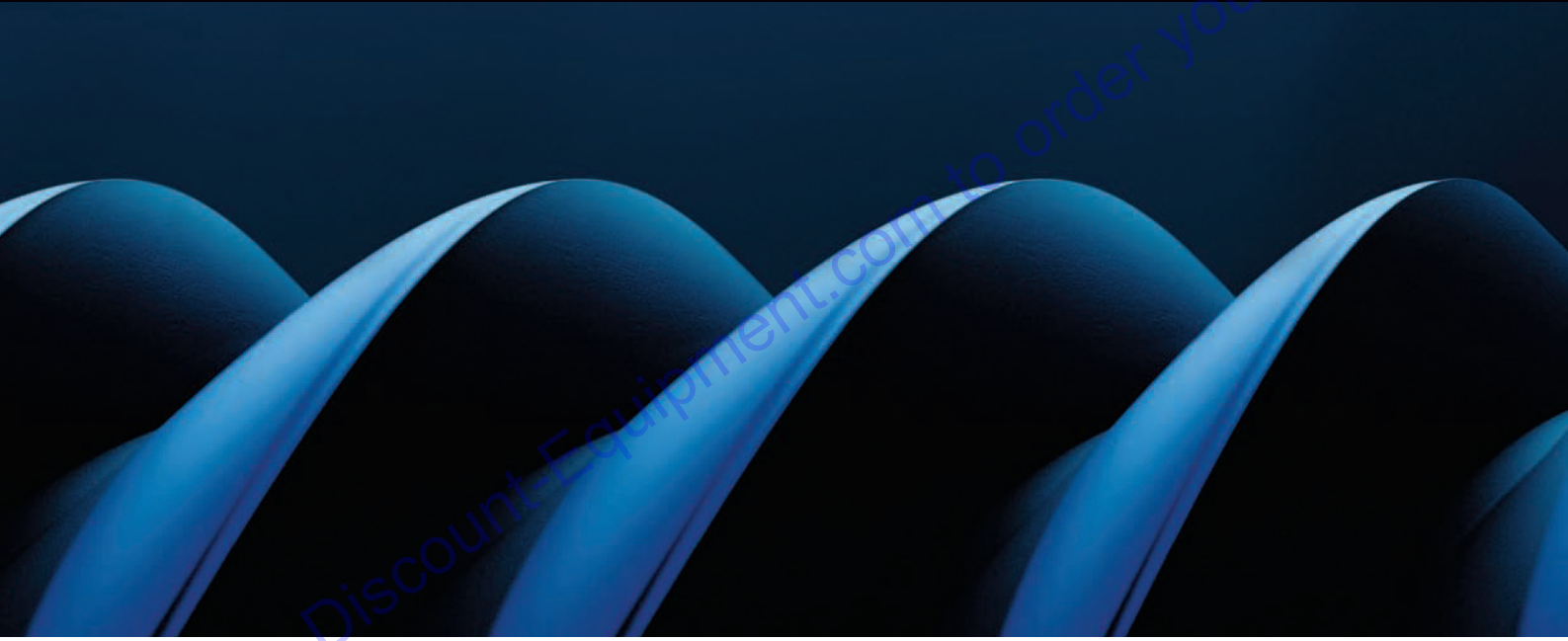
Chicago Pneumatic







Discount Equipment

# CPS 110 T4F DOT APP

Instruction Manual

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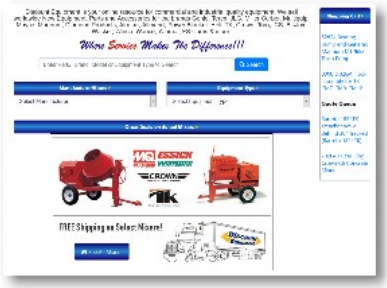

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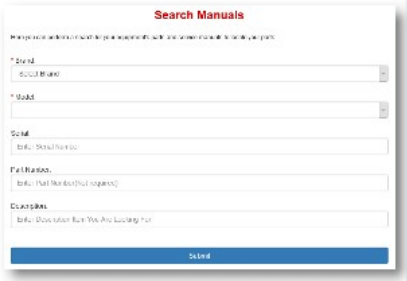


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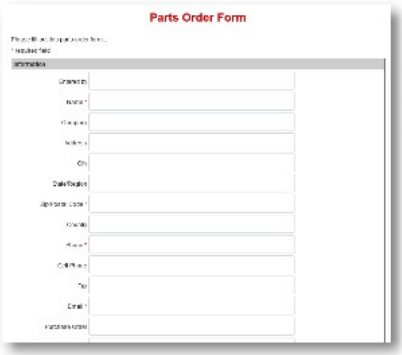


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## CALIFORNIA Proposition 65

**⚠ WARNING**

Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to www.P65warnings.ca.gov/diesel.

# Operator Manual
# for Portable Compressors

# CPS 110 T4F DOT APP



**Original instructions**

Printed matter No.
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01/2019

Chicago Pneumatic

CHICAGO PNEUMATIC - PORTABLE ENERGY DIVISION
www.cp.com

**Warranty and Liability Limitation**

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

## Preface

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

*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.*

# Table of content







Chicago Pneumatic

# Safety precautions

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

## INTRODUCTION

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

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

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

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

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

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

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

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

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

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

## GENERAL SAFETY PRECAUTIONS

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

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

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

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

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

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

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

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.

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

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

## SAFETY DURING TRANSPORT AND INSTALLATION

Transport of the unit has to be done by authorized/ experienced people.

When towing, lifting or transporting the compressor in any way, the battery switch must always be switched off.

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:
- machine hood must be closed,
- 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,
- keep hands/fingers away from the coupling device and all other potential pinch points. Keep feet away from the towbar to avoid injury if it should slip,
- 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 ascertain that the signalisation cable can not drag on the ground when towing the unit,
- attach the safety break-away cable or safety chain to the towing vehicle,
- remove wheel chocks, if applied, and disengage the parking brake,
- check whether springs on wheelchocks are missing or broken.

2 To tow a unit use a towing vehicle of ample capacity. Refer to the documentation of the towing vehicle.

3 If the unit is to be backed up by the towing vehicle, disengage the overrun brake mechanism (if it is not an automatic mechanism).

4 Never exceed the maximum towing speed of the unit (mind the local regulations).

5 Place the unit on level ground and apply the parking brake before disconnecting the unit from the towing vehicle. Remove 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. The unit must always be used/ parked/stored in a non publicly accessible area, locked away from access by unauthorized persons.

6 To lift heavy parts, a hoist of ample capacity, tested and approved according to local safety regulations, shall be used.

7 Lifting hooks, eyes, shackles, etc., shall never be bent and shall only have stress in line with their design load axis. The capacity of a lifting device diminishes when the lifting force is applied at an angle to its load axis.

8 For maximum safety and efficiency of the lifting apparatus all lifting members shall be applied as near to perpendicular as possible. If required, a lifting beam shall be applied between hoist and load.

9 Never leave a load hanging on a hoist.

10 A hoist has to be installed in such a way that the object will be lifted perpendicular. If that is not possible, the necessary precautions must be taken to prevent load-swinging, e.g. by using two hoists, each at approximately the same angle not exceeding 30° from the vertical.

11 Locate the unit away from walls. Take all precautions to ensure that hot air exhausted from the engine and driven machine cooling systems cannot be recirculated. If such hot air is taken in by the engine or driven machine cooling fan, this may cause overheating of the unit; if taken in for combustion, the engine power will be reduced.

12 Before moving the compressor, switch it off.

## SAFETY DURING USE AND OPERATION

1 When the unit has to operate in a fire-hazardous environment, each engine exhaust has to be provided with a spark arrestor to trap incendiary sparks.

2 The exhaust contains carbon monoxide which is a lethal gas. When the unit is used in a confined space, conduct the engine exhaust to the outside atmosphere by a pipe of sufficient diameter; do this in such a way that no extra back pressure is created for the engine. If necessary, install an extractor. Observe any existing local regulations. Make sure that the unit has sufficient air intake for operation. If necessary, install extra air intake ducts.

3 When operating in a dust-laden atmosphere, place the unit so that dust is not carried towards it by the wind. Operation in clean surroundings considerably extends the intervals for cleaning the air intake filters and the cores of the coolers.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

21 When using compressed air or inert gas to clean down equipment, do so with caution and use the appropriate protection, at least safety glasses, for the operator as well as for any bystander. Do not apply compressed air or inert gas to your skin or direct an air or gas stream at people. Never use it to clean dirt from your clothes.

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

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

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

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

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

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

## SAFETY DURING MAINTENANCE AND REPAIR

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

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

2 Parts shall only be replaced by genuine Chicago Pneumatic 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 Chicago Pneumatic or the machine manufacturer. Ascertain that the selected lubricants comply with all applicable safety regulations, especially with regard to explosion or fire-risk and the possibility of decomposition or generation of hazardous gases. Never mix synthetic with mineral oil.

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

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

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

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

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

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

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

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

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

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

## TOOL APPLICATIONS SAFETY

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

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

## SPECIFIC SAFETY PRECAUTIONS

### Batteries

When servicing batteries, always wear protecting clothing and glasses.

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

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

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

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

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

### Pressure vessels

Maintenance/installation requirements:

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

- pressure vessel for compressor,
- medium AIR/OIL,

and operates as detailed on the data plate of the vessel:

- the maximum working pressure ps in bar (psi),
- the maximum working temperature Tmax in °C (°F),
- the minimum working temperature Tmin in °C (°F),
- the capacity of the vessel V in l (US gal).

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

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

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

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

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

7 Installation, design and connections should not be changed.

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

9 (Pressure) vessel maintenance is to be performed by Chicago Pneumatic.

### Safety valves

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

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

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

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

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

6 Safety valves must be frequently tested and regularly maintained.

7 The set pressure should be periodically checked for accuracy.

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

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

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

11 Do not paint or coat the installed safety valve.

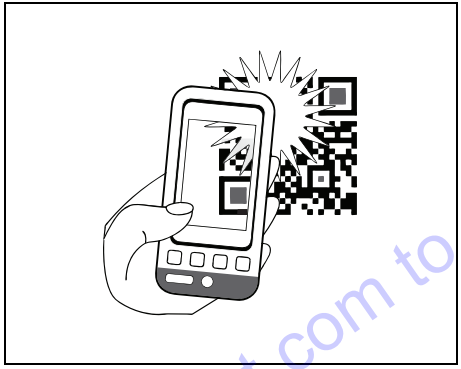
# Leading particulars

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

**This symbol is followed by supplementary information.**

**Before performing any maintenance or repair the Operator manual of the machine has to be read and understood. Not following this obligation may lead to hazardous situations and result in injuries and damage to the equipment.**

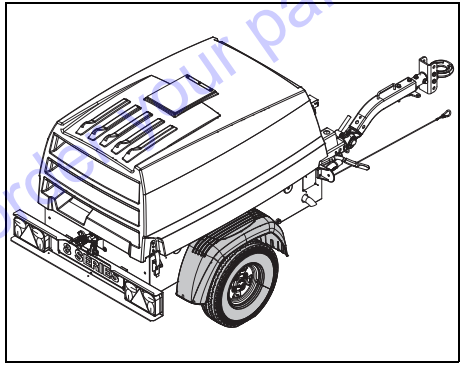
## QR CODE



The unit is equipped with a QR code label. You will find the QR code next to the operating panel. Scanning the code with your smartphone or tablet will lead you to a website with additional information about your compressor.

**Some parts of this website may be password protected.**

## GENERAL DESCRIPTION



The compressor type CPS 110 is silenced, single-stage, oil-injected screw compressor, built for a nominal effective working pressure of 7 bar (101.5 psi) (see chapter **Technical specifications**).

The compressor is equipped with a PE canopy.

PE is very robust, cannot corrode and will keep its shape and color during the full lifetime of the machine. It is fully recyclable to keep the environmental impact as low as possible. Its low weight (below 750 kg) makes it possible to tow it with a standard US driver's license.

The canopy has openings at the shaped front and rear end for the intake and outlet of cooling air. The canopy is internally lined with sound-absorbing material.

## Engine

The compressor is driven by a liquid-cooled diesel engine.

The engine's power is transmitted to the compressor through a gear box.

## Compressor element

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

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

## Compressor oil system

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

The entire oil system is equipped with screwed oil hoses to ensure higher quality and less failures.

The oil is removed from the air, in the air/oil vessel first by centrifugal force, secondly by the oil separator element. A Spin-on oil separator assures for quick service.

## Regulation

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

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

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

## Cooling system

The engine is provided with a liquid cooler and the compressor is provided with an oil cooler.

The top tank of the engine cooler is integrated in the cooler to reduce the amount of connections. This results in higher general robustness and less engine failures.

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

## Fuel system

The fuel feed lines and fuel filtration are designed in such a way that after running the fuel tank dry, air pockets cannot reach the engine and smooth starting is ensured.

## Safety devices

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

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

## Frame and axles

The machine is equipped with a spillage-free frame.

The base frame which is made out of a single metal sheet, can contain up to 110% of all the liquids in the compressor. A drain plug is installed to drain the frame and safely capture all the spilled liquids.

The bumper is designed in such a way that it protects the rear bottom of the frame if the machine would be tilted on its rear.

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

The unit can be delivered with or without wheels. If equipped with wheels, fixed towbar without brakes. The towbar can be equipped with a pintle eye that can be mounted on different vertical positions according to the requirements (towing vehicle).

The towbar is equipped with a retractable support leg.

### Lifting eye

A lifting eye is accessible through a rubber flap covered hole at the top of the unit.

### Control panel

The control panel grouping the air pressure gauge, start switch etc., is placed in the center at the rear end.

A main switch is included to prevent for unauthorized starting.

### Data plate

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

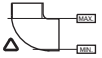
### VIN number

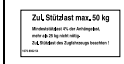
The VIN number is located on the right-hand front side of the frame.

## MARKINGS AND INFORMATION LABELS

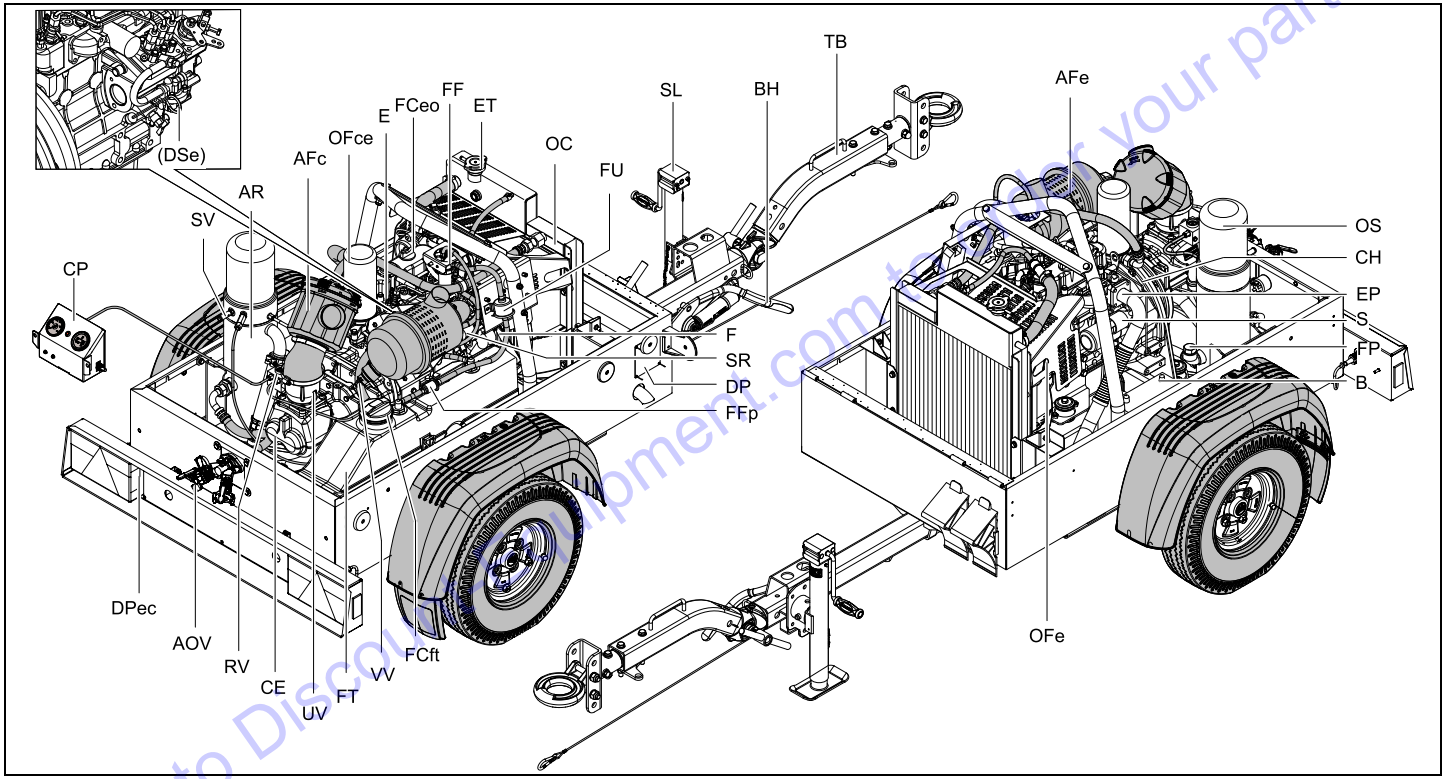
For location of the labels refer to the spare parts manual.

| | |
|---|---|
|  | Danger, outlet gases. |
|  | Danger, hot surface. |
|  | Electrocution hazard. |
|   | Mineral compressor oil. |
|   | Synthetic compressor oil. |
|   | Mineral engine oil. |
|   | Synthetic engine oil. |
|  | Manual. |
|  | Read the instruction manual before working on the battery. |
|  | On/off button. |
|  | Hours, time. |

| | |
|---|---|
|  | Prohibition to open air valves without connected hoses. |
|  | Runlamp. |
|  | Airfilter. |
|  | Compressor temperature too high. |
|   | Compressor oil level. |
|  | Rotation direction. |
|  | Read the instruction manual before starting. |
|   | Service every 24 hours. |
|  | Warning! Part under pressure. |
|  | Do not stand on outlet valves. |
|  | Do not run the compressor with open doors. |

| | |
|---|---|
|  | Lifting device. |
|   | Use diesel fuel only. |
|   | Tyre pressure. |
|  | Service. |
|  | Engine coolant. |
|   | Sound power level in accordance with Directive 2000/14/EC (expressed in dB (A)). |
|  | Horizontal towbar position required in case of coupling. |
|  | Start engine. |
|  | Preheating. |
|   | Towing eye load. |
|  | Flammable substances. |

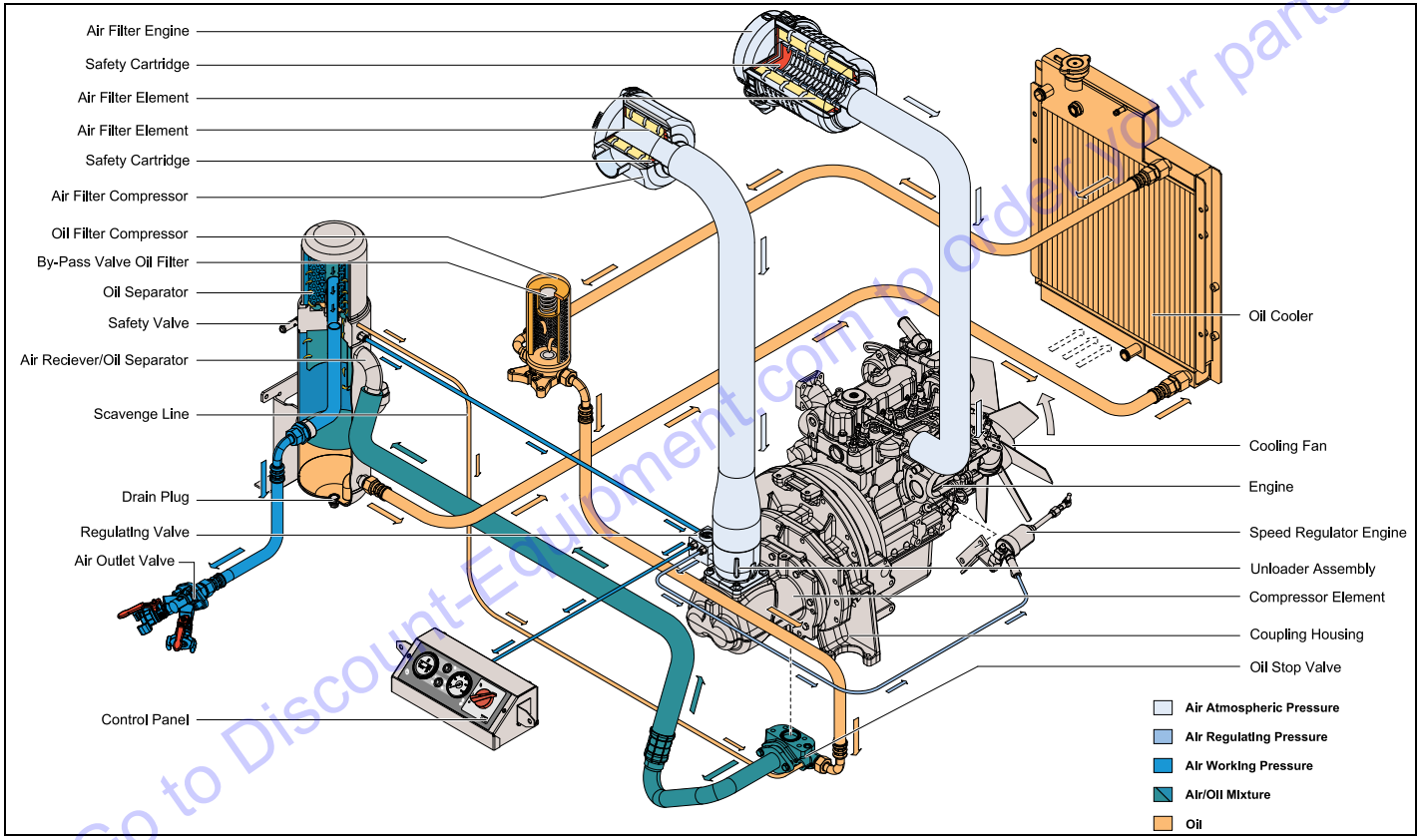
# Main Parts



| Reference | Name |
|---|---|
| AFc | Air Filter Compressor |
| AFe | Air Filter Engine |
| AOV | Air Outlet Valves |
| AR | Air Receiver |
| B | Battery |
| BH | Brake Handle |
| CE | Compressor Element |
| CH | Coupling housing |
| CP | Control Panel |
| DP | Data Plate |
| DPec | Drain Plug (engine oil cooler) |
| DSe | Dip Stick (engine oil) |
| E | Engine |
| EP | Exhaust Pipe |
| ET | Expansion Tank |
| F | Fan |
| FCeo | Filler Cap (engine oil) |
| FCft | Filler Cap (fuel tank) |
| FF | Fuel Filter |

| Reference | Name |
|---|---|
| FFp | Fuel pre filter |
| FP | Filler Plug |
| FT | Fuel Tank |
| FU | Fuel Pump |
| OC | Oil Cooler |
| OFce | Oil Filter (compressor element) |
| OFe | Oil Filter (engine) |
| OS | Oil Separator |
| RV | Regulating Valve |
| S | Starting Motor |
| SL | Support leg |
| SR | Speed Regulator |
| SV | Safety Valve |
| TB | Towbar |
| UV | Unloader Valve |
| VV | Vacuator Valve |

# Overview



## AIR FLOW

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

A check valve in the unloader assembly (UA) prevents blow-back of compressed air when the compressor is stopped. In the air receiver (AR), most of the oil is removed from the air/oil mixture; the remaining oil is removed by the separator element (OS).

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

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

The system comprises of a temperature switch (TS) and a working pressure gauge (PG).

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

## OIL SYSTEM

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

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

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

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

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

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

When cold start equipment is installed, a thermostatic valve will bypass the compressor oil (oil will not pass through oil cooler OC), until the working temperature is reached.

## CONTINUOUS PNEUMATIC REGULATING SYSTEM

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

When the air consumption increases, the air receiver pressure will decrease and vice versa. This receiver pressure variation is sensed by the regulating valve which, by means of control air to the unloader, matches the air output to the air consumption. The air receiver pressure is maintained between the preselected working pressure and the corresponding unloading pressure.

When starting the compressor, the unloader valve in the unloader assembly (UA) is kept open by spring force, the engine runs at maximum speed. The compressor element (CE) takes in air and pressure builds up inside the receiver (AR).

The air output is controlled from maximum output (100%) to no output (0%) by:

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

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

If the air consumption is less than the maximum air output, the regulating valve supplies control air to unloader assembly (UA) to reduce the air output and holds air receiver pressure between the normal working pressure and the corresponding unloading pressure at approximately 1.5 bar (22 psi) above the normal working pressure.

When the air consumption is resumed, the unloader valve in the unloader assembly (UA) gradually opens the air intake and the speed regulator (SR) increases the engine speed.

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

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

## PARKING, TOWING AND LIFTING INSTRUCTIONS

### Safety precautions

**The operator is expected to apply all relevant Safety precautions.**

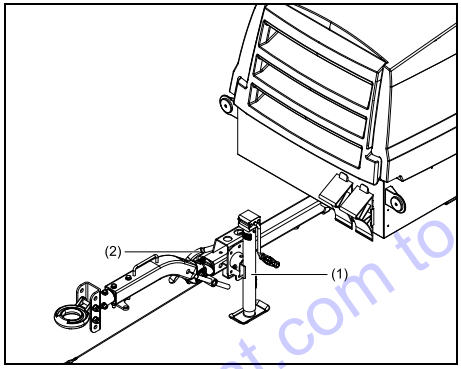
### Attention

**After the first 100 km travel:**

**Check and retighten the wheel nuts and towbar bolts to the specified torque. See section Compressor/engine specifications.**

**When using a towing vehicle to manoeuver the unit, take care that the support leg is lifted maximally.**

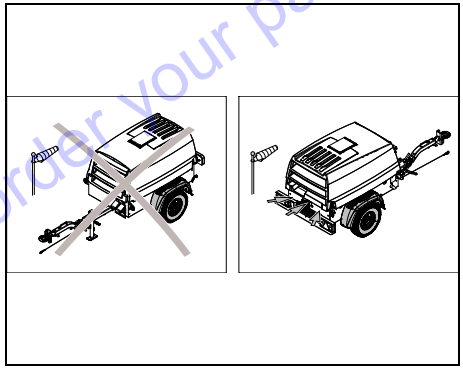
## PARKING INSTRUCTIONS



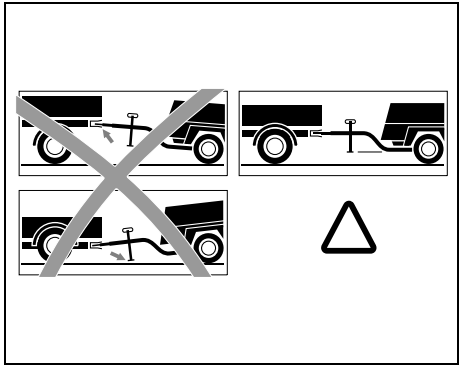

*Fixed towbar with support leg*

Release the adjustable handle to put in a vertical position. Secure the support leg (1) to support the compressor in a level position.

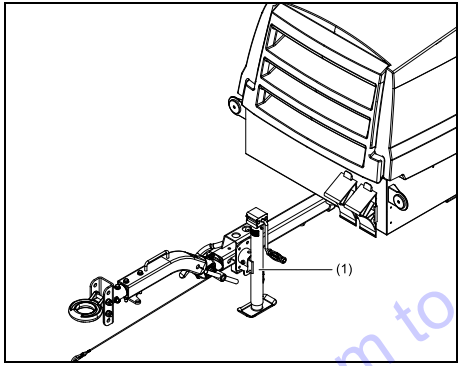
Apply parking brake by pulling parking brake handle (2) upwards. Place the compressor as level as possible; however, it can be operated temporarily in an out-of-level position not exceeding 15°. If the compressor is parked on sloping ground, immobilize the compressor by placing wheel chocks (available as an option) in front of or behind the wheels.



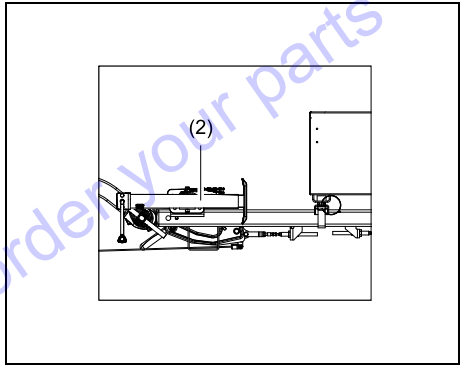
Locate the rear-end of the compressor upwind, away from contaminated wind-streams and walls. Avoid recirculation of exhaust gas and warmed-up cooling air. This causes overheating and engine power decrease. Do not obstruct air evacuation from the cooling system. The compressor oil lifetime will be shortened when the compressor inlet air is contaminated.



*Label on towbar, towing instructions*




*Towbar with support leg*



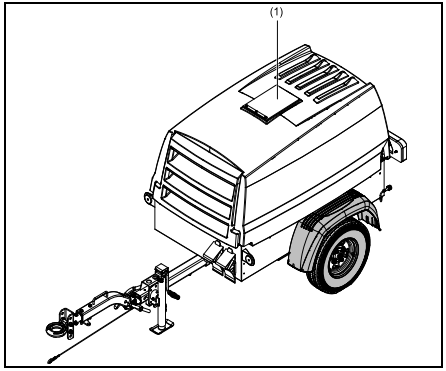

*Towing position*

**Before towing the compressor, ensure that the towing equipment of the vehicle matches the towing eye or ball connector, and ensure that the hood is closed and locked properly.**

The towbar should be as level as possible and the compressor and towing eye end in a level position.

Secure support leg (1) in the highest possible position, by pulling hand brake lever.

## LIFTING INSTRUCTIONS




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

The lifting eye should preferably be used. The lifting eye is accessible when lifting the rubber flap (1).

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

**Helicopter lifting is not allowed.**

**Lifting is not allowed when the unit is running.**

**Preferably use a lifting rope to avoid damage to the lifting beam structure and canopy.**

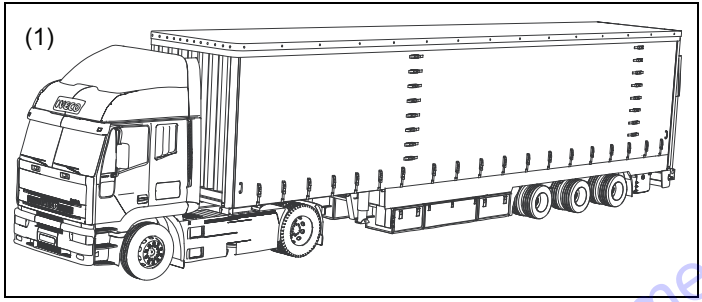
**Use a rope of ample capacity, that is tested and approved according to local safety regulations.**

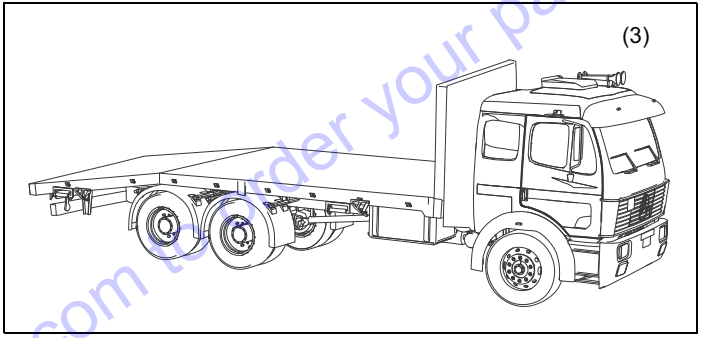
## SHIPPING THE COMPRESSOR

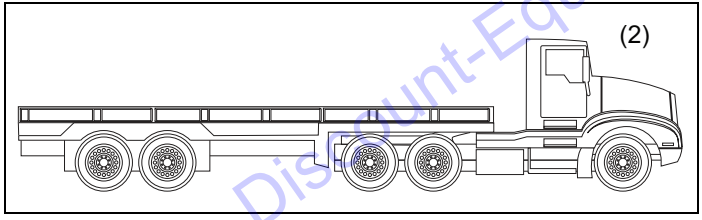
### SPECIFIED SHIPPING VEHICLE

Use only these shipping vehicles to transport the unit to the required location:

1. Curtain Trailers
2. Open Trailers
3. Winch Trucks



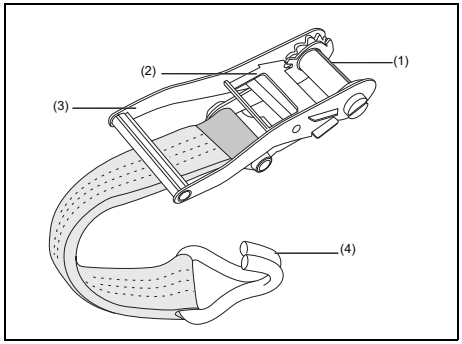



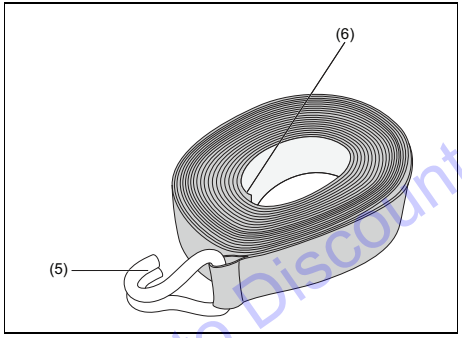
## FIXATION TOOLS

Use only CE-approved lashing belts (ratchet straps).

The lashing belts (ratchet straps) must be of type LC 2000 daN and Stf 350 daN.




Fixed belt




Adjusting belt

The lashing belt set has two separate belts- the fixed belt and the adjusting belt.

| Reference | Description |
|---|---|
| 1 | Slot for adjusting belt |
| 2 | Ratchet locking tool (Pawl) |
| 3 | Ratchet handle |
| 4 | Hook of fixed belt |
| 5 | Hook of adjusting belt |
| 6 | Open end of adjusting belt |

### Fixing The Lashing Belts

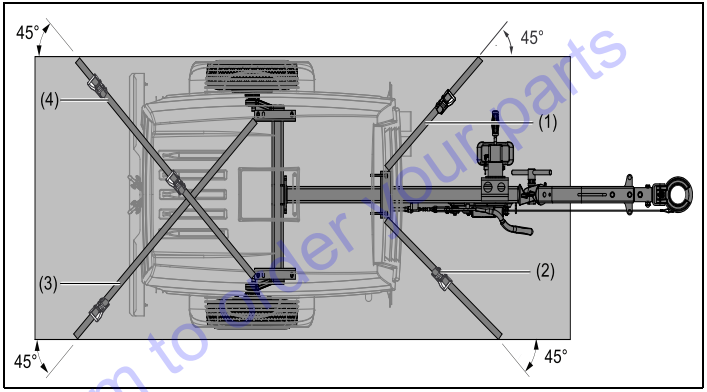
1. Fix the hook of the fixed belt (4) to an eye on the shipping vehicle. Open the ratchet handle (3) on the fixed belt. Raise and lower the ratchet handle (3) till the slot (1) is visible and accessible (as shown in the figure).
2. Fix the hook of the adjusting belt (5) to an eye on the unit. Pass the open end of the adjusting belt (6) through the slot (1) from the bottom to the top.
3. Pull out the open end (6) such that a loop is formed. The open end (6) must be pulled till there is no slack in the adjusting belt.
4. Raise and lower the ratchet handle (3) till the force required to add tension to the belt becomes too great.
5. Push the ratchet handle (3) down to lock the belts in place.

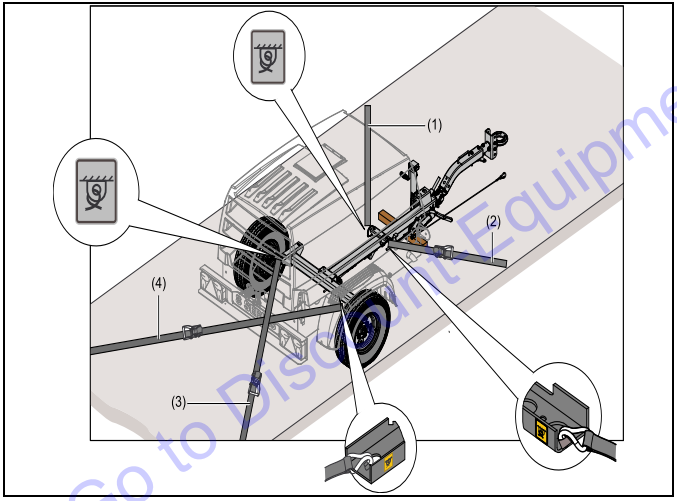
### Removing the Lashing belts

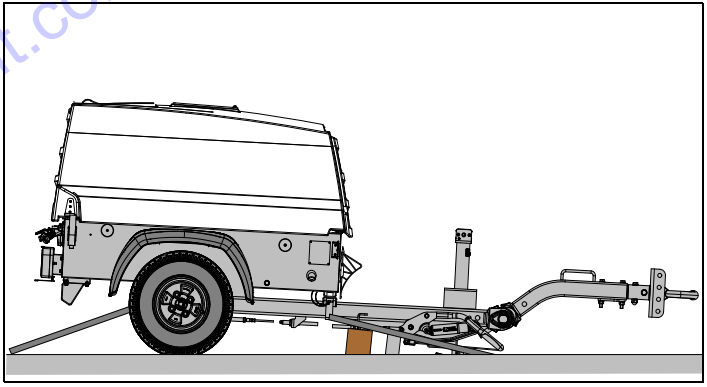
1. Open the ratchet handle (3).
2. Pull the ratchet locking tool (2) towards the grip of the ratchet handle (3) to free the tension on the adjusting belt.
3. Pull out the open end of the adjusting belt (6) from the slot (1).
4. Unhook the fixed and adjusting belts from the eyes where they had been fitted.
5. Keep the lashing belts in a safe area.

## SECURING THE UNIT TO THE SHIPPING VEHICLE

1. Place the unit in centre position into the shipping vehicle so that the canopy is parallel to the edges of the shipping vehicle.
2. For tie points 1 to 4, hook the four adjusting belts to the eyes of the unit and four fixed belts to the eyes on the shipping vehicle.
3. Place the wooden block below the towbar to make sure that the floor is not damaged. It is recommended to keep minimum height of 15 cm.
4. Fasten the adjusting belts to the fixed belts, refer to **Fixing The Lashing Belts**. Make sure that an angle of 45° is maintained between the above fitted lashing belts and the horizontal sides of the shipping unit.
5. For tie point 5, fit the hooks of the adjusting belt and the fixed belt to eyes opposite to one another on the shipping vehicle.
6. Fasten the adjusting belt to the fixed belt so that the towing bar is tied down. For the fastening procedure, refer to **Fixing The Lashing Belts**.



## OPERATING THE COMPRESSOR

### PREVENT LOW LOADS

Low loads may lead to:

- High oil consumption: prolonged no-load/low load operation of the engine may cause it to blue/grey smoke at low rpm with an associated increase in oil consumption.
- Low combustion temperature: this will result in insufficiently burned fuel, which will cause diluting of the lube oil. Also, unburned fuel and lube oil can enter the exhaust manifold and eventually leak out through joints in the exhaust manifold.
- Risk for fire.
- Formation of condensation in the oil filter, which can collapse the filter.

Reduce low load periods to a minimum.

It is recommended that a unit is always used with a load >30% of nominal. Actions should be taken if due to circumstances this minimum load capacity cannot be obtained.

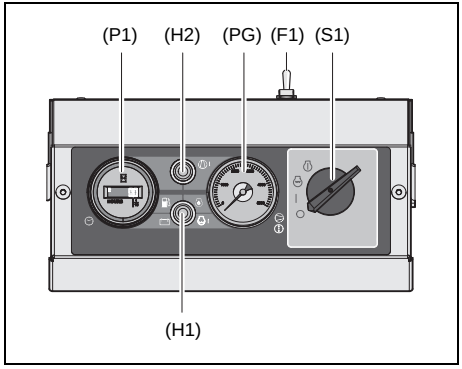
**For more info, please contact your Chicago Pneumatic Service Center.**

Please note that when a failure occurs and is deemed due to low load operation, repair is not covered by warranty.

## BEFORE STARTING

1. Before initial start-up, prepare battery for operation if not already done. See section **Recharging a battery**.
2. With the compressor standing level, check the level of the engine oil. Add oil, if necessary, up to the upper mark on the dipstick. See section **Oil level check**.
3. Check the level of the compressor oil. Add oil if necessary. See section **Compressor oil level check**.
4. Check the coolant level at the level gauge on the radiator. If necessary top up with coolant. See section **Topping up of coolant**.
5. Check that the fuel tank contains sufficient diesel fuel. Top up, if necessary. For priming the engine, the fuel must be electrically pumped up by holding the start switch in the “preheat” position, for maximum 20 seconds. If necessary, return to “0” position and repeat. See further starting instructions.
6. Drain leaking fluid from the frame.
7. Check the air filter vacuum indicators (if present). If the yellow piston reaches the red marked service range, have the filter element replaced. After replacing, reset the indicator by pushing the reset button.
8. Press vacuator valves of the air filter to remove dust.
9. Open air outlet valve to allow air flow to the atmosphere.

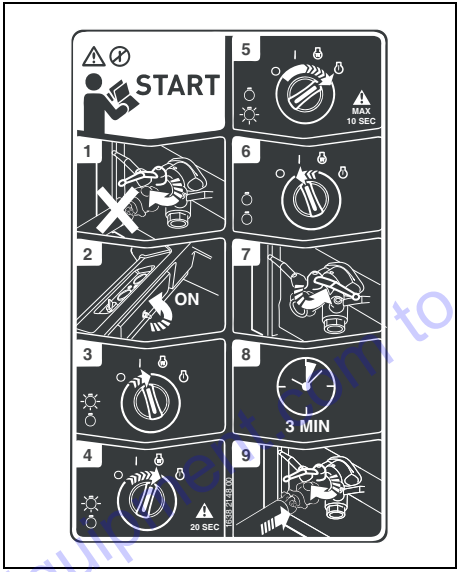
## CONTROL PANEL




| Reference | Name |
|---|---|
| P1 | Hour meter |
| F1 | Main switch |
| PG | Working pressure gauge |
| H1 | General alarm lamp (red) |
| H2 | Temperature alarm lamp (red) |
| S1 | Start switch with pre-heating position |

**The main switch is a protection against unintended starting of the compressor.**

## STARTING PROCEDURE




Before operating the unit first read the manual.

1. Open air outlet valve, do not connect a hose yet.
2. Open the hood and switch the main switch at the back of the control panel to ON.
3. Turn the start switch S1 clockwise to position 1, lamp H2 (temperature alarm lamp) will go on.
4. To preheat turn the start switch S1 clockwise to position 2 for 20 sec (also to allow the fuel pump priming).
5. Turn start switch S1 further clockwise into position 3. The general alarm lamp H1 will go on. The starter motor will set the engine in motion. The maximum allowed starter time, where the starter motor is running continuously, is 10 seconds. If the engine does not catch, a new attempt can be made after waiting 30 seconds. General alarm lamp H1 will go out as soon as the engine has been started.
6. The start switch automatically springs back to position 1 and both lamps will be off.
7. Close the air outlet valve(s).
8. Let the engine warm up for 3 minutes.
9. After warming up the air hose can be connected and the unit is ready for operation.

**Lamp H2 will only come on when the compressor outlet temperature is too high.**

## DURING OPERATION

**When the engine is running, the air outlet valves (ball valves) must always be in a fully opened or fully closed position.**

**The hood must be closed during operation and may be opened for short periods only.**

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

- Check that the regulating valve is correctly functioning, i.e. starts decreasing the engine speed when reaching the working pressure.
- Check on abnormal noise.
- Check the alarm lamps.

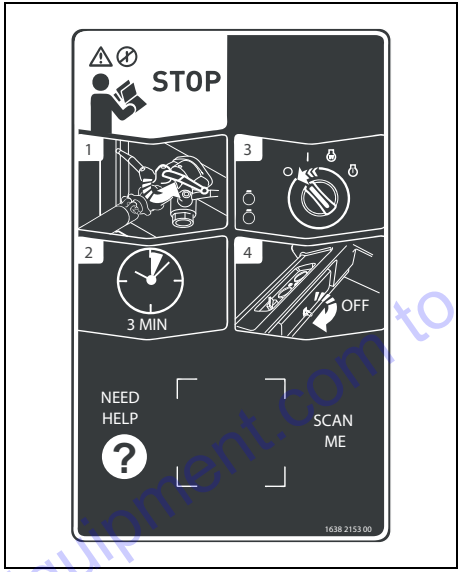
## AIR OUTLET PRESSURE

The air outlet pressure is set in the factory.

**Modifying the set point above the nominal working pressure can affect the correct working of the unit and result in failure. Only the Chicago Pneumatic customer center or an authorized distributor may work on, or adjust the regulating valve.**

**Incorrect use/operation of the machine, including modifying the working pressure above the nominal pressure, will void warranty.**

## STOPPING PROCEDURE




1. Close the air outlet valves (AOV).
2. Run unloaded for 3 minutes.
3. Turn the start switch S1 counterclockwise (CCW) to position 0.

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

4. Open the hood and switch the main switch at the back of the control panel to “OFF”.

**Do not open the air outlet valve when machine is shut down. Remaining air inside the vessel will automatically be evacuated via a blow down valve.**

**If pressure is released from the vessel too quickly, oil will start creating foam. This foam could reach the oil separator element resulting in oil carry over.**

**Failures caused by incorrectly shutting down the compressor will not be covered by warranty.**

## FAULT SITUATIONS AND PROTECTIVE DEVICES

- A fault involving the engine, either oil pressure (too low), coolant temperature (too high), will always and immediately cause the engine to cut out and the alarm lamp H1 will light up.
- When the air outlet temperature is too high the alarm lamp H2 will light up. The alarm lamp will stay on, until the compressor has been restarted (start switch to position 3), or the contact is turned off (start switch to position 0; also when, due to cooling off, the thermocontact has closed again (= memory function).

# Maintenance

**Unauthorised modifications can result in injuries or machine damage.**

**Always keep the machine tidy to prevent fire hazard.**

**Poor maintenance can void any warranty claims.**

**The operator is only allowed to execute the daily maintenance. All other maintenance/repair is to be done by authorized personnel.**

## PREVENTIVE MAINTENANCE SCHEDULE

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

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

For engine maintenance refer to Engine Operation Manual.

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

## USE OF SERVICE PAKS

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

Service Paks minimize downtime and keep your maintenance budget low.

Order Service Paks at your local Chicago Pneumatic dealer.

## LIABILITY

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

## DAILY MAINTENANCE COMPRESSOR BEFORE STARTING A JOB

| | |
|---|---|
| Drain water from fuel filter | |
| Drain condensate and water from spillage-free frame | see Spillage-free frame |
| Empty air filter vacuator valves | see Air filter engine/ compressor |
| Check engine oil level (if necessary top up) | see Engine oil level check |
| Check compressor oil level (if necessary top up) | see Compressor oil level check |
| Check coolant level | see Coolant level check |
| Check/Fill fuel level after a day's work | |
| Check on abnormal noise | |
| Check control panel | see Control panel |

## DAILY MAINTENANCE UNDERCARRIAGE BEFORE A ROADGOING JOB

| | |
|---|---|
| Check towbar, spring actuator, reversing lever, linkage and all movable parts for ease of movement | |
| Check coupling head for damage | |
| Check height of adjusting facility | see Height adjustment |
| Check tyre pressure | see Technical specifications |
| Check safety cable for damage | |

**For fluids to be used and their ordering numbers refer to the spare parts manual.**

## MAINTENANCE SCHEDULE COMPRESSOR

| *To determine the maintenance intervals, use service hours, or calendar time, whichever occurs first.* | | | | | |
|---|---|---|---|---|---|
| **Maintenance schedule (running hrs)** | **50 hrs after initial start-up** | **Every 250 hrs** | **Every 500 hrs** | **Every 750 hrs** | **Yearly** |
| *For the most important subassemblies, Chicago Pneumatic has developed service kits that combine all wear parts. These service kits offer you the benefits of genuine parts, save administration costs and are offered at a reduced price, compared to individual components. Refer to the parts list for more information on the contents of the service kits/service paks and their ordering numbers.* | | | | | |
| Change engine oil (2) | x | x | | | x |
| Replace engine oil filter (2) | x | x | | | x |
| Check for leaks in engine, compressor, air, oil, or fuel system | x | | x | | x |
| Check torque on critical bolt connections | x | | x | | x |
| Hoses and clamps - Inspect/Replace | x | | x | | x |

| Maintenance schedule (running hrs) | 50 hrs after initial start-up | Every 250 hrs | Every 500 hrs | Every 750 hrs | Yearly |
|---|---|---|---|---|---|
| Inspect/Adjust fan belt | | x | | | x |
| Check valve in the fuel return line (for mechanical injection system) | | x | | | x |
| Clean after cooler (option) (1) | | x | | | x |
| Drain/Clean fuel tank water and sediments (1) | | x | | | x |
| Replace fuel (pre)filters (5) | | x | | | x |
| Clean oil cooler(s) /radiator (1) | | x | | | x |
| Inspection by Chicago Pneumatic service technician | | x | | | x |
| Check engine & compressor anti-vibration pads | | | x | | x |
| Check functioning of regulating valve | | | x | | x |
| Check electrical system cables for wear | | | x | | x |
| Check engine (minimum and maximum) speed | | | x | | x |
| Clean flow restrictor in oil scavenge line | | | x | | x |
| Grease hinges | | | x | | x |
| Check/Test glow plugs - grid heater | | | x | | x |
| Replace bleed-off valve unloader | | | x | | x |
| Check rubber flexibles (9) | | | x | | x |
| Analyse coolant (3) (7) | | | x | | x |
| Replace fan belt | | | x | | |
| Adjust engine inlet and outlet valves (2) | | | | x | |
| Replace oil separator element | | | x | | x |
| Check/Replace safety cartridge | | | x | | x |

| Maintenance schedule (running hrs) | 50 hrs after initial start-up | Every 250 hrs | Every 500 hrs | Every 750 hrs | Yearly |
|---|---|---|---|---|---|
| Replace compressor oil filter(s) (4) | | | x | | x |
| Change compressor oil (1) (6) | | | x | | x |
| Replace air filter element (1) | | | x | | x |
| Measure alternator insulation resistance (on optional genset) | | | | | x |
| Check electrolyte level and terminals of battery | | | | | x |
| Test safety valve (8) | | | | | x |
| Check emergency stop | | | | | x |

**Notes**

1. More frequently when operating in a dusty environment.
2. Refer to engine operation manual.
3. Yearly is only valid when using GENCOOL. Change coolant every 5 years.
4. Use Chicago Pneumatic oil filters, with by-pass valve as specified in the parts list.
5. Gummed or clogged filters means fuel starvation and reduced engine performance.
6. See section **Oil**.
7. The following part numbers can be ordered from Chicago Pneumatic to check on inhibitors and freezing points
   - 2913 0028 00: refractometer
   - 2913 0029 00: pH meter
8. See section **Safety valve**.
9. Replace all rubber flexibles every 6 years, according to DIN 20066.
10. For other specific engine and alternator requirements refer to specific manuals.

**Keep the bolts of the housing, the lifting eye, the towbar and the axle securely tightened.**

**Refer to section Technical specifications for the torque values.**

## MAINTENANCE SCHEDULE UNDERCARRIAGE

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

## ADJUSTMENT OF THE CONTINUOUS PNEUMATIC REGULATING SYSTEM

**Modifying the set point above the nominal working pressure can affect the correct working of the unit and result in failure. After the end test in the factory the regulating valve is sealed. Only the Chicago Pneumatic customer center or an authorized distributor may work on the regulating valve.**

**Incorrect use/operation of the machine, including modifying the working pressure above the nominal pressure, will void warranty.**

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

To adjust the normal working pressure, proceed as follows:

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

1. Start and warm up the engine.
2. With the outlet valves (AOV) closed, pull out the knob, adjust the regulating valve (RV) until a pressure of X bar is reached (see table).
3. Check the minimum speed of the engine. Adjust minimum speed stop screw if necessary.
4. Open an outlet valve (AOV) sufficiently to let the engine run at maximum speed. The working pressure must be Y bar (see table); adjust if necessary with regulating valve (RV).
5. Check the engine maximum speed. Adjust the maximum speed by means of adjustable eccentric nut on top of speed regulator (SR).
6. Close the outlet valves (AOV), check that the pressure is between Z1 and Z2 bar (see table). Lock the regulating valve (RV) by pushing the knob down.

| | | X (pressure at unload) | Y(pressure at load) | Z1 - Z2 |
|---|---|---|---|---|
| Settings for working pressure of 7 bar | bar | 7.9 | 7 | 7.7-8.2 |
| | psi | 120.4 | 101.5 | 111.7-119.0 |

## OIL

**It is strongly recommended to use Chicago Pneumatic lubrication oils for both compressor and engine. If you want to use another brand of oil, consult Chicago Pneumatic.**

**Never mix synthetic with mineral oil.**

**Remark:**

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

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

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

## OIL LEVEL CHECK

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

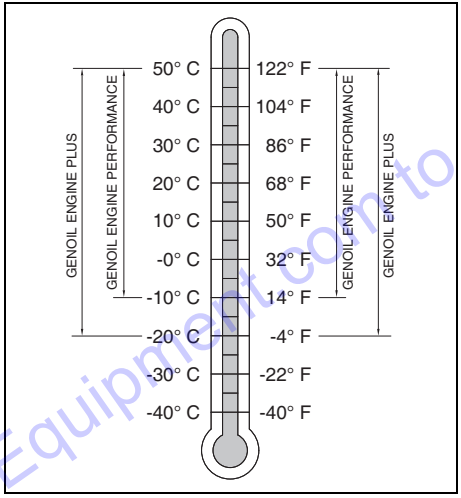
**Use only non-toxic oils where there is a risk of inhaling delivered air.**

Let the engine cool down for about 10 minutes. With the compressor standing level, check the level of the engine oil. Add oil, if necessary, up to the upper mark on the dipstick.

## ENGINE OIL LEVEL CHECK

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

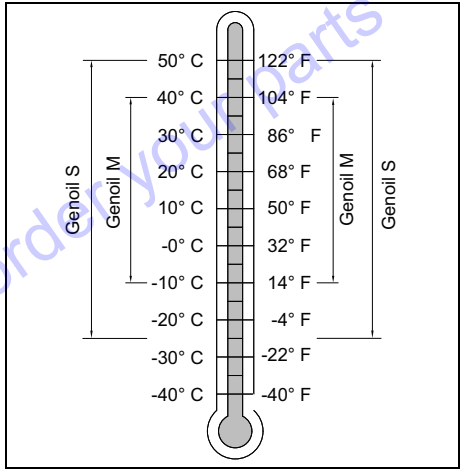
## ENGINE OIL




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

**For ordering numbers refer to the spare parts list.**

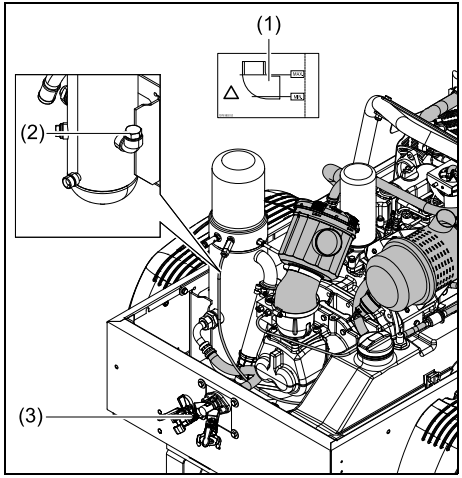
## COMPRESSOR OIL




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

**For ordering numbers refer to the spare parts list.**

## COMPRESSOR OIL LEVEL CHECK




## DAILY CHECK

Check the compressor oil level daily, after running the compressor.

**The compressor oil level needs to be checked with the compressor in an horizontal position after running the compressor to warm up so that the thermostatic valve is open (if present).**

1. Stop the compressor with closed air outlet valve and let it rest for a short period, to allow the system to relief pressure inside the vessel and settle down the oil.
2. Check the oil level by opening an oil filler plug (2). The oil level must always be above the bend of the elbow. If the oil level is below the bend of the elbow, fill up the oil via the same bend..

**Before removing the oil filler plug, ensure that the pressure is released by opening the air outlet valve (3) and checking the vessel pressure on the controller or the pressure gauge.**

3. Reinstall and tighten the filler plug (2).

## CHECK AFTER A LONGER PERIOD WITHOUT RUNNING THE COMPRESSOR

1. Check the oil level by opening an oil filler plug (2). The oil level must always be above the bend of the elbow.
2. If the oil level is too low, remove the oil filler plug (2) and check if there is still oil in the vessel.
   - No oil in the vessel: Top up the compressor with oil until the oil level is at the upper level as indicated on the label and follow the steps as described above in **Daily check**.
   - Oil in the vessel: Start up the unit to warm up and give time for the thermostatic valve to open. Stop the compressor with closed outlet valve (3) and follow the steps described above in **Daily check**.

**At temperatures below 0 °C, you have to load the compressor to be sure that the compressor thermostat will be open (If present).**

## COMPRESSOR OIL AND OIL FILTER CHANGE

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

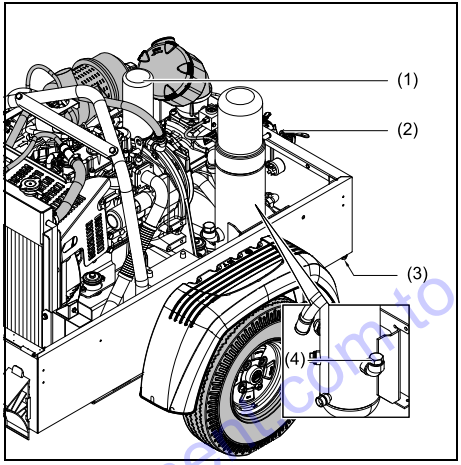
The prescribed interval is based on normal operating conditions and an oil temperature of up to 100 °C (212 °F) (see section **Preventive maintenance schedule**).

**The prescribed interval for compressor oil change is not to be exceeded in any case. When the oil exchange interval is exceeded, this could lead to serious damage to the compressor.**

**In case the compressor oil lifetime has been exceeded, please consult the Chicago Pneumatic Customer Center for appropriate cleaning and flushing instructions.**

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

**In this case, contact Chicago Pneumatic.**




1. Run the compressor until warm. Close the outlet valve(s) (2) and stop the compressor. Wait until the pressure is released through the automatic blow-down valve. Unscrew the oil filler plug (4) by a single turn. This uncovers a vent hole, which permits any pressure in the system to escape.
2. Drain the compressor oil by removing the drain plug (3). Drain plugs are fitted on the air receiver and compressor element. Catch the oil in a drain pan. Unscrew the filler plug to speed up draining. After draining, reposition and tighten the drain plugs.
3. Remove the oil filter (1), e.g. by means of a special tool. Catch the oil in a drain pan.
4. Clean the filter seat on the manifold, taking care that no dirt drops into the system. Oil the gasket of the new filter element. Screw it into place until the gasket contacts its seat, then tighten one half turn only.
5. Fill the air receiver until the oil level reaches the thread. Take care that no dirt drops into the system. Reinstall and tighten the filler plug (4).
6. Run the unit unloaded for a few minutes to circulate the oil and evacuate the air trapped in the oil system.
7. Stop the compressor. Let the oil settle for a few minutes. Check that the pressure is released by opening an air outlet valve (2). Unscrew filler plug (4) and add oil until the oil level reaches the thread. Reinstall and tighten the filler plug.

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

## COMPRESSOR OIL FLUSHING PROCEDURE

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

To avoid problems when changing over to a new type of oil a special Compressor Oil Flushing Procedure has to be followed. The procedure is only valid when the replaced oil has not exceeded its lifetime. For more information consult Chicago Pneumatic Service department.

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

Whenever aged oil is discovered, e.g. when changing the oil separator, contact Chicago Pneumatic Service department to have your compressor cleaned and flushed.

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

**Instructions on replacing the oil separator element are available from Chicago Pneumatic Service dept.**

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

*Vessel cover contaminated* *clean*

*Vessel contaminated* *clean*

| | GENOIL M | GENOIL S |
|---|---|---|
| GENOIL M | drain* | Flush |
| GENOIL S | drain** | drain* |

* When changing over to the same oil within the oil changing interval, draining is sufficient

**Change over not recommended.

## COOLANT

**It is strongly recommended to use Chicago Pneumatic coolant.**

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

### GENCOOL EG

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

**For ordering numbers refer to the spare parts list.**

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

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

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

In order to guarantee the lifetime and quality of the product, thus optimising engine protection, regular coolant-condition-analysis is recommended.
The quality of the product can be determined by three parameters:

### Visual check

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

### pH measurement

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

### Glycol concentration measurement

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

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

## COOLANT LEVEL CHECK

- Check the coolant level at the level gauge on the radiator. If necessary top up with coolant. See section **Topping up of coolant**.
- Low coolant level can lead to engine overheating, and will eventually result in permanent engine damage.

## TOPPING UP OF COOLANT

**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.**

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

## REPLACING THE COOLANT

### Drain

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

### Flush

- Flush twice with clean water. Used coolant must be disposed or recycled in accordance with laws and local regulations.
- Determine the amount of GENCOOL EG required, see **Technical specifications**, and pour it into the radiator top tank.
- It should be clearly understood that proper cleaning reduces contamination risks.
- In case of “other” coolant residues inside the system, the coolant with the lowest properties influences the quality of the ‘mixed’ coolant.

### Fill

- To assure proper operation and the release of trapped air, run the engine until normal engine operation temperature is reached. Turn off the engine and allow to cool.
- Recheck coolant level and add coolant mixture if necessary.

**Caution: Do not top up when the engine is hot.**

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

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

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

## ELECTROLYTE

**Read the safety instructions carefully.**

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

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

**Always pour the sulphuric acid carefully into the distilled water; never pour the water into the acid.**

## ACTIVATING A DRY-CHARGED BATTERY

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

## RECHARGING A BATTERY

**Read the safety instructions carefully.**

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 in accordance with the manufacturer's instructions.**

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

## MAKE-UP DISTILLED WATER

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

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

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

## PERIODIC BATTERY SERVICE

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

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

## AIR RECEIVER

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

## SAFETY VALVE

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

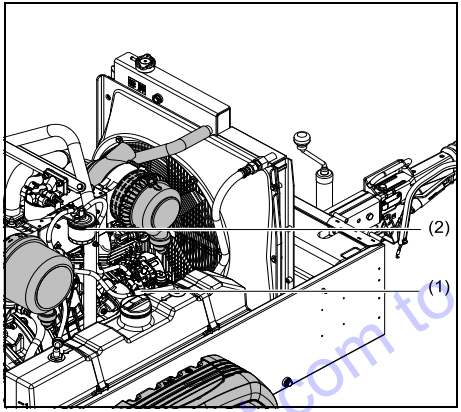
Following checks must be carried out:

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

## COMPRESSOR ELEMENT OVERHAUL

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

## FUEL SYSTEM




Replacing the filter element:

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

## CLEANING FUEL TANK

**Observe all relevant environmental and safety precautions.**

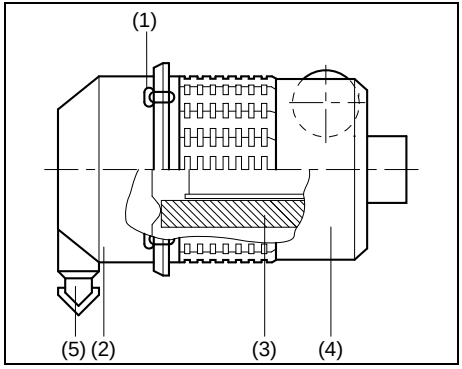
The fuel tank can be easily cleaned by taking it out of the frame.

There is no need to loosen the side panel

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

Refill the fuel tank with clean fuel.

## AIR FILTER ENGINE



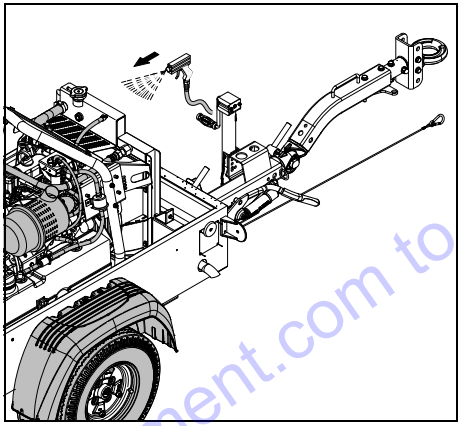

| Reference | Name |
|---|---|
| 1 | Snap clips |
| 2 | Dust trap cover |
| 3 | Filter element |
| 4 | Filter housing |
| 5 | Vacuator valve |

### CLEANING THE DUST TRAP

To remove dust from the dust trap squeeze the vacuator valve (1) several times.

## CLEANING

### CLEANING COOLERS



Keep the coolers clean to maintain the cooling efficiency.

The fan side surface of the compressor oil cooler and engine coolant cooler is accessible by removing the fan cowl upper part.

The opposite surface of the compressor oil cooler and engine coolant cooler is accessible by removing the center part of the front baffles.

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

Steam cleaning in combination with a cleansing agent may be applied.

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

Close the service door(s).

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

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

### CLEANING HARDHAT

Optimal cleaning of the HardHat can be achieved by high pressure cleaning in combination with liquid soap.

**Do not use water with a temperature > 50 °C (122 °F).**

## REPLACING THE AIR FILTER ELEMENT

**The Chicago Pneumatic air filters are specially designed for the application. The use of non-original air filters may lead to severe damage of engine and/or compressor element.**

**Never run the compressor without air filter element.**

**The filter element must be cleaned or replaced when the yellow indicator (8) has reached the bottom of the vacuum indicator.**

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

Discard the element (3) when damaged.

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

## WHEELS

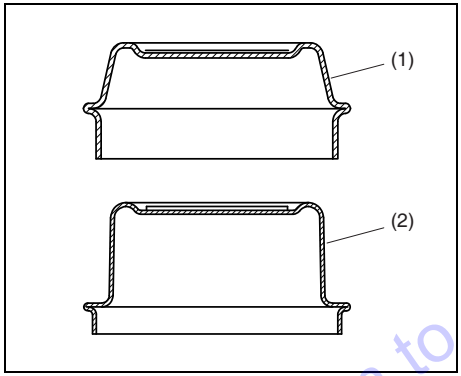
### Wheel bolts check

Tighten the wheel bolts crosswise using a torque wrench. Tighten the bolts in compliance with the torque in Technical specifications.

### Changing tyres

When changing a tyre, please observe that the arrow on the tyre in top position points in the driving direction (towards the towbar).

**If noticeable bearing play is felt, adjust bearings (taper roller bearings) or replace (compact bearings).**




The compressor can have maintenance free bearings, recognizable by cylindrical hub cap shape (1), or conventional taper roller bearings, recognizable by tapered hub cap shape (2), see figure.

### Wheel bearing check

Jack up the compressor, release brakes. Turn the wheels manually and rock.

If any bearing play is noticeable, adjust (taper roller bearings) or replace (compact bearings).

### Wheel bearing maintenance

Remove wheels and wheel hubs.

Mark dismounted wheel hubs and bearing races so that their identity is not mistaken during reassembly.

Clean wheel hubs thoroughly inside and outside. Remove old grease totally.

Clean taper roller bearings and seals (using diesel fuel) and check for reusability.

Work special long-life grease ECO_Li 91 or similar into the cavities between the taper roller and cage. Smear grease into the hub's outer bearing race.

Fill the hub caps to 3/4 full with grease.

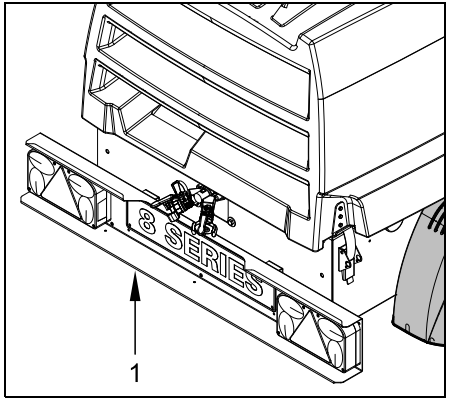
Fit wheel hubs, adjust the bearing play at taper roller bearings (see below) and fit the hub caps.

### Setting wheel bearing play

1. Lever off hub cap. Remove split pin from axle nut and tighten so that rotation of the wheel is slightly braked.
2. Turn back the axle nut to the next possible split pin hole, by a maximum of 30 degrees.
3. Insert split pin and bend ends slightly outwards.
4. Check wheel rotation, fit hub cap.

**The grease in the hub cap and bearing must not be contaminated with dirt during this job**

## SPILLAGE-FREE FRAME




The compressor is fitted with a leak-proof undercarriage in order to protect the environment.

Any leaking fluid is collected in case of malfunctions. This fluid can be removed via a drain (1), normally secured by caps.

Tighten the cap firmly and check for leakages.

Please observe the locally applicable environmental regulations when removing the leaked liquid.

## STORAGE

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

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

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

**Contact Chicago Pneumatic for correct measures.**

# Problem solving

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

**An electrical fault must be traced by an electrician.**

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

**If it is not possible to solve the problem with this problem solving table, please consult Chicago Pneumatic.**

### Alternator precautions

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

### FAULT SITUATIONS AND PROTECTIVE DEVICES

- A fault involving the engine, either oil pressure (too low), coolant temperature (too high), will always and immediately cause the engine to cut out and the alarm lamp H1 will light up. By doing some simple checks, the cause of the engine failure can be determined: low oil level, clogged-up cooler.
- Alarm lamp H2 will light up. The alarm lamp will stay on, until the compressor has been restarted (start switch to position 3), or the contact is turned off (start switch to position 0; also when, due to cooling off, the thermocontact has closed again (= memory function).

| Problem | Possible faults | Corrective actions |
|---|---|---|
| 1. Lamp H2 does not light up when turning the start switch (S1) to position 1. | a. Discharged or defective battery.<br>b. Loose battery cable(s) or oxidised terminals.<br>c. Loose connection or damaged wiring.<br>d. Start switch (S1) defective.<br>e. Circuit breaker (F1) defective. | a. Check electrolyte level and charge battery. If no cells are shorted and battery is discharged, trace cause and correct.<br>b. Check and correct if necessary.<br>c. Check wiring and connections; correct if necessary.<br>d. With (S1) switched in “I”, check voltage between earth and each of the terminals of (S1) respectively. Voltage must register at each of the terminals; if not, replace (S1).<br>e. Replace circuit breaker. |
| 2. General alarm lamp (H1) does not light up when turning the start switch (S1) to position 2. | a. Lamp (H2) blown.<br>b. Alternator (A)/regulator defective. | a. Replace lamp.<br>b. Disconnect the wire from alternator terminal D+ and connect it to terminal D–. If (H1) lights up, replace the alternator; if not, test (S1); see remedy 1d. |

| Problem | Possible faults | Corrective actions |
|---|---|---|
| 3. Engine does not start after turning (S1) to position 1. | a. Low battery output.<br>b. Circuit breaker button (F1) not pressed.<br>c. Loose or damaged electric wiring.<br>d. Fuel tank empty.<br>e. Start switch (S1) defective.<br>f. Starter motor defective. | a. See remedy 1a.<br>b. Press circuit breaker button.<br>c. Repair electric wiring.<br>d. Refuel and prime fuel pump.<br>e. Repair (S1).<br>f. Repair starter motor. |
| 4. Starter motor cranks engine when turning start switch (S1) to position 3, but engine does not fire. | a. Start switch (S1) defective.<br>b. Fuel solenoid (Y1) defective.<br>c. Low battery output. | a. See remedy 1d.<br>b. Check solenoid and its valve, correct or replace if necessary.<br>c. See 1a. |
| 5. Engine is running, but shuts down immediately after the start switch (S1) has been released. | a. Start switch (S1) released too soon.<br>b. Insufficient engine oil pressure.<br>c. Fuel tank contains insufficient fuel. | a. Release button after engine oil pressure has built up above the minimum allowed value.<br>b. Stop at once, consult the Engine Operation Manual.<br>c. Fill fuel tank. |
| 6. General alarm lamp (H1) remains alight for over 5 seconds after starting. | a. Insufficient engine oil pressure or too high engine coolant temperature.<br>b. Engine oil pressure switch (S3), or compressor temperature switch (S5) defective.<br>c. Relay (K5) and/or (K7) defective. | a. Stop at once, consult Engine Operation Manual.<br>b. Stop at once, test switches, replace as necessary.<br>c. Replace relay (K5) and/or (K7). |
| 7. Hour meter (P1) does not count running time. | a. Hour meter (P1) defective. | a. Replace |
| 8. Compressor does not unload and engine keeps running at maximum speed when closing the air outlet valves; safety valve blows. | a. Air leaks in regulating system.<br>b. Regulating valve (RV) incorrectly set or defective.<br>c. Unloader valve (UV) or its actuating piston stuck. | a. Check and repair.<br>b. Consult Chicago Pneumatic.<br>c. Repair unloader valve assembly. |

| Problem | Possible faults | Corrective actions |
|---|---|---|
| 9. Compressor capacity or pressure below normal. | a. Air consumption exceeds capacity of compressor.<br>b. Choked air filter elements (AF).<br>c. Unloader valve (UV) not completely open.<br>d. Engine does not run at max. speed.<br>e. Oil separator element (OS) clogged. | a. Check equipment connected.<br>b. Replace air filter element (AF).<br>c. Check unloader valve; replace if necessary.<br>d. Check the maximum speed, service the fuel filter.<br>e. Have element removed and inspected by an Chicago Pneumatic Service representative. |
| 10. Overheating; alarm lamp goes on. | a. Insufficient compressor cooling.<br>b. Oil / coolant cooler clogged externally. | a. Relocate compressor.<br>b. Clean cooler; see section **Cleaning coolers**. |
| 11. Engine keeps running at maximum speed when closing the air outlet valves; safety valve blows. | | a. Consult authorized technician/Chicago Pneumatic. |
| 12. Working pressure rises during operation and causes safety valve to blow. | a. See faults 8.<br>b. Safety valve (SV) opens too soon. | a. See remedies 8.<br>b. Have safety valve adjusted; consult Chicago Pneumatic. |
| 13. Excessive compressor oil consumption.Oil mist being discharged from air outlet valve(s). | a. Restrictor in oil scavenging line (SL) clogged.<br>b. Oil separator element (OS) defective.<br>c. Oil level too high.<br>d. Non return valve missing in scavenge line. | a. Dismount, clean and refit restrictor.<br>b. Replace element.<br>c. Check for overfilling. Release pressure and drain oil to correct level.<br>d. Install non return valve. |
| 14. Compressor shuts down through a shutdown switch. | a. Alternator V-belt broken or slipping.<br>b. Compressor overheating.<br>c. Engine oil pressure too low.<br>d. Engine temperature too high.<br>e. Low coolant level. | a. Re-tense or replace V-belt.<br>b. See condition 14.<br>c. Check lubricating system.<br>d. Check engine coolant system; see Engine Operation Manual.<br>e. Top up cooling system. |
| 15. Air and oil mist expelled from air filter after stopping. | a. Unloader valve (UV) blocked.<br>b. Wrong oil type (without foam-retarding additives). | a. Repair valve.<br>b. Consult Chicago Pneumatic. |

# Technical specifications

## TORQUE VALUES

### GENERAL TORQUE VALUES

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

**For hexagon screws and nuts with strength grade 8.8**

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

**For hexagon screws and nuts with strength grade 12.9**

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

### CRITICAL TORQUE VALUES

| Assemblies | Torque value, Nm (lbf.ft) |
|---|---|
| Wheel bolts | See section **Wheels** |
| Bolts, axle/beams | 80 (59) +/- 10% |
| Bolts, towbar/axle | 80 (59) +/- 10% |
| Bolts, towbar/bottom | 80 (59) +/- 10% |
| Bolts, towing eye/towbar | 80 (59) +/- 10% |
| Bolts, lifting eye/flywheel housing | 80 (59) +/- 10% |
| Bolts, engine/drive housing (M12) | 80 (59) +/- 10% |
| Bolts, engine/drive housing (M14) | 125 (92) +/- 10% |
| Bolts, compressor element/drive housing | 80 (59) +/- 5% |
| Safety switches | 35 (26) +/- 5% |

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

## COMPRESSOR/ENGINE SPECIFICATIONS

### REFERENCE CONDITIONS

| Designation | Unit | CPS 110 T4F DOT |
|---|---|---|
| Absolute inlet pressure | bar | 1 |
| | psi | 14.5 |
| Relative air humidity | % | 0 |
| Air inlet temperature | °C | 20 |
| | °F | 68 |
| Nominal effective working pressure | bar | 7 |
| | psi | 101.5 |

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

### LIMITATIONS

| Designation | Unit | CPS 110 T4F DOT |
|---|---|---|
| Minimum effective receiver pressure | bar | 2 |
| | psi | 29 |
| Maximum effective receiver pressure, compressor unloaded | bar | 8.8 |
| | psi | 128 |
| Maximum ambient temperature at sea level with aftercooler | °C | 43 |
| | °F | 109.4 |
| Minimum starting temperature | °C | -10 |
| | °F | 14 |

## ALTITUDE UNIT PERFORMANCE CURVES

Maximum achievable working pressure in relation to altitude and ambient temperature.

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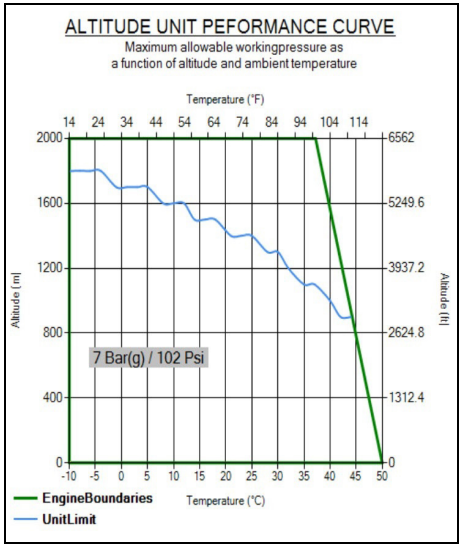



Graphic represents working conditions. For starting conditions, please contact Chicago Pneumatic service centre.

## PERFORMANCE DATA

**At reference conditions, if applicable, and at normal shaft speed, unless otherwise stated.**

| Designation | | Unit | CPS 110 T4F DOT |
|---|---|---|---|
| Free air delivery | | cfm | 95 |
| Compressed air temperature at outlet valves | | °C | 85 |
| | | °F | 185 |
| Specific fuel consumption at 100% FAD | | $g/m^3$ | 29.8 |
| Engine oil consumption (maximum) | | g/h | 17 |
| | | oz/h | 0.6 |
| Engine shaft speed, normal and maximum | | rpm | 2200 |
| Engine shaft speed, compressor unloaded | | rpm | 3600 |
| Fuel Consumption | at 100% FAD | kg/h | 4.64 |
| | | lb/h | 10.23 |
| | at 75% FAD | kg/h | 3.82 |
| | | lb/h | 8.42 |
| | at 50% FAD | kg/h | 2.73 |
| | | lb/h | 6.02 |
| | at 25% FAD | kg/h | 1.98 |
| | | lb/h | 4.37 |
| | at unload | kg/h | 1.79 |
| | | lb/h | 3.95 |

## DESIGN DATA

### Compressor

| Designation |
|---|
| Number of compression stages: 1 |

### Engine

| Designation | Unit | CPS 110 T4F DOT |
|---|---|---|
| Make | | Kubota |
| Type | | D902 |
| Coolant | | GENCOOL |
| Number of cylinders | | 3 |
| Bore | mm | 72 |
| | in | 2.83 |
| Stroke | mm | 73.6 |
| | in | 2.9 |
| Swept volume | l | 0.898 |
| | cu.in | 54.79 |
| Power output according to SAE J1995 at normal shaft speed | kW | 18.5 |
| | BHP | 21.6 |
| Load factor | % | 100 |
| Capacity of oil sump: | | |
| - Initial fill | l | 4 |
| | US gal | 1 |
| - Refill (maximum) | l | 3.8 |
| | US gal | 1.0 |

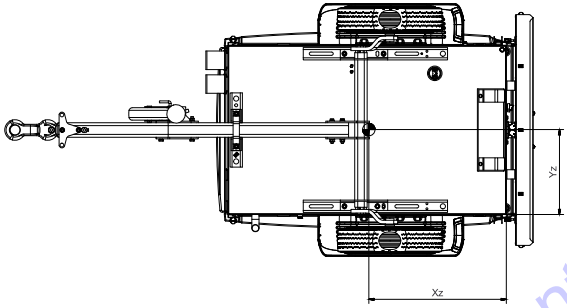
## Units

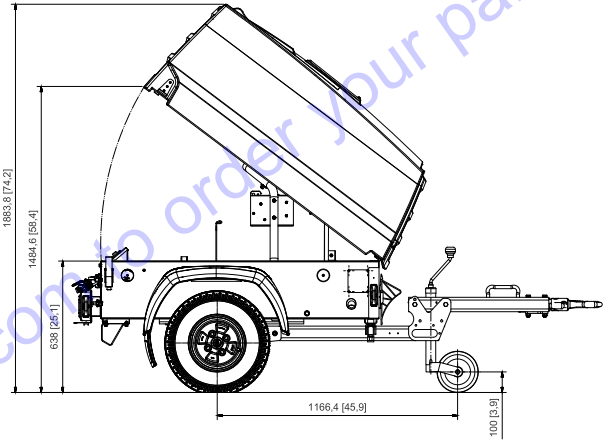
| Designation | Unit | CPS 110 T4F DOT |
|---|---|---|
| Capacity of compressor oil system | l | 6 |
| | US gal | 1.6 |
| Net capacity of air receiver | l | 6.7 |
| | US gal | 1.8 |
| Capacity of standard fuel tank | l | 28.5 |
| | US gal | 7.5 |
| Air volume at inlet grating (approximately) | $m^3/s$ | 0.93 |
| | cuft/s | 32.8 |

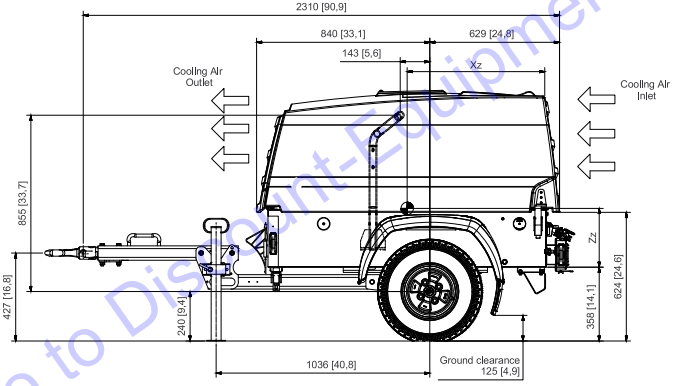
# Dimension drawings

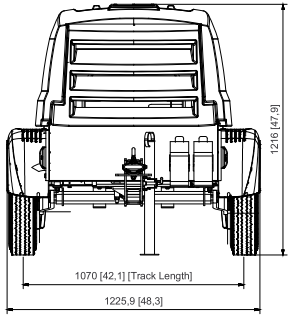
### 9822 1264 78 - Fixed unbraked towbar

| Centet of Gravity | | | | | | | |
|---|---|---|---|---|---|---|---|
| Net Mass | Xz | Yz | Zz | Wet Mass | Xz | Yz | Zz |
| Kg/Lbs | mm / [Inches] | mm / [Inches] | mm / [Inches] | Kg/Lbs | mm / [Inches] | mm / [Inches] | mm / [Inches] |
| 533/1172,6 | 667/[26,2] | 412/[16,2] | 282/[11,8] | 569/1251,8 | 654/[25,7] | 398/[15,6] | 277/[10,9] |



# Electrical drawings

**9822108230-02-1**

| INDEX | |
|---|---|
| SHEET | DESCRIPTION |
| 1 | INDEX & LEGEND |
| 2 | CONTROL CIRCUIT |
| 3 | FLEETLINK |

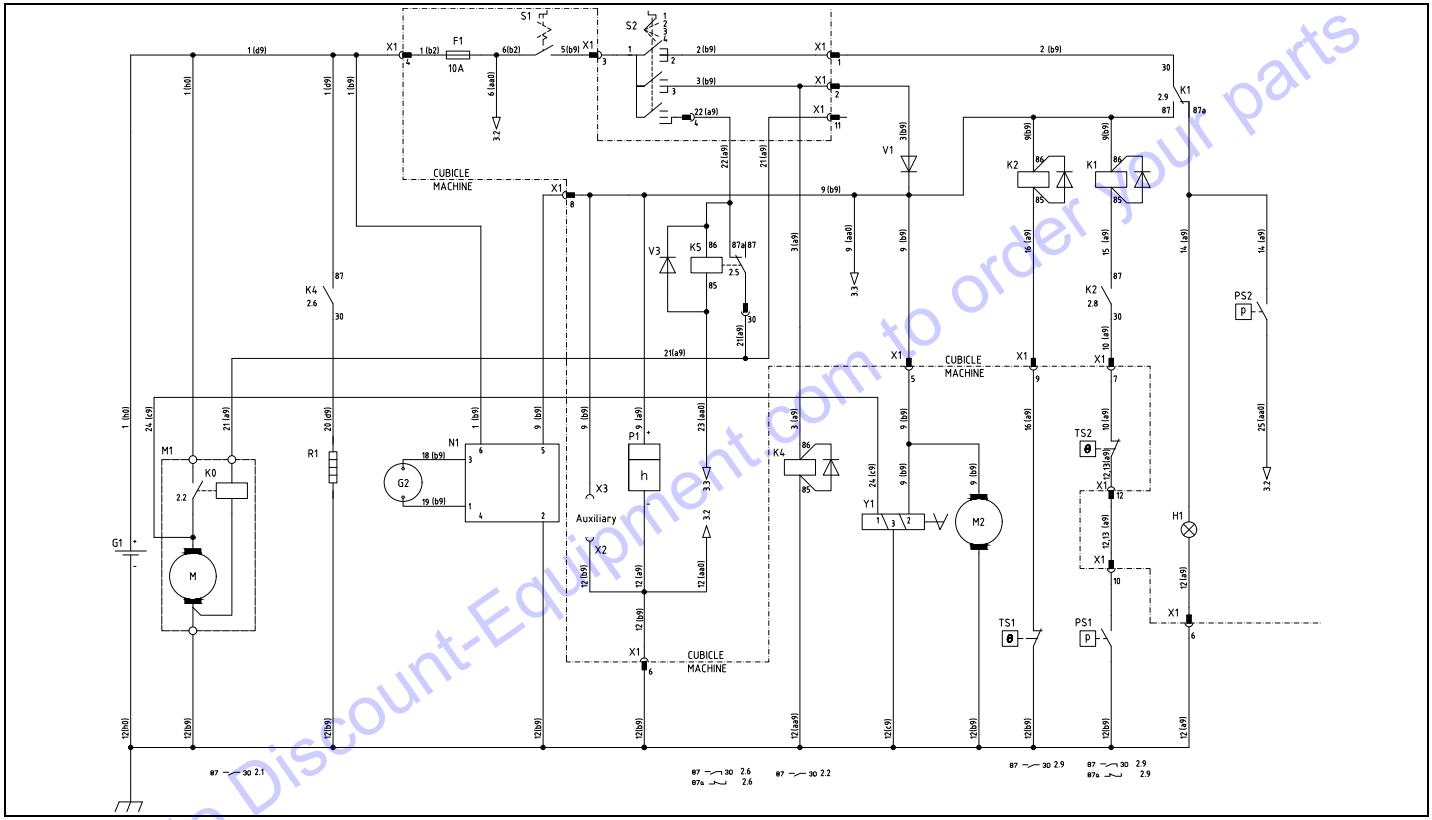
Color code

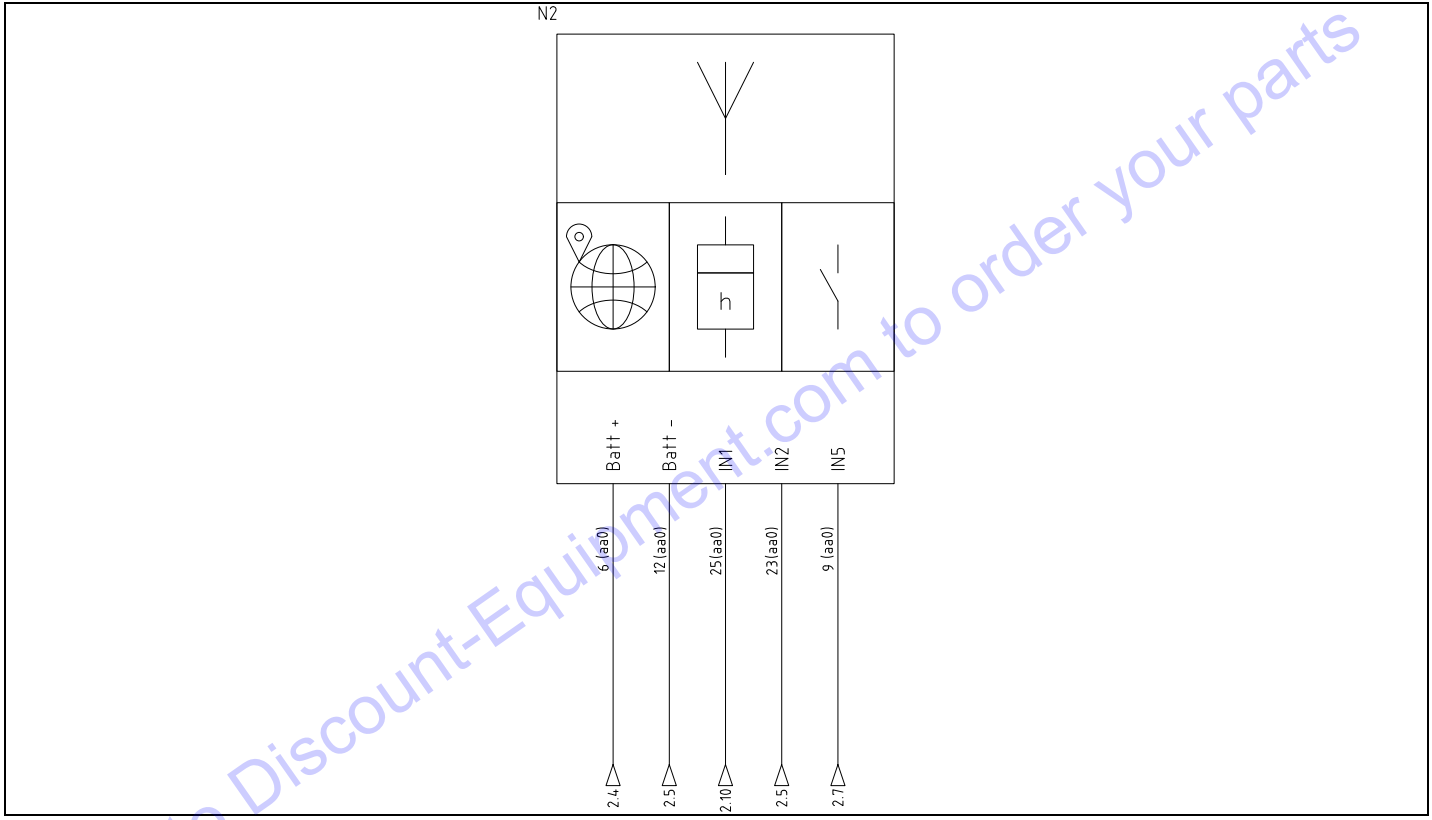
| | |
|---|---|
| 0 = black | 5 = green |
| 1 = brown | 6 = blue |
| 2 = red | 7 = purple |
| 3 = orange | 8 = grey |
| 4 = yellow | 9 = white |
| 54 = green/yellow | |

Wire size

aa = 0.5mm$^2$
a = 1 mm$^2$
b = 1,5 mm$^2$
c = 2,5 mm$^2$
d = 4 mm$^2$
e = 6 mm$^2$
f = 10mm$^2$
g = 16mm$^2$
h = 25 mm$^2$
i = 35 mm$^2$
j = 50 mm$^2$

| LEGEND | | | | | |
|---|---|---|---|---|---|
| TAG NAME | DESCRIPTION 1 | DESCRIPTION 2 | LOCATION | PAGE | COL. |
| F1 | FUSE | 10A | CUBICLE | 2 | 3 |
| G1 | BATTERY | MAIN | MACHINE | 2 | 1 |
| G2 | ALTERNATOR | CHARGING | ENGINE | 2 | 3 |
| H1 | LAMP | GENERAL ALARM | CUBICLE | 2 | 9 |
| K0 | RELAY | STARTER SOLENOID | ENGINE | 2 | 2 |
| K1 | RELAY | COMPRESSOR TEMPERATURE ALARM | CUBICLE | 2 | 9 |
| K2 | RELAY | GENERAL ALARM | CUBICLE | 2 | 8 |
| K4 | RELAY | PREHEAT | MACHINE | 2 | 6 |
| K5 | RELAY | RUN CONTROL | CUBICLE | 2 | 5 |
| M1 | MOTOR | STARTER | ENGINE | 2 | 1 |
| M2 | PUMP | FUEL FEED | MACHINE | 2 | 8 |
| N1 | REGULATOR | VOLTAGE | MACHINE | 2 | 3 |
| N2 | MODULE | FLEETLINK | MACHINE | 3 | 2 |
| P1 | METER | DIGITAL HOUR METER | CUBICLE | 2 | 5 |
| PS1 | PRESSURE SWITCH | ENGINE OIL | ENGINE | 2 | 9 |
| PS2 | PRESSURE SWITCH | VESSEL PRESSURE | CUBICLE | 2 | 10 |
| R1 | HEAT PLUG | PREHEAT | ENGINE | 2 | 2 |
| S1 | SWITCH | POWER ON/OFF | CUBICLE | 2 | 4 |
| S2 | SWITCH | SELECTER SWITCH OFF/ON/PREHEAT/START | CUBICLE | 2 | 5 |
| TS1 | TEMPERATURE SWITCH | ENGINE COOLANT | ENGINE | 2 | 8 |
| TS2 | TEMPERATURE SWITCH | COMPRESSOR | ENGINE | 2 | 9 |
| V1 | DIODE | | CUBICLE | 2 | 7 |
| V3 | DIODE | | CUBICLE | 2 | 5 |
| X1 | CONNECTOR | CONTROL PANEL | CUBICLE | 2 | 6 |
| X2 | TERMINAL | AUXILIARY | CUBICLE | 2 | 4 |
| X3 | TERMINAL | AUXILIARY | CUBICLE | 2 | 4 |
| Y1 | SOLENOID VALVE | FUEL | ENGINE | 2 | 7 |





# Data plate

### Weight

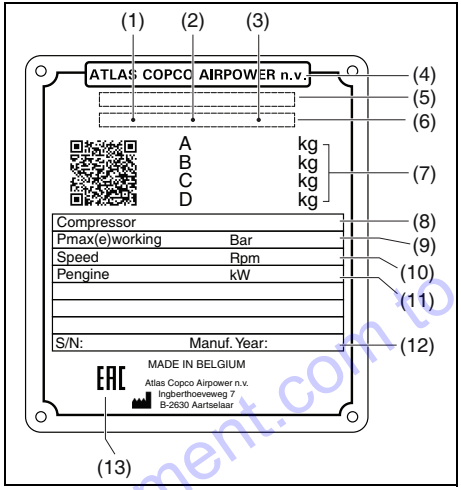
| | |
|---|---|
| Weight ready to operate | See dataplate |

### Air Outlet

| | |
|---|---|
| Air outlet valves | 3 x 3/4 |

### Wheels

| | | |
|---|---|---|
| Tyre pressure | bar | 2.7 |
| | psi | 39 |
| Wheel bolt torque | Nm | 85 |
| | lbf.ft | 63 |




1. Company code
2. Product code
3. Unit serial number
4. Name of the manufacturer
5. EEC or national type approval number
6. Vehicle identification number
7. Undercarriage
   - **A** Maximum permitted total weight of the vehicle
   - **B** Maximum permitted load on the towing eye
   - **C** Maximum permitted load on axle (or front axle on dual axle units
   - **D** Maximum permitted load on rear axle (dual axle units
8. Model
9. Working pressure
10. Speed
11. Engine power
12. Manufacturing year
13. EAC certification symbol, if applicable

# Disposal

## GENERAL

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

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

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

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

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

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

## DISPOSAL OF MATERIALS

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

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

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

Dispose of all components in accordance with applicable disposal regulations.

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

## DIRECTIVE 2012/19/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL ON WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE)

This equipment falls under the provisions of the European Directive 2012/19/EU on waste electrical and electronic appliances (WEEE) and may not be disposed as unsorted waste.

**The equipment is labelled in accordance with the European Directive 2012/19/EU with the crossed-out wheel bin symbol.**

**At the end of life-time of the electric and electronic equipment (EEE) it must be taken to separate collection.**

For more information check with your local waste authority, customer center or distributor.

# Maintenance Log

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

**Serial number** ..... .....

| Service hours | Maintenance action | Date | By: initials |
|---|---|---|---|
| | | | |
| | | | |
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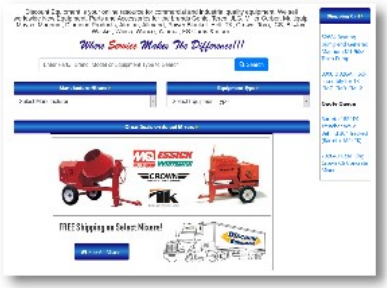
Chicago Pneumatic

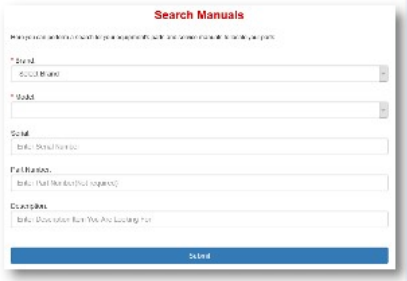
# PARTS FINDER

**Search Website by Part Number**

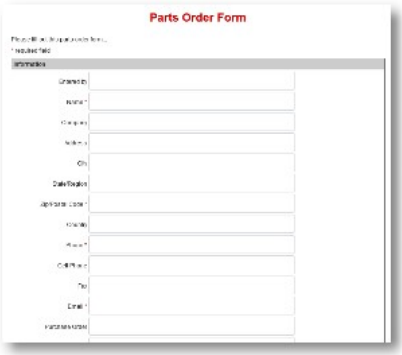
Discount Equipment



**Search Manual Library For Parts Manual & Lookup Part Numbers – Purchase or Request Quote**




**Can't Find Part or Manual? Request Help by Manufacturer, Model & Description**

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Click on this link: http://www.discount-equipment.com/category/5443-parts/ and choose one of the options to help get the right parts and equipment you are looking for. Please have the machine model and serial number available in order to help us get you the correct parts. If you don't find the part on the website or on one of the online manuals, please fill out the request form and one of our experienced staff members will get back to you with a quote for the right part that your machine needs.

We sell worldwide for the brands: Genie, Terex, JLG, MultiQuip, Mikasa, Essick, Whiteman, Mayco, Toro Stone, Diamond Products, Generac Magnum, Airman, Haulotte, Barreto, Power Blanket, Nifty Lift, Atlas Copco, Chicago Pneumatic, Allmand, Miller Curber, Skyjack, Lull, Skytrak, Tsurumi, Husquvarna Target, Stow, Wacker, Sakai, Mi-T-M, Sullair, Basic, Dynapac, MBW, Weber, Bartell, Bennar Newman, Haulotte, Ditch Runner, Menegotti, Morrison, Contec, Buddy, Crown, Edco, Wyco, Bomag, Laymor, EZ Trench, Bil-Jax, F.S. Curtis, Gehl Pavers, Heli, Honda, ICS/PowerGrit, IHI, Partner, Imer, Clipper, MMD, Koshin, Rice, CH&E, General Equipment ,Amida, Coleman, NAC, Gradall, Square Shooter, Kent, Stanley, Tamco, Toku, Hatz, Kohler, Robin, Wisconsin, Northrock, Oztec, Toker TK, Rol-Air, APT, Wylie, Ingersoll Rand / Doosan, Innovatech, Con X, Ammann, Mecalac, Makinex, Smith Surface Prep,Small Line, Wanco, Yanmar