - PN - 059
 Terminals: Size 12 (large): Deutsch 0460-204-12141
 Size 16 (small): Deutsch 0460-202-16141
 Nut: Deutsch 112263-90
 Lockwasher: Deutsch 112264
 Unused Cavities to be sealed with: Deutsch 114017
 Wiring braided until connector, and attached to strain relief with nylon strap.

Note 5: Connector: Deutsch DTP 06 - 4S
 Terminals: Deutsch 0460-204-12141
 Unused Cavities to be sealed with: Deutsch 114017
 Secondary Lock: Deutsch WP 4S

Note 6: Connector: AMP 0-963040-3
 Terminals: AMP 0-929939-1
 Wire seal: AMP 828904-1
 Seal Grommet: Bosch 1280 703 26026

Note 7: - Terminals 84, 85 shall be equipped with a label with printing:
 "ALWAYS INSULATE WIRE".
 - Label and printing must be water, oil and coolant resistant.
 - Terminals 84, 85, 86 shall be equipped with a shrinkable sleeve with a layer of glue, as in drawing below, and strapped to the harness with nylon straps.



- 1: Wire
- 2: Sleeve
- 3: Squeezed tight when hot

Note 9: Connector: Deutsch DT06-2S
 Terminals: 1062-16-0144
 Wedge: W2SA

Note 10: Wire insulation should be resistant to oil, diesel fuel and coolant.

Note 11: Connector according to DIN 72585 4 pins.
 Connector: G&H 17984.000.002
 Terminals: G&H 26570.201.184
 Wire seal: G&H 14414.627.626
 Unused cavities to be sealed with: G&H 14416.627.646
 Strain relief of fuel level: G&H 14830.625.699
 Wiring braided until connector, and attached to strain relief with nylon strap.

Note 12: Connector: Deutsch HD14-5-16P
 Terminals: Deutsch 0460-202-16141
 Unused Cavities to be sealed with: Deutsch 114017
 Protective cover Deutsch HDC 16-5 fixed to harness with wire.
 Both ends of wire run at least 200mm into harness.

Note 13: Fuse holder: Multicomp MCCQ-211CN (or equal)

Note 14: Fuse (10A): Littelfuse 0257010 (or equal) or Multicomp MCCQ-211CN (or equal)
 Fuse holder's wires to be cut to appropriate length

Note 15: Connector: Deutsch HD16-9-16S
or
Deutsch HD16-9-96S
Terminals: Deutsch 0462-209-16141
or
Deutsch 0462-209-16141

Note 20: Wire harness shall be provided with a marking label with AC part number and edition.

Note 21: Scan test to be performed on every conductor

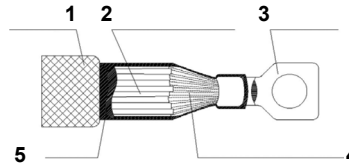
Note 22: Marking to be printed on each end of all wires

Note 23: All plugs seen from wire connecting side

Note 24: Wire harness finishing: black braiding, unless stated otherwise

Note 25: Diodes positioned as on drawing

Note 26: Terminal and shrinkable sleeve to be mounted as in drawing
Wire number printed on shrinkable sleeve



- 1: Braiding
- 2: Insulated wires
- 3: Terminal
- 4: Non-insulated wires
- 5: Sleeve

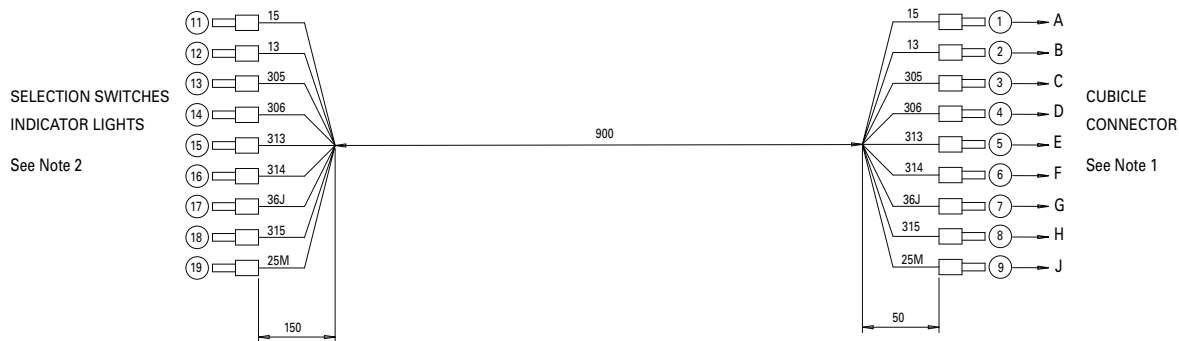
Note 26.1: shrinkable sleeve color = red
Note 26.2: shrinkable sleeve color = blue

Note 27: All wire type H05V-K/H07V-K according to AC standard 0995 2000 00 unless specified otherwise

Note 28: Label indicating AC part. Nr.and edition, testing and/or production date, supplier reference
Black text on white background

1626 9917 00/01

Applicable for PTS 1600 - Wire harness (add-on)



TERMINAL END A		WIRE			TERMINAL END B	
nr.	terminal	nr.	mm ²	color	nr.	terminal
1	See note 1	15	1	orange	11	See note 2
2	See note 1	13	1	orange	12	See note 2
3	See note 1	305	1	orange	13	See note 2
4	See note 1	306	1	orange	14	See note 2
5	See note 1	313	1	orange	15	See note 2
6	See note 1	314	1	orange	16	See note 2
7	See note 1	36J	1.5	orange	17	See note 2
8	See note 1	315	1	orange	18	See note 2
9	See note 1	25M	1	red	19	See note 2

Note 1: Connector: Deutsch HD 14-9-16P
Terminal: Deutsch 0460-202-16141

Note 2: Provide wires with AMP DIN wire ferrules
Tubing form with plastic sleeve, according
DIN46228, part 4

Following documents are provided with this unit:

- Test Certificate
- EC Declaration of Conformity:

Atlas Copco

EC DECLARATION OF CONFORMITY

1 We, Atlas Copco Airpower n.v., declare under our sole responsibility, that the product

2 Machine name : **Compressor (≥ 350 kW)**

3 Commercial name :

4 Serial number :

5

6 Which falls under the provisions of article 12.2 of the EC Directive 2006/42/EC on the approximation of the laws of the Member States relating to machinery, is in conformity with the relevant Essential Health and Safety Requirements of this directive.

The machinery complies also with the requirements of the following directives and their amendments as indicated.

Directive on the approximation of laws of the Member States relating to	Harmonized and/or Technical Standards used	Alt' mnt
7 Pressure equipment	97/23/EC	x
8 Machinery safety	2006/42/EC EN ISO 12100-1 EN ISO 12100-2 EN 1012-1	
9 Electromagnetic compatibility	2004/108/EC EN 61000-6-2 EN 61000-6-4	
10 Low voltage equipment	2006/95/EC EN 60034 EN 60204-1 EN 60439	

11 The harmonized and the technical standards used are identified in the attachments hereafter

12 Atlas Copco Airpower n.v. is authorized to compile the technical file

	Conformity of the specification to the Directives	Conformity of the product to the specification and by implication to the directives
13 Issued by	Product engineering	Manufacturing
14 Name		
15 Signature		
16 Place , Date		

Form 500 2610 015
ed. 10.2011-05-15

Atlas Copco Airpower n.v. A company within the Atlas Copco Group

Postal address P.O. Box 100 B-2610 Wilrijk-Antwerp Belgium www.atlascopco.com	Visitors address Bismarcksteernweg 957 B-2610 Wilrijk-Antwerp Belgium	Phone: +32 (0)3 870 21 11 Fax: +32 (0)3 870 24 43 For info, please contact your local Atlas Copco representative	Com. Reg. Antwerp 44651 V.A.T. 403.992.231
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Pressure Equipment Directive 97/23/EC

1. Conformity assessments followed : See table T.1

a. Category	b. Applicable	c. Module	d. Notified body	e. Reference certificate
I		H	(1)	
II	x	H	(1)	0038/PED/20030004/A/M
III		H	(1)	
IV		B	(1)	
		D	(1)	

Table T.1

(1) Notified body number 0038
Lloyd's Register Verification ltd
71 Fenchurch street
EC3M -- 4 BF London
United Kingdom

2 Description of the pressure equipment constituting the assembly : see table T.2

a. Equipment, subject to the Simple Pressure Vessel directive 2009/105/EC, is excluded from 97/23/EC according article I, section 3.3.			
b. Equipment of category I, according 97/23/EC, is integrated into the machine and falls under the exclusion of article I, section 3.6.			
c. Equipment of article 3.3 of 97/23/EC is subject to good engineering practice			
"Cat I and higher"	d. Equipment		e. Declaration of conformity attached (including conformity assessment procedure followed, identification of standards)
	e. Description and/or i. Part number		
	i. Safety accessories	Safety valve	x
		Safety valve	x

Table T.2

3. Harmonised standards used : see table T.2

4. National technical standards and specifications used: see table T.2

