OPERATION and MAINTENANCE MANUAL

COMPRESSOR MODELS

HP375WCU (B11)
XP375WCU (B12)
P425WCU (B13)
HP375WCU-T2 (D46)
XP375WCU-T2 (D44)
P425WCU-T2 (D45)

This manual contains important safety information.
Do not destroy this manual.
This manual must be available to the personnel who operate and maintain this compressor.

Doosan Infracore Portable Power
1293 Glenway Drive
Statesville, N.C. 28625
DoosanPortablePower.com

P/N: 22592083 (5-2014) Rev C

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Foreword

Information

The contents of this manual are considered to be proprietary and confidential to Doosan Infracore Portable Power (herein referred to as “Portable Power”), and should not be reproduced without the prior written permission of Portable Power.

Nothing contained in this document is intended to extend any promise, warranty or representation, expressed or implied, regarding the Portable Power products described herein. Any such warranties or other terms and conditions of sale of products shall be in accordance with the standard terms and conditions of sale for such products, which are available upon request.

This manual contains instructions and technical data to cover all routine operation and scheduled maintenance tasks by operation and maintenance staff. Major overhauls are outside the scope of this manual and should be referred to an authorized Portable Power Service department.

All components, accessories, pipes and connectors added to the compressed air system should be:

- of good quality, procured from a reputable manufacturer and, wherever possible, be of a type approved by Portable Power.
- clearly rated for a pressure at least equal to the compressor safety valve setting.
- compatible with the compressor oil.
- accompanied with instructions for safe installation, operation and maintenance.

Details of approved equipment are available from the Portable Power Service departments. The use of repair parts other than those included within the approved parts list may create hazardous conditions over which Portable Power has no control. Therefore, Portable Power cannot be held responsible for equipment in which non-approved repair parts are installed.

Portable Power reserves the right to make changes and improvements to products without notice and without incurring any obligation to make such changes or add such improvements to products sold previously.

The intended uses of this compressor are outlined below and examples of unapproved usage are also given. However, Portable Power cannot anticipate every application or work situation that may arise. **If in doubt, consult supervision**.

This compressor has been designed and supplied for above ground operation to be used for compression of normal ambient air containing no additional gases, vapors or particles within the ambient temperature range specified in the general data section of this manual.

This compressor should not be used:

A. For direct or indirect human consumption of the compressed air.

B. Outside the ambient temperature range specified in the general data section of this manual.

C. When an actual or foreseeable risk of hazardous levels of flammable gases or vapors exists.

D. With other than Portable Power approved components.

E. With guards, or controls or switches missing or disabled.

F. For storage or transportation of materials inside or on the enclosure.

This company accepts no responsibility for errors in translation of this manual from the original English version.

You as the customer are expected to provide certain service and maintenance items. Your Portable Power dealer will provide all other more detailed service and maintenance items on a special preventive maintenance schedule for each compressor. It is very important that the minimum service and maintenance requirements explained in this manual be performed at the required intervals. Exceeding these intervals may reduce the reliability of the compressor.

The purpose of this manual is to train the operator with functions, operation, and basic service and maintenance requirements of the compressor. During the preparation of this manual, every effort was made to ensure the adequacy and accuracy of the contents.

Your Portable Power dealer will assist with setup and initial startup of the compressor. He will also provide brief operating and service instructions and will insure that a copy of this manual is included with the compressor. Before starting the compressor, this manual and instructions should be carefully read to obtain a thorough knowledge of the duties to be performed. Please take pride in the compressor, keep it clean, and in good mechanical condition.

To enable proper maintenance records, Portable Power provides a Noise Emission Control Maintenance Log within this manual. This section contains a recommended schedule and space so that the serviceman can note what service and maintenance was done, by whom, where, and when.

Section A - Safety

Safety

Safety Precautions

General Information

Never operate unit without first observing all safety warnings and carefully reading the operation and maintenance manual shipped from the factory with this machine.

Ensure that the operator reads and understands the decals and consults the manuals before maintenance or operation.

Ensure that maintenance personnel are adequately trained, competent and have read the Maintenance Manuals.

Make sure that all protective covers are in place and that the canopy/doors are closed during operation.

The specification of this machine is such that the machine is not suitable for use in flammable gas risk areas. If such an application is required then all local regulations, codes of practice and site rules must be observed. To ensure that the machine can operate in a safe and reliable manner, additional equipment such as gas detection, exhaust spark arrestors, and intake (shut-off) valves may be required, dependent on local regulations or the degree of risk involved.

A weekly visual check must be made on all fasteners/fixing screws securing mechanical parts. In particular, safety-related parts such as coupling hitch, drawbar components, road-wheels, and lifting bail should be checked for total security.

All components which are loose, damaged or unserviceable, must be rectified without delay.

Air discharged from this machine may contain carbon monoxide or other contaminants which will cause serious injury or death. Do not breathe this air.

This machine produces loud noise with the doors open or service valve vented. Extended exposure to loud noise can cause hearing loss. Always wear hearing protection when doors are open or service valve is vented.

Never inspect or service unit without first disconnecting battery cable(s) to prevent accidental starting.

Do not use petroleum products (solvents or fuels) under high pressure as this can penetrate the skin and result in serious illness. Wear eye protection while cleaning unit with compressed air to prevent debris from injuring eye(s).

Rotating fan blade can cause serious injury. Do not operate without guard in place.

Use care to avoid contacting hot surfaces (engine exhaust manifold and piping, air receiver and air discharge piping, etc.).

Ether is an extremely volatile, highly inflammable gas. When it is specified as a starting aid, use sparingly. DO NOT USE ETHER IF THE MACHINE HAS GLOW PLUGS OR INLET HEATER STARTING AIDS OR ENGINE DAMAGE WILL RESULT.

Never operate unit with guards, covers or screens removed. Keep hands, hair, clothing, tools, blow gun tips, etc. well away from moving parts.

Compressed Air

Compressed air can be dangerous if incorrectly handled. Before doing any work on the unit, ensure that all pressure is vented from the system and that the machine cannot be started accidentally.

Ensure that the machine is operating at the rated pressure and that the rated pressure is known to all relevant personnel.

All air pressure equipment installed in or connected to the machine must have safe working pressure ratings of at least the machine safety valve setting.

If more than one compressor is connected to one common downstream plant, effective check valves and isolation valves must be fitted and controlled by work procedures, so that one machine cannot accidentally be pressurized or over pressurized by another.

Compressed air must not be used for a direct feed to any form of breathing apparatus or mask.

High Pressure Air can cause serious injury or death. Relieve pressure before removing filler plugs/caps, fittings or covers.

Air pressure can remain trapped in air supply line which can result in serious injury or death. Always carefully vent air supply line at tool or vent valve before performing any service.

The discharged air contains a very small percentage of compressor lubricating oil and care should be taken to ensure that downstream equipment is compatible.

If the discharged air is to be ultimately released into a confined space, adequate ventilation must be provided.

When using compressed air, always use appropriate personal protective equipment.

All pressure containing parts, especially flexible hoses and their couplings, must be regularly inspected, be free from defects and be replaced according to the Manual instructions.

Avoid bodily contact with compressed air.

The safety valve located in the separator tank must be checked periodically for correct operation.

Whenever the machine is stopped, air will flow back into the compressor system from devices or systems downstream of the machine unless the service valve is closed. Install a check valve at the machine service valve to prevent reverse flow in the vent of an unexpected shutdown when the service valve is open.

Disconnected air hoses whip and can cause serious injury or death. Always attach a safety flow restrictor to each hose at the source of supply or branch line in accordance with OSHA Regulation 29CFR Section 1926.302(b).

Never allow the unit to sit stopped with pressure in the receiver-separator system.

Materials

The following substances may be produced during the operation of this machine:

- brake lining dust
- engine exhaust fumes

Avoid inhalation

Ensure that adequate ventilation of the cooling system and exhaust gases is maintained at all times.

The following substances are used in the manufacture of this machine and may be hazardous to health if used incorrectly:

- anti-freeze
- compressor lubricant
- engine lubricant
- preservative grease
- rust preventative
- diesel fuel
- battery electrolyte

Avoid ingestion, skin contact and inhalation of fumes

Should compressor lubricant come into contact with the eyes, then irrigate with water for at least 5 minutes.

Should compressor lubricant come into contact with the skin, then wash off immediately.

Consult a physician if large amounts of compressor lubricant are ingested.

Consult a physician if compressor lubricant is inhaled.

Never give fluids or induce vomiting if the patient is unconscious or having convulsions.

Safety data sheets for compressor and engine lubricants should be obtained from the lubricant supplier.

Do NOT start or operate this machine in a confined area. Avoid breathing exhaust fumes when working on or near the machine.

This machine may include such materials as oil, diesel fuel, antifreeze, brake fluid, oil/air filters and batteries which may require proper disposal when performing maintenance and service tasks. Contact local authorities for proper disposal of these materials.

Battery

A battery contains sulfuric acid and can give off gases which are corrosive and potentially explosive. Avoid contact with skin, eyes and clothing. In case of contact, flush area immediately with water.

⚠ WARNING

Do not attempt to slave start a frozen battery since this may cause it to explode.

Exercise extreme caution when using booster battery. To jump battery, connect ends of one booster cable to the positive (+) terminal of each battery. Connect one end of other cable to the negative (-) terminal of the booster battery and other end to a ground connection away from dead battery (to avoid a spark occurring near any explosive gases that may be present). After starting unit, always disconnect cables in reverse order.

Radiator

Hot engine coolant and steam can cause injury. Ensure that the radiator filler cap is removed with due care and attention.

Do not remove the pressure cap from a HOT radiator. Allow radiator to cool down before removing pressure cap.

Transport

When loading or transporting machines ensure that the specified lifting and tie down points are used.

When loading or transporting machines ensure that the towing vehicle, its size, weight, towing hitch and electrical supply are all suitable to provide safe and stable towing at speeds either, up to the legal maximum for the country in which it is being towed or, as specified for the machine model if lower than the legal maximum.

Do not exceed gross vehicle weight rating.

Before towing the machine, ensure that:-

- the tires and towing hitch are in a serviceable condition.
- the canopy is secure.
- all ancillary equipment is stored in a safe and secure manner.
- the brakes and lights are functioning correctly and meet necessary road traffic requirements.
- break-away cables/safety chains are connected to the towing vehicle.

The machine must be towed in a level attitude in order to maintain correct handling, braking and lighting functions. This can be achieved by correct selection and adjustment of the vehicle towing hitch and, on variable height running gear, adjustment of the drawbar.

1. Make sure wheels, tires and tow bar connectors are in safe operating condition and tow bar is properly connected before towing.
2. When parking always use the handbrake and, if necessary, suitable wheel chocks.

Safety chains/connections and their adjustment where fitted:

Ensure that the breakaway cable is securely coupled to the trailer and also to a substantial point on the towing vehicle.

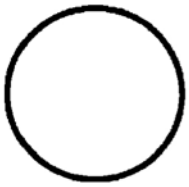
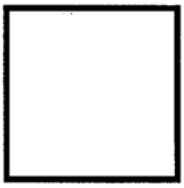
Ensure that the cable length is as short as possible, while still allowing enough slackness for the trailer to articulate without the handbrake being applied.

Loop the chains onto the towing vehicle using the towing vehicle hitch as an anchorage point, or any other point of similar strength.

Ensure that the effective chain length is as short as possible while still allowing normal articulation of the trailer and effective operation of the breakaway cable.

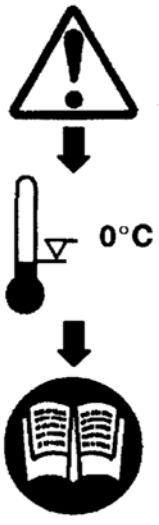
Decals

Graphic Form and Meaning of ISO Symbols

 Prohibition / Mandatory	 Information / Instructions	 Warning
 WARNING: Electrical shock risk.	 WARNING – Pressurised component or system.	 WARNING – Hot surface.
 WARNING – Pressure control.	 WARNING – Corrosion risk.	 WARNING – Air/gas flow or Air discharge.
 WARNING – Pressurised vessel.	 WARNING – Hot and harmful exhaust gas.	 WARNING – Maintain correct tyre pressure. (Refer to the **GENERAL INFORMATION** section of this manual).

WARNING – Flammable liquid.

WARNING – Before connecting the tow bar or commencing to tow consult the operation and maintenance manual.



WARNING – For operating temperature below 0°C, consult the operation and maintenance manual.

WARNING – Do not undertake any maintenance on this machine until the electrical supply is disconnected and the air pressure is totally relieved.

WARNING – Consult the operation and maintenance manual before commencing any maintenance.

Do not breathe the compressed air from this machine.

Do not remove the Operating and Maintenance manual and manual holder from this machine.

Do not stack.

Do not operate the machine without the guard being fitted.

Do not stand on any service valve or othe parts of the pressure system.

Do not operate with the doors or enclosur open.

Do not use fork lift truck from this side.

Do not exceed the trailer speed limit.

No naked lights.

Do not open the service valve before the airhose is attached.

Use fork lift truck from this side only.

Emergency stop.

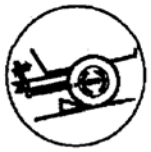
Tie down point

Lifting point.

On (power).

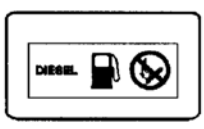
Off (power).

Read the Operation and Maintenance manual before operation or maintenance of this machine is undertaken.



When parking use prop stand, handrake and wheel chocks.

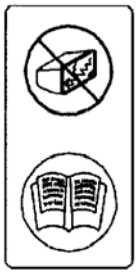
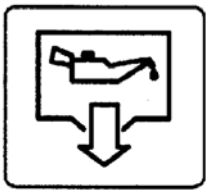
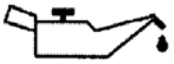
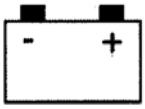
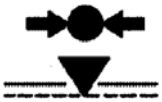
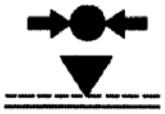
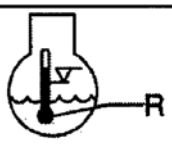
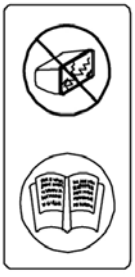
Compressor oil filling



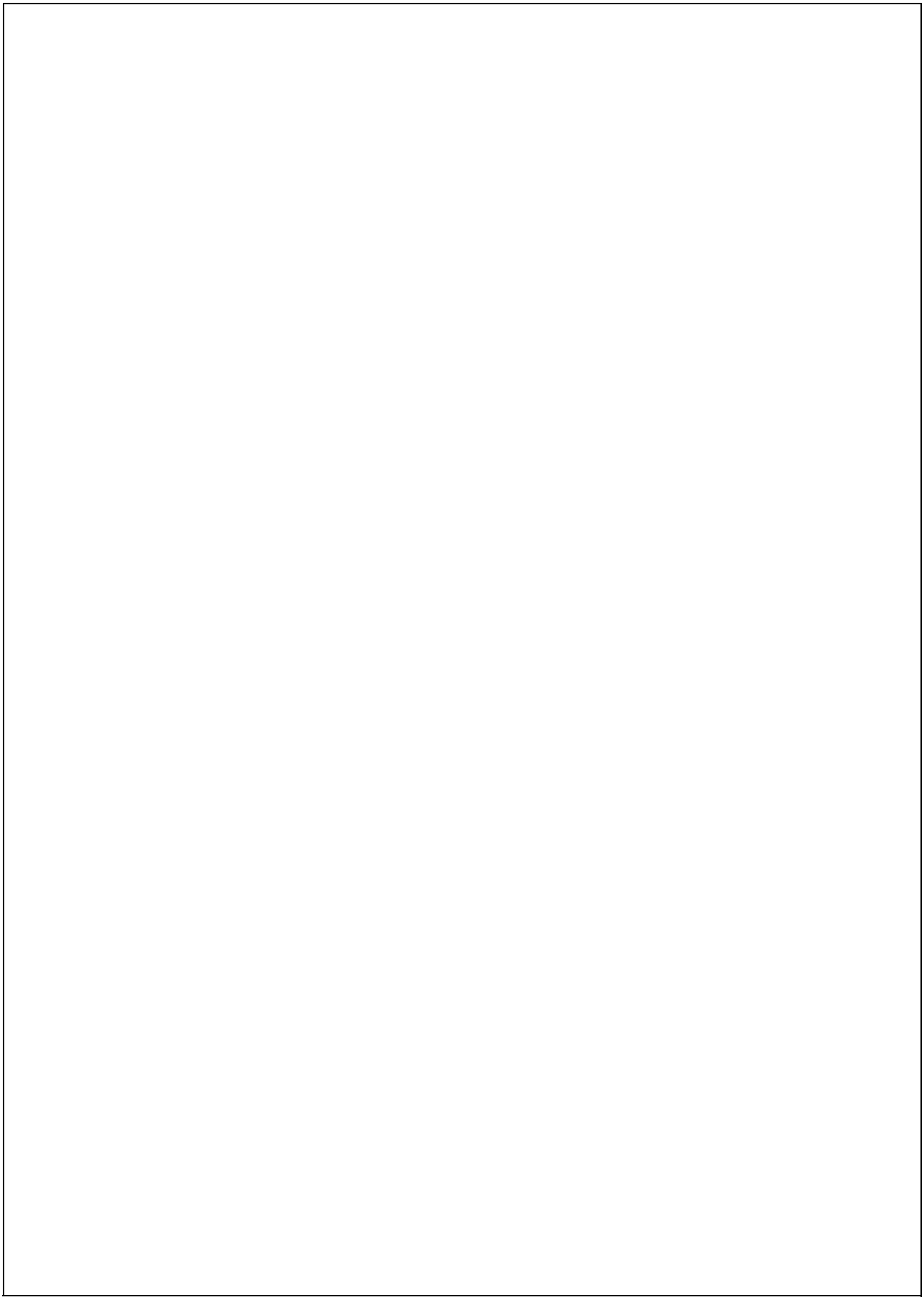
Diesel fuel
No open flame.

Parking brake.

Rough Service Designation.
Wet Location Operation.

 Replace any cracked protective shield.	 Oil drain.	 Engine Oil
 Fuel level/point	 Pressure control	 Malfunction
 Battery charging condition	 Low pressure	 High pressure
 Engine malfunction	 High compressor temperature	 Compressor malfunction
 Low engine oil pressure	 Engine high temperature	
 Replace any cracked protective shield.	 Oil drain.	

Free Safety Decals
To promote communication of Safety Warnings on products manufactured by the Portable Power Division in Statesville, N.C., Safety Decals are available FREE of charge. Safety Decals are identified by the decal heading: DANGER, WARNING, CAUTION, NOTICE.
Decal part numbers are on the bottom of each decal and are also listed in the compressor parts manual. Submit orders for Safety Decals to the Statesville Parts Service Dept. The no charge order should contain only Safety Decals.
Help promote product safety! Assure that decals are present on the compressor. Replace decals that are not readable.



Noise Emission

NOISE EMISSION CONTROL MAINTENANCE LOG

COMPRESSOR MODEL_____

SERIAL NO. _____

USER UNIT NO. _____

UNIT IDENTIFICATION	**DEALER OR DISTRIBUTOR FROM WHOM PURCHASED:**
ENGINE MAKE & MODEL:	
SERIAL NO:_____	_____
PURCHASER OR OWNER:_____	_____
ADDRESS: _____	DATE PURCHASED:_____

The Noise Control Act of 1972 (86 Stat. 1234) prohibits tampering with the noise control system of any compressor manufactured and sold under the above regulations, specifically the following acts or the causing thereof:

(1) The removal or rendering inoperative by any persons, other than for purposes of maintenance, repair, or replacement, of any device or element of design incorporated into any new compressor for the purpose of noise control prior to its sale or delivery to the ultimate purchaser or while it is in use; or (2) the use of the compressor after such device or element of design has been removed or rendered inoperative by any person.

Noise Emission Warranty

The manufacturer warrants to the ultimate purchaser and each subsequent purchaser that this air compressor was designed, built and equipped to conform at the time of sale to the first retail purchaser, with all applicable U.S. EPA Noise Control Regulations.

This warranty is not limited to any particular part, component, or system of the air compressor. Defects in the design, assembly or in any part, component, or system of the compressor which, at the time of sale to the first retail purchaser, caused noise emissions to exceed Federal Standards are covered by this warranty for the life of the air compressor. (40FR204.58-1).

Introduction

The unit for which this Maintenance Log is provided conforms to U.S. E.P.A. Regulations for Noise Emissions, applicable to Portable Air Compressors.

The purpose of this book is to provide (1) the Maintenance Performance Schedule below for all required noise emission controls and (2) space so that the purchaser or owner can record what maintenance was done, by whom, where and when. Detailed instructions on the maintenance items below are given on following page.

Maintenance Schedule

ITEM	AREA	PERIOD
A.	COMPRESSED AIR LEAKS	AS DETECTED
B.	SAFETY AND CONTROL SYSTEMS	AS DETECTED
C.	ACOUSTIC MATERIALS	DAILY
D.	FASTENERS	100 HOURS
E.	ENCLOSURE PANELS	100 HOURS
F.	AIR INTAKE & ENGINE EXHAUST	100 HOURS
G.	COOLING SYSTEMS	250 HOURS
H.	ISOLATION MOUNTS	250 HOURS
I.	ENGINE OPERATION	SEE OPERATOR'S MANUAL
J.	FUELS & LUBRICANTS	SEE OPERATOR'S MANUAL

A. Compressed Air Leaks

Correct all compressed air leaks during the first shutdown period after discovery. If severe enough to cause serious noise problems and efficiency loss, shut down immediately and correct the leak(s).

B. Safety and Control Systems

Repair or replace all safety and control systems or circuits as malfunction occurs. No compressor should be operated with either system bypassed, disabled, or nonfunctional.

C. Acoustic Materials

In daily inspections, observe these materials. Maintain all acoustic material as nearly as possible in its original condition. Repair or replace all sections that have: 1) sustained damage, 2) have partially separated from panels to which they were attached, 3) are missing, or have otherwise deteriorated due to severe operating or storage conditions.

D. Fasteners

All fasteners such as hinges, nuts, bolts, clamps, screws, rivets, and latches should be inspected for looseness after each 100 hours of operation. They should be retightened, repaired, or if missing, replaced immediately to prevent subsequent damage and noise emission increase.

E. Enclosure Panels

Enclosure panels should also be inspected at 100 hour operational intervals. All panels that are warped, punctured, torn, or otherwise deformed, such that their noise containment function is reduced, should be repaired or replaced before the next operation interval. Doors, access panels, and hatch closures especially, should be checked and adjusted at this time to insure continuous seating between gasket or acoustic material and the mating frame.

F. Air Intake and Engine Exhaust

Engine and compressor air intake and engine exhaust systems should be inspected after each 100 hours of operation for loose, damaged, or deteriorated components. Repairs or replacements should be made before the next period of use.

G. Cooling Systems

All components of the cooling system for engine water and compressor oil should be inspected every 250 hours of use. Any discrepancies found should be corrected before placing the unit back in operation. Unrestricted airflow over the radiator and oil cooler must be maintained at all times during operation.

H. Isolation Mounts

Engine/airend isolation mounts should be inspected after each 250 hours of operation. Those mounts with cracks or splits in the molded rubber, or with bent or broken bolts due to operation or storage in severe environments, all should be replaced with equivalent parts.

I. Engine Operation

Inspect and maintain engine condition and operation as recommended in the manuals supplied by the engine manufacturer.

J. Fuels and Lubricants

Use only the types and grades of fuels and lubricants recommended in the Portable Power Engine Manufacturer’s Operator and Maintenance Manuals.

MAINTENANCE RECORD FOR NOISE EMISSION CONTROL AND EXTENDED WARRANTY					
ITEM NO.	DESCRIPTION OF WORK OR COMMENTS	HOURMETER READING	MAINT/ INSPECT DATE	LOCATION CITY/ STATE	WORK DONE BY (NAME)

Section C - General Data

General Data

Actual free air delivery

P425WCU	12,0m^3 (425 CFM)
XP375WCU	10,6m^3 (375 CFM)
HP375WCU	10,6m^3 (375 CFM)

Normal operating discharge pressure

P425WCU	6,9 bar (100 psi)
XP375WCU	8,6 bar (125 psi)
HP375WCU	10,3 bar (150 psi)

Maximum Allowable Pressure

P425WCU	8,6 bar (125 psi)
XP375WCU	10,3 bar (150 psi)
HP375WCU	12,1 bar (175 psi)

Safety Valve Setting

P425WCU	10 bar (150 psi)
XP375WCU	14 bar (200 psi)
HP375WCU	14 bar (200 psi)

Maximum Pressure Ratio (absolute)

P425WCU	7,9:1
XP375WCU	9,6: 1
HP375WCU	11,3: 1

Operating ambient temperature

Whisperized	-12°C to +48°C (10°F to 118°F)

Cooling system	Oil injection
Oil capacity	36 liters (9.5 gal)
Maximum oil system temperature	120°C (248°F)

Engine (P425WCU, XP375WCU, HP375WCU)

Type/Model	Cummins/4B3.9TAA
Number of Cylinders	4
Oil Capacity	13.6 litres (3 gal)
Speed at Full Load min -1 (RPM)	2200 revs
Speed at Idle min -1 (RPM)	1500 revs
Power Available at Full Load	93kW(125hp)

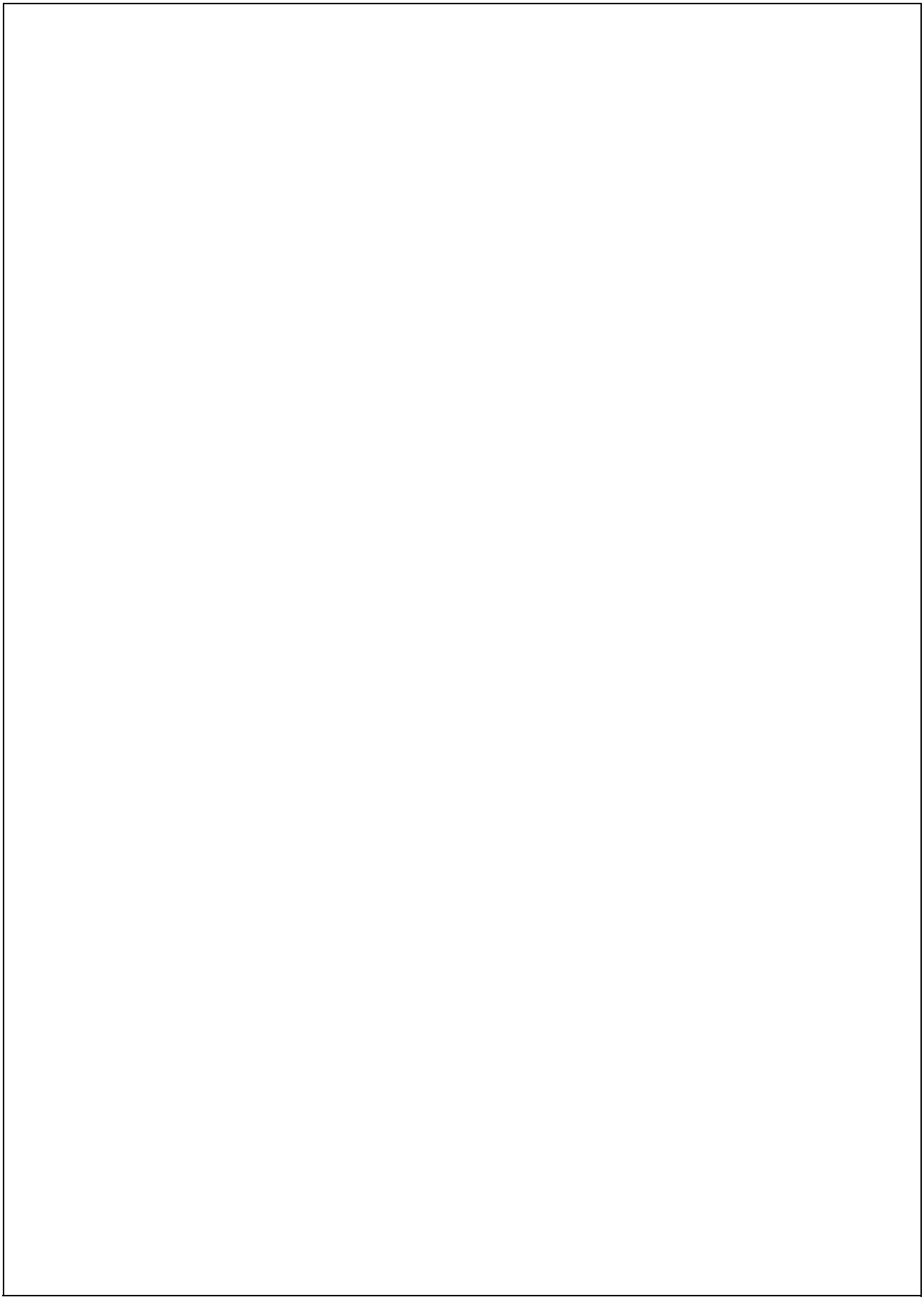
Electrical System	12 V neg. ground
Fuel Tank Capacity	219 liters (58 gal)
Oil Specification	Refer to engine manual
Coolant Capacity	17 liters (4.5 gal)

Sound Level Data

A) "W" Model, EPA Noise	76 dB (A)

Wheels and Tires (P425WCU, XP375WCU, HP375WCU)

Number of Wheels	2 x 5.5
Tire Size	ST225/75R15 (D)
Tire Pressure	4.5 bar (65 psi)
Net Weight (Less Fuel)	1980KG (4360 lb)



Section D - Operating Instructions

Operating Instructions

Commissioning

Upon receipt of the unit, and prior to putting it into service, it is important to adhere strictly to the instructions given below in PRIOR TO STARTING.

Ensure that the operator reads and understands the decals and consults the manuals before maintenance or operation.

Ensure that the position of the emergency stop device is known and recognized by its markings. Ensure that it is functioning correctly and that the method of operation is known.

Before towing the unit, ensure that the tyre pressures are correct (refer to the GENERAL DATA SECTION of this manual). Before towing the unit, ensure that the lights are functioning correctly (where fitted).

Ensure that all transport and packing materials are discarded.

Ensure that the correct fork lift truck slots or marked lifting / tie down points are used whenever the machine is lifted or transported.

When selecting the working position of the machine ensure that there is sufficient clearance for ventilation and exhaust requirements.

Adequate clearance needs to be allowed around and above the machine to permit safe access for specified maintenance tasks.

Ensure that the machine is positioned securely and on a stable foundation. Any risk of movement should be removed by suitable means, especially to avoid strain on any rigid discharge piping.

Compressor Mounting

Portable compressors, which are modified to remove the running gear and mount the machine direct to trailers, truck beds or frame, etc. may experience failure of the enclosure, frame, and/ or other components. It is necessary to isolate the compressor package from the carrier base with a flexible mounting system. Such a system must also prevent detachment of the package from the carrier base in the event the isolators fail. Contact Doosan Portable Power representative for flexible mounting kits.

Warranty does not cover failures attributable to mounting of the compressor package to the carrier base unless it is a Portable Power provided system.

Attach the battery cables to the battery(s) ensuring that they are tightened securely. Attach the positive cable before attaching the negative cable.

⚠ WARNING

All air pressure equipment installed in or connected to the machine must have safe working pressure ratings of at least the machine safety valve setting, and materials compatible with the compressor lubricant (refer to the GENERAL DATA SECTION).

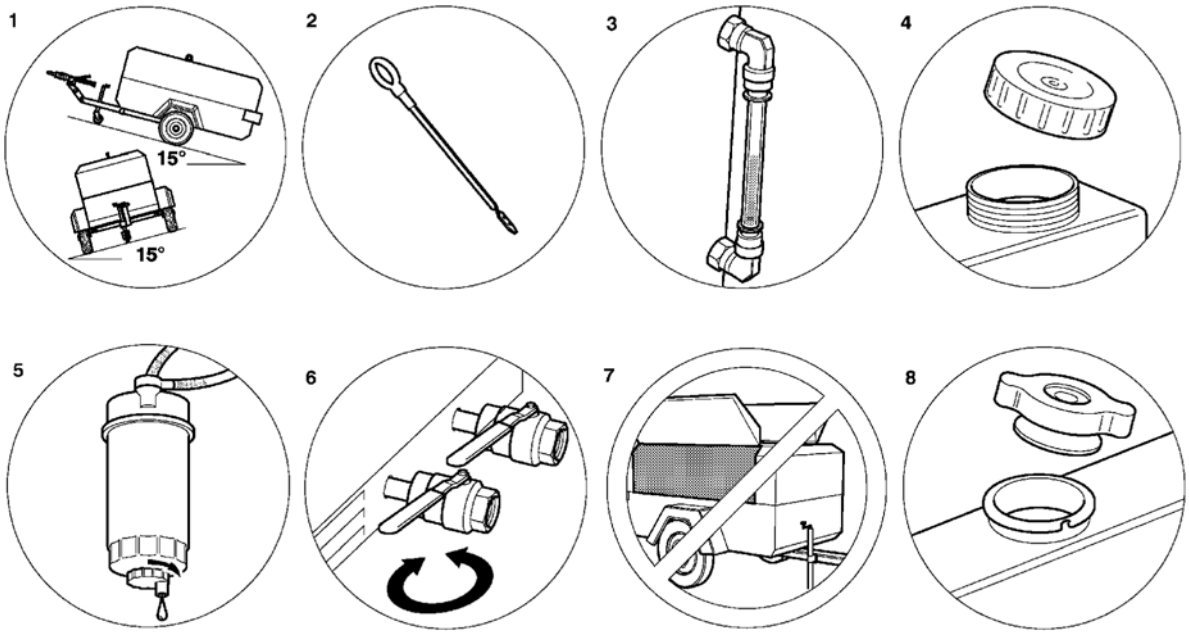
⚠ WARNING

If more than one compressor is connected to one common downstream plant, effective check valves and isolation valves must be fitted and controlled by work procedures, so that one machine cannot accidently be pressurized / over pressurized by another.

⚠ WARNING

When flexible discharge hoses are used, it is recommended that safety retaining wires are fitted.

Prior to Starting



1. Place the unit in a position that is as level as possible. The design of the unit permits a 15 degree lengthways and sideways limit on out of level operation.

   When the unit has to be operated out of level, it is important to keep the engine oil level near the high level mark (with the unit level).

2. Check the engine lubrication oil in accordance with the operating instructions in the Engine Operator's Manual or section.
3. Check the compressor oil level in the sight glass located on the separator tank.
4. Check the diesel fuel level. A good rule is to top up at the end of each working day. This prevents condensation from occurring in the tank. Refer to the engine operator's manual/section for diesel fuel specification.

⚠ CAUTION

When refuelling:-

- **switch off the engine.**
- **do not smoke.**
- **extinguish all naked lights.**
- **do not allow the fuel to come into contact with hot surfaces.**
- **wear personal protective equipment.**

5. Drain the fuel filter water separator of water, ensuring that any released fuel is safely contained.

6. Open the service valve(s) to ensure that all pressure is relieved from the system. Close the service valve(s).

⚠ CAUTION

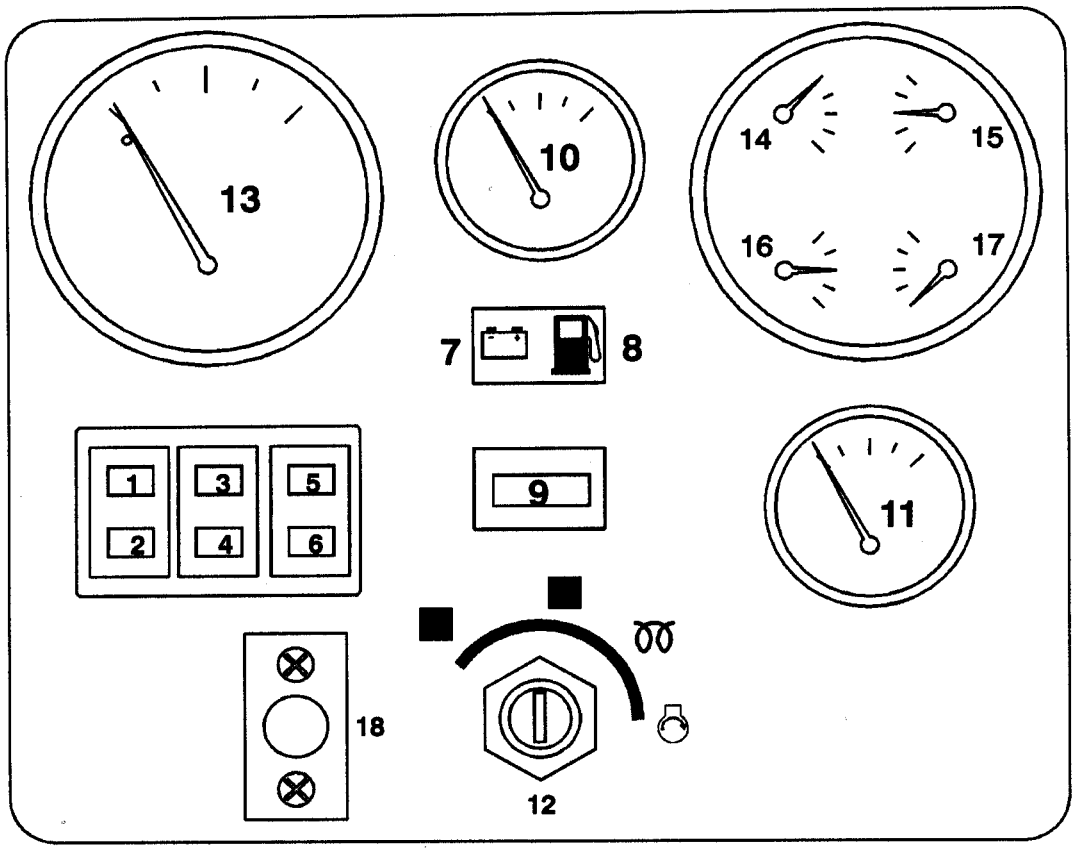
Do not operate the machine with the canopy/doors in the open position as this may cause overheating and operators to be exposed to high noise levels.

7. Check the radiator coolant level (with the unit level).

Check the air filter restriction indicator(s). Refer to the MAINTENANCE section of this manual.

When starting or operating the machine in temperatures below or approaching 0°C (32°F), ensure that the operation of the regulation system, the unloader valve, the safety valve, and the engine are not impaired by ice or snow, and that all inlet and outlet pipes and ducts are clear of ice and snow.

Control Panel



Diagnostic/Auto Shutdown (Optional)

1. **High Engine Temperature** - Coolant above 220°F (104°C) or more.
2. **Low Engine Oil Pressure** - 12 psi or less.
3. **High Compressor Temperature** - 248°F (120°C).
4. **Air Filters Restricted** - Needs servicing.
5. **Spare**
6. **Spare**

Diagnostic/Auto Shutdown (Standard)

7. **Alternator Not Charging** - Needs attention.
8. **Low Fuel Level** - Must add fuel to operate.
9. **Hourmeter** - Records running time for maintenance.
10. **Compressor Discharge Pressure Gauge**- Indicates pressure in receiver tank, psi (kPa).
11. **Fuel Level Gauge** - Indicates amount of fuel in tank.

Controls (Standard)

12. **Power Switch -** Rotate “ON” to activate systems prior to Starting. Rotate “OFF” to stop engine.

18. **Service Air Button -** PUSH, after warm-up. Provides full air pressure at the service outlet.

Optional Controls

13. **Engine Speed Gauge** - Indicates engine speed.

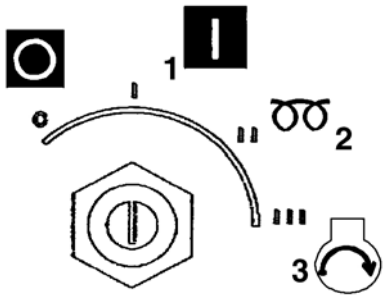
14. **Discharge Air Temp. Gauge** - Indicates in °F and °C. Normal operating range: 185°F/85° to 248°F/104°C.

15. **Engine Oil Pressure Gauge** - Indicates engine oil pressure (psi) (kPa).

16. **Engine Water Temp. Gauge** - Indicates coolant temperature, with normal operating range from 180°F (82°C) to 210°F (99°C).

17. **Voltmeter** - Indicates battery condition.

Starting The Machine



All normal starting functions are incorporated in the key operated switch.

- Turn the key switch to position 1.
- Turn the key switch to crank position (3) (engine start position)

NOTE: Position (2) is used only when grid heater option is installed.

If grid heater option is installed, refer to the chart below for guidelines on use.

Table 1: Grid Heater Chart Guidelines

	Temperatures below -2°F (-19°C)	Temperatures between -2°F and 17°F (-19°C and -8°C)	Temperatures between 17°F and 46°F (- 8°C and 8°C)
Preheat time	30 sec	20 sec	10 sec

- Release to position (1) when engine starts. The engine will now be running at a reduced speed.

At temperatures below 32°F (0°C) or if there is difficulty starting first time:

- Open the manual blowdown valve fully.
- Complete starting sequence above.
- Close manual blowdown valve as soon as engine runs freely.
- Do not allow machine to run for long periods with manual blowdown valve open.
- Allow the engine to reach operating temperature.
- At this point in the operation of the machine it is safe to apply full load to the engine.

NOTE: Wear hearing protection at all times when the engine is started with the manual blowdown valve open and air is flowing from the valve.

Push After Warm Up

NOTE: In order to allow the machine to start at a reduced load, a valve, which is operated by a button located on the instrument panel, is incorporated in the regulation system. (The valve automatically returns to the start position when the machine is switched off and air pressure relieved from the system).

- Allow the engine to reach its operating temperature, then press the button.

Dual Pressure Regulation When Fitted

Machines which operate in excess of 7 bar (100 psi) can optionally be fitted with a dual pressure switch inside the unit. This switch selects between 7 bar (100 psi) and the machine rated pressure, cfm remains nominally constant.

Starting and stopping are unaffected by the selection and during normal running the selector switch may be safely operated. Precaution must be taken to ensure that downstream equipment is rated to suit the available pressure.

The pressure gauge indicates which setting has been selected.

Stopping The Machine

- Close the service valve
- Allow the machine to run unloaded for a short period of time to reduce the engine temperature.
- Turn the start switch to the 0 (OFF) position.

NOTE: As soon as the engine stops, the automatic blowdown valve will relieve pressure from the system.

If the automatic blowdown valve fails to operate, then pressure must be relieved from the system by means of the manual blowdown valve(s).

⚠ CAUTION

Never allow the machine to stand idle with pressure in the system.

Emergency Stopping

In the event that the unit has to be stopped in an emergency, turn the Key Switch located on the Instrument Panel to the 0 (OFF) POSITION, or push the Emergency Stop Switch (when fitted).

Re-Starting After an Emergency

If the machine has been switched off because of a machine malfunction, then identify and correct the fault before attempting to re-start.

If the machine has been switched off for reasons of safety, then ensure that the machine can be operated safely before re-starting.

Refer to the PRIOR TO STARTING and STARTING THE MACHINE instructions earlier in this section before re-starting the machine.

Monitoring During Operation

Should any of the safety shut-down conditions occur, the unit will stop.

Refer to the diagnostic display page for a listing of shutdown conditions.

⚠ CAUTION

To ensure an adequate flow of oil to the compressor at low temperature, never allow the discharge pressure to fall below 3,5 bar (50 psi).

Decommissioning

When the machine is to be permanently decommissioned or dismantled, it is important to ensure that all hazard risks are either eliminated or notified to the recipient of the machine. In particular:

- Do not destroy batteries or components containing asbestos without containing the materials safely.
- Do not dispose of any pressure vessel that is not clearly marked with its relevant data plate information or rendered unusable by drilling, cutting etc.
- Do not allow lubricants or coolants to be released into land surfaces or drains.
- Do not dispose of a complete machine without documentation relating to instructions for its use.

Section E - Maintenance

Maintenance

	Initial 500 miles /850 km	Daily	Weekly	Monthly	3 Months 500 hrs.	6 Months 1000 hrs.	12 Months 2000 hrs.
Compressor Oil Level		C					
Engine Oil Level		C					
*Radiator Coolant Level		C					
Gauges/Lamps		C					
*Air Cleaner Service Indicators		C					
Fuel Tank (Fill at end of day)		C				D	
*Fuel/Water Separator Drain		C					
Oil Leaks		C					
Fuel Leaks		C					
Drain Water From Fuel Filters		D					
Coolant Leaks		C					
Radiator Filler Cap		C					
Air Cleaner Precleaner Dumps			C				
Fan/Alternator Belts			C				
Battery Connections/Electrolyte			C				
Tire Pressure and Surface			C				
*Wheel Lug Nuts				C			
Hoses (Oil, Air, Intake, etc.)				C			
Automatic Shutdown System				C			
Air Cleaner System				C			
Compressor Oil Cooler Exterior				C			
*Engine Rad/Oil Cooler Exterior				C			
Fasteners, Guards					C		
Air Cleaner Elements					R/WI		

*Disregard if not appropriate for this particular machine.

(1) or 3000 miles/5000km whichever is the sooner

C = Check (adjust, clean or replace as necessary)

CBT = Check before towing.

CR = Check and report

D = Drain

G = Grease

R = Replace

T = Test

W I = or when indicated if earlier.

Refer to specific sections of the operator's manual for more information.

	Initial 500 miles /850 km	Daily	Weekly	Monthly	3 Months 500 hrs.	6 Months 1000 hrs	12 Months 2000 hrs	18 Months 3000 hrs
*Fuel/Water Separator Element					R			
Compressor Oil Filter Element					R			
Compressor Oil					R			
Engine Oil Change					R			
Engine Oil Filter					R			
*Water Pump Grease.							R	
*Wheels (Bearings, Seals, etc.)						C	G	
*Engine Coolant						C	R	
Fuel Filter Element					R			
*Injection Nozzle Check								C
Shutdown Switch Settings							T	
Scavenger Orifice & Related Parts							C	
Oil Separator Element							R	
*Feed Pump Strainer Cleaning.							C	
*Valve Clearance Check							C	
Lights (running, brake, & turn)		CBT						
Pintle Eye Bolts		CBT						
* Brakes	C				C			
* Brake linkage	C							
* Emergency stop		T						
Running gear linkage				G				
Safety valve					C			
Running gear bolts(1)					C			

*Disregard if not appropriate for this particular machine.

(1) or 3000 miles/5000km whichever is the sooner

(2) or as defined by local or national legislation

C = Check (adjust, clean or replace as necessary)

CBT = Check before towing.

CR = Check and report

D = Drain

G = Grease

R = Replace

T = Test

W I = or when indicated if earlier.

Refer to specific sections of the operator's manual for more information.

	Initial 500 miles /850 km	Daily	Weekly	Monthly	3 Months 500 hrs.	6 Months 1000 hrs	12 Months 2000 hrs
Scavenge line							C
* Engine breather element							C
Separator tank (2) exterior							CR
*Lubricator (Fill)		C					

	2 Yrs	4 Yrs	6 Yrs				
Safety valve	C						
Hoses		R					
Separator tank (2) interior			C				

*Disregard if not appropriate for this particular machine.

(1) or 3000 miles/5000km whichever is the sooner

(2) or as defined by local or national legislation

C = Check (adjust, clean or replace as necessary)

CBT = Check before towing.

CR = Check and report

D = Drain

G = Grease

R = Replace

T = Test

W I = or when indicated if earlier.

Refer to specific sections of the operator's manual for more information.

ROUTINE MAINTENANCE

This section refers to the various components which require periodic maintenance and replacement.

The Maintenance Chart indicates the various components' descriptions and the intervals when maintenance has to take place. Oil capacities, etc., can be found in the General Data Section.

For any specification or specific requirement on service or preventative maintenance for the engine, refer to the Engine Section.

Compressed air can be dangerous if incorrectly handled. Before doing any work on the unit, ensure that all pressure is vented from the system and that the machine cannot be started accidentally.

If the automatic blowdown fails to operate, then pressure must be gradually relieved by operating the manual blowdown valve. Suitable personal protective equipment should be worn.

Ensure that maintenance personnel are adequately trained, competent and have read the Maintenance Manuals.

Prior to attempting any maintenance work, ensure that:

- all air pressure is fully discharged and isolated from the system. If the automatic blowdown valve is used for this purpose, then allow enough time for it to complete the operation.
- the discharge pipe / manifold area is depressurized by opening the discharge valve, while keeping clear of any airflow from it.

⚠ WARNING

Pressure will remain in the system between the minimum pressure valve and the service valve after shutdown and operation of the auto blowdown valve.

This pressure must be relieved by:

(a) Disconnecting any downstream equipment.

(b) Opening the discharge valve to atmosphere.

- the machine cannot be started. Post warning signs and/or fit anti-start devices.
- Disconnect battery cables.

Prior to opening or removing panels or covers to work inside a machine, ensure that:

- anyone entering the machine is aware of the reduced level of protection and the additional hazards, including hot surfaces and intermittently moving parts.
- The machine cannot be started.

Prior to attempting any maintenance work on a running machine, ensure that:

- the work carried out is limited to only those tasks which require the machine to run.
- the work carried out with safety protection devices disabled or removed is limited to only those tasks which require the machine to be running with safety protection devices disabled or removed.
- all hazards present are known (e.g. pressurised components, electrically live components, removed panels, covers and guards, extreme temperatures, inflow and outflow of air, intermittently moving parts, safety valve discharge etc.).
- appropriate personal protective equipment is worn.
- loose clothing, jewelry, long hair etc. is made safe.
- warning signs indicating that Maintenance Work is in Progress are posted in a

position that can be clearly seen.

Upon completion of maintenance tasks and prior to returning the machine into service, ensure that:

- the machine is suitably tested.
- all guards and safety protection devices are refitted.
- all panels are replaced, canopy and doors closed.
- hazardous materials are effectively contained and disposed of.

PROTECTIVE SHUTDOWN SYSTEM

Refer to the diagnostic display codes table for a listing of shutdown conditions.

Low engine fuel level switch.

Test the low engine fuel level switch circuit as follows:

- Start the machine.

NOTE: Do not press the load button.

- Disconnect the switch, the machine should shutdown.
- Re-connect the switch.

Test the low engine fuel level switch by removing and operating the float manually.

⚠ WARNING

Never remove or replace switches when the machine is running.

SCAVENGE LINE

The scavenge line runs from the combined orifice/drop tube in the separator tank, to the orifice fitting located in the airend.

Check that the scavenge line and tube are clear of any obstruction each time the compressor lubricant is changed as any blockage will result in oil carryover into the discharge air.

COMPRESSOR OIL FILTER

Refer to the MAINTENANCE CHART in this section for the recommended servicing intervals.

Removal

⚠ WARNING

Do not remove the filter(s) without first making sure that the machine is stopped and the system has been completely relieved of all air pressure. (Refer to STOPPING THE MACHINE in the OPERATING INSTRUCTIONS section of this manual)

Clean the exterior of the filter housing and remove the spin-on element.

Inspection

Inspect the oil filter head to be sure the gasket was removed with the oil filter element. Clean the gasket seal area on the oil filter head.

⚠ CAUTION

If there is any indication of the formation of varnishes, shellacs or lacquers on the filter element, it is a warning that the compressor lubricating and cooling oil has deteriorated and that it should be changed immediately. Refer to LUBRICATION later in this section.

NOTICE

Installing a new oil filter element when the old gasket remains on the filter head, will cause an oil leak and can cause property damage.

Reassembly

Clean the filter gasket contact area and install the new element.Tighten until the gasket makes contact with the filter housing. Tighten an additional 1/2 to 3/4 of a revolution.

⚠ CAUTION

Start the machine (refer to PRIOR TO STARTING and STARTING THE

MACHINE in the OPERATING INSTRUCTIONS section of this manual) and check for leakage before the machine is put back into service.

COMPRESSOR OIL SEPARATOR ELEMENT

Refer to the MAINTENANCE CHART in this section for the recommended servicing intervals.

If, however, the element has to be replaced, then proceed as follows:

Removal

⚠ WARNING

Do not remove the filter(s) without first making sure that the machine is stopped and the system has been completely relieved of all air pressure. (Refer to STOPPING THE MACHINE in the OPERATING INSTRUCTIONS section of this manual).

Disconnect all hoses and tubes from the separator tank cover plate. Remove the drop-tube from the separator tank cover plate and then remove the cover plate. Remove the separator element.

Inspection

Examine the filter element. Examine all hoses and tubes, and replace if necessary.

Reassembly

Thoroughly clean the orifice/drop tube and filter gasket contact area before reassembly. Install the new element.

⚠ WARNING

DO not remove the staple from the anti-static gasket on the separator element since it serves to ground any possible static build-up. Do not use gasket sealant since this will affect electrical conductance.

Reposition the cover plate, taking care not to damage the gasket, and replace the cover plate screws tightening in a criss-cross pattern to the recommended torque (refer to the TORQUE SETTING TABLE later in this section).

Reconnect all hoses and tubes to the separator tank cover plate.

Replace the compressor oil (refer to LUBRICATION later in this section).

⚠ CAUTION

Start the machine (refer to PRIOR TO STARTING and STARTING THE MACHINE in the OPERATING INSTRUCTIONS section of this manual) and check for leakage before the machine is put back into service.

COMPRESSOR OIL COOLER AND ENGINE RADIATOR

When grease, oil and dirt accumulate on the exterior surfaces of the oil cooler and radiator, the efficiency is impaired. It is recommended that each month the oil cooler and radiator be cleaned by directing a jet of compressed air, (carrying if possible a non-flammable cleaning solvent) over the exterior core of the cooler/radiator. This should remove any accumulation of oil, grease and dirt from the exterior core of the cooler so that the entire cooling area can radiate the heat of the lubricating and cooling oil/water into the air stream.

⚠ WARNING

Hot engine coolant and steam can cause injury. When adding coolant or antifreeze solution to the engine radiator, stop the engine at least one minute prior to releasing the radiator filler cap. Using a cloth to protect the hand, slowly release the filler cap, absorbing any released fluid with the cloth. Do not remove the filler cap until all excess fluid is released and the engine cooling system fully depressurized.

⚠ WARNING

Follow the instructions provided by the antifreeze supplier when adding or draining the antifreeze solution. It is advisable to wear personal protective equipment to prevent skin and eye contact with the antifreeze solution.

DRAIN and FLUSH RADIATOR (2000 hour intervals)

1. Level the unit and shut off the engine.

⚠ WARNING

DO NOT attempt this procedure when the engine is hot. Wait for the engine, muffler and tailpipes to cool down before proceeding. Failure to do so could result in severe burns.

2. Unlatch and open the engine cover. Allow time for the engine to cool down before proceeding. Draining and flushing the engine cooling system while the engine is still hot can cause cracks in the engine block.

⚠ WARNING

NEVER remove the radiator cap while the engine is hot. The cooling system is under pressure. Hot coolant can cause severe burns or eye injury. Wear protective clothing and safety glasses.

3. Slowly turn the radiator cap to the first stop and allow any pressure to escape. Remove the radiator cap.
4. Locate the petcock on the bottom of the radiator. Place a hose onto the petcock and channel the coolant into a container. Open the petcock and allow the coolant to drain.
5. Flush the radiator with clean water and allow to drain. After radiator is drained, close the petcock and remove the hose.
6. Transfer used coolant to a properly labeled container and dispose of properly.
7. Drain the contents of the overflow bottle by removing the overflow hose from the radiator fill neck. Use the hose to channel the coolant into a container. Transfer the used coolant to a properly labeled container and dispose of properly.
8. Reattached the overflow hose to the radiator fill neck.
9. Fill the radiator completely with a 50/50 mixture of ethylene glycol and water. Replace the radiator cap. Add coolant to the overflow bottle until the bottle is 1/2 to 3/4 full. This “overfilling” will compensate for any air in the cooling system.
10. Clean any dirt and debris from the radiator fins and core.
11. Start the engine and run the vehicle to the normal operating temperature, then shut off the engine. While the engine is cooling, check for leaks.

12. Allow the engine to cool. Check the coolant level in the radiator again, top off the radiator with a 50/50 mixture of ethylene glycol and water. Replace the radiator cap.
13. The overflow bottle should be 1/4 to 1/2 full. If not, fill to this level with a 50/50 mixture of ethylene glycol and water.

AIR FILTER ELEMENTS

The air filter element should be replaced regularly (refer to the MAINTENANCE CHART) or when the restriction indicator shows red, whichever comes first. The aircleaner precleaner dumps should be cleaned as indicated in the MAINTENANCE CHART (more frequently in dusty operating conditions).

Removal

⚠ CAUTION

Never remove and replace element(s) when the machine is running.

Clean the exterior of the filter housing and remove the filter element by releasing the nut.

Reassembly

Assemble the new element into the filter housing ensuring that the seal seats properly. Secure element by tightening nut. Before restarting the machine, check that all clamps are tight.

VENTILATION

Always check that the air inlets and outlets are clear of debris etc.

COOLING FAN DRIVE

Periodically check that the fan mounting bolts in the fan hub have not loosened. If, for any reason, it becomes necessary to remove the fan or re-tighten the fan mounting bolts, apply a good grade of commercially available thread locking compound to the bolt threads and tighten to the torque value shown in the TORQUE SETTING TABLE later in this section. Fan belt(s) should be check regularly for wear and correct tensioning.

FUEL SYSTEM

The fuel tank should be filled daily or every eight hours. To minimize condensation in the fuel tank(s), it is advisable to top up after the machine is shut down or at the end of each working day. Drain any sediment or condensate that may have accumulated in the tank(s). Refer to MAINTENANCE CHART.

FUEL FILTER WATER SEPARATOR

The fuel filter water separator contains a filter element which should be replaced at regular intervals (see the SERVICE/MAINTENANCE CHART).

CHARGE AIR COOLER PIPEWORK

Inspect all hoses and clamps on the charge cooler pipe work.

Engine damage will occur if the charge cooling system leaks.

HOSES

All components of the engine cooling air intake system should be checked periodically to keep the engine at peak efficiency.

At the recommended intervals, (see the MAINTENANCE CHART), inspect all of the intake lines to the air filter, and all flexible hoses used for air lines, oil lines and fuel lines.

Periodically inspect all pipework for cracks, leaks, etc. and replace immediately if damaged.

ELECTRICAL SYSTEM

⚠ WARNING

Disconnect the battery cables before performing any maintenance or service.

Check the security of electrical terminals on the switches and relays i.e. nuts or screws loose, which may cause local hot spot oxidation.

Inspect the components and wiring for signs of overheating i.e. discolouration, charring of cables, deformation of parts, acrid smells and blistered paint.

BATTERY

Keep the battery terminals and cable clamps clean and lightly coated with petroleum jelly to prevent corrosion.

The battery restraint should be kept tight enough to prevent the battery from moving.

PRESSURE SYSTEM

Regularly, it is necessary to inspect the external surfaces of the system (from the airend through to the discharge valve(s)) including hoses, tubes, tube fittings and the separator tank, for visible signs of impact damage, excessive corrosion, abrasion, tightness and chafing. Any suspect parts should be replaced before the machine is put back into service.

TIRE PRESSURE

See the GENERAL DATA SECTION of this manual.

RUNNING GEAR/WHEELS

Check the wheel nut torque 20 miles (30 kilometres) after refitting the wheels. Refer to the Torque Setting Chart below.

M12 Bolts	Torque (Ft-Lbs)
13” Wheel	60-70
1/2” Lug Nuts	
13” Wheel	80-90
15” Wheel	105-115
16” Wheel	105-115
16.5 Wheel	105-115
5/8” Lug Nuts	
16” Wheel	190-210
17.5 Wheel	190-210

Lifting jacks should only be used under the axle.

The bolts securing the running gear to the chassis should be checked periodically for tightness (refer to the MAINTENANCE CHART for frequency) and re-tighten where necessary.

LUBRICATION

⚠ CAUTION

Always check the oil levels before a new machine is put into service.

If, for any reason, the unit has been drained, it must be re-filled with new oil before it is put into operation.

ENGINE LUBRICATING OIL

The engine oil and oil filter element should be changed at the engine manufacturer's recommended intervals. Refer to the Engine operator manual/section.

Refer to the Engine operators' manual/section for engine oil specifications.

COMPRESSOR LUBRICATING OIL

Refer to the MAINTENANCE CHART in this section for service intervals.

NOTE: If the machine has been operating under adverse conditions, or has suffered long shutdown periods, then more frequent service intervals will be required.

⚠ WARNING

DO NOT, under any circumstances, remove any drain plugs or the oil filler-plug from the compressor lubricating and cooling system without first making sure that the machine is stopped and the system has been completely relieved of all air pressure (refer to STOPPING THE MACHINE in the OPERATING INSTRUCTIONS section of this manual).

Completely drain the receiver/separator system including the piping and oil cooler by removing the drain plug(s) and collecting the used oil in a suitable container.

Replace the drain plug(s) ensuring that each one is secure.

NOTE: If the oil is drained immediately after the machine has been running, then most of the sediment will be in suspension and will therefore drain more readily.

⚠ CAUTION

Some oil mixtures are incompatible and result in the formation of varnishes, shellacs or lacquers which may be insoluble. Refer to Portable Compressor Fluid Chart.

RUNNING GEAR WHEEL BEARINGS

Wheel bearings should be packed with grease every 12 months. The type of grease used should conform to specification MIL-G-10924.

Section F - Lubrication

Lubrication

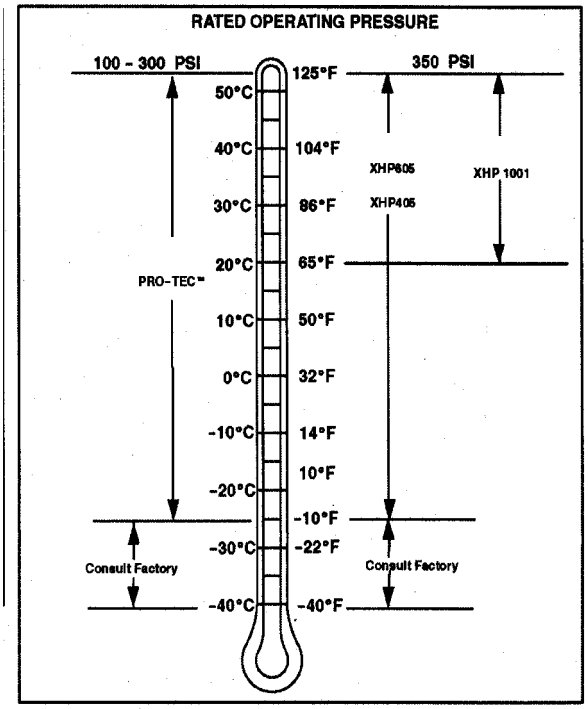
Portable Compressor Fluid Chart

Refer to these charts for correct compressor fluid required. Note that the selection of fluid is dependent on the design operating pressure of the machine and the ambient temperature expected to be encountered before the next oil change.

NOTE: Fluids listed as “preferred” are required for extended warranty.

Compressor oil carryover (oil consumption) may be greater with the use of alternative fluids.

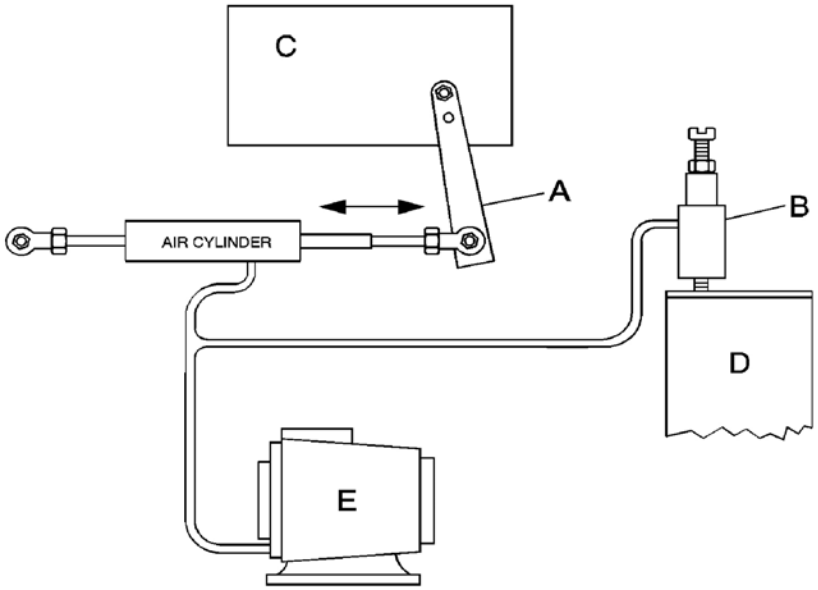
Design Operating Pressure	Ambient Temperature	Specification
100 psi to 300 psi	-10°F to 125°F (-23°C to 52°C)	Preferred: **Pro-Tec™** Alternate: ISO Viscosity Grade 46 with rust and oxidation inhibitors, designed for air compressor service.
350 psi	-10°Fto125°F (-23°C to 52°C)	Preferred: **XHP 605** Alternate: XHP405 ISO Viscosity Grade 68 Group 3 or 5 with rust and oxidation inhibitors designed for air compressor service.
	65°Fto125°F (-18°C to 52°C)	Preferred: **XHP605** **XHP1001**



Preferred Fluids - Use of these fluids with original filters can extend airend warranty. Refer to operator's manual warranty section for details or contact your Portable Power representative.

Preferred Fluids	1 gal. (3.8 Litre)	5 gal. (19.0 Litre)	55 gal. (208.2 Litre)	220 gal. (836 Llitre)
Preferred:				
Pro-Tec™	36899698	36899706	36899714	36899722
XHP605	-	22252076	22252050	22252068
XHP1001	-	35612738	35300516	-
XHP405	-	22252126	22252100	22252118

Speed and Pressure Regulation Adjustment



Normally, regulation requires no adjusting, but if correct adjustment is lost, proceed as follows:

Refer to the diagram above.

A. Throttle Arm
B. Adjusting Screw
C. Engine Governor
D. Separator Tank
E. Inlet Unloader

Start the machine (Refer to STARTING INSTRUCTIONS in the OPERATING INSTRUCTIONS section of this manual).

Inspect the throttle arm on the engine governor to see that it is extended in the full speed position when the engine is running at full-load speed and the service valve is fully open. (Refer to the GENERAL INFORMATION section of this manual).

Adjust the service valve on the outside of the machine to maintain normal operating discharge pressure without the throttle arm moving from the full speed position before normal operating discharge pressure is attained. Turn the adjusting screw clockwise to increase the pressure. Optimum adjustment is achieved when the throttle arm just moves from its full speed position and the pressure gauge reads normal operating discharge pressure.

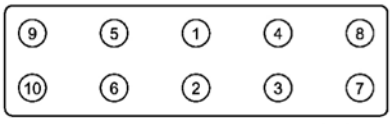
Close the service valve. The engine will slow to idle speed.

⚠ CAUTION

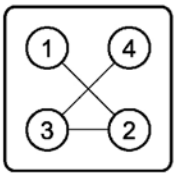
Never allow the idle pressure to exceed maximum allowable pressure on the pressure gauge, otherwise the safety valve will operate.

Torque Setting Table

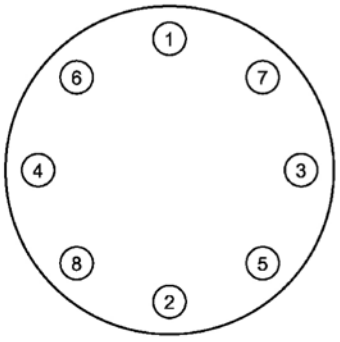
CAPSCREW OR NUT THREAD SIZE AND PITCH	NOMINAL DESIGN TORQUE			
	8AE J249 GRADE 5 (HEAD MARKING)		8AE J249 GRADE 8 (HEAD MARKING)	
	(Nm.)	(FT-LBF)	(Nm.)	(FT-LBF)
1/4 - 20	11	8	16	12
5/16 - 18	24	17	33	25
3/8 - 16	42	31	59	44
7/16 - 14	67	49	95	70
1/2 - 13	102	75	144	106
9/16 - 12	148	109	208	154
5/8 - 11	203	150	287	212
3/4 - 10	361	266	509	376



TYPICAL RECTANGULAR TORQUE PATTERN



TYPICAL SQUARE TORQUE PATTERN

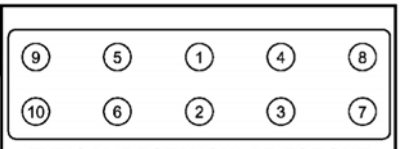


TYPICAL CIRCULAR TORQUE PATTERN

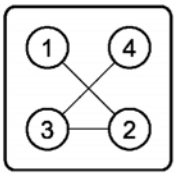
Torque Setting Table

TABLE 2 METRIC FASTENERS

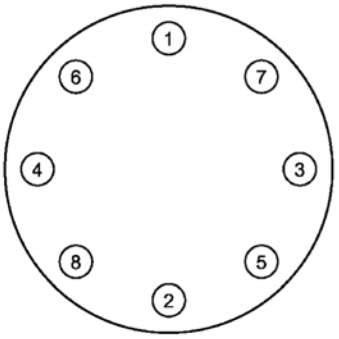
CAPSCREW OR NUT THREAD SIZE AND PITCH	NOMINAL DESIGN TORQUE					
	PROPERTY GRADE 8.8 (HEAD MARKING)		PROPERTY GRADE 10.9 (HEAD MARKING)		PROPERTY GRADE 12.9 (HEAD MARKING)	
	(Nm.)	(FT-LBF)	(Nm.)	(FT-LBF)	(Nm.)	(FT-LBF)
M6 X 1.0	11	8	15	11	18	13
M8 X 1.25	26	19	36	27	43	31
M10 X 1.5	52	38	72	53	84	62
M12 X 1.75	91	67	126	93	147	109
M14 X 2	145	107	200	148	234	173
M16 X 2	226	166	313	231	365	270
M20 X 2.5	441	325	610	450	713	526



TYPICAL RECTANGULAR TORQUE PATTERN



TYPICAL SQUARE TORQUE PATTERN



TYPICAL CIRCULAR TORQUE PATTERN

Fault Finding

FAULT	CAUSE	REMEDY
No reaction from instrument panel when key turned to (I) position.	Batteries not connected.	connect batteries.
	Fuse at starter motor 'blown'.	Replace fuse.
Engine fails to start.	Low battery charge.	Check the fan belt tension, battery and cable connections.
	Bad earth connection.	Check the earth cables, clean as required.
	Loose connection.	Locate and make the connection good.
	Fuel starvation.	Check the fuel level and fuel system components.
		Replace the fuel filter if necessary.
	Relay failed.	Replace the relay.
	Faulty stop solenoid	Check the stop solenoid
Engine stops while in service or is reluctant to start.	Low fuel level.	Fill fuel tank and bleed air from fuel system if necessary. (Refer to MAINTENANCE SECTION).
	Safety shut-down system in operation	Check the safety shut-down switches.
Engine starts but stalls when the switch returns to position /.	Electrical fault	Test the electrical circuits.
	Low engine oil pressure.	Check the oil level and the oil filter(s).
	Faulty relay	Check the relays.
	Faulty key -switch	Check the key-switch.

FAULT	CAUSE	REMEDY
Engine starts but will not turn or engine shuts down prematurely.	Electrical fault.	Test the electrical circuits.
	Low engine oil pressure.	Check the oil level and oil filter(s).
	Safety shut-down system in operation.	Check the safety shut-down switches.
	Fuel starvation.	Check the fuel level and fuel system components.
		Replace the fuel filter if necessary.
	Switch failure	Test the switches.
	High compressor oil temperature.	Check the compressor oil level and oil cooler. Check the fan drive.
	Water present in fuel system.	Check the water separator and clean if required.
	Faulty relay.	Check the relays and replace if necessary.
Engine Overheats.	Low water level	Check the level and replenish if necessary.
	Blocked radiator.	Stop the machine and clean the cooling fins with compressed air or steam. Use reduced pressure for cleaning the fins.
	Reduced cooling air from fan.	Check the fan and the drive belts. Check for any obstruction inside the cowl.
	Faulty thermostat	Check the thermostat and replace if necessary.
Engine speed too high.	lncorrect throttle arm setting.	Check the engine speed setting.
Engine speed too low.	lncorrect throttle arm setting.	Check the throttle setting.
	Blocked fuel filter.	Check and replace if necessary.
	Blocked air filter.	Check and replace the element if necessary.
	Incorrectly set regulation system.	Reset the regulation system. Refer to SPEED AND PRESSURE REGULATION ADJUSTMENT in the MAINTENANCE section of this manual.
	Premature unloading.	Check the regulation system.
Excessive vibration.	Engine speed too low.	See "Engine speed too low"
Leaking oil seal.	Improperly fitted oil seal.	Replace the oil seal.

Revision History

Rev.	EC Number	Comments
A		Original release
B		
C	CN026142	Updated with Doosan references
D	CN034866	Flex Models Added to Front Cover

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