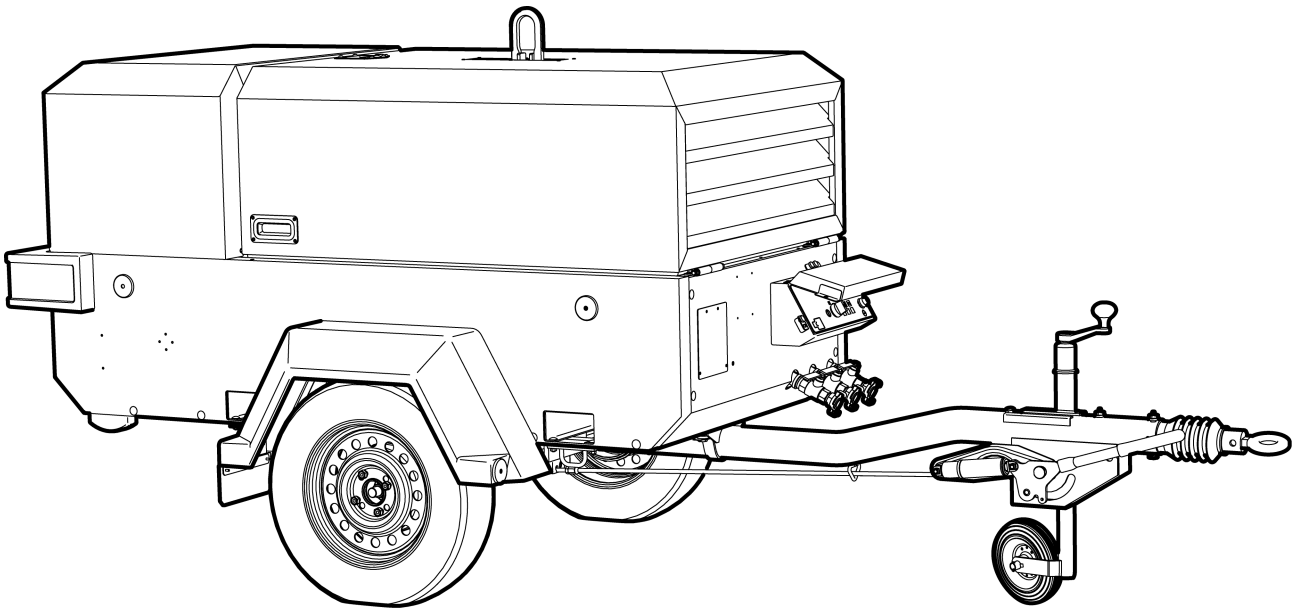
DOOSAN

Portable Power

7/53

OPERATION AND MAINTENANCE MANUAL
Original Instruction



This manual contains important safety information and must be made available to personnel who operate and maintain this machine.

7/53	SERIAL No : 444800 - 449999

46673723_en_A_04/15

Machine models represented in this manual may be used in various locations world-wide. Machines sold and shipped into European Union Territories require that the machine display the CE Mark and conform to various directives. In such cases, the design specification of this machine has been certified as complying with EC directives. Any modification to any part is absolutely prohibited and would result in the CE Certification and marking being rendered invalid. A declaration of that conformity follows:

CE

DOOSAN

1) **EC Declaration of Conformity**

2) Original declaration

3) **We:**
Doosan International USA, Inc
1293 Glenway Drive
Statesville
North Carolina 28625-9218
USA

4) **Represented in EC by:**
Doosan Trading Limited
Block B, Swords Business Campus
Swords
Co. Dublin
Ireland

5) **Hereby declare that, under our sole responsibility the product(s)**

6) Machine description: Portable Screw Compressor

7) Machine Model: 7/20; 7/26E; 7/31E; 7/41; 7/51; 7/53 ; 7/73-10/53; 7/125-9/115; 7/125-10/110; 14/90; 7/170; 10/125; 14/115; 12/154; 9/274; 9/304; 12/254; 17/244; 21/224

8) Commercial name: 7/20; 7/26E; 7/31E; 7/41; 7/51; 7/53 ; 7/73-10/53; 7/125-9/115; 7/125-10/110; 14/90; 7/170; 10/125; 14/115; 12/154; 9/274; 9/304; 12/254; 17/244; 21/224

9) VIN / Serial number: U N 5

10) **is (are) in conformity with the relevant provisions of the following EC Directive(s)**

11) 2006/42/EC The Machinery Directive
12) 2004/108/EC The Electromagnetic Compatibility Directive
13) 2000/14/EC The Noise Emission Directive
14) 97/23/EC The Pressure Equipment Directive
15) 2009/105/EC The Simple Pressure Vessels Directive
16) 97/68/EC The emission of engines for no-road mobile machinery
31) 2006/95/EC The Low Voltage Equipment Directive
17) and their amendments

18) **Conformity with the Noise Emission Directive 2000/14/EC**

19) Directive 2000/14/EC, Annex VI, Part I
20) Notified body: AV Technology, Stockport, UK. Nr 1067

21) Machine		23) Measured sound power level	24) Guaranteed sound power level	21) Machine		23) Measured sound power level	24) Guaranteed sound power level
22) Type	kW			22) Type	kW		
7/20	17,5	**96L$_{WA}$**	**97L$_{WA}$**	**7/125-9/115; 7/125-10/110; 14/90**	97	**98L$_{WA}$**	**99L$_{WA}$**
7/26E	21,3	**97L$_{WA}$**	**98L$_{WA}$**				
7/31E	25,9	**97L$_{WA}$**	**98L$_{WA}$**				
7/41	35	**98L$_{WA}$**	**98L$_{WA}$**	**7/170; 10/125; 14/115**	126,5	**98L$_{WA}$**	**99L$_{WA}$**
7/51	50,2	**98L$_{WA}$**	**98L$_{WA}$**				
7/53	36	**97L$_{WA}$**	**98L$_{WA}$**	**12/154**	168	**98L$_{WA}$**	**99L$_{WA}$**
7/73-10/53	55	**96L$_{WA}$**	**98L$_{WA}$**	**9/274**	226	**99L$_{WA}$**	**100L$_{WA}$**
				9/304; 12/254; 17/244; 21/224	247	**99L$_{WA}$**	**100L$_{WA}$**

25) **Conformity with the Pressure Equipment directive 97/23/EC**

26)

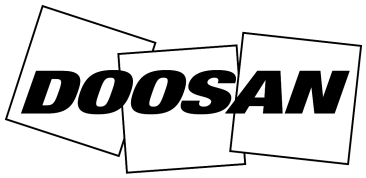
We declare that this product has been assessed according to the Pressure Equipment Directive 97/23/EC and, in accordance with the terms of this Directive, has been excluded from the scope of this Directive. It may carry "CE" marking in compliance with other applicable EC directives.

Jan Moravec
27) Engineering Manager
28) Issued at Dobris, Czech Republic

29) Date

30) **The technical documentation for the machinery is available from:**
Doosan Infracore Portable Power EMEA, Dreve Richelle 167, B-1410 Waterloo, Belgium

Portable Power



Portable Power

ABBREVIATIONS & SYMBOLS

Contact the company for serial number
->#### Up to Serial No.
####-> From Serial No.

***** Not illustrated
† Option
AR As required
HA High ambient machine
F.H.R.G. Fixed height running gear
V.H.R.G. Variable height running gear

bg Bulgarian
cs Czech
da Danish
de German
el Greek
en English
es Spanish
et Estonian
fi Finnish
fr French
hu Hungarian
it Italian
lt Lithuanian
lv Latvian, Lettish
mt Maltese
nl Dutch
no Norwegian
pl Polish
pt Portuguese
ro Romanian
ru Russian
sk Slovak
sl Slovenian
sv Swedish
zh Chinese

The contents of this manual are considered to be proprietary and confidential to and should not be reproduced without the prior written permission of the company.

Nothing contained in this document is intended to extend any promise, warranty or representation, expressed or implied, regarding the 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 authorised service department.

The design specification of this machine has been certified as complying with EC directives. As a result:

a) Any machine modifications are strictly prohibited, and will invalidate EC certification.
b) A unique specification for USA/Canada is adopted and tailored to the territory.

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 the company.
- clearly rated for a pressure at least equal to the machine maximum allowable working pressure.
- compatible with the compressor lubricant/coolant.
- accompanied with instructions for safe installation, operation and maintenance.

Details of approved equipment are available from the company Service departments.

The use of repair parts / lubricants / fluids other than those included within the approved parts list may create hazardous conditions over which the company has no control. Therefore the company cannot be held responsible for equipment in which non-approved repair parts are installed.

The company 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 machine are outlined below and examples of unapproved usage are also given, however the company cannot anticipate every application or work situation that may arise.

IF IN DOUBT CONSULT SUPERVISION.

This machine has been designed and supplied for use only in the following specified conditions and applications:

- Compression of normal ambient air containing no known or detectable additional gases, vapours. or particles
- Operation within the ambient temperature range specified in the *GENERAL INFORMATION* section of this manual.
- Generation of electricity at 110v (1ph) with centre tap earth, 230v (1ph), 230v (3ph) and 400v (3ph) / 230v (1ph) nominal at 50 Hertz.

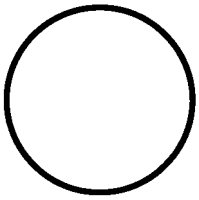
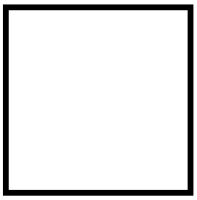
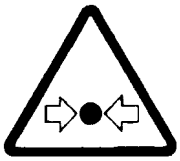
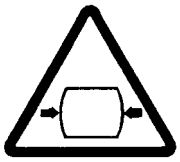
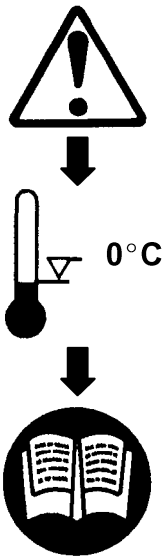
The use of the machine in any of the situation types listed in table 1:-

a Is not approved,
b) May impair the safety of users and other persons, and
c) May prejudice any claims made against the company.

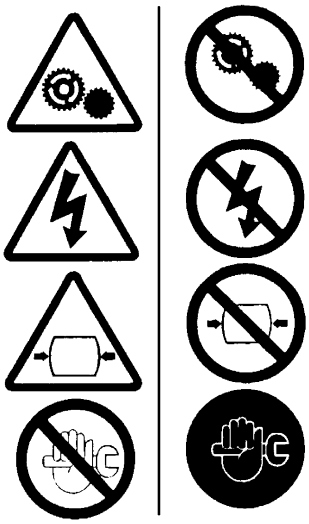
TABLE 1
Use of the machine to produce compressed air for: a) direct human consumption b) indirect human consumption, without suitable filtration and purity checks.
Use of the machine outside the ambient temperature range specified in the *GENERAL INFORMATION SECTION* of this manual.
This machine is not intended and must not be used in potentially explosive atmospheres, including situations where flammable gases or vapours may be present.
Use of the machine fitted with non approved components / lubricants / fluids.
Use of the machine with safety or control components missing or disabled.
Use of the machine for storage or transportation of materials inside or on the enclosure except when contained within the toolbox.
GENERATOR
Use of the generator to supply load(s) greater than those specified.
Use of unsafe or unserviceable electrical equipment connected to the generator.
Use of electrical equipment: a) Having incorrect voltage and/or frequency ratings. b) Containing computer equipment and/or similar electronics.

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

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 - Flammable liquid.**
		
WARNING - Maintain correct tyre pressure. (Refer to the GENERAL INFORMATION section of this manual).	**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 - Maintenance work in progress.



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 other parts of the pressure system.

Do not operate with the doors or enclosure open.

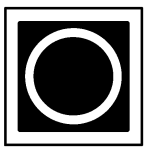
Do not use fork lift truck from this side.

Do not exceed the trailer speed limit.

No naked lights.

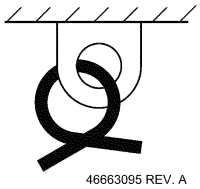
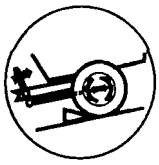
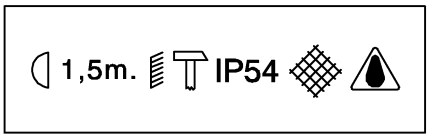
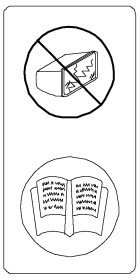
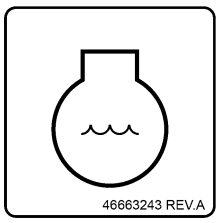
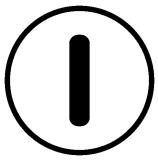
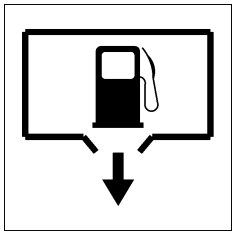
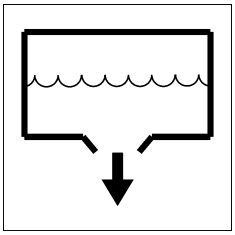
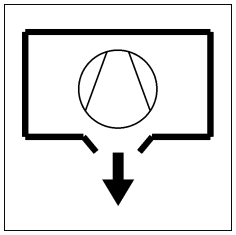
Do not open the service valve before the airhose is attached.

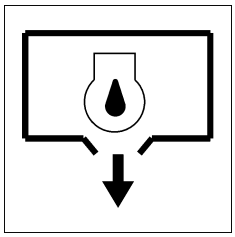
Use fork lift truck from this side only.



Emergency stop.

6 DECALS

 Lashing point (Tie down).	 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, handbrake and wheel chocks.
 Compressor oil filling.	 Diesel fuel. No open flame.	 Parking brake.
 Rough Service Designation. Wet Location Operation.	 Replace any cracked protective shield.	 Coolant fill.
 Prohibition: Do not start	 Start and stop device.	 Mandatory action: Hearing protection must be worn.
 Diesel fuel drain.	 Engine coolant drain.	 Compressor oil drain.



Engine oil drain.

WARNINGS

Warnings call attention to instructions which must be followed precisely to avoid injury or death.

CAUTIONS

Cautions call attention to instructions which must be followed precisely to avoid damaging the product, process or its surroundings.

NOTES

Notes are used for supplementary information.

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 the Operation and Maintenance manual, and the manual holder, are not removed permanently from the machine.

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

Ensure that ice and snow do no block the cooling air inlets.

Use hearing protectors when the machine is running.

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, dependant 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 PLUG STARTING AID 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 rated pressure.

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 pressurised / over pressurised 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 event 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:

- 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.

Never operate the engine of this machine inside a building without adequate ventilation. 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 sulphuric 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.

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.

Generator sets

The generator set is designed for safety in use. However, the responsibility for safe operation rests with those who install, use and maintain it. The following safety precautions are offered as a guide, which, if conscientiously followed, will minimise the possibility of accidents throughout the useful life of this equipment.

Emergency Stop Controls

Important Note:- In addition to the key operated emergency stop control on the main control panel, a second control is provided at the socket control panel in the event of electrical hazards associated with generator operation. Use this second control to immediately isolate all electrical power to all sockets, then use the key control to stop the engine.

Operation of the generator must be in accordance with recognised electrical codes and local health and safety codes.

The generator set should be operated by those who have been trained in its use and delegated to do so, and who have read and understand the operator's manual. *Failure to follow the instructions, procedures and safety precautions in the manual may increase the possibility of accidents and injuries.*

Do not start the generator set unless it is safe to do so. Do not attempt to operate the generator set with a known unsafe condition. Fit a danger notice to the generator set and render it inoperative by disconnecting the battery and disconnecting all ungrounded conductors so others who may not know of the unsafe condition will not attempt to operate it until the condition is corrected.

An earth point is provided beneath the socket outlets.

The generator set should only be used with the earth point connected directly to the general earth/ground mass. An earth spike kit is available as an optional extra for this purpose (refer to the *parts catalogue*).

WARNING: DO NOT OPERATE THE MACHINE UNLESS IT HAS BEEN SUITABLY EARTHED.

Generator sets must be connected to the load only by trained and qualified electricians who have been delegated to do so, and when required by applicable regulations, their work should be inspected, and accepted by the inspection agency having authority, prior to attempting to operate the generator set.

Do not make contact with electrically energised parts of the generator set and/or interconnecting cables or conductors with any part of the body or with any non-insulated conductive object.

Make sure the generator set is effectively grounded in accordance with all applicable Regulations prior to attempting to make or break load connections and prior to attempting operation.

Do not attempt to make or break electrical connections to generator sets standing in water or on wet ground.

Prior to attempting to make or break electrical connections at the generator set, stop the engine, disconnect the battery and disconnect and lock out the ungrounded conductors at the load end.

Keep all parts of the body and any hand-held tools or other conductive objects, away from exposed live parts of the generator set engine electrical system. Maintain dry footing, stand on insulating surfaces and do not contact any other portion of the generator set when making adjustments or repairs to exposed live parts of the generator set engine electrical system.

Replace the generator set terminal compartment cover as soon as connections have been made or broken. Do not operate the generator set without the terminal cover secured firmly in place.

Close and lock all access doors when the generator set is left unattended.

Do not use extinguishers intended for Class A or Class B fires on electrical fires. Use only extinguishers suitable for class *BC* or class *ABC* fires.

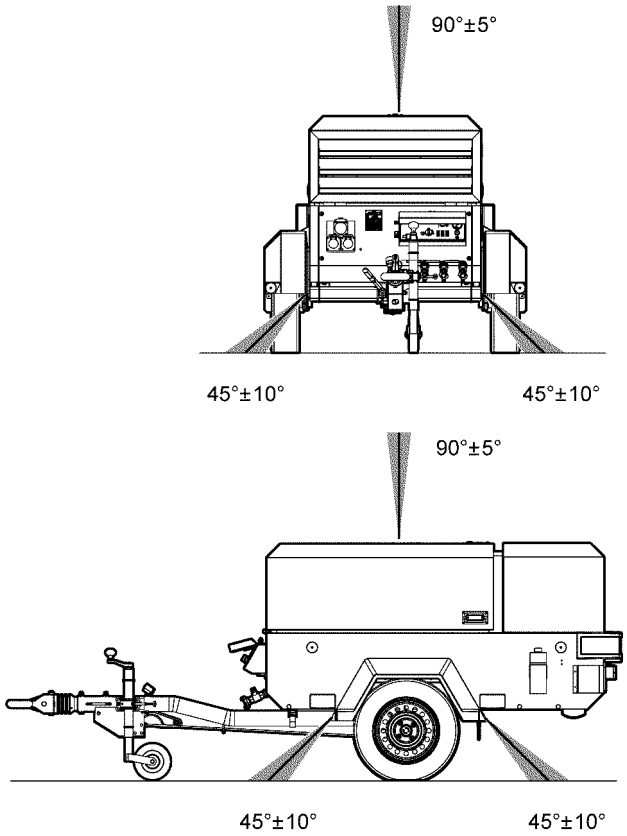
Keep the towing vehicle or equipment carrier, generator set, connecting cables, tools and all personnel at least 3 metres from all power lines and buried power cables, other than those connected to the generator set.

Attempt repairs only in clean, dry, well lighted and ventilated areas.

Connect the generator set only to loads and/or electrical systems that are compatible with its electrical characteristics and that are within it's rated capacity.

Transport

When loading or transporting machines ensure that the specified lifting and tie down points are used and cables or chains are within safe limits.



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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.

Ensure that the maximum trailer weight does not exceed the maximum gross weight of the machine (by limiting the equipment load), limited by the capacity of the running gear.

NOTE: Gross mass (on data plate) is for the basic machine and fuel only, excluding any fitted options, tools, equipment and foreign materials.

Before towing the machine, ensure that:-

- the tyres 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 (the maximum permissable drawbar angle is between 0° and +5° from horizontal) 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.

To ensure full braking efficiency, the front (towing eye) section must always be set level.

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When adjusting variable height running gear:-

- Ensure front (towing eye) section is set level
- When raising towing eye, set rear joint first, then front joint.
- When lowering towing eye, set front joint first, then rear joint.

After setting, fully tighten each joint by hand and then tighten further to the next pin. Refit the pin.

When parking always use the handbrake and, if necessary, suitable wheel chocks.

Make sure wheels, tyres and tow bar connectors are in safe operating condition and tow bar is properly connected before towing.

Safety chains / connections and their adjustment

The legal requirements for the joint operation of the breakaway cable and safety chains are as yet unidentified by 71/320/EEC or UK regulations. Consequently we offer the following advice / instructions.

Where brakes only are fitted:

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

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

Where brakes and safety chains are fitted:

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

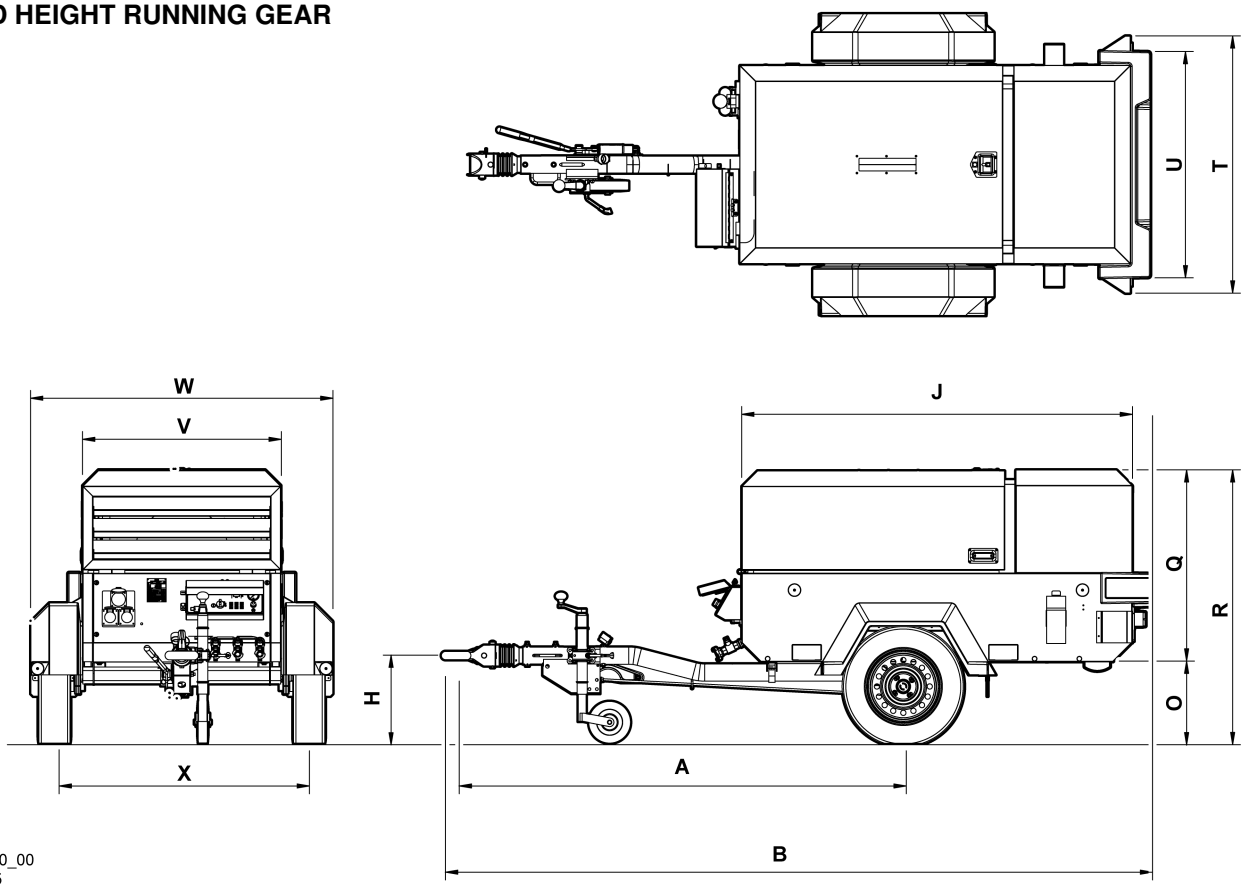
b) Ensure that the effective chain length is as short as possible whilst still allowing normal articulation of the trailer and effective operation of the breakaway cable.

Where safety chains only are fitted:

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

b) When adjusting the safety chains there should be sufficient free length in the chains to allow normal articulation, whilst also being short enough to prevent the towbar from touching the ground in the event of an accidental separation of the towing vehicle from the trailer.

7/53
FIXED HEIGHT RUNNING GEAR



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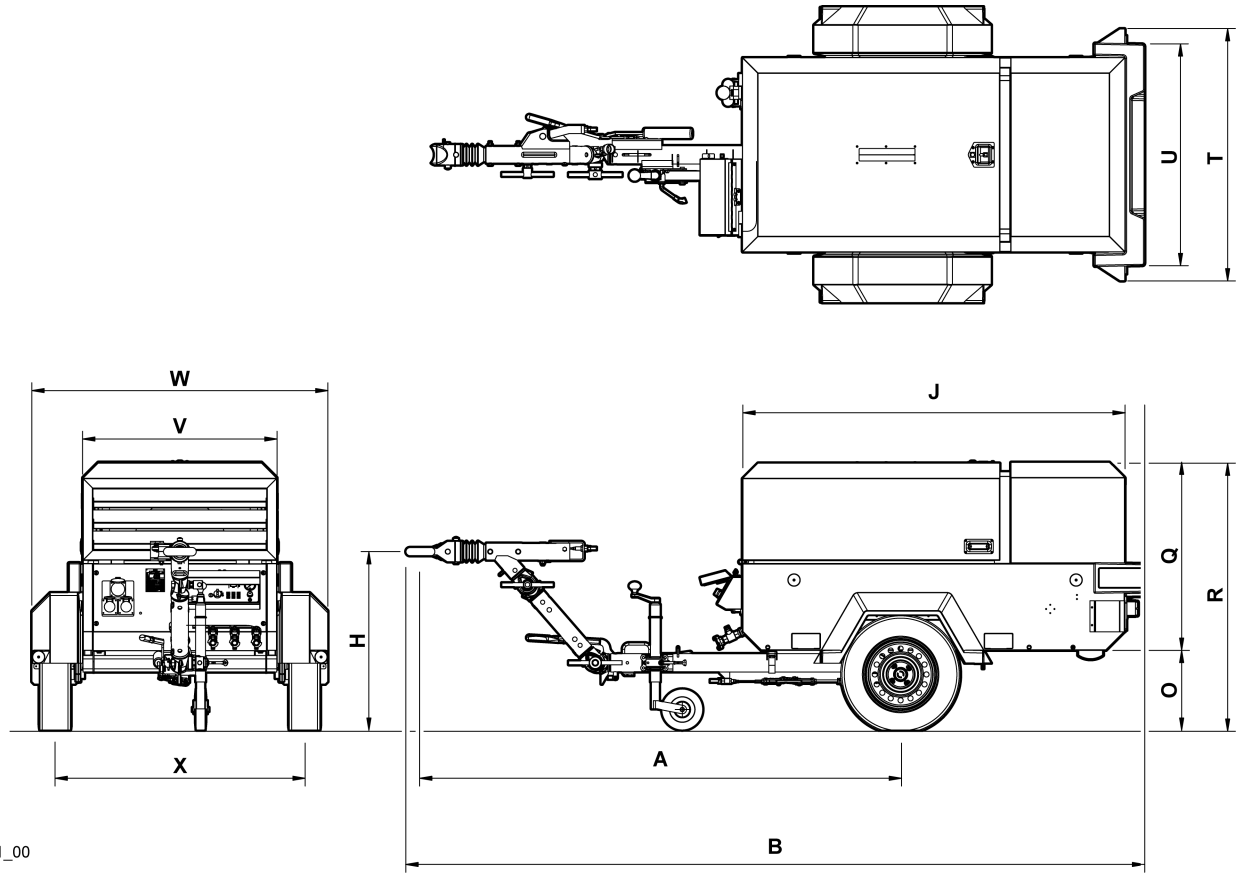
VARIABLE HEIGHT RUNNING GEAR



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SHIPPING SKID

Contact Doosan Portable Power dealer for more information concerning the shipping skid, permanent skid and truck-mounted version.

		A	B	H	J.	O	P	Q	R	S	T	U	V.	W	X	Y	Z
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1	**7/53 Fixed Height - braked**	2110 MIN 2127 MAX	3325 MIN 3380 MAX	405	1851	386	-	904	1290	-	1220	TBA	940	1430	1205	-	-
2	**7/53 Variable Height - braked**	2315 MIN 2492 MAX	2733 MIN 3745 MAX	400 MIN 840 MAX	1851	386	-	904	1290	-	1220	TBA	940	1430	1205	-	-
3	**7/53 Shipping Skid**	TBA	TBA	TBA	TBA	TBA	-	TBA	TBA	-	TBA	TBA	TBA	TBA	TBA	-	-

COMPRESSOR

Actual free air delivery.	5,0 m^3 min^{-1} (177 CFM)
Normal operating discharge pressure.	6,9 bar (100 PSI)
Maximum allowable pressure.	8,6 bar (125 PSI)
Safety valve setting.	10 bar (145 PSI)
Maximum pressure ratio (absolute).	7,5 : 1
Operating ambient temperature. CE regions High ambient temp.	 -10°C TO +46°C (14°F TO 115°F) -10°C TO +52°C (14°F TO 126°F)
Maximum discharge temperature.	120°C (248°F)
Cooling system.	Oil injection
Oil capacity.	7,0 litres (1,8 US GAL)
Maximum oil system temperature.	120°C (248°F)
Maximum oil system pressure.	8,6 bar (125 PSI)

LUBRICATING OIL SPECIFICATION

(for the specified ambient temperatures).

ABOVE -23°C(-9°F)

Recommended: PRO-TEC

Approved: SAE 10W, API CF-4/CG-4

PRO-TEC compressor fluid is factory-fitted, for use at all ambient temperatures above -23°C(-9°F).

NOTE: Warranty may be extended only by continuous use of PRO-TEC and Doosan oil filters and separators.

No other oil/fluids are compatible with PRO-TEC

No other oils/fluids should be mixed with PRO-TEC because the resulting mixture could cause damage to the airend.

In the event that PRO-TEC is not available and / or the end user needs to use an approved single grade engine oil, the complete system including separator / receiver, cooler and pipework must be flushed clear of the first fill fluid and new Doosan oil filters installed.

When this has been completed, the following oils are approved:

a) for ambient temperatures above -23°C(-9°F),
SAE 10W, API CF-4/CG-4

Safety data sheets can be obtained on request from your Doosan dealership.

For temperatures outside the specified ambient range, consult the company.

ENGINE

Type/model.	Yanmar 4TNV84T-BMDP
Number of cylinders.	4
Oil capacity.	5,5 litres
Speed at full load.	2600 revs min^{-1}
Speed at idle.	1700 revs min^{-1}
Electrical system.	12V negative earth
Power available at 2600 revs min^{-1}	36kW kW (49 HP)
Fuel tank capacity	60 litres (11US GAL)
Oil specification	Refer engine section
Coolant capacity	7 litres (1,8) US GAL

INFORMATION ON AIRBORNE NOISE (CE regions)

- The A-weighted emission sound pressure level

. 84 dB(A), uncertainty 1 dB(A)

- The A-weighted emission sound power level

. 98 dB(A), uncertainty 1 dB(A)

The operating conditions of the machinery are in compliance with ISO 3744:1995 and EN ISO 2151:2004

FIXED HEIGHT RUNNING GEAR
Braked Version

Shipping weight.	875 kg (1929 lbs)
Maximum weight.	1100 kg (2425 lbs)
Maximum horizontal towing force.	12,1 kN (2720 lbs)
Maximum vertical coupling load (nose weight).	100 kg (165 lbs)

VARIABLE HEIGHT RUNNING GEAR
Braked Version

Shipping weight.	910 kg (2002 lbs)
Maximum weight.	1100 kg (2420 lbs)
Maximum horizontal towing force.	12,1 kN (2720 lbs)
Maximum vertical coupling load (nose weight).	100 kg (165 lbs)

WHEELS AND TYRES

Number of wheels.	2 x $4^1/_2$ J x 13
Tyre size.	155 R13
Tyre pressure.	2,9 bar (42 PSI)

Further information may be obtained by request through the customer services department.

14 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 recognised by its markings. Ensure that it is functioning correctly and that the method of operation is known.

Running gear drawbar - Machines are shipped to some areas with the drawbar removed. Fitting involves four nuts / bolts to secure the drawbar to the axle and two bolts to fit the drawbar to the front of the machine with the saddle and spacer block.

Support the front of the machine, fit the wheel chocks to stop the machine moving and attach the drawbar. Refer to the torque value table in the *MAINTENANCE* section of this manual for the correct torque values.

CAUTION: *This is a safety critical procedure. Double check the torque settings after assembly.*

Fit the propstand and coupling. Remove the supports and set the machine level.

Before towing the unit, ensure that the tyre pressures are correct (refer to the *GENERAL INFORMATION* section of this manual) and that the handbrake is functioning correctly (refer to the *MAINTENANCE* section of this manual). Before towing the unit during the hours of darkness, 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, observing any specified minimum dimensions (to walls, floors etc.).

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

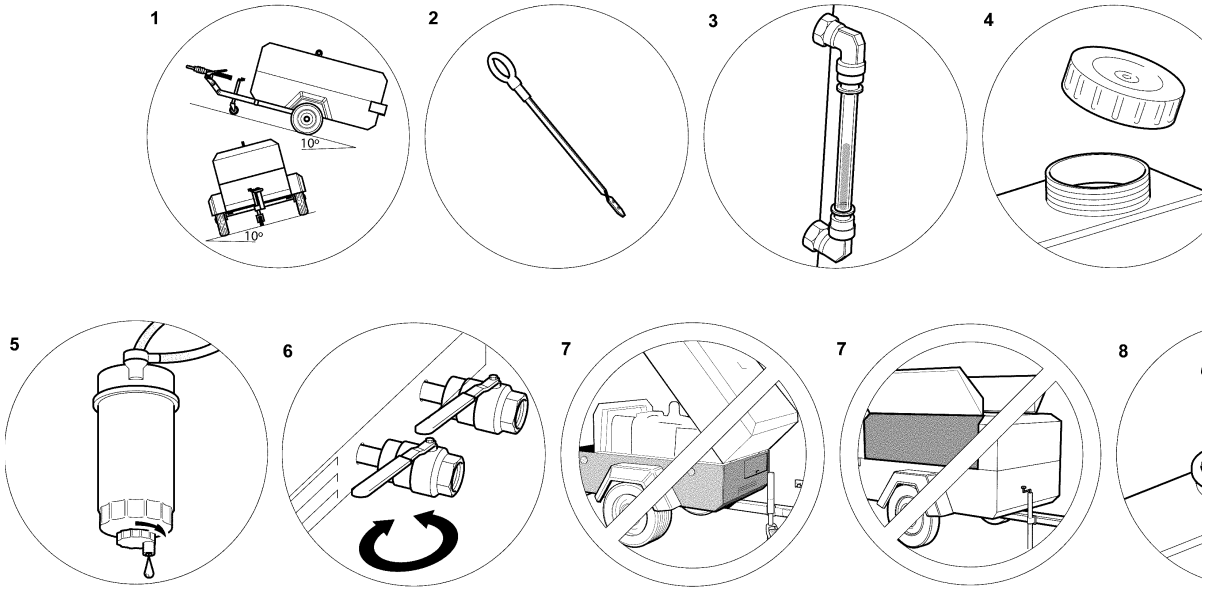
Ensure that the machine is positioned securely and on a stable foundation. Any risk of movement should be removed by suitable means, especially to avoid strain on any rigid discharge piping.

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

WARNING: All air pressure equipment installed in or connected to the machine must have safe working pressure ratings of at least the machine rated pressure, and materials compatible with the compressor lubricant (refer to the *GENERAL INFORMATION* 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 accidentally be pressurised / over pressurised by another.

WARNING: If flexible discharge hoses are to carry more than 7 bar pressure then it is recommended that safety retaining wires are used on the hoses.



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PRIOR TO STARTING

1. Place the unit in a position that is as level as possible. The design of the unit permits a 10 degree lengthways and sideways limit on out of level operation. It is the engine, not the compressor, that is the limiting factor.

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).

CAUTION: *Do not overfill either the engine or the compressor with oil.*

2. Check the engine lubrication oil in accordance with the operating instructions in the *Engine Operator's Manual.*
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.

CAUTION: *Use only specified diesel fuels (see engine section for details)*

CAUTION: *When refueling:-*
- *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).

7. ***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.*

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

AIR HOSE RESTRAINT INSTALLATION

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

When starting or operating the machine in temperatures below or approaching 0°C, 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.

Safety devices such as hose restraints (whipchecks)must be used to prevent hose whipping if a connection fails. Whipchecks are to be constructed of woven stainless steel, galvanized steel wire rope or

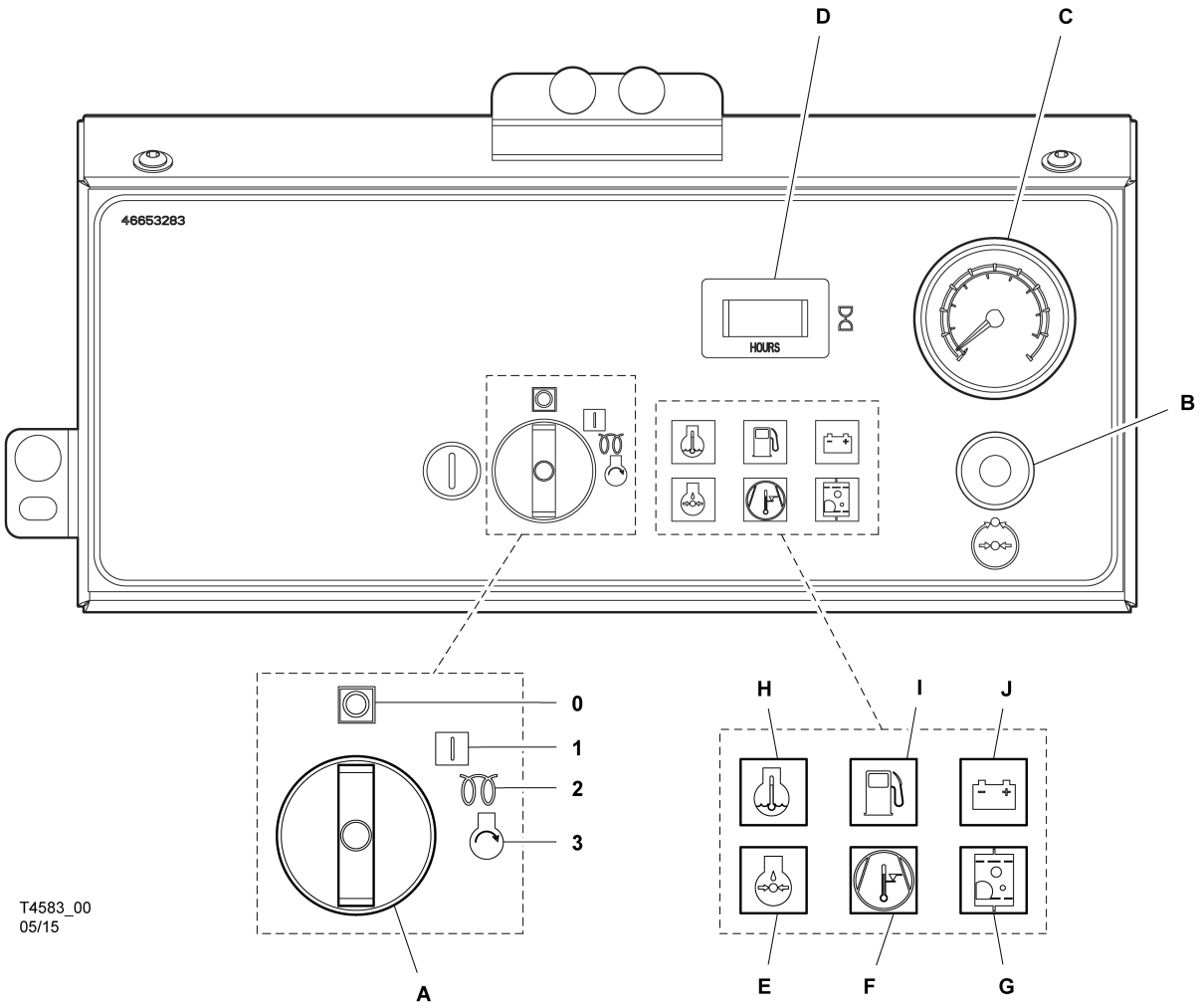
chain with aminimum strength adequate for the supplied pressure and hose diameter. Whipchecks must be fastened to suitable mounting points or shackles.

The mounts and/or shackles are to be of the same or greater strength as the whipchecks. An engineer should be consulted about suitability of whipchecks, mounts, mounting points, shackles and fittings as well as strength rating of materials. Whipchecks must be used at the hose origination, termination and each hose to hose connection.

Hoses can fail in areas other than at connecting points and require daily inspection of the hoses for:

- *Cuts, cracks or kinks*
- *Weakened clamps due to rust and corrosion*
- *Damaged connections*
- *Deformity*
- *Incorrect or incompatible components or fittings*
- *Any visual damage*

Hoses must be selected that are rated for the application as to the maximum pressure and temperature to be encountered as well as compatible with the materials being conveyed inside the hose. Hoses must be compatible with the compressor oil.



KEY

A	Main switch
B	Service air button
C	Air pressure gauge
D	Hourmeter
E	Warning lamp, low engine oil pressure
F	Warning lamp, high airend discharge temperature
G	Warning lamp, dirty IQ filters (IQ filters option)
H	Warning lamp, High engine coolant temperature
I	Warning lamp, low engine fuel level
J	Warning lamp, low battery voltage

STARTING THE MACHINE

WARNING: Under no circumstances should volatile liquids such as Ether be used for starting this machine.

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

- *Turn the key switch to position 2 and hold for max 15 seconds to allow the air inlet heater to reach working temperature.*
- *Turn the key switch to position 3 (engine start position).*
- *Release to position 2 when the engine starts.*
- *Release to position 1 when the alternator charge light is extinguished.*

At temperatures below 0°C or if there is difficulty starting first time:

- *Open the service valve fully, with no hose connected.*
- *Complete starting sequence above.*
- *Close service valve as soon as engine runs freely.*
- *Do not allow machine to run for long periods with service valve open.*
- *Allow the engine to reach operating temperature. Then press button (A) when fitted.*
- *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 service valve open and air is flowing from the valve.

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 all pressure from the system.

If the automatic blowdown valve fails to operate, then pressure must be relieved from the system by means of the service 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.**

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 UNIT* 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. These are:

- *Low engine oil pressure*
- *High airend discharge temperature*
- *High engine coolant temperature*
- *Alternator drive belt failure. (warning message only)*
- *Low engine fuel level.*

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.*

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.*

COMPRESSOR MOUNTING

Portable compressors, which are modified to remove the running gear and mount the compressor directly to trailers, truck beds or frames, etc. may experience failure of the enclosure, frame, and/or other components.

It is necessary to isolate the compressor package from the carrier basewith a flexiblemounting system. Such a system must also prevent detachment of the package from the carrier base in the event the isolators fail.

Contact your 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.

NOTE: The maintenance schedule in this manual describes the service intervals that should be followed for normalapplications of this compressor. This page may be reproduced and used as a checklist by service personnel.

In more severe applications such as sandblasting, quarry drilling, well drilling, and oil and gas drilling, more frequent service intervals will be required to ensure long component life.

Dust and dirt, high humidity, and high temperatures will affect lubricant life and service intervals for components such as inlet air filters, oil separation elements and oil filters.

MAINTENANCE SCHEDULE

	Daily	Weekly	Monthly	6 Monthly. 500 hrs	1 year. 1000 hrs	2000 hrs
Compressor Oil Level	C					
Engine Oil Level	C					
Coolant Level	C					
Gauges/Lamps	C					
Air cleaner service indicators	C					
Fuel Tank	C					
Fuel/Water separator	D					
Fluid Leaks	C					
Radiator Filler Cap	C					
Crankcase Breather Tube	C					
Air Cleaner Dust Ejector Valve		C				
Fan / Alternator / Generator Belts		C				
Battery connections/Electrolyte		C				
Tire Pressure & Surface		C				
Wheel Lug Nuts			C			
Hoses (Oil,Air,Intake...)			C			
Automatic Shutdown System			C			
Air Cleaner System			C			
Coolers & Radiator Exterior			C			
Fastener & Guards			C			
Primary Air Cleaner Elements					R/WI	
Secondary Air Cleaner Elements						R/WI
Fuel/Waterseparator element				R		
Final Fuel Filter				R		
Engine Oil Filter				R		

C = Check and act if required

T = Test

D = Drain

R = Replace

R/WI = Replace or when indicated earlier

C/R = Check and replace if required

G/C = Grease and check

C/A = Check and adjust if required

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

NOTE: 500 and 1000 hour intervals are meant to be repeated at every 500 or 1000 hours. Other intervals only to be performed at hours indicated.

NOTE: All fluid and filter intervals are valid for near perfect conditions only. High ambient temperatures - high dust concentration - high humidity as well as using lower grade oils and fuels will require a decrease in maintenance intervals.
Contact your Doosan Infracore Portable Power dealer for more information or assistance in determining the optimum intervals for your application.

	Daily	Weekly	Monthly	6 Monthly. 500 hrs	1 Year. 1000 hrs	2000 hrs
Engine Oil				R		
Engine Valve lash					C/A	
Engine Valve lapping						C/A
Engine Coolant & Fuel hoses						C/R
Compressor Oil Filter				R		
Compressor Oil				R		
Oil Separator Element					R	
Engine Coolant				C	R	
Wheels(bearings,seals,etc.)				C		
Fan Hub					C	
Cooling Fan Belt Tensioner					C	
Shutdown Switch Settings					T	
Scavenger Orifice & related					C	
Lights(brake,running & turn)	CBT					
Pintle Eye Bolts	CBT					
Brakes	C					
Brake Linkage	C					
Emergency Stop	T					
Fasteners	C					
Running Gear Linkage & Bolts			G/C			
Safety Valve				C		
Minimum Pressure Valve				C		
Pressure System					C	
Pressure Gauge					C	
Pressure Regulator					C	
Separator Tank Exterior					C	
Lubricator (Fill)	C					
Engine Air inlet shutdown valve					C	

C = Check and act if required

T = Test

D = Drain

R = Replace

R/WI = Replace or when indicated earlier

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NOTE: 500 and 1000 hour intervals are meant to be repeated at every 500 or 1000 hours. Other intervals only to be performed at hours indicated.

NOTE: All fluid and filter intervals are valid for near perfect conditions only. High ambient temperatures - high dust concentration - high humidity as well as using lower grade oils and fuels will require a decrease in maintenance intervals.
Contact your Doosan Infracore Portable Power dealer for more information or assistance in determining the optimum intervals for your application.

ROUTINE MAINTENANCE

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

The *SERVICE/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 INFORMATION* section of this manual.

For any specification or specific requirement on service or preventative maintenance for the engine, refer to the *Engine Manufacturer's Manual*.

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 depressurised by opening the discharge valve, whilst keeping clear of any airflow from it.

MINIMUM PRESSURE VALVE - WHEN FITTED

NOTE: Pressure will always remain in the part of the system between the minimum pressure valve and the discharge valve after operation of the auto blowdown valve.

This pressure must be relieved by carefully:

a) Disconnecting any downstream equipment.

b) Opening the discharge valve to atmosphere.

c) (Use hearing protection if necessary).

- the machine cannot be started accidentally or otherwise, by posting warning signs and/or fitting appropriate anti-start devices.
- all residual electrical power sources (mains and battery) are isolated.

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 accidentally or otherwise, by posting warning signs and/or fitting appropriate anti-start devices.

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

Comprises:

- Low engine oil pressure switch
- High airend discharge temperature switch
- High coolant temperature switch
- Alternator/drive belt failure circuit.
- Low engine fuel level switch.

LOW ENGINE OIL PRESSURE SWITCH

At three month intervals, test the engine oil pressure switch circuit as follows:

- Start the machine.

NOTE: Do not press the load button.

- Remove a wire from one terminal of the switch. The machine should shutdown.

At twelve month intervals, test the engine oil pressure switch as follows:-

- Remove the switch from the machine.
- Connect it to an independent low pressure supply (either air or oil).
- The switch should operate at 1,0 bar.
- Refit the switch.

TEMPERATURE SWITCH(ES)

At three month intervals, test the temperature switch circuit(s) as follows:

- Start the machine.

NOTE: Do not press the load button.

- Disconnect each switch in turn. The machine should shutdown.
- Re-connect the switch.

HIGH AIREND DISCHARGE TEMPERATURE SWITCH(ES)

At twelve month intervals, test the high airend discharge temperature switch(es) by removing it from the machine and immersing in a bath of heated oil. The switch should operate at 120°C. Refit the switch.

HIGH COOLANT TEMPERATURE SWITCH

At twelve month intervals, test the coolant temperature switch by removin g it from the machine and immersing in a bath of heated oil. The switch should operate at 105°C. Refit the switch.

ALTERNATOR/DRIVE BELT FAILURE CIRCUIT

At twelve month intervals test the alternator drive belt failure circuit as follows:

- Remove the drive belt from the machine.
- Turn the key switch to position 1, the alternator charge light will illuminate.
- Turn the key switch to position 3 (engine start position).
- The machine will start and alternator charge light/battery light will illuminate.

LOW ENGINE FUEL LEVEL SWITCH

At three month intervals, 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.

At twelve month intervals, test the low engine fuel level switch by removing and operating the float manually.

CAUTION: *Never remove or replace switches when the machine is running.*

SCAVENGE LINE

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

Examine the orifice, check valve and hoses at every service or in the event of oil carryover into the discharge air.

It is good preventative maintenance to 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 UNIT* in the *OPERATING INSTRUCTIONS* section of this manual).

Clean the exterior of the filter housing and remove the spin-on element by turning it in a counter-clockwise direction.

Inspection

Examine the filter element.

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.*

Reassembly

Clean the filter gasket contact area and install the new element by screwing in a clockwise direction until the gasket makes contact with the filter housing. Tighten a further $^{1}/_{2}$ to $^{3}/_{4}$ of a revolution.

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

COMPRESSOR SPIN-ON OIL SEPARATOR FILTER ELEMENT

See maintenance schedule.

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 UNIT* in the *OPERATING INSTRUCTIONS* section of this manual).

Remove the spin-on separator filter element.

Reassembly

Check spin-on filter base for contamination and clean as required

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

CAUTION: *Start the machine (refer to PRIOR TO STARTING and STARTING THE UNIT 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 depressurised.

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.

AIR FILTER ELEMENTS

The air filter should be inspected regularly (refer to the *SERVICE/ MAINTENANCE CHART*) and the element replaced when the restriction indicator shows red or every 6 Months (500 hours), whichever comes first. The dust collector box(es) should be cleaned daily (more frequently in dusty operating conditions) and not allowed to become more than half full.

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.

Inspection

Check for cracks, holes or any other damage to the element by holding it up to a light source, or by passing a lamp inside.

Check the seal at the end of the element and replace if any sign of damage is evident.

Reassembly

Assemble the new element into the filter housing ensuring that the seal seats properly.

Reset the restriction indicator by depressing the rubber diaphragm.

Assemble the dust collector box parts, ensuring that they are correctly positioned.

Before restarting the machine, check that all clamps are tight.

VENTILATION

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

CAUTION: *NEVER clean by blowing air inwards.*

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.

The fan belt(s) should be checked regularly for wear and correct tensioning.

FUEL SYSTEM

The fuel tank should be filled daily or every eight hours. To minimise 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. At six month intervals drain any sediment or condensate that may have accumulated in the tank(s).

FUEL FILTER WATER SEPARATOR

If the fuel filter water separator contains a filter element, it should be replaced at regular intervals (see the *SERVICE/MAINTENANCE CHART*).

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 *SERVICE/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: Always disconnect the battery cables before performing any maintenance or service.

Inspect the safety shutdown system switches and the instrument panel relay contacts for evidence of arcing and pitting. Clean where necessary.

Check the mechanical action of the components.

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 retaining clamp should be kept tight enough to prevent the battery from moving.

PRESSURE SYSTEM

At 500 hour intervals 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.

TYRES/TYRE PRESSURE

See the *GENERAL INFORMATION* 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 TABLE* later in this section.

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 *SERVICE/MAINTENANCE CHART* for frequency) and re-tightened where necessary. Refer to the *TORQUE SETTING TABLE* later in this section.

BRAKES

Check and adjust the brake linkage at 500 miles (850Km) then every 3000 miles (5000Km) or 3 months (whichever is the sooner) to compensate for any stretch of the adjustable cables. Check and adjust the wheel brakes to compensate for wear.

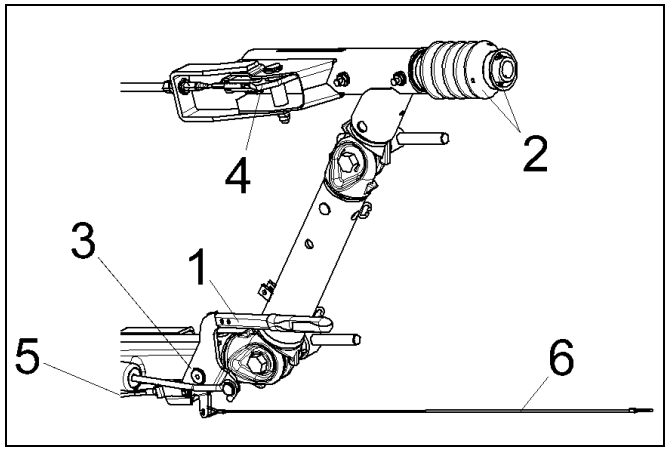
Adjusting the overrun braking system

1. Preparation

Jack up the machine

Disengage the handbrake lever [1].

Fully extend the draw bar [2] on the overrun braking system.



1. Handbrake lever
2. Draw bar and bellows
3. Handbrake lever pivot
4. Transmission lever
5. Brake cable
6. Breakaway Cable

Requirements:

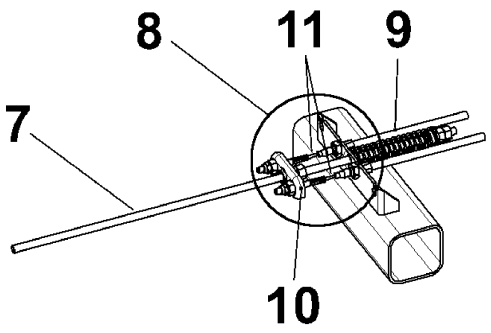
During the adjustment procedure always start with the wheel brakes.

Always rotate the wheel in the direction of forward movement.

Ensure that an M10 safety screw is fitted to the handbrake pivot.

The brake actuators must not be pre-tensioned - if necessary loosen the brake linkage [7] on the brake equalisation assembly [8].

Check that brake actuators and cables [11] operate smoothly.

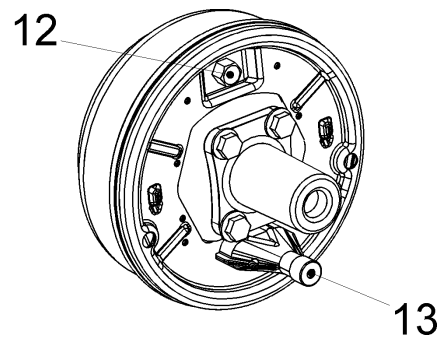


7. Brake linkage
8. Equalisation assembly
9. Compression spring
10. Equaliser plate
11. Cable

CAUTION: *The compression spring [9] must only be lightly pre-tensioned and when operating must never touch the axle tube.*

Never adjust the brakes at the brake linkage [7].

2. Brake Shoe Adjustment



12. Adjusting screw
13. Cable entry

Width across flats of adjusting screw [12]

Brake size	**Key width**
160x35 / 200x50	SW 17
250x40	SW 19
300x60	SW 22

Tighten adjusting screw [12] clockwise until the wheel locks.

Loosen adjusting screw [12] anti-clockwise (approx. ½ turn) until the wheel can be moved freely.

Slight dragging noises that do not impede the free movement of the wheel are permissible.

This adjustment procedure must be carried out as described on both wheel brakes.

When the brake has been adjusted accurately the actuating distance is approximately 5-8mm on the cable [11]

3. Compensator assembly adjustment

Variable Height model

Fit an M10 safety screw to the handbrake pivot.

Disconnect the handbrake cable [5] at one end.

Pre-adjust brake linkage [7] lengthways (a little play is permissible) and re-insert the cable [5], adjusting it to give a small amount of play.

Remove the M10 safety screw from the handbrake pivot.

All Models

Engage the handbrake lever [1] and check that the position of the equaliser plate [10] is at right angles to the pulling direction. If necessary correct the position of the equaliser plate [10] on the cables [11].

The compression spring [9] must only be slightly pre-tensioned and when engaged must not touch the axle tube.

4. Brake linkage adjustment

Adjust the brake linkage [7] lengthways without pre-tension and without play in the transmission lever [4].

Readjustment

Engage the handbrake lever [1] forcefully a number of times to set the brake.

Check the alignment of the equalisation assembly [8], this should be at right angles to the pulling direction

Check the play in the brake linkage [7]

If necessary adjust the brake linkage [7] again without play and without pre-tensioning

There must still be a little play in cable [5] (Variable Height Only)

Check the position of the hand brake lever [1]. The start of resistance should be approximately 10-15mm above the horizontal position.

Check that the wheels move freely when the handbrake is disengaged.

Final test

Check the fastenings on the transmission system (cables, brake equalisation system and linkage).

Check the handbrake cable [5] for a small amount of play and adjust if necessary (Variable height only)

Check the compression spring [9] for pre-tensioning.

Test run

If necessary carry out 2-3 test brake actions.

Test brake action

Check the play in brake linkage [7] and if necessary adjust the length of brake linkage [7] until there is no play.

Apply the handbrake while rolling the machine forward, travel of the handbrake lever up to 2/3 of maximum is allowed.

Re-adjusting the overrun braking system

Re-adjustment of the wheel brakes will compensate for brake lining wear. Follow the procedure described in 2: Brake Shoe Adjustment.

Check the play in the brake linkage [7] and re-adjust if necessary.

Important

Check the brake actuators and cables [11]. The brake actuators must not be pre-tensioned.

Excessive operation of the handbrake lever, which may have been caused by worn brake linings, must not be corrected by re-adjusting (shortening) the brake linkage [7]

Re-adjustment

The handbrake lever [1] should be engaged forcefully several times to set the braking system.

Check the setting of the brake equalisation assembly [8], which should be at right angles to the pulling direction.

Check the play in the brake linkage [7] again, ensuring that there is no play in the brake linkage and that it is adjusted without pre-tension

Check the position of the hand brake lever [1], cable [5] (with little play) and the compression spring [9] (only slight pre-tension). The start of resistance of the handbrake lever should be approximately 10-15mm above the horizontal position.

Final test

Check the fastenings on the transmission system (cables, brake equalisation system and linkage)

Apply the handbrake while rolling the machine forward, travel of the handbrake lever up to 2/3 of maximum is allowed.

Check the handbrake cable [5] for a small amount of play and adjust if necessary (Variable height only)

Check the compression spring [9] for slight pre-tensioning.

CAUTION: *Check the wheel nut torque 20 miles (30 kilometres) after refitting the wheels (Refer to the TORQUE SETTING TABLE later in this section).*
Periodically check the drawbar and axle to frame bolts for correct torque. Should any of the threaded frame inserts appear damaged then replace immediately with the right insert.

RUNNING GEAR WHEEL BEARINGS

Wheel bearings should be packed with grease every 6 months. The type of grease used should conform to specification *MIL-G-10924*.

LUBRICATION

The engine is initially supplied with engine oil sufficient for a nominal period of operation (for more information, consult the Engine section of this manual).

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 should be changed at the engine manufacturer's recommended intervals. Refer to the Engine section of this manual.

ENGINE LUBRICATING OIL SPECIFICATION

Refer to the Engine section of this manual.

ENGINE OIL FILTER ELEMENT

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

COMPRESSOR LUBRICATING OIL

Refer to the *SERVICE/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 UNIT* 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.*

NOTE: Always specify PRO-TEC oil for use at all ambient temperatures above -23°C.

COMPRESSOR OIL FILTER ELEMENT

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

LONG TERM STORAGE RECOMMENDATIONS (6 months or more)

Spare Airends

- *Long--term storage of airends should include filling the airend with the standard compressor fluid, PRO--TEC, XHP605 or XHP405. Upon installation of the airend, drain the storage oil from the airend and proceedwith the installation, assuring fresh oil is poured into the intake prior to start up.*

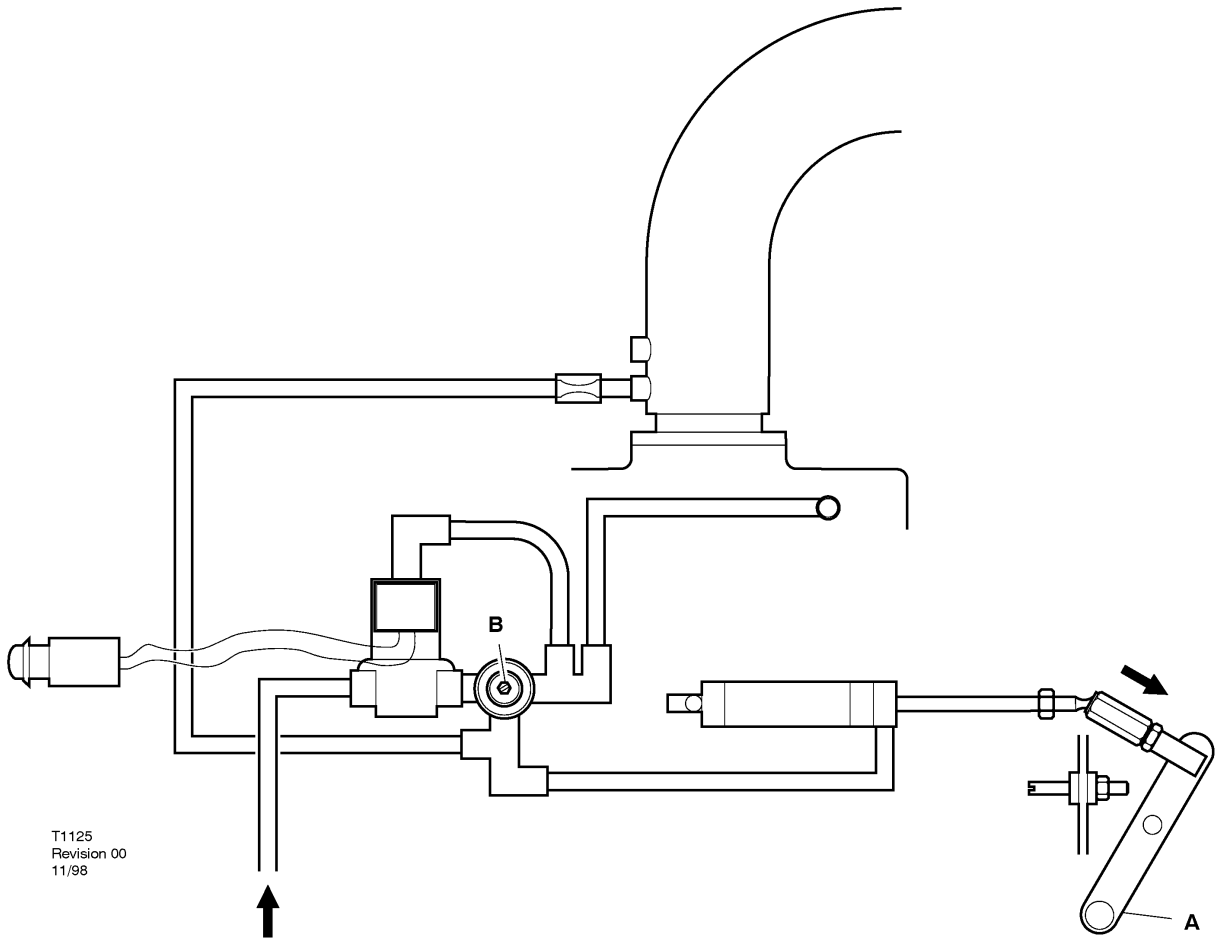
Portable Compressors

- *Airend -- Remove the intake connection and pour the airend intake full with Doosan compressor fluid PRO--TEC, XHP605 or XHP405. Reconnect the intake connection.*
- *Engine cooling system -- Treat with rust inhibitor and drain. Check with engine dealer for further recommendations.*
- *Compressor Oil Filter/s-- fill with Doosan compressor fluid PRO--TEC, XHP605 or XHP405.*
- *Seal all opening with waterproof tape.*
- *Place a desiccant in the exhaust pipes, engine and compressor air intake pipes.*
- *Loosen tension on belts, fan, airend, etc.*
- *Block axles so tyres are off ground and do not support any weight.*
- *Disconnect battery cables.*
- *Drain fuel system.*

SHORT TERM STORAGE

Machines that stand idle for extended periods of timegreater than 30 days:

- *Start and operate the machine every 30 days. Operate long enough to allow the engine and compressor to reach operating temperature.*
- *Open and close the service valve to exercise machine fromfull load to idle RPM.*
- *Drain fuel tank to remove any water.*
- *Drain water from fuel water separator.*



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 knob

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 7 bar without the throttle arm moving from the full speed position. If the throttle arm moves away from the full speed position before 7 bar is attained, then 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 7,2 bar.

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

CAUTION: *Never allow the idle pressure to exeed 8,6bar on the pressure gauge, otherwise the safety valve will operate.*

TORQUE VALUES

	ft lbf	Nm
Airend to engine	29-35	39-47
Air filter to bracket	16-20	22-27
Autella clamp to exhaust	9-11	12-15
Baffle to frame	9-11	12-15
Blowdown solenoid valve	21-26	28-35
Discharge manifold to frame	29-35	39-47
Drive pins to engine flywheel	57-69	77-93
Drop Leg	53-63	72-85
Engine/airend to chassis	54-58	73-78
Euro-Loc adaptor to separator tank	58-67	78-91
Exhaust flange to manifold	17-21	23-28
Fan guard	9-11	12-15
Fan to hub	12-15	16-20
Lifting bail bracket to engine	29-35	39-47
Oil pipe (-12jic)	71-88	96-119
Radiator/Cooler to baffle	9-11	12-15
Running gear front to chassis	63-69	82-93
Running gear rear to chassis	63-69	82-93
Running gear drawbar to axle	29-35	39-47
Separator tank cover	40-50	54-68
Separator tank to frame	18-22	24-30
Service pipe (-20jic)	106-133	143-180
Sight glass	40-50	54-68
Wheel nuts	62-70	85-95

COMPRESSOR LUBRICATION

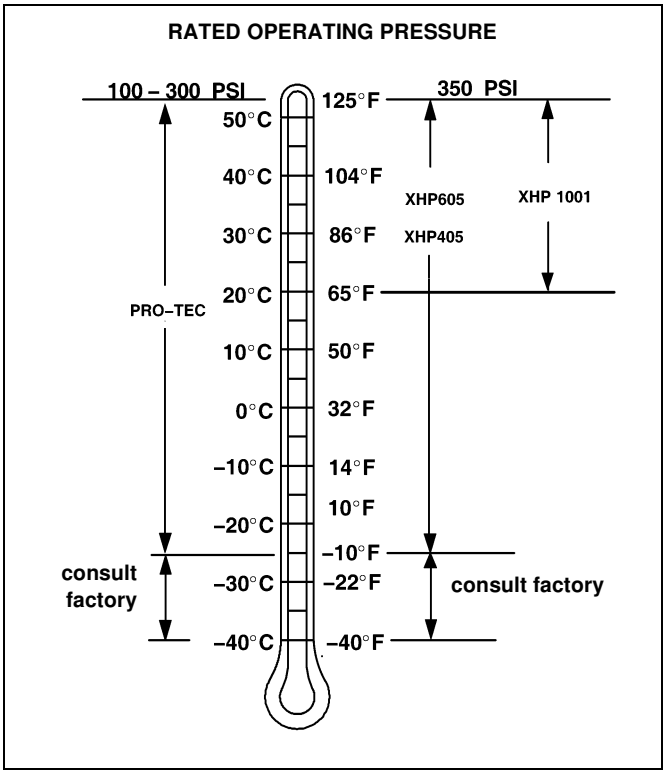
Portable Compressor Fluid Chart

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.

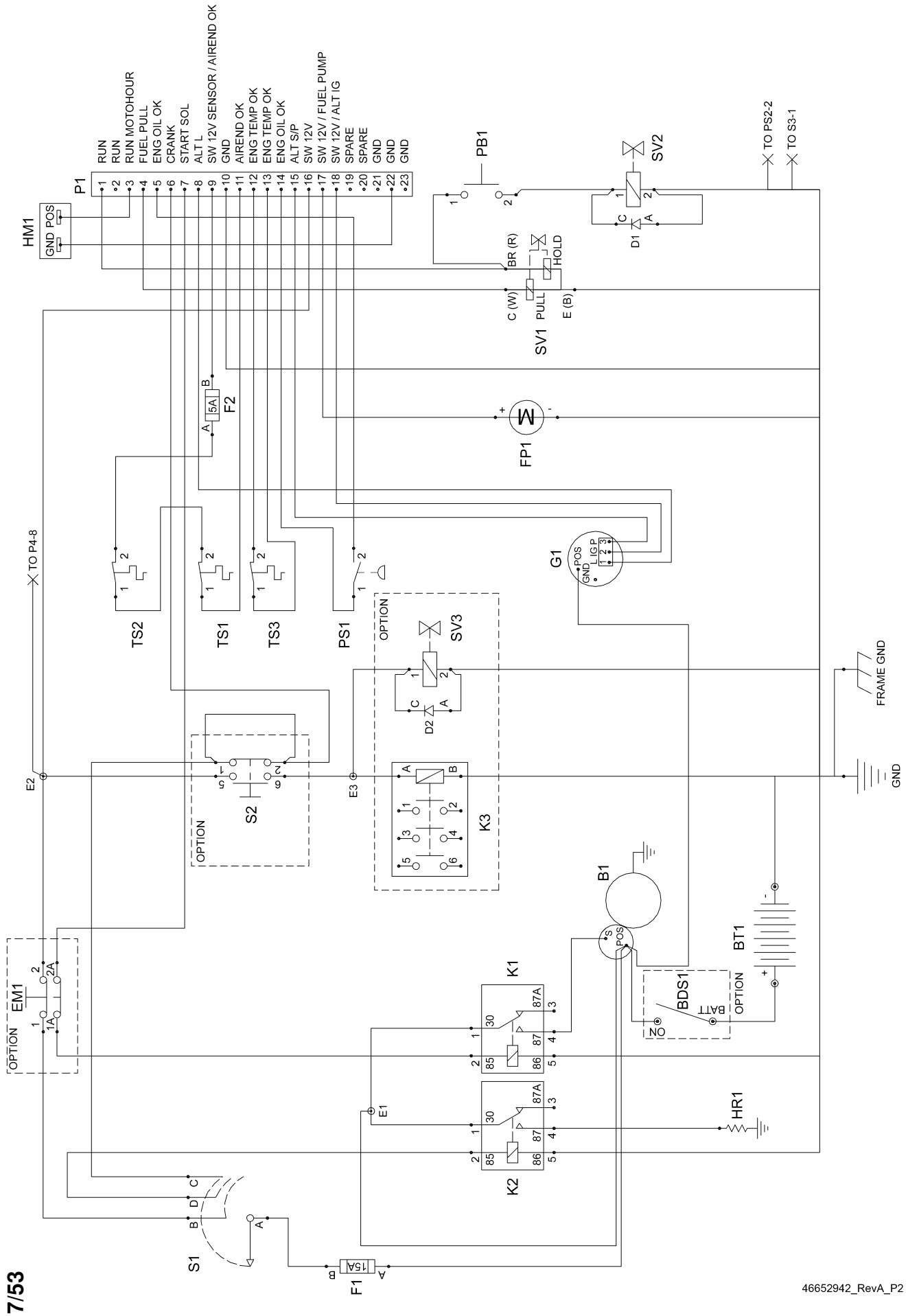
Compressor oil carryover (oil consumption) may be greater with the use of alternative fluids.

Design Operating Pressure	Ambient Temperature	Specification
100 psi to 300 psi (7 bar to 21 bar)	-10°F to 125°F (-23°C to 52°C)	Preferred: **PRO-TEC** Alternate: ISO Viscosity Grade 46 with rust and oxidisation inhibitors, designed for air compressor service.
350 psi (24 bar)	-10°F to 125°F (-23°C to 52°C)	Preferred: **XHP 605** Alternate: **XHP 405** ISO Viscosity Grade 68 Group 3 or 5 with rust and oxidisation inhibitors, designed for air compressor service.
	65°F to 125°F (18°C to 52°C)	Preferred: **XHP 605** **XHP 1001**



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

Doosan Preferred Fluids	19.0 Litre	208.2 Litre	836 Litre
PRO-TEC	89292973	89292981	22082598
XHP 605	22252076	22252050	22252068
XHP 1001	35612738	35300516	-
XHP 405	22252126	22252100	22252118



46652942_RevA_P2

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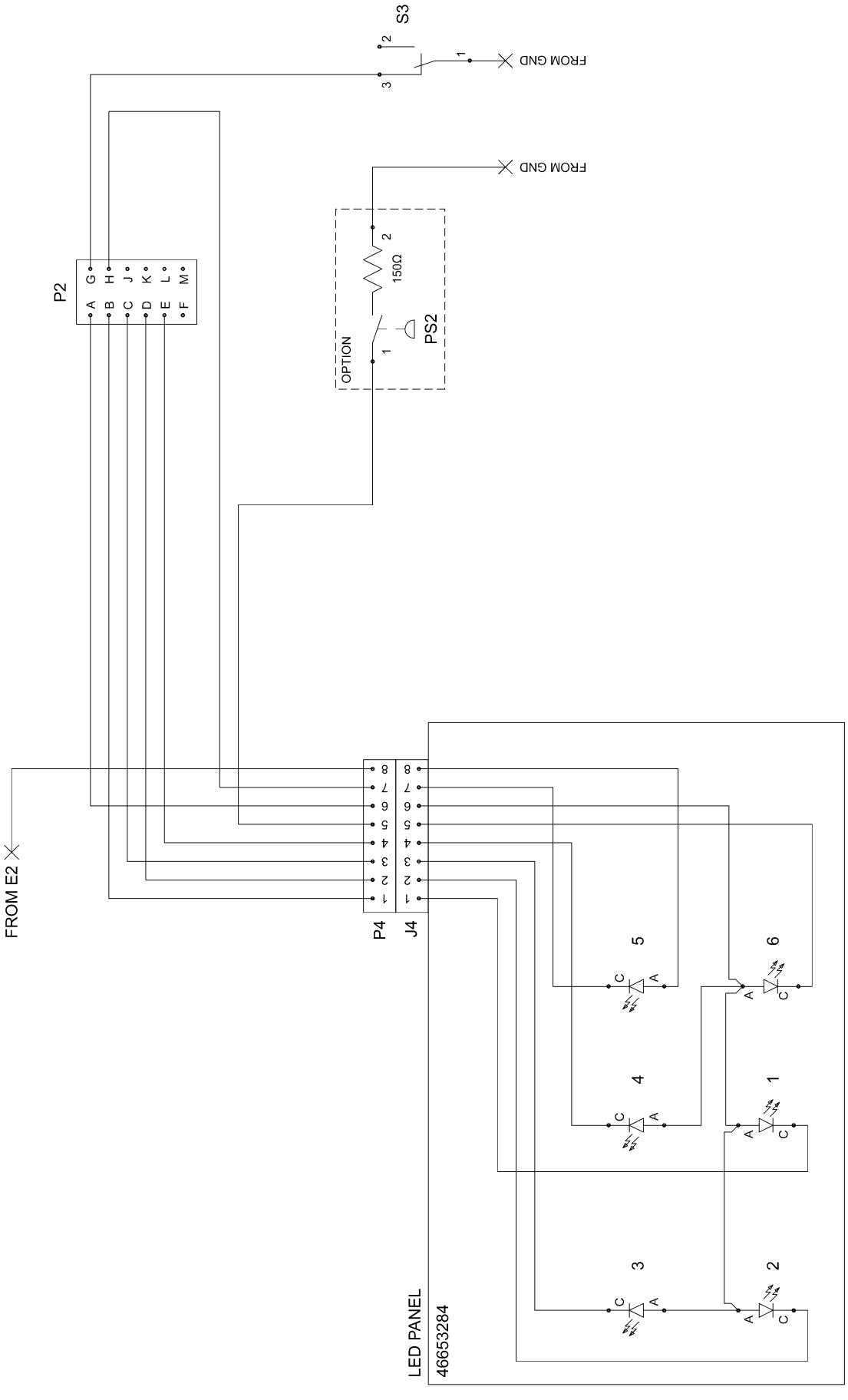
KEY

BDS1	Battery disconnect switch (Option)
BT1	Battery
B1	Starter
EM1	Emergency stop (Option)
FP1	Fuel pump
F1	Fuse (15A)
F2	Fuse (5A)
G1	Alternator
H1	Hourmeter
K1	Crank relay
K2	Engine heater relay
K3	Contactor (Option)
PB1	Warm up button
PS1	Oil pressure switch
P1	Mini controller
SV1	Fuel solenoid
SV2	Warm up solenoid
SV3	Generator speed solenoid (Option)
S1	Keyswitch
S2	Generator switch (Option)
TS1	Airend temperature switch
TS2	Airend temperature switch
TS3	Water temperature switch


S3
FROM GND
FROM GND
P2
OPTION
150Ω
PS2
FROM E2
P4
J4
LED PANEL
46653284
46652942_RevA_P3

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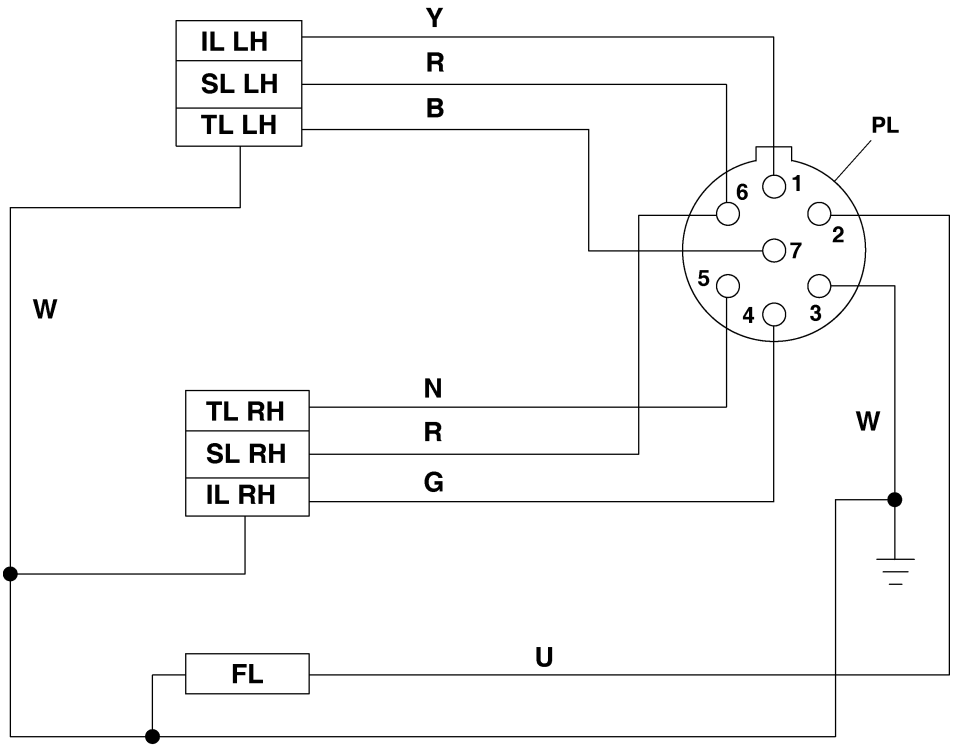
KEY

PS2	IQ restriction switch
P2	Mini controller
S3	Low fuel switch
1	Airend temperature
2	Engine oil pressure
3	Engine temperature
4	Low fuel
5	No charge
6	IQ filter restriction

SCHEMATIC DIAGRAM FOR EUROPEAN CE LIGHTING SYSTEM - 7 PINS



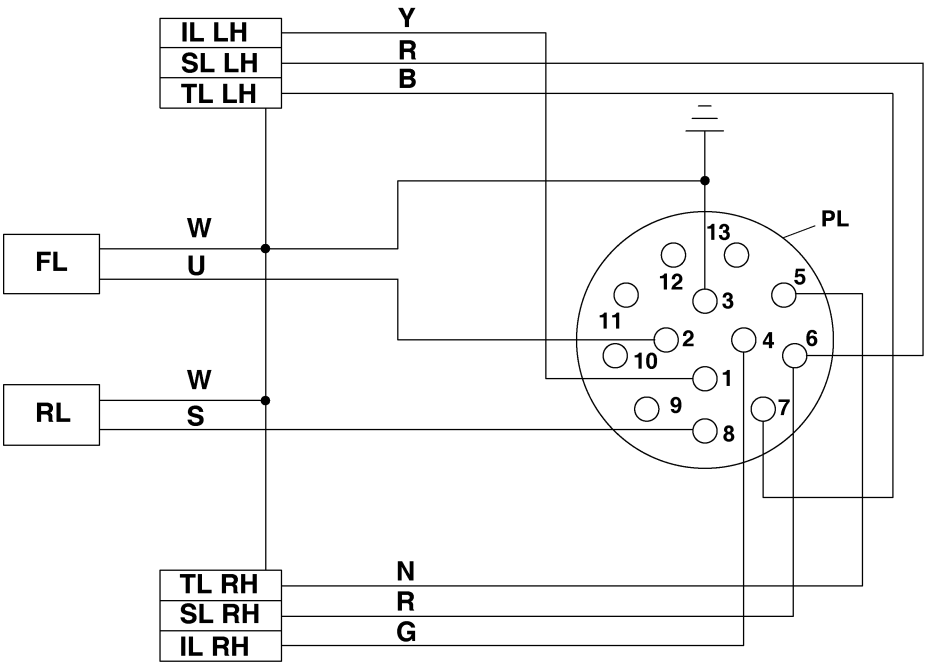
T2404
Revision 00
09/08

KEY

IL LH	Indicator light - left hand
IL RH	Indicator light - right hand
FL	Fog light
SL LH	Stop light - left hand
SL RH	Stop light - right hand
TL LH	Tail light - left hand
TL RH	Tail light - right hand
PL	Plug

B	Black
G	Green
K	Pink
N	Brown
O	Orange
P	Purple
R	Red
S	Grey
U	Blue
W	White
Y	Yellow

SCHEMATIC DIAGRAM FOR EUROPEAN CE LIGHTING SYSTEM - 13 PINS REVERSE LIGHT, STEEL CANOPY OPTION

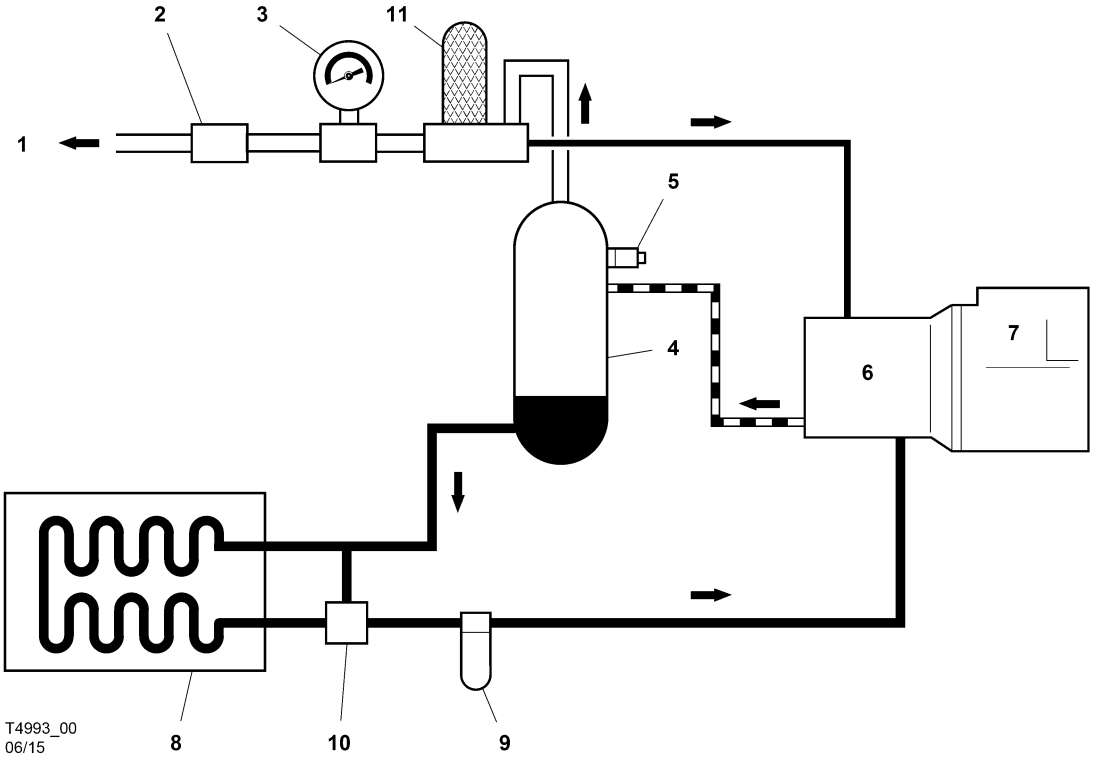


T2405
Revision 00
09/08

KEY

IL LH	Indicator light - left hand
IL RH	Indicator light - right hand
FL	Fog light
RL	Reverse light
SL LH	Stop light - left hand
SL RH	Stop light - right hand
TL LH	Tail light - left hand
TL RH	Tail light - right hand
PL	Plug

B	Black
G	Green
K	Pink
N	Brown
O	Orange
P	Purple
R	Red
S	Grey
U	Blue
W	White
Y	Yellow



KEY

1	Air discharge
2	Sonic orifice (restricts flow)
3	Pressure gauge
4	Separator tank
5	Safety valve
6	Compressor
7	Engine
8	Oil cooler
9	Oil filter
10	Thermostatic valve (Where fitted)
11	Separator filter assembly (spin-on)

Air
Oil
Air/oil

FAULT	CAUSE	REMEDY
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.
	Engine control not in 'run' position.	Check the speed cylinder and stop position.
Engine starts but stalls when the switch returns to position *I*.	*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.
Engine starts but will not run 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 relay in the holder and replace if necessary.
Engine Overheats.	*Reduced cooling air from fan.*	Check the fan and the drive belts. Check for any obstruction inside the cowl.
Engine speed too high.	*Incorrect throttle arm setting.*	Check the engine speed setting.
	Faulty regulator valve.	Check the regulation system.
Engine speed too low.	*Incorrect 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.
	Faulty regulator valve.	Check the regulation system.
	Premature unloading.	Check the regulation and the operation of the air cylinder.
Excessive vibration.	*Engine speed too low.*	See "*Engine speed too low*"
Refer also to the *engine section of this manual.*		
Air discharge capacity too low.	*Engine speed too low.*	Check the air cylinder and air filter(s).
	Blocked air cleaner.	Check the restriction indicators and replace the element(s) if necessary.
	High pressure air escaping.	Check for leaks.
	Incorrectly set regulation system.	Reset the regulation system. Refer to *SPEED AND PRESSURE REGULATION ADJUSTMENT* in the *MAINTENANCE* section of this manual.

38 FAULT FINDING

FAULT	CAUSE	REMEDY
Compressor overheats.	*Low oil level.*	Top up the oil level and check for leaks.
	Dirty or blocked oil cooler.	Clean the oil cooler fins.
	Incorrect grade of oil.	Use Doosan recommended oil.
	Recirculation of cooling air.	Move the machine to avoid recirculation.
	Faulty temperature switch.	Check the operation of the switch and replace if necessary.
	Reduced cooling air from fan.	Check the fan and the drive belts. Check for any obstruction inside the fan cowl.
Excessive oil present in the discharge air.	*Blocked scavenge line.*	Check the scavenge line, drop tube and orifice. Clean and replace.
	Perforated separator element.	Replace the separator element.
	Pressure in the system is too low.	Check the minimum pressure valve or sonic orifice.
Safety valve operates.	*Operating pressure too high.*	Check the setting and operation of the regulator valve piping.
	Incorrect setting of the regulator.	Adjust the regulator.
	Faulty regulator.	Replace the regulator.
	Inlet valve set incorrectly.	Refer to *SPEED AND PRESSURE REGULATION ADJUSTMENT* in the *MAINTENANCE* section of this manual.
	Loose pipe/hose connections.	Check all pipe/hose connections.
	Faulty safety valve.	Check the relieving pressure. Replace the safety valve if faulty. **DO NOT ATTEMPT A REPAIR.**
Oil is forced back into the air filter.	*Incorrect stopping procedure used*	Always employ the correct stopping procedure. Close the discharge valve and allow the machine to run on idle before stopping.
	Faulty inlet valve.	Check for free operation of the inlet valve(s).
	Faulty discharge check valve.	Remove the valve from the discharge pipe and check the operation.
Machine goes to full pressure when started.	*Inlet valve set incorrectly.*	Refer to *SPEED AND PRESSURE REGULATION ADJUSTMENT* in the *MAINTENANCE* section of this manual.
Machine fails to load when the load button is pressed.	*Faulty load solenoid.*	Replace the solenoid. Check the electrical circuit by feeling for movement whilst depressing the load button.

AFTERCOOLER AND WATER SEPARATOR

OPERATING INSTRUCTIONS

The compressed air exits the separator tank through the top cover piping, and will then travel into the aftercooler inlet side.

The aftercooler is cooled by the incoming compressor package air.

The compressed air and condensate (water with a small amount of compressor lubricant) exits the aftercooler and enters the moisture separator, where most of the condensate is removed.

At the bottom of the moisture separator a strainer and constant-bleed orifice is fitted, which are sized to allow the maximum flow of condensate while minimising compressed air loss.

A second condensate drain valve is mounted on the aftercooler body, this valve will open on machine shutdown thereby allowing any remaining condensate in the aftercooler to drain. This is to prevent cooler damage at freezing temperatures.

These drains are plugged through the compressor frame and will expel condensation to atmosphere. Should site contamination by this condensate be prohibited, the user can connect an additional section of drain hose and route into an allowed drain point.

MAINTENANCE

Daily Maintenance:

Verify, during full-load (maximum compressed air delivery) that condensate can be seen to drain from the water separator drain hose.

Weekly Maintenance:

- Verify that the piping from the orifice purge points are not clogged.
- Clean the inside of the water separator housing.

Water separator maintenance:

- With engine stopped, ensure pressure is relieved from air system.
- Remove any hose connected to the water separator housing. Inspect fittings and hoses for any blockage. Clean if necessary.
- Remove and clean the water separator float.

PRIMARY AND SECONDARY FILTER MAINTENANCE (where used)

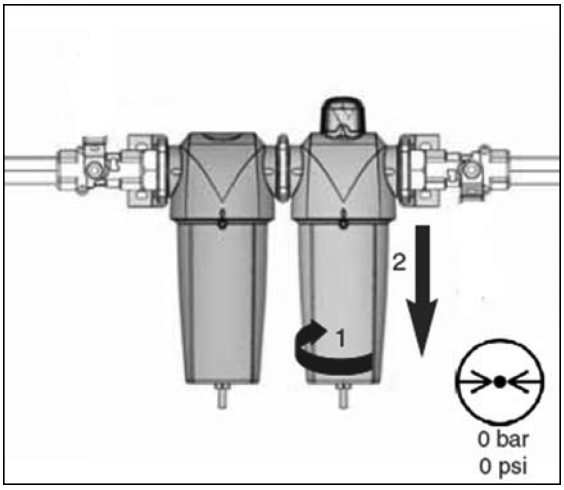


FIGURE 1.

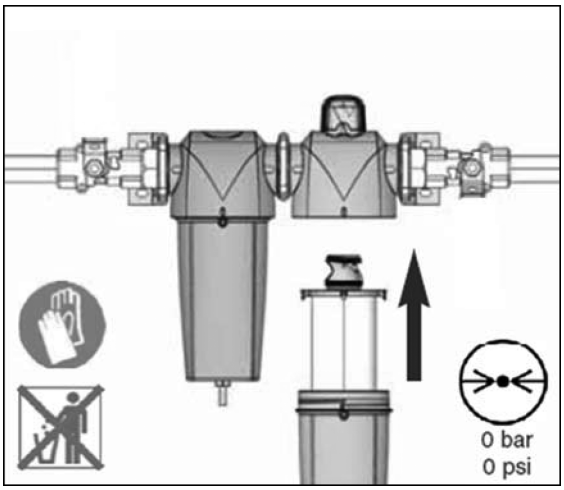


FIGURE 2.

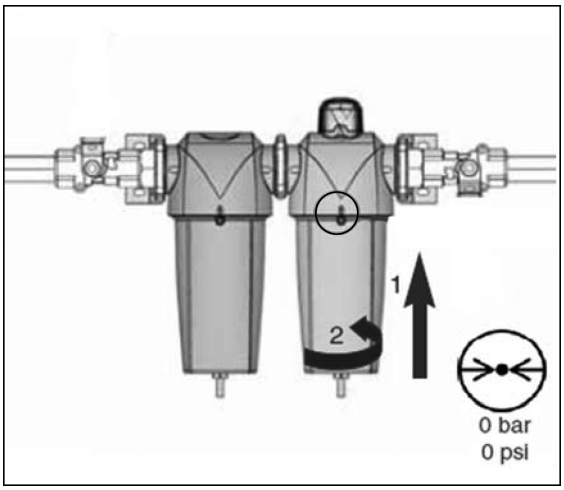


FIGURE 3.

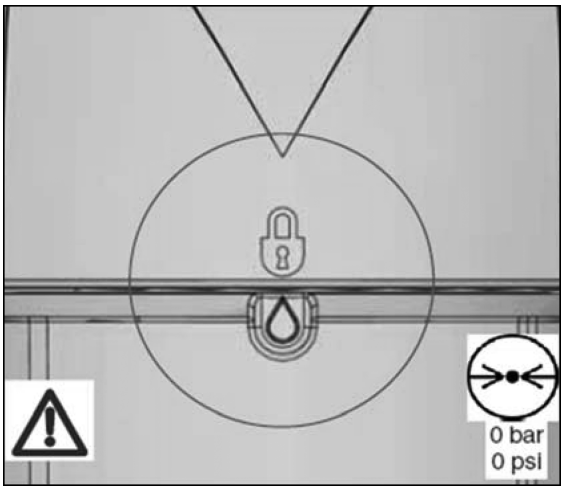


FIGURE 4.

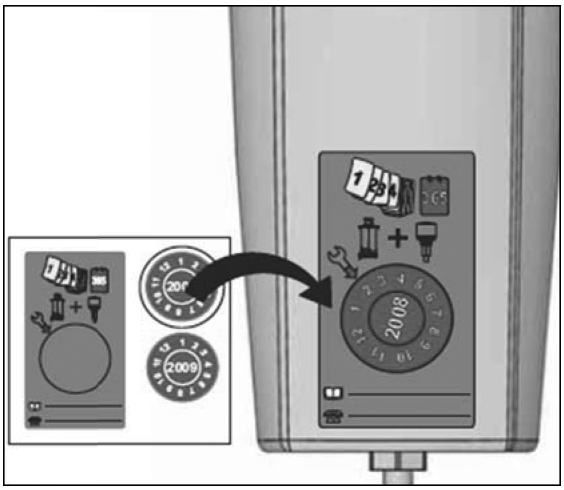


FIGURE 5.

WATER SEPARATOR MAINTENANCE

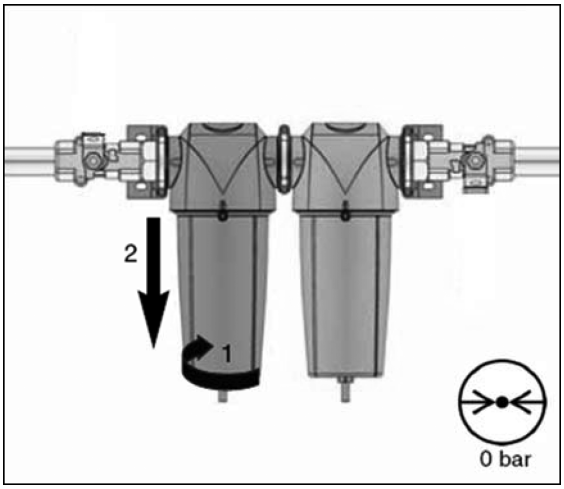


FIGURE 1.

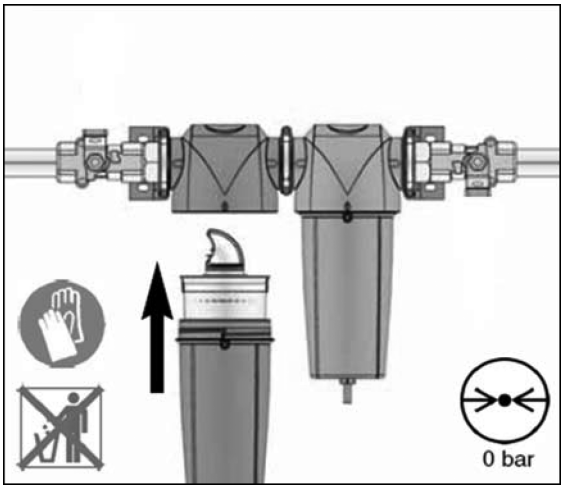


FIGURE 2.

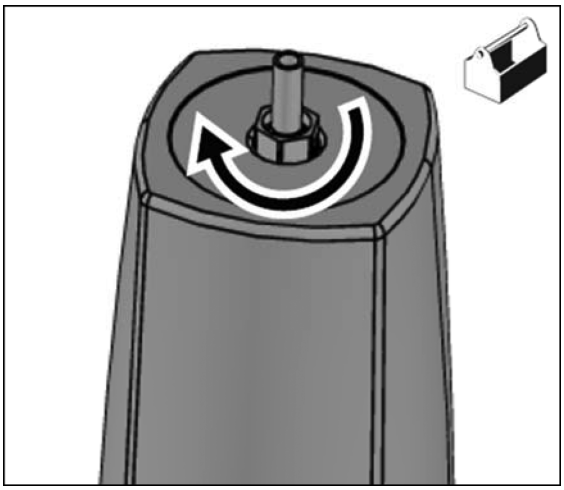


FIGURE 3.

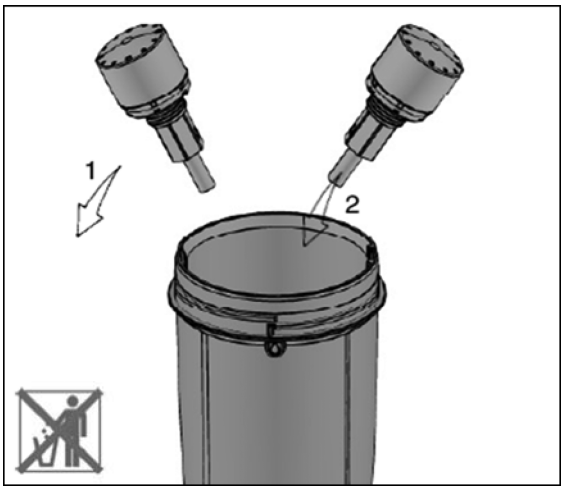


FIGURE 4.

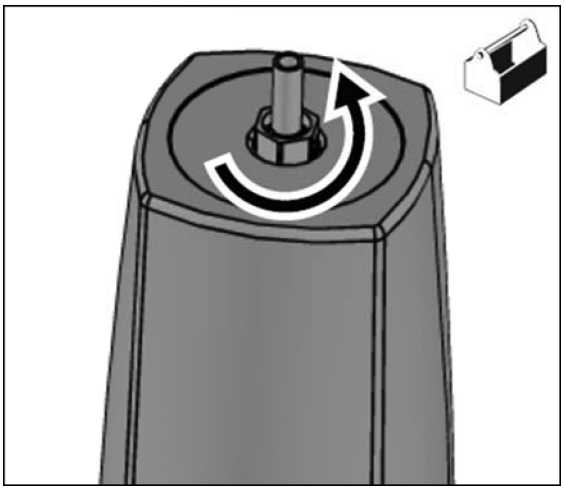


FIGURE 5.

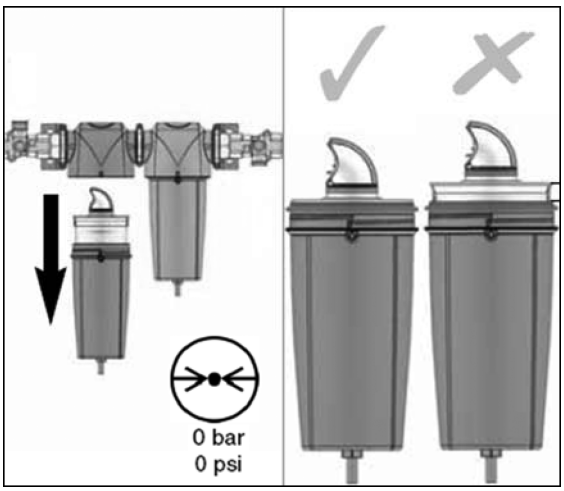


FIGURE 6.

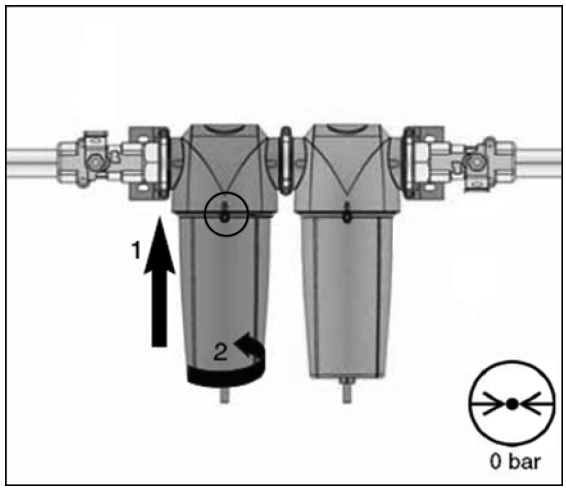


FIGURE 7.

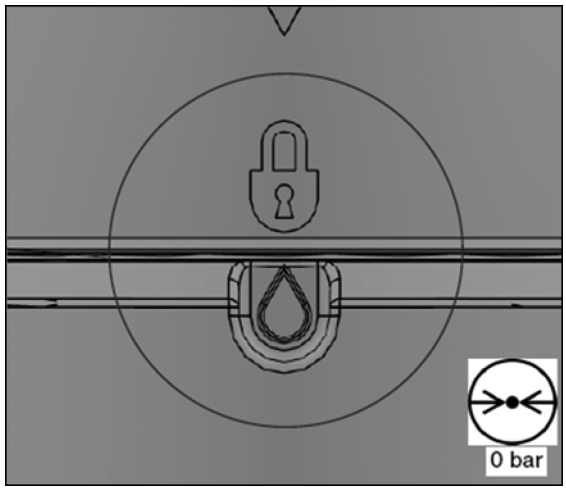


FIGURE 8.

SAFETY

CAUTION: *The compressor regulation system is adjusted to maintain regulated pressure at the separator tank. DO NOT adjust regulation to provide full regulation pressure at the service valve when the IQ System is enabled. This will result in operation at excessive horsepower levels, causing overheating, reduced engine life, and reduced airend life.*

CAUTION: *Excessively restricted filter elements may cause an increase in the amount of aerosol water and oil carryover, which could result in damage to downstream equipment. Normal service intervals should not be exceeded.*

CAUTION: *Blockage of the condensate will result in flooding of the vessels. If flooding occurs, excessive condensate may enter the air stream and could result in damage to downstream equipment.*

NOTICE: Do not operate at temperatures less that 2°C (35°F).

BUNDED BASE

DESCRIPTION

This machine can be fitted with bund equipment to contain leakages and spillages, which occur within the machine enclosure.

The bund will contain all fluids normally installed in the machine, plus an additional 10%.

When fitted with bund, the machine must only be operated when level. Drains for engine coolant, engine oil and compressor oil, fuel tank and bunded base drains are located at the left rear side of the machine. Bunded based to be drained daily

DRAINING OF CONTAMINATED FLUIDS

Contaminated fluid must be removed by authorized personnel only. Captured fluids can be drained from the bund by removing the plug or uncoupling the flexible pipe secured at the left side of the machine. The plug must be re-sealed after draining. The flexible pipe must be re-secured after draining.

DRAINING OF MACHINE FLUIDS

During maintenance operations drain machine fluids using the drain ports indicated.

WARNING: Major leakages or spillages must be drained before the machine is towed.

GENERATOR

SAFETY

Refer to the SAFETY SECTION in this manual.

GENERAL INFORMATION

Rated output	4,8 kW @ 0,8 Power factor (PF) lagging
Rated voltage	110V 1ph or 230V 1ph or 230V 3ph or 400V 3ph + 230V 1ph @ 3000 revs min-1
Voltage regulation	+/- 6%
Maximum continuous output	6 kVA @ 0,8 PF
Rotor type	Brushless (110/230V 1ph)
Rotor type	Rotating armature with sliprings (230V 3ph / 400V 3ph + 230V 1ph)

De-rating factors at 0.8 pf continuous load:

Air in temp 20℃	Continuous
Air in temp 30℃	5,7 KVA @ 0.8 p.f continuous
Air in temp 46℃	4,5 KVA @ 0.8 p.f continuous

De-rating factors for intermittent load:

Air in temp 20-35℃,55 mins/hr @ 0.8, 5 mins off load
Air in temp 35-40℃,50 mins/hr @ 0.8, 10 mins off load
Air in temp 40℃ + ,45 mins/hr @ 0.8, 15 mins off load

Socket outlets:

110V 1ph & 230V 1ph	*1 x 32 amperes*
	2 x 16 amperes
230V 3ph	*1 x 16 amperes*
400V 3ph + 230V 1ph	*400V 3ph = 1 x 16 amperes*
	230V 1ph = 2 x 16 amperes

Earth leakage protection is provided by a single residual current device. Miniature circuit breakers (MCB) are fitted to provide both overcurrent and short circuit protection for the generator.

Each socket outlet is protected by a spring loaded weather–proof cover.

OPERATING INSTRUCTIONS

A mode selector switch is provided to switch the machine between compressor and generator mode.

CAUTION: *Do not start or stop the machine with the compressor/ generator mode switch in the* ***Generator*** *position.*

When the switch is in the *Generator* position the normally-open solenoid valve switches to the closed position and air in the line to the engine speed control cylinder vents to the atmosphere via the solenoid exhaust port. This causes the cylinder to move to its maximum speed position. The engine will now maintain maximum speed as the air line from the pressure regulator valve to the solenoid valve is now closed.

When the switch is returned to the *Compressor* position, the solenoid valve is de-energised thus returning it to its normally open position. The engine speed cylinder would then respond via the pressure regulator valve according to the air demand.

When connecting electrical equipment to any of the socket outlets, it is recommended that the appropriate MCB is in the *OFF* position before making the connection, switching the MCB to the *ON* position immediately prior to using the equipment.

PRIOR TO STARTING (GENERATOR)

If the generator should become exposed or saturated with moisture/ water deposits, it must be safely dried off before attempting to make any part or conductor electrically live. This should be done by wiping away excess water, then running the engine with no electrical loads connected, until the generator is completely dry.

Ensure all persons concerned are suitably competent with electrical installations.

Ensure that there is a safe working procedure which has been issued by supervisory personnel, and that it is understood by all persons concerned with the operation of the generator.

Ensure that the safety procedure to be applied is based on the appropriate national regulations.

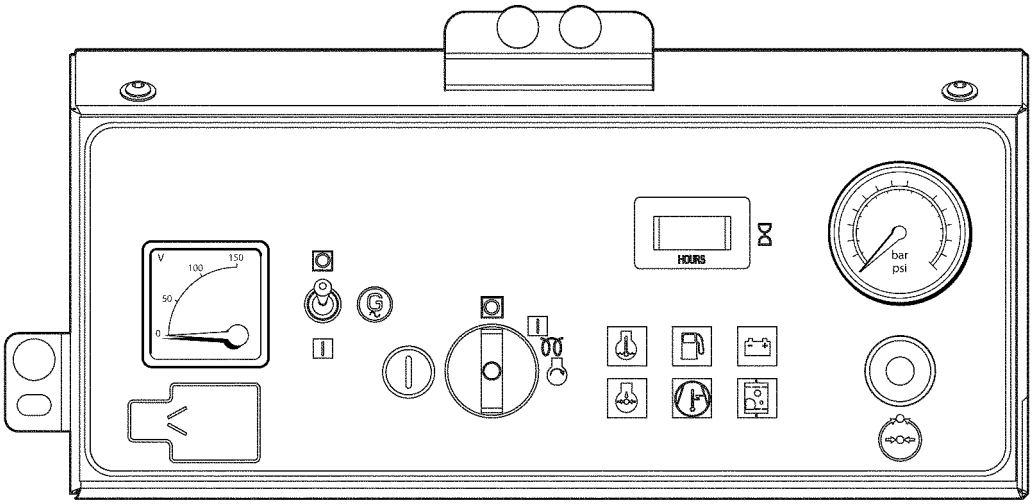
Ensure that the safety procedure is followed at al times.

Ensure that suitable guidance codes are available to indicate safe working practices, and any hazards to avoid.

Before starting the engine and switching in the generator load, ensure that :-

- The system has been inspected and earthed.
- No persons are in a hazardous position.
- Any warnings necessary have been suitably displayed (where applicable).

Ensure compressor / generator mode switch is set to compressor.



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STARTING THE MACHINE

WARNING: Under no circumstances should volatile liquids such as Ether be used for starting this machine.

CAUTION: *Do not start or stop the machine with the compressor/ generator mode switch in the Generator position.*

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

- Turn the key switch to position *1*, the alternator charge light will illuminate.
- Turn the key switch to position *3* (engine start position).
- Release to position *2* when the engine starts.
- Release to position *1* when the alternator charge light is extinguished.

At temperatures below 0°C or if there is difficulty starting first time:

Push and release button 'A'.

- 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 top open and air is flowing from the valve.*

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 all pressure from the system.*

If the automatic blowdown valve fails to operate, then pressure must be relieved from the system by means of the service 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.**

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 UNIT* instructions earlier in this section before re-starting the machine.

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.

MAINTENANCE

General

Ensure all electrical equipment is properly maintained and controlled.

Ensure all earth connections are secure and regularly maintained.

Earth leakage circuit breaker (ELCB)

The earth leakage circuit breaker must be mechanically tested daily by pushing the test button with the machine in its *no load condition*. The ELCB should trip to the *off* (down) position.

The earth leakage circuit breaker should also be tested every 3 months. A proprietary test meter should be used to induce live to earth preset flow at each socket outlet. This current flow will produce the required earth fault check. The test should be conducted in accordance with appropriate national standards.

Instruments and controls

A Voltmeter is provided to indicate the output voltage.

Miniature circuit breakers provide over-current protection. In the event of excess current the appropriate circuit breaker will trip to the *OFF* position.

NOTE: *The current trip rating is quoted at a nominal 40°C ambient temperature.*

An earth leakage circuit breaker provides additional protection in the event of a leakage to earth in excess of 30 milliamperes on the connected appliance or in the connections to the generator.

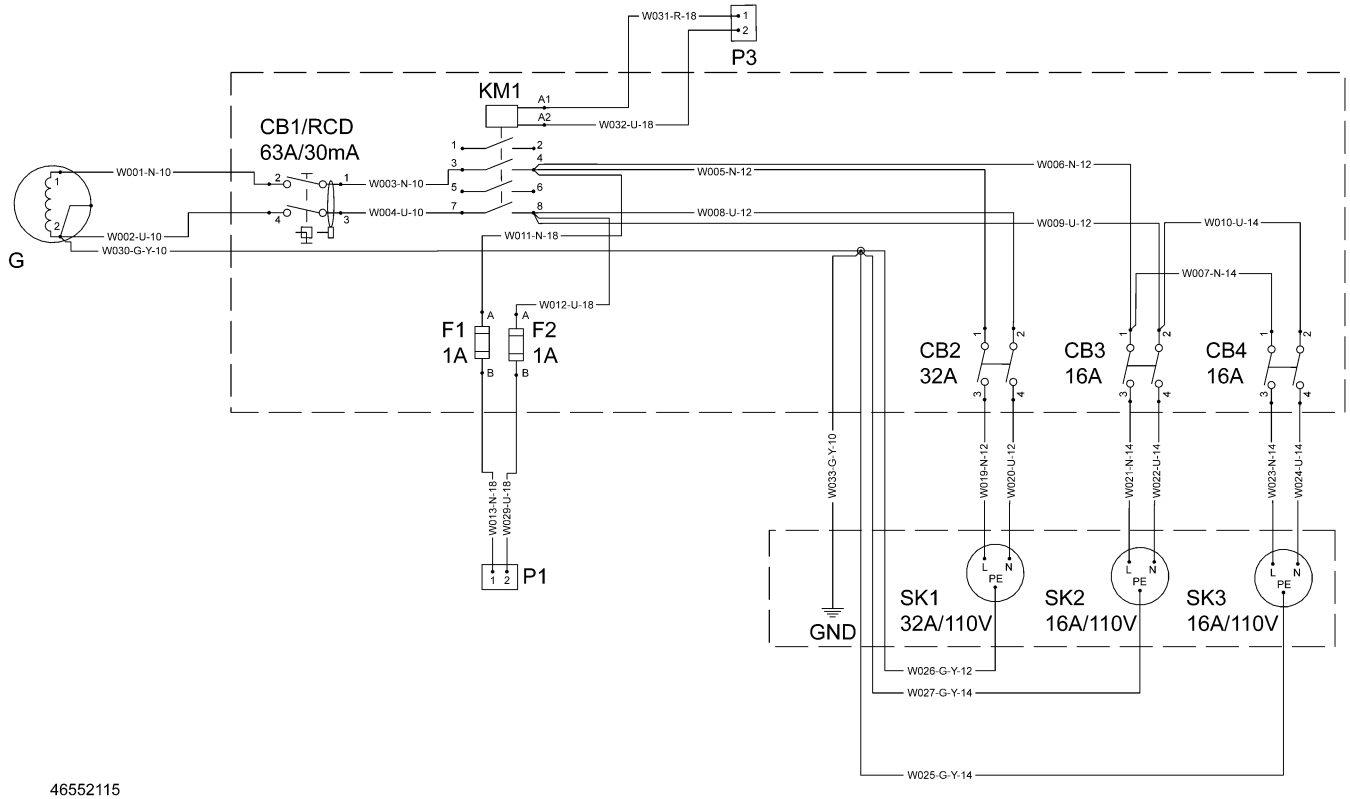
For alternator maintenance refer to Mecc Alte operation and maintenance manual.

GENERATOR FAULT FINDING

FAULT	CAUSE	REMEDY
No output.	*Load plugs not fitted into socket outlets correctly*.	Ensure that the load plugs are fitted correctly into the socket outlets.
No output.	*Loose connection.*	Remove end cover and terminal box lid and check for loose connections. Rectify the fault as necessary.
	Faulty rectifier.	Check the rectifier bridge which is located inside the rear housing.
	Faulty capacitor.	Check the capacitors.
	The No load voltage is low but increases when a load is applied.	Check the capacitors and associated wiring.
	The No load voltage falls when a load is applied.	Check the capacitors and associated wiring.
	Loss of residual magnetic field	Refer to Mecc Alte maintenance manual
No output.	*Output winding(s) damaged.*	Measure the voltage across the winding(s). Replace the generator if damaged.
	Field winding damaged.	Replace the generator.
Generator fails to provide maximum output.	*Engine is not running at full speed.*	Check the engine speed with a tachometer. Consult the company if the engine is found to be running slow (Refer to section 4 *General Information*).
	Drive belt is not tensioned correctly.	Re-tension the drive belt.
	Drive pulley is loose on the drive shaft.	Check the drive pulley and tighten as required.

FAULT	CAUSE	REMEDY
The output voltage collapses when a load is connected.	*Overload condition.*	Check and reset each circuit breaker. If the condition persists then investigate the cause and rectify the fault as necessary. (see also '*Circuit breaker trips*')
	Short circuit.	Check for a short circuit and rectify the fault as necessary.
	Incorrect wiring.	Check the wiring and rectify the fault as necessary.
Circuit breaker trips.	*Overload condition.*	Check and reset each circuit breaker. If the condition persists then investigate the cause and rectify the fault as necessary. (see also '*Circuit breaker trips*')
	Short circuit.	Check for a short circuit and rectify the fault as necessary.
	Fault in appliance.	Check the appliance and rectify the fault as necessary.
A circuit breaker fails to re-set whilst the machine running.	*Circuit breaker latching mechanism faulty.*	Repair or replace as necessary.
Refer to *Engine Manufacturer's manual* and *Mecc Alte manufacturer's manual*		

A.C. Electrical Power Schematic Diagram. 115V 1 - phase. Valid for units with component box located inside the machine, above the generator.



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Revision A
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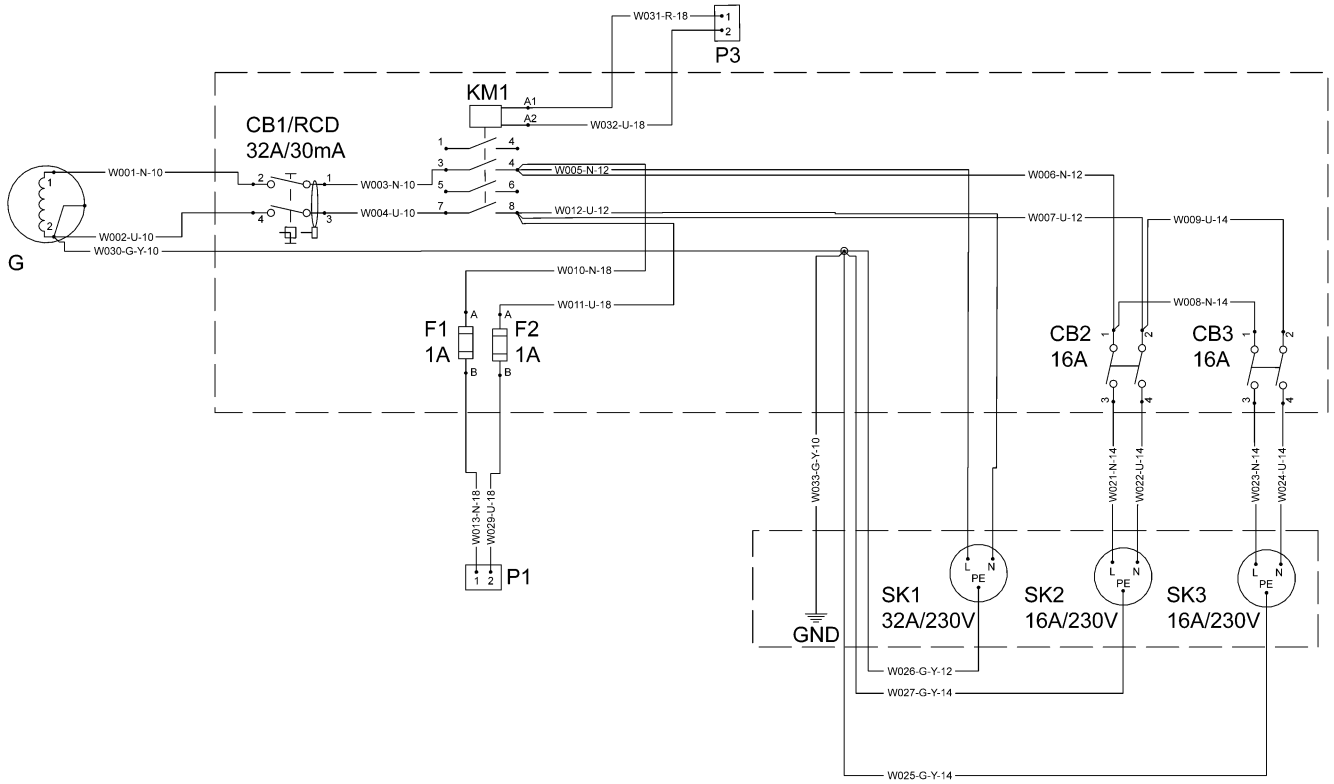
KEY

CB1/ RCD	Circuit breaker 63A
CB2	Circuit breaker 32A
CB3	Circuit breaker 16A
CB4	Circuit breaker 16A
F1	Fuse 1A
F2	Fuse 1A
G	Alternator - 1 phase
GND	Earth stud
KM1	Contactor
P1	Connector - voltmeter
P3	Connector - general enable switch
SK1	Socket outlet 32A/110V
SK2	Socket outlet 16A/110V
SK3	Socket outlet 16A/110V

A.C. Electrical Power Schematic Diagram. 230V 1 - phase. Valid for units with component box located inside the machine, above the generator.

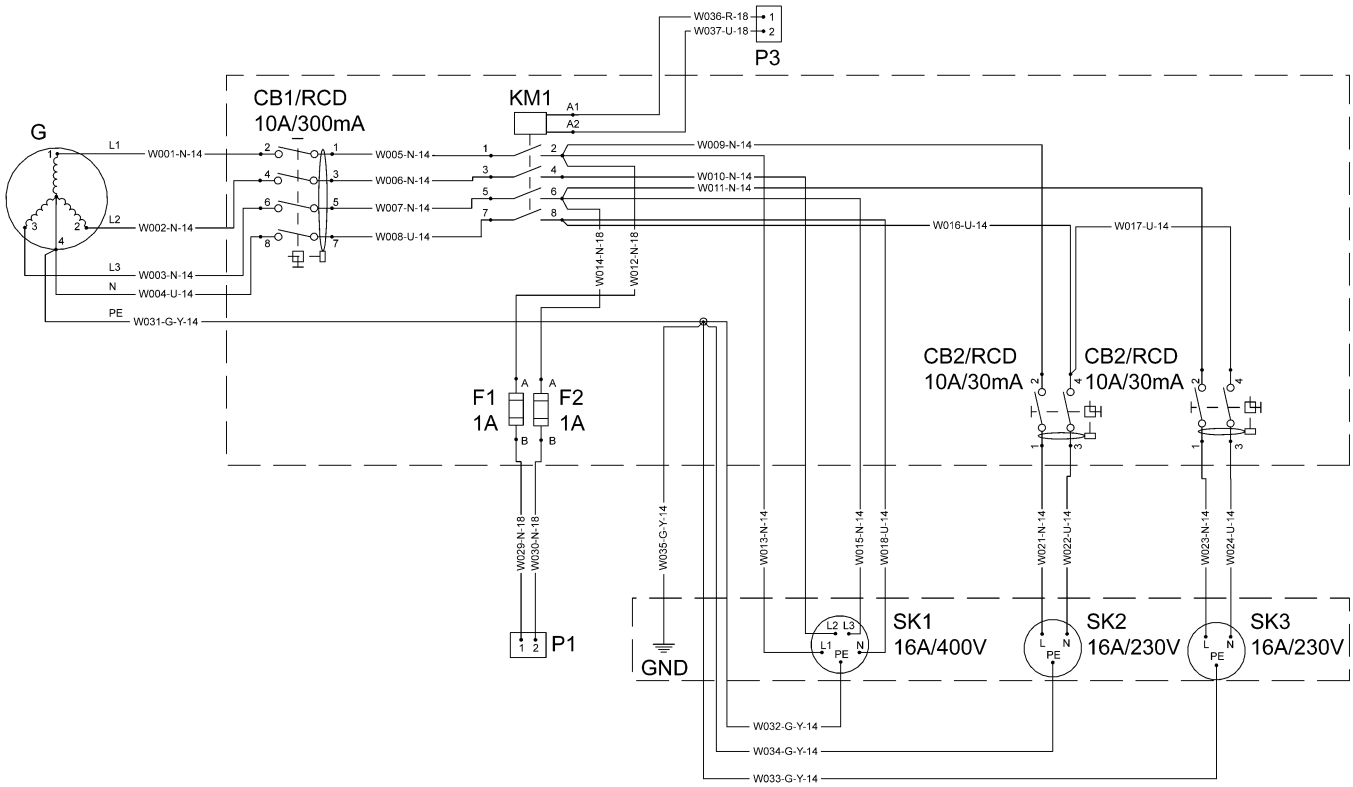


46552117
Revision A
03/10

KEY

CB1/ RCD	Circuit breaker 32A
CB2	Circuit breaker 16A
CB3	Circuit breaker 16A
F1	Fuse 1A
F2	Fuse 2A
G	Alternator - 1 phase
GND	Earth stud
KM1	Contactor
P1	Connector - voltmeter
P3	Connector - generator enable switch
SK1	Socket outlet 32A/230V
SK2	Socket outlet 16A/230V
SK3	Socket outlet 16A/230V

A.C. Electrical Power Schematic Diagram. 400/230V 3 - phase. Valid for units with component box located inside the machine, above the generator.



46552116
Revision A
03/10

KEY

CB1/ RCD	Circuit breaker 10A
CB2	Circuit breaker 10A
CB3	Circuit breaker 10A
F1	Fuse 1A
F2	Fuse 1A
G	Alternator - 3 phase
GND	Earth stud
KM1	Contactor
P1	Connector - voltmeter
P3	Connector - generator enable switch
SK1	Socket outlet 16A/400V
SK2	Socket outlet 16A/230V
SK3	Socket outlet 16A/230V

LUBRICATOR

SAFETY

WARNING: Ensure that the lubricator filler cap is re-tightened correctly after replenishing with oil.

WARNING: Do not replenish the lubricator oil, or service the lubricator without first making sure that the machine is stopped and the system has been completely relieved of all air pressure (Refer to STOPPING THE UNIT in the OPERATING INSTRUCTIONS section of this manual).

CAUTION: *If the nylon tubes to the lubricator are disconnected then ensure that each tube is re-connected in its original location.*

GENERAL INFORMATION

Oil capacity: 2 litres

Oil specification: *Refer to the Tool Manufacturer's Manual.*

OPERATING INSTRUCTIONS

COMMISSIONING

Check the lubricator oil level and fill as necessary.

PRIOR TO STARTING

Check the lubricator oil level and fill as necessary.

MAINTENANCE

Check the lubricator oil level and replenish as necessary.

FAULT FINDING

FAULT	CAUSE	REMEDY
No oil flow.	*Incorrect connection.*	Reverse the nylon tube connections to the lubricator.

OVERSPEED (CHALWYN) VALVE

MAINTENANCE

Three Monthly:

1) Disconnect intake pipework and release the valve from any support brackets etc. to allow it to be removed.

2) Inspect the valve internally for cleanliness. If necessary, clean in paraffin of white spirit taking normal precautions. Dry the valve thoroughly.

3) Check there is no excessive wear and that the valve moves smoothly over its complete operating stroke. DO NOT LUBRICATE.

4) Refit valve. Check valve setting.

Note: The recommended routine maintenance period is three months. This period is dependent on the operating conditions of the engine and, by experience, may need to be varied.

ADJUSTMENT

Once the Chalwyn valve is installed, adjustment of the overspeed trip setting is carried out using the adjuster and locknut. Basically rotating the adjuster clockwise will increase the engine speed at which automatic shut down occurs.

1) Start engine. Slowly accelerate. Note speed at which shut down occurs.

2) Remove hose at air inlet to Chalwyn valve to expose the adjuster and locknut.

3) Release locknut. Turn adjuster clockwise one turn. Tighten locknut.

4) Refit inlet hose to Chalwyn valve.

5) Start engine. Slowly accelerate. Note speed at which shut down occurs.

6) Repeat the above steps ”2” to ”5” until the first setting at which the engine does not shut down at high idle speed. Then either: A) Use the results of shut down speed versus adjuster setting as a calibration check to make a final adjustment to give the required setting (typically 10% to 15% over high idle) or B) if a very precise setting is not required, turn the adjuster a further one turn clockwise to take the shut down above high idle speed by a suitable margin. When using this setting procedure it may be found that the engine occasionally shuts down during the normal operation. If so, turn the adjuster clockwise by a further one half turn.

7) Ensure the adjuster locknut is fully tightened.

Notes:

Turbocharged engines - when setting up a valve on a turbocharged engine using the preceding method, it may be found that at high power outputs, the engine will shut down at lower speed than required. If this occurs, further small adjustment in step of one half turn clockwise should be made until the problem is eliminated.

Jammed valve - if in the course of adjusting the valve it jams on its seat, release by turning CLOCKWISE viewed from adjuster end of valve.

SPARK ARRESTOR

MAINTENANCE

Daily:

Examine the spark arrestor for any sign of gas leakage, cracks or significant areas of damage, i.e. dents of more than a few millimetres in depth.

Three Monthly:

Remove spark arrestor. Tap with a soft mallet to loosen any internal deposits and shake out. Also by shaking check for any loose internal baffles.

Six Monthly (or 1500 hours operation, whichever is sooner):

Examine the exhaust discharge in darkness whilst repeatedly loading and accelerating the engine. If any sparks are observed, the spark arrestor is not suitable for further use.

Note: Ensure adequate ventilation if this check is carried out in an enclosed area.

Note: The engine must not be put back into service until any problems identified by the above checks are rectified.

Portable Power

DOOSAN

Portable Power