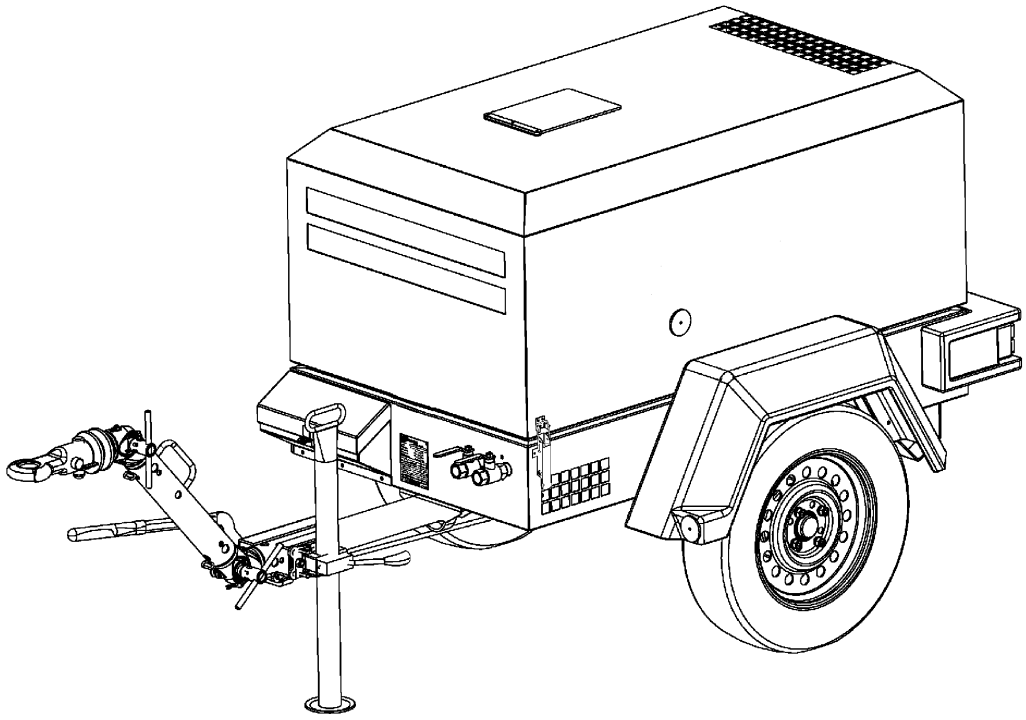
DOOSAN

Portable Power

7/20, P65

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.

SERIAL No : 121000 - 124199
SERIAL No : 124200 - 129999

22311203 _en_K_12/15

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

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 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.

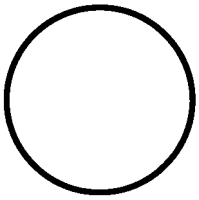
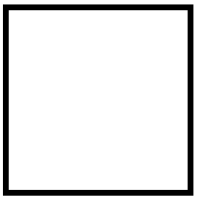
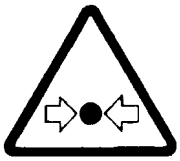
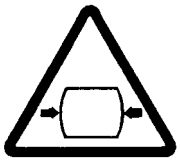
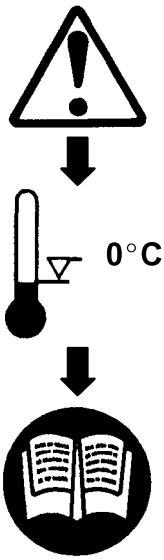
The use of the machine in any of the situation types listed in table 1:-

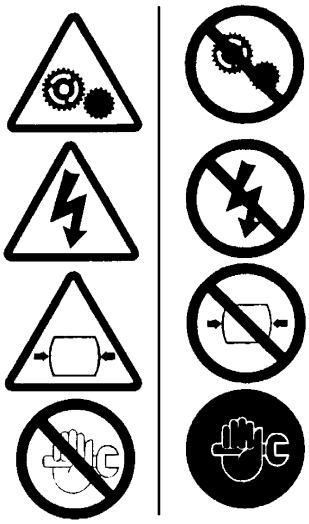
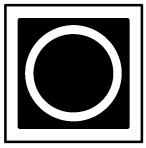
a Is not approved,
b) May impair the safety of users and other persons, and
c) May prejudice any claims made.

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.

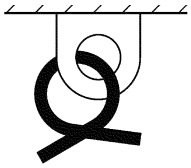
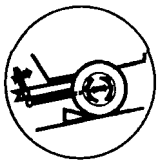
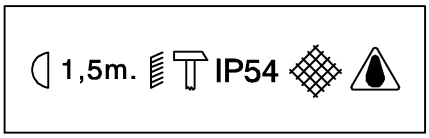
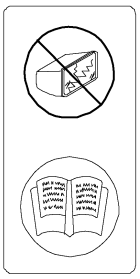
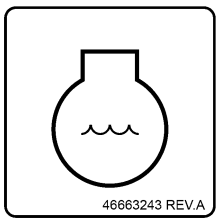
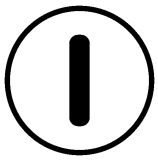
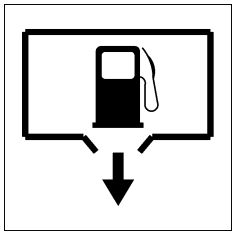
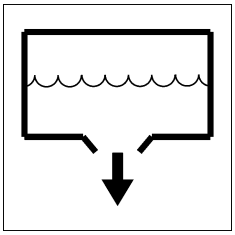
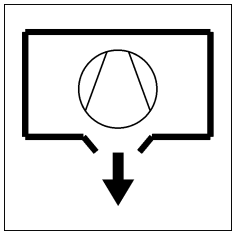
The company accepts no responsibility for errors in translation of this manual from the original English version.

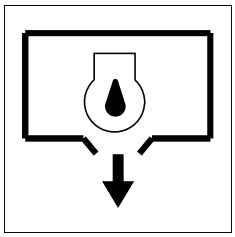
GRAPHIC FORM AND MEANING OF ISO SYMBOLS

		
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.	Cold Start Procedure.

8 NOISE EMISSION

This section pertains only to machines distributed within the United States.

WARNING

TAMPERING WITH NOISE CONTROL SYSTEM PROHIBITED

Federal law prohibits the following acts or the causing thereof:

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

Among those acts included in the prohibition against tampering are these:

1. Removal or rendering inoperative any of the following:
   a. the engine exhaust system or parts thereof
   b. the air intake system or parts thereof
   c. enclosure or parts thereof
2. Removal of any of the following:
   a. fan shroud
   b. vibration mounts
   c. sound absorption material
3. Operation of the compressor with any of the enclosure doors open.

Compressor Noise Emission Control Information

A. The removal or rendering inoperative, other than for the purpose of maintenance, repair, or replacement of any noise control device or element of design incorporated into this compressor in compliance with the noise control act;

B. The use of this compressor after such device or element of design has been removed or rendered inoperative.

Note: the above information applies only to units that are built in compliance with the U.S. Environmental Protection Agency.

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

The Purchaser is urged to include the above provisions in any agreement for any resale of this compressor.

NOISE EMISSION CONTROL MAINTENANCE LOG

COMPRESSOR MODEL .....

SERIAL NO. .....

USER UNIT NO......

UNIT IDENTIFICATION

ENGINE MAKE & MODEL:
SERIAL NO.: .....
PURCHASER OR OWNER: .....
ADDRESS: .....
.....

DEALER OR DISTRIBUTOR
FROM WHOM PURCHASED:
.....
.....

DATE PURCHASED: .....

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

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

NOISE EMISSION WARRANTY

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

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

10 NOISE EMISSION

INTRODUCTION

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

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

MAINTENANCE SCHEDULE

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

A. COMPRESSED AIR LEAKS

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

B. SAFETY AND CONTROL SYSTEMS

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

C. ACOUSTIC MATERIALS

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

D. FASTENERS

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

E. ENCLOSURE PANELS

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

F. AIR INTAKE AND ENGINE EXHAUST

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

G. COOLING SYSTEMS

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

H. ISOLATION MOUNTS

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

I. ENGINE OPERATION

Inspect and maintain engine condition and operation as recommended in the manuals supplied by the engine manufacturer. The engine operation manual is intended for trained personnel only and can be obtained upon request.

J. FUELS AND LUBRICANTS

Use only the types and grades of fuels and lubricants recommended in the Doosan and Engine Manufacturer's Operator and Maintenance Manuals.

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

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.

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.).

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

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.

Transport

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

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

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 permissible 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.

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:

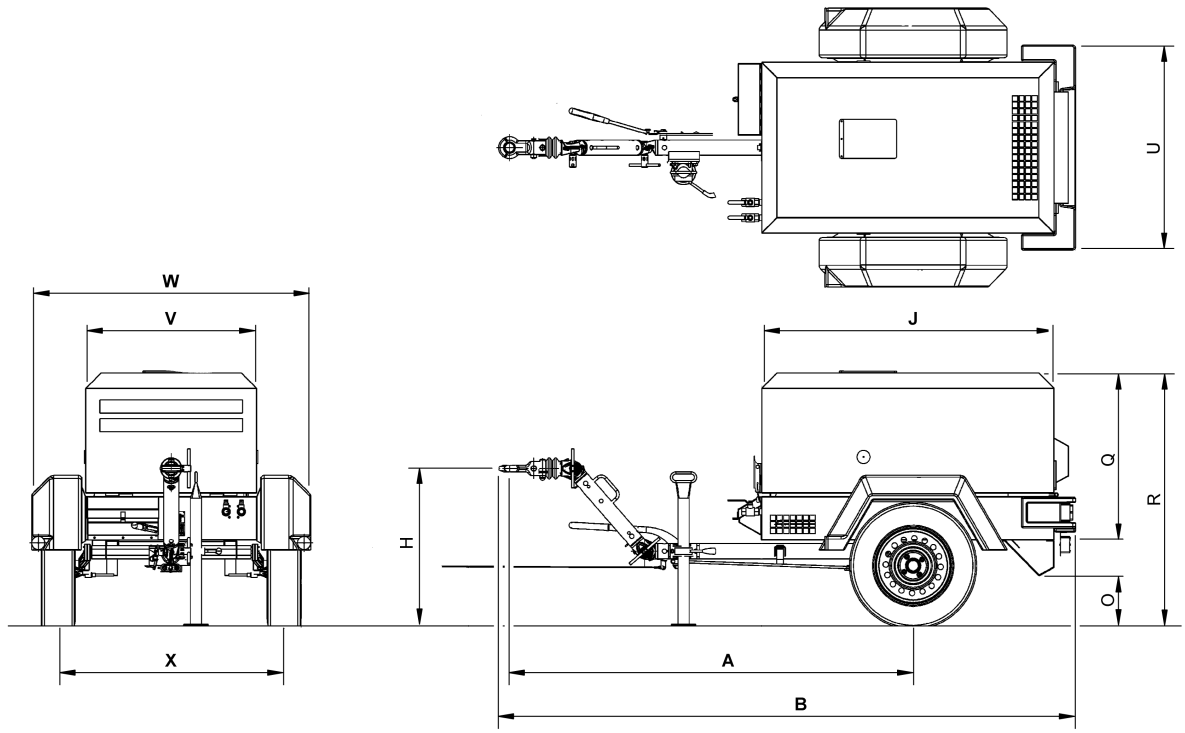
a) Loop the chains onto the towing vehicle using the towing vehicle hitch as an anchorage point, or any other point of similar strength.

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.

Disposal of contaminated fluids from bund

Contaminated fluids removed from bund (where fitted), must be disposed of to designated containers only.

VARIABLE HEIGHT RUNNING GEAR



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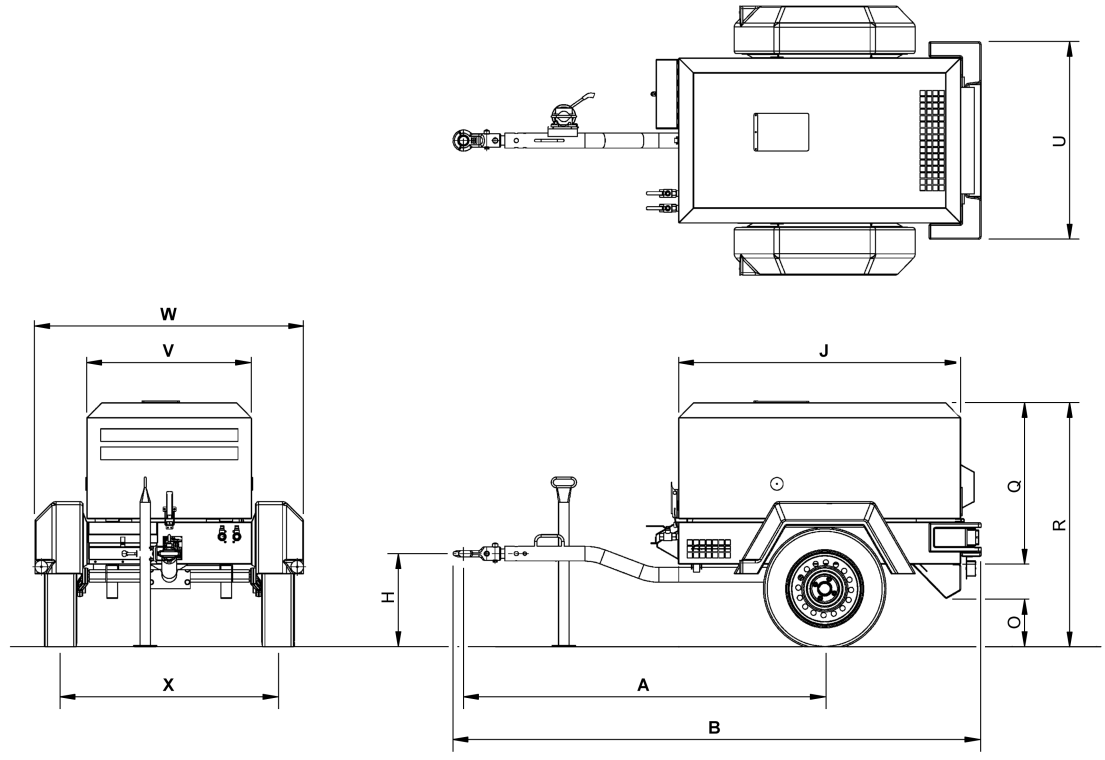
FIXED HEIGHT RUNNING GEAR



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	A	B	H	J	O	P	Q	R	S	T	U	V	W	X
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
7/20 Fixed Height Running Gear	1710	2451	441	1335	205	-	763	1154	-	-	935	780	1272	1030
7/20 Variable Height Running Gear	1840 MIN 2026 MAX	2581 MIN 2767 MAX	372 MIN 719 MAX	1335	205	-	763	1154	-	-	935	780	1272	1030
	“	“	“	“	“	“	“	“	“	“	“	“	“	“
P65 Fixed Height Running Gear	67.32	96.5	17.36	52.56	8.07	-	30.04	45.43	-	-	36.81	30.71	50.08	40.55
P65 Variable Height Running Gear	72.44 MIN 79.76 MAX	101.61 MIN 108.93 MAX	14.65 MIN 28.31 MAX	52.56	8.07	-	30.04	45.43	-	-	36.81	30.71	50.08	40.55

COMPRESSOR

Actual free air delivery.	1,84 m^3 min^{-1} (65 CFM)
Normal operating discharge pressure.	7 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. **Whisperised** -10°C TO +46°C (14°F TO 115°F) **High ambient temp.** -10°C TO +52°C (14°F TO 126°F)	
Maximum discharge temperature.	120°C (248°F)
Cooling system.	Oil injection
Oil capacity.	2,31 litres (0,61 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:

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

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

ENGINE
7/20, P65

Type/model.	7/20	D1005-E3B
	P65	D1005-T4i
Number of cylinders.		3
Oil capacity.		5,1 litres (1,35 US GAL)
Speed at full load.		3000 revs min^{-1}
Speed at idle.		2000 revs min^{-1}
Electrical system.		12V negative earth
Power available at 2800 revs min^{-1}		17,5kW (23,5 HP)
Fuel tank capacity		26 litres (6,87 US GAL)
Oil specification		Refer to *MAINTENANCE SHEDULE*
Coolant capacity		4 litres (1,06 US GAL)
Oil specification:		
Above 25°C (77°F)		SAE30, SAE10W-30 or 15W-40
-10 to 25°C (14°F to 77°F)		SAE10W-30 or 15W-40
Below -10°C (14°F)		SAE10W-30

Engine oil specification

Temperature range:	Oil type:
Above 25°C (77°F)	SAE30, SAE10W-30 or 15W-40
-10 to 25°C (14°F to 77°F)	SAE10W-30 or 15W-40
Below -10°C (14°F)	SAE10W-30

Diesel fuel specification

DO NOT USE Fuels that have sulfur content greater than 1.0 % (10000 ppm).

The minimum recommended Fuel Cetane Rating is 45.

Diesel fuels specified to EN 590 or ASTM D975 are recommended.

INFORMATION ON AIRBORNE NOISE (“W” model)

- The A-weighted emission sound pressure level

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

- The A-weighted emission sound power level

. 97 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
Unbraked version (KNOTT)

Shipping weight.	430kg (948 lbs)
Maximum weight.	515kg (1136 lbs)
Maximum horizontal towing force.	725 kgf (1600 lbs)
Maximum vertical coupling load (nose weight).	51,5 kgf (114 lbs)

VARIABLE HEIGHT RUNNING GEAR
Unbraked version (KNOTT)

Shipping weight.	445kg (981 lbs)
Maximum weight.	515kg (1136 lbs)
Maximum horizontal towing force.	725 kgf (1600 lbs)
Maximum vertical coupling load (nose weight).	51,5 kgf (114 lbs)

FIXED HEIGHT RUNNING GEAR
Braked version (KNOTT)

Shipping weight.	455kg (1003 lbs)
Maximum weight.	515kg (1136 lbs)
Maximum horizontal towing force.	725 kgf (1600 lbs)
Maximum vertical coupling load (nose weight).	51,5 kgf (114 lbs)

VARIABLE HEIGHT RUNNING GEAR
Braked version (KNOTT)

Shipping weight.	470kg (1036 lbs)
Maximum weight.	515kg (1136 lbs)
Maximum horizontal towing force.	725 kgf (1600 lbs)
Maximum vertical coupling load (nose weight).	51,5 kgf (114 lbs)

WHEELS AND TYRES (KNOTT)

Number of wheels.	2 x 4 1/2 J x 13H2
Tyre size.	155 R13 (C)
Tyre pressure.	2,4 bar (35 PSI)

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

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.

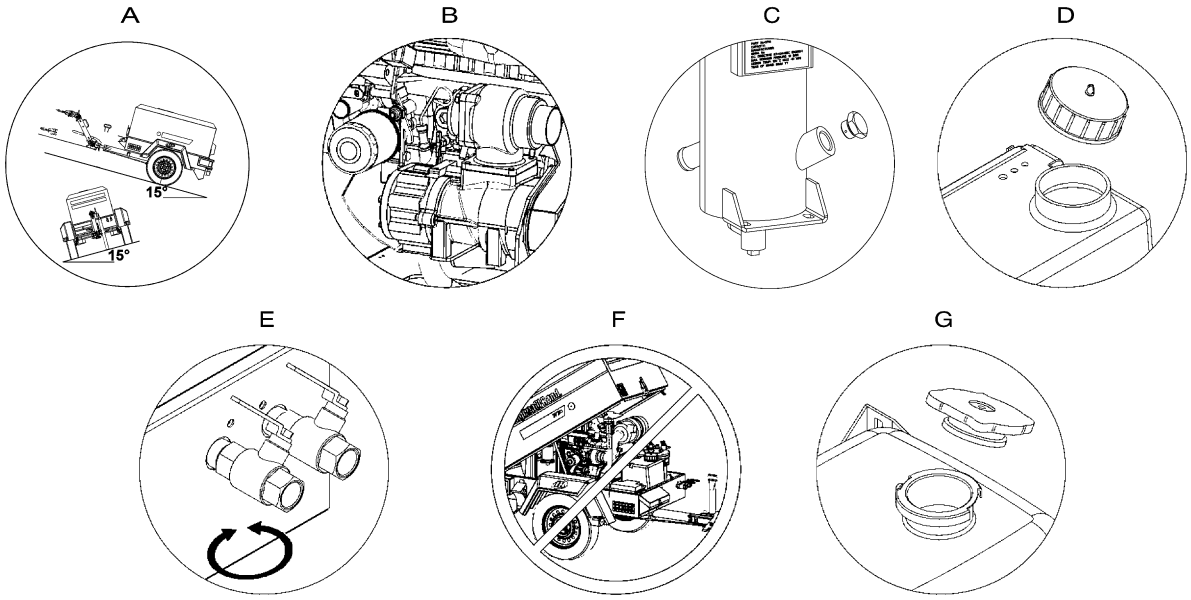
Ensure that the machine is positioned securely and on a stable foundation. Any risk of movement should be removed by suitable means, especially to avoid strain on any rigid discharge piping.

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 (100psi) pressure then it is recommended that safety retaining wires are used on the hoses.



PRIOR TO STARTING

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

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

C. Check the compressor oil level (with the unit level).

CAUTION: *Fill oil up to the filler neck end.*

D. 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.*

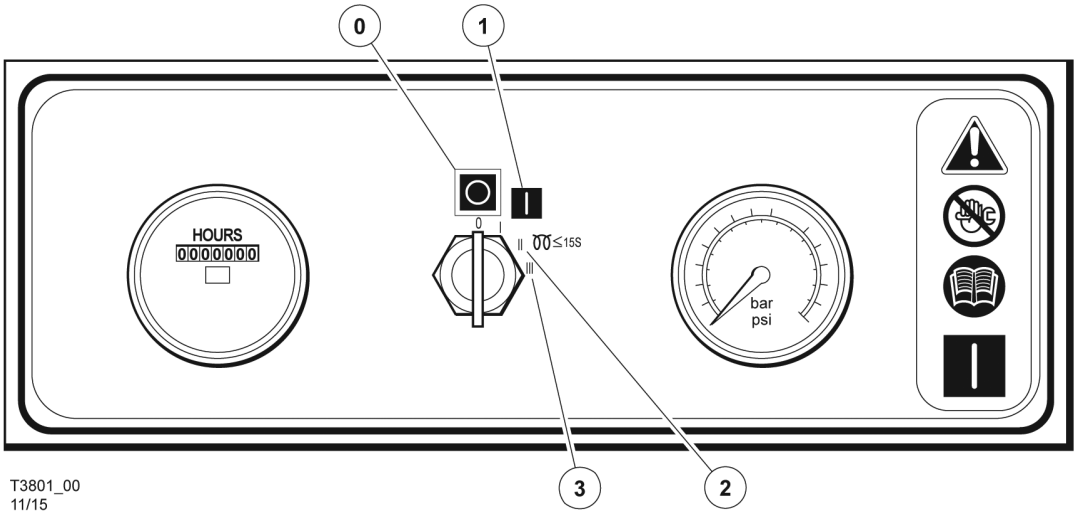
E. Open the service valve(s) to ensure that all pressure is relieved from the system.

F. ***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.*

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

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.



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STARTING THE MACHINE

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

Open and close service valve to ensure no compressed air is present in the system.

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 1 when the engine starts.

In cold conditions or if there is difficulty starting first time:

- Open the service valve fully, with no hose connected.
- Complete the starting sequence as shown 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.
- 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 air discharge temperature
- High engine coolant temperature

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 (51psi).*

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 SCHEDULE

	Daily	Weekly	Monthly / Hours			
			1/-	3/250	6/500	12/1,000
Compressor Oil Level	C					
Engine Oil Level	C					
*Radiator Coolant Level	C					
Gauges/Lamps	C					
*Air Cleaner Service Indicators	C					
Fuel Tank (Fill at end of day)	C					
*Fuel/Water Separator Drain	C					
Oil Leaks	C					
Fuel Leaks	C					
Drain Water From Fuel Filters	C					
Coolant Leaks	C					
Header Tank Cap.	C					
Airend Drive Belt					C	
Fan/Alternator Belts		C			R	
Battery Connections/Electrolyte		C				
Tire Pressure and Surface		C				
*Wheel Lug Nuts			C			
Hoses (Oil, Air, Intake, etc.)			C			
Automatic Shutdown System			C			
Air Cleaner System			C			
Compressor Oil Cooler Exterior			C			
*Engine Rad/Oil Cooler Exterior			C			
Fasteners, Guards				C		
Air Cleaner Elements					R/WI	

*Disregard if not appropriate for this particular machine.

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

(2) or as defined by local or national legislation

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

CBT = Check before towing

CR = Check and report

D = Drain

G = Grease

R = Replace

T = Test

W I = or when indicated if earlier.

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

	Initial.		Daily	Monthly / Hours			
	km (miles)	Hours		1/-	3/250	6/500	12/1,000
	850 (500)	50					
*Fuel/Water Separator Element						R	
Compressor Oil Filter Element						R	
Compressor Oil						R	
Engine Oil Change		R			-/R		
Engine Oil Filter		R			-/R		
*Water Pump Grease.							R
*Wheels (Bearings, Seals, etc.)						C	
*Engine Coolant						C	
Fuel Filter Element						-/R	
*Injection Nozzle Check						C	
Shutdown Switch Settings							T
Scavenger Orifice & Related Parts							C
Oil Separator Element							R
*Feed Pump Strainer Cleaning.							C
Coolant Replacement							R
*Valve Clearance Check							C
Lights (running, brake, & turn)			CBT				
Pintle Eye Bolts			CBT				
*Brakes	C			C			
*Brake linkage	C						
Emergency stop		T					
Fasteners		C					
Running gear linkage				G			
Safety valve					C		
Running gear bolts(1)					C		

*Disregard if not appropriate for this particular machine.

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

(2) or as defined by local or national legislation

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

CBT = Check before towing.

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G = Grease

R = Replace

T = Test

W I = or when indicated if earlier.

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

	Initial.		Daily	Monthly / Hours			
	km (miles)	Hours		1/-	3/250	6/500	12/1,000
	850 (500)	50					
Scavenge line						C	
Pressure system						C	
Engine breather element							C
Pressure gauge							C
Pressure regulator							C
Separator tank (2) exterior							CR
Lubricator (Fill)			C				

	2,000 Hours / 2 Years.	2 Yrs	4 Yrs	6 Yrs
Airend drive belt.	R			
Safety valve		C		
Hoses			R	
Separator tank (2) interior				C

*Disregard if not appropriate for this particular machine.

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

(2) or as defined by local or national legislation

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

CBT = Check before towing.

CR = Check and report

D = Drain

G = Grease

R = Replace

T = Test

W I = or when indicated if earlier.

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

ROUTINE MAINTENANCE

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

The *MAINTENANCE SHEDULE* 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.
- 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 discharge air temperature switch
- High engine coolant temperature switch

Low engine oil pressure switch.

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

- Start the machine.
- 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 0,83 bar (12 psi).
- 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 discharge air temperature switch(es).

At twelve month intervals, test the air 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 (248°F.) Refit the switch.

High coolant temperature switch.

At twelve month intervals, test the coolant temperature switch by removing it from the machine and immersing in a bath of heated oil. The switch should operate at 115°C (239°F). Refit the switch.

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 separator tank, 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 SHEDULE* 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 OIL SEPARATOR ELEMENT

Normally the separator element will not require periodic maintenance provided that the air and oil filter elements are correctly maintained.

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

Removal

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

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

Inspection

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

Reassembly

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

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

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

Engage the adaptor in the cover plate with the drop-tube integral with the filter, reconnect all hoses and tubes to the separator tank cover plate.

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

CAUTION: *Start the machine (refer to PRIOR TO STARTING and STARTING THE 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/coolant 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 *MAINTENANCE SHEDULE*) 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).

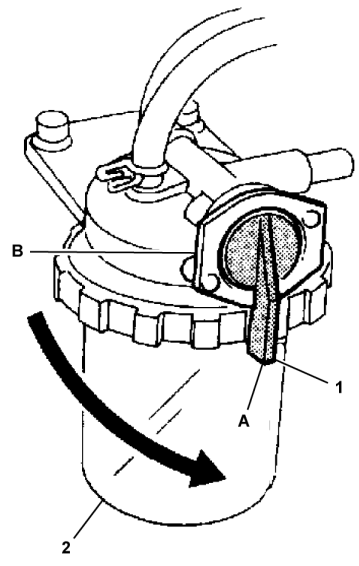
FUEL FILTER WATER SEPARATOR

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

Cleaning the fuel filter pot

Every 100 hours of operation, clean the fuel filter in a clean place to prevent dust intrusion.

1. Close the fuel filter lever.



1. Fuel filter lever
2. Fuel filter pot

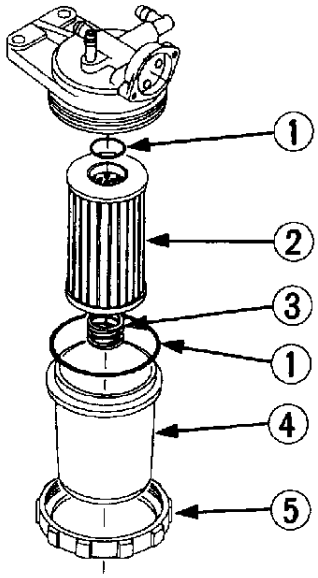
A. “OFF”

B. “ON”

2. Remove the top cap, and rinse the inside with diesel fuel.
3. Take out the element, and rinse it with diesel fuel.
4. After cleaning, reinstall the fuel filter, keeping out of dust and dirt.
5. Air-bleed the injection pump.

Fuel filter cartrtidge replacement

1. Apply fuel oil thinly over the gasket and tighten the cartridge into position by hand-tightening only.
2. Finally, vent the air.



1. O ring
2. Filter element
3. Spring
4. Filter bowl
5. Screw ring

HOSES

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

At the recommended intervals, (see the *MAINTENANCE SHEDULE*), 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 *MAINTENANCE SHEDULE* 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.

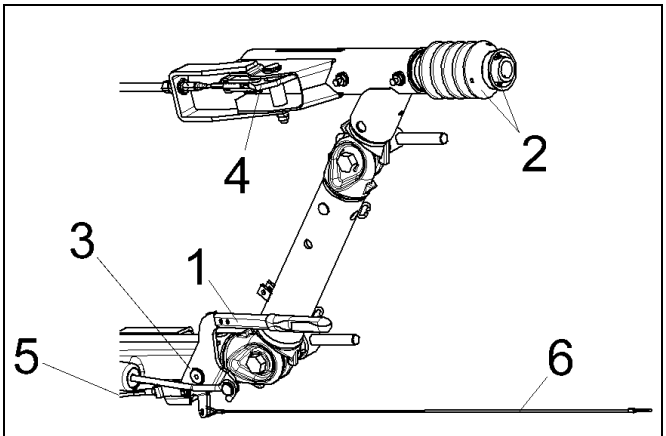
Adjusting the overrun braking system (KNOTT Running Gear)

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:

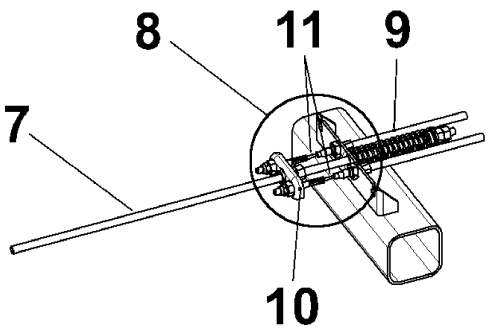
During the adjustment procedure always start with the wheel brakes.

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].

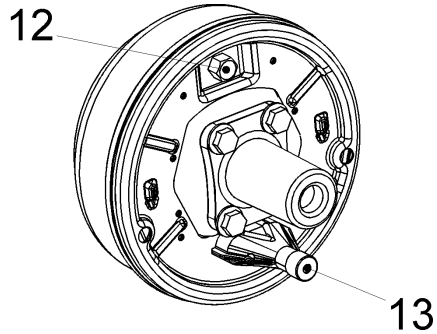
Check that brake actuators and cables [11] operate smoothly.



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.

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 (KNOTT Running Gear)

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).*

LUBRICATION

The engine is initially supplied with engine oil sufficient for a nominal period of operation (for more information, consult the *MAINTENANCE SHEDULE*).

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.

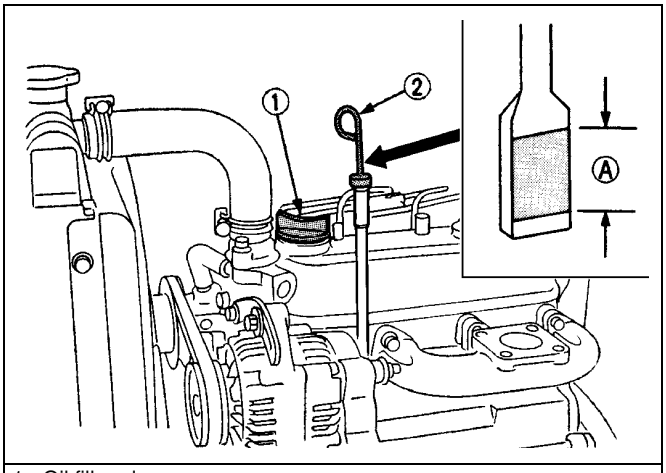
ENGINE LUBRICATING OIL

The engine oil should be changed at the engine manufacturer's recommended intervals. Refer to the *MAINTENANCE SHEDULE*.

Checking oil level and adding engine oil

1. Check the engine oil level before starting or more than 5 minutes after stopping the engine.
2. Remove the oil level gauge, wipe it clean and reinstall it.
3. Take the oil level gauge out again, and check the oil level.
4. If the oil level is too low, remove the oil filler plug, and add new oil to the prescribed level.

5. After adding oil, wait more than 5 minutes and check the oil level again. It takes some time for the oil to drain down to the oil pan.



1. Oil filler plug
2. Oil level gauge

A. Engine oil level within this range is proper.

Changing engine oil

1. Remove the drain plug at the bottom of the engine, and drain all the old oil. Drain oil will drain easier when the oil is warm.
2. Add new engine oil up to the upper limit of the oil level gauge.

ENGINE LUBRICATING OIL SPECIFICATION

Refer to the *MAINTENANCE SHEDULE*.

ENGINE OIL FILTER ELEMENT

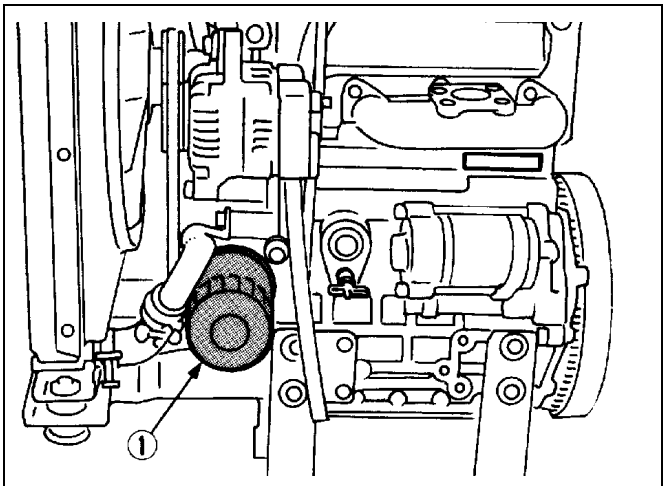
The engine oil filter element should be changed at the engine manufacturer's recommended intervals. Refer to the *MAINTENANCE SHEDULE*.

Replacing the oil filter cartridge

CAUTION: *To avaid personal injury ensure that the engine is stopped before changing the oil filter cartridge.*

Allow the engine to cool down sufficiantly, oil can be hot and cause burns.

1. Replace the oil filter cartridge after the initial 50 hours of operation and every 200 hours thereafter.
2. Remove the old oil filter cartridge with a filter wrench.
3. Apply a film of oil to the gasket for the new cartridge.
4. Screw in the cartridge by hand. When the gasket contacts the seal surface, tighten the cartridge enough by hand. Because, if you tighten the cartridge with a wrench, it will be tightened too much.



1. Oil filter cartridge (Remove with a filter wrench and hand tighten).

5. After the new cartridge has been replaced, the engine oil level normally decreases a little. Thus, run the engine for a while and check for oil leaks through the seal before checking the engine oil level. Add oil if necessary.

COMPRESSOR LUBRICATING OIL

Refer to the *MAINTENANCE SHEDULE* 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.*

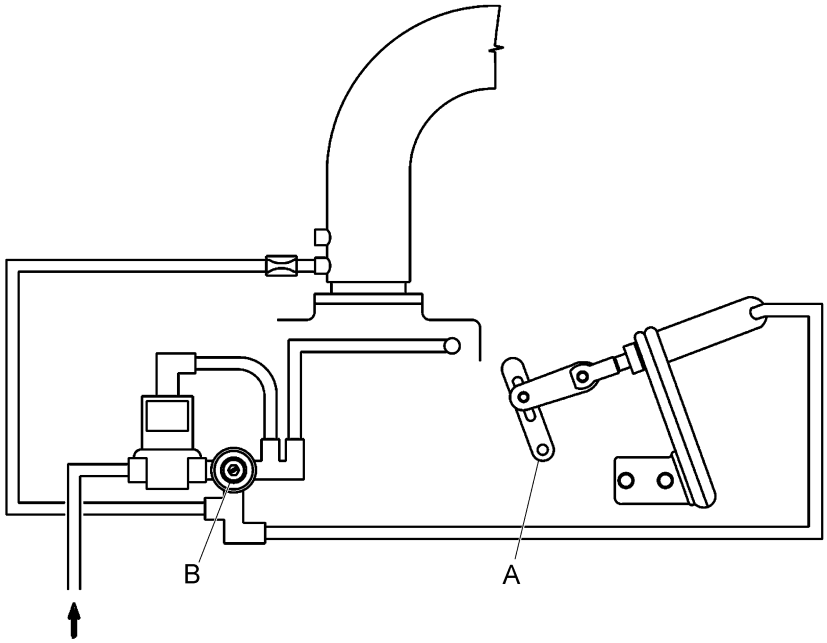
NOTE: Always specify PRO-TEC oil for use at all ambient temperatures above -23°C.

COMPRESSOR OIL FILTER ELEMENT

Refer to the *MAINTENANCE SHEDULE* in this section for service intervals.

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*.



SPEED AND PRESSURE REGULATION ADJUSTMENT

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

Refer to the diagram above.

A: Throttle arm

B: Adjusting screw

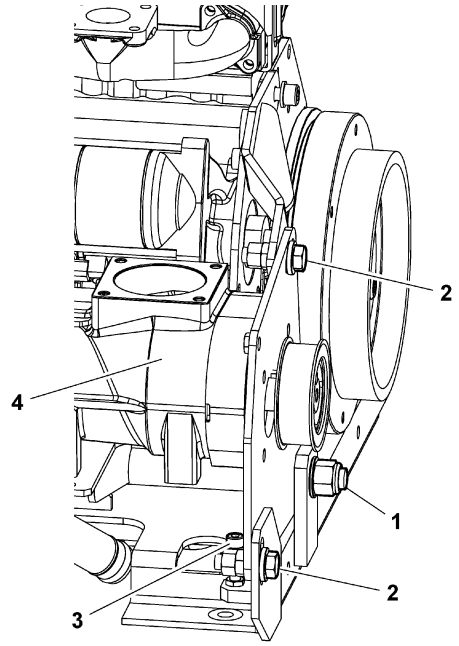
Start the machine (Refer to *STARTING INSTRUCTIONS* in the *OPERATING INSTRUCTIONS* section of this manual).

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 exceed 8,6 bar on the pressure gauge, otherwise the safety valve will operate.*



1. Main pivot bolt.
2. Securing screw.
3. Adjusting screw.
4. Airend

DRIVE BELT REPLACEMENT / ADJUSTMENT

WARNING: DURING THE ADJUSTMENT / REPLACEMENT PROCEDURE ALWAYS DISCONNECT BATTERY.

Remove drive belt guard.

Loosen securing screw M12 beside and above the Airend.

Loosen main pivot bolt M16.

Disconnect adjusting screw and pivot Airend towards engine to slacken belt and remove belt from pulleys.

Fit new belt over pulleys, pivot Airend away from engine and reengage adjusting screw.

Adjust drive belt tightening by means of adjusting screw with M8 head socket screw.

Adjustment values:

New drive belt
144-151 Hz (34N-37N/2.9mm)

Run in drive belt
120-129 Hz (24N-27N/2.9mm)

Tighten securing screw M12 beside and above the Airend.

Tighten main pivot bolt M16 and secure by lock nut.

Check belt adjustment.

Install drive belt guard.

TORQUE VALUES

	ft lbf	Nm
Engine mounts to engine	29-35	39-47
Airend to pivot plate	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
Discharge manifold to frame	29-35	39-47
Pulley to flywheel	57-69	77-93
Drop Leg	53-63	72-85
Engine/airend to chassis	54-58	73-78
Band clamp on discharge hose	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

	ft lbf	Nm
Lifting bail to frame	29-35	39-47
Band clamp on oil pipes	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
Main pivot bolt	106-133	143-180
Pivot locking bolt	54-58	73-78
Separator tank cover	40-50	54-68
Separator tank to frame	18-22	24-30
Band clamp on hose	106-133	143-180
Wheel nuts	50-80	67-109

COMPRESSOR LUBRICATION

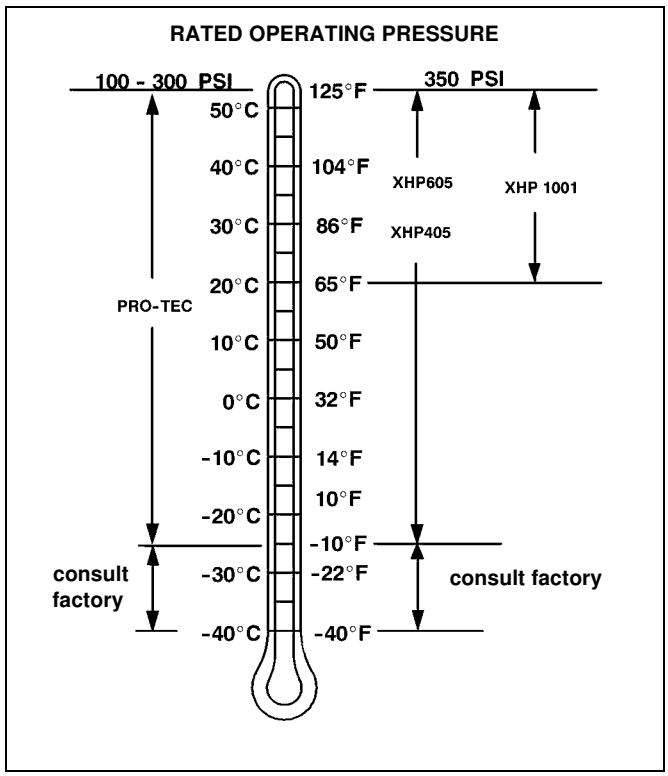
Portable Compressor Fluid Chart

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.

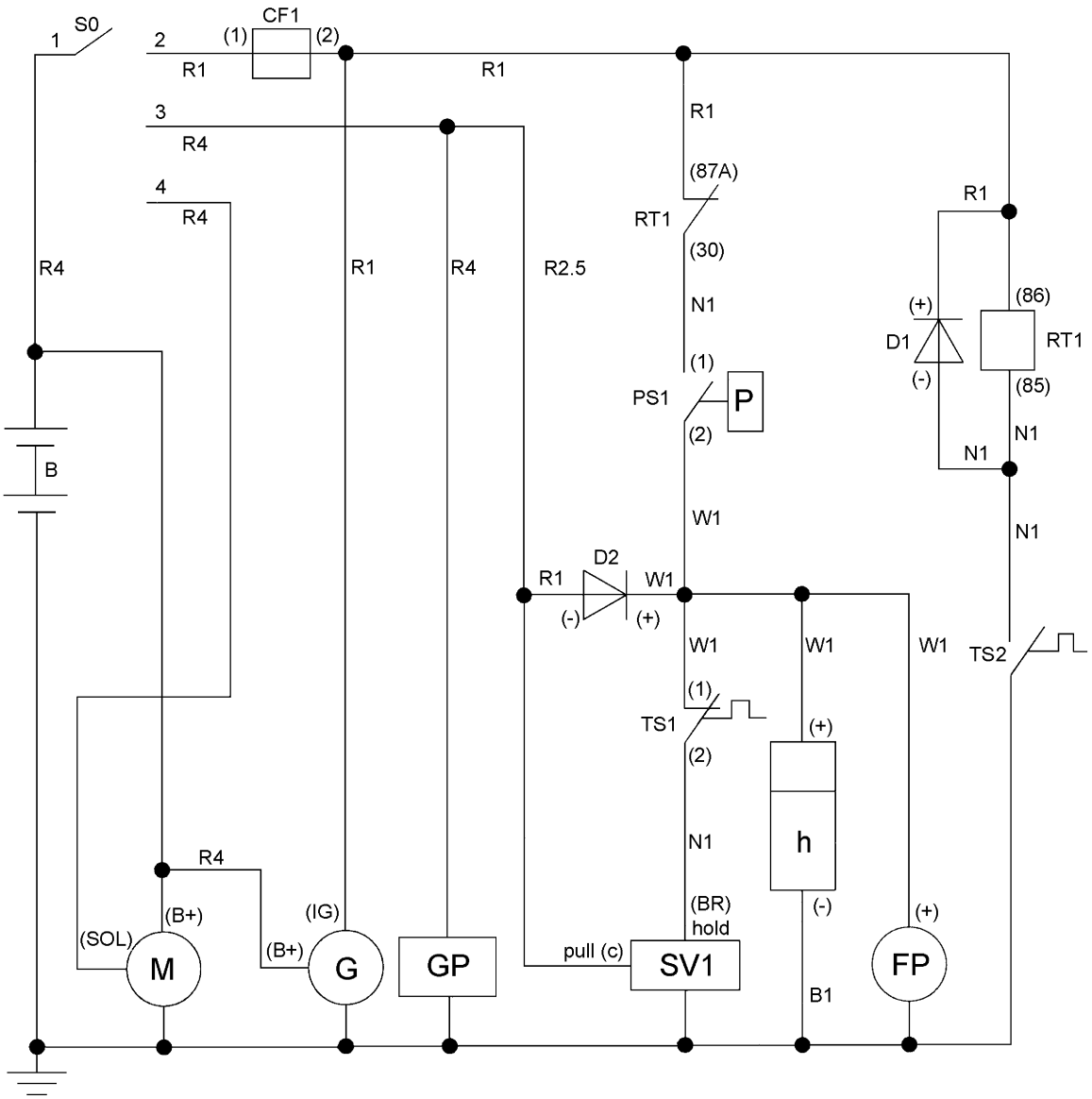
Compressor oil carryover (oil consumption) may be greater with the use of alternative fluids.

Design Operating Pressure	Ambient Temperature	Specification
100 psi to 300 psi	-10°F to 125°F (-23°C to 52°C)	Preferred: **PRO-TEC** Alternate: ISO Viscosity Grade 46 with rust and oxidation inhibitors, designed for air compressor service
350 psi	-10°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 oxidation inhibitors designed for air compressor service.
24,1bar (350 psi)	65°F to 125°F (18°C to 52°C)	Preferred: **XHP 605** **XHP1001**



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.

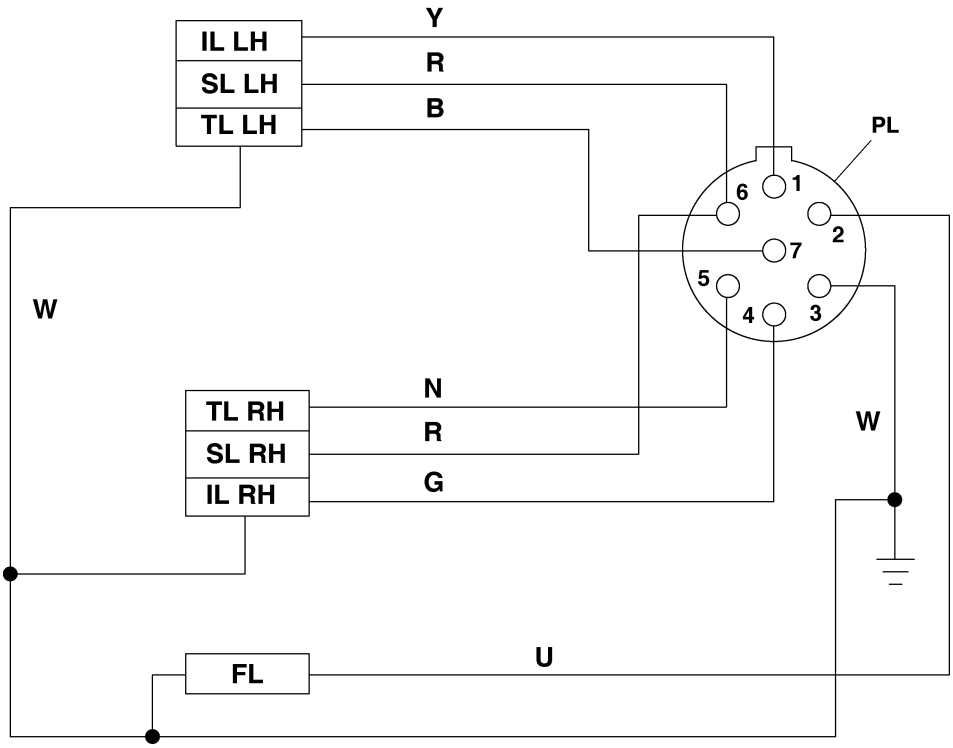
Doosan Preferred Fluids	1 gal. (3.8 Litre)	5 gal. (19.0 Litre)	55 gal. (208.2Litre)	220 gal. (836 litre)
PRO-TEC	-	89292973	89292981	22082598
XHP 605	-	22252076	22252050	22252068
XHP 1001	-	35612738	35300516	-
XHP 405	-	22252126	22252100	22252118



KEY

B	Battery 12V
CF1	Control fuse 5A
D1-2	Diode, blocking
FP	Fuel pump
G	Alternator 12V
GP	Glow plugs
h	Hourmeter
M	Starter motor
NP1-4	Node point
PS1	Engine oil pressure switch
RT1	Relay, temperature switch
SO	Key-switch
SV1	Solenoid, fuel
TS1	High air temperature switch (airend)
TS2	High coolant temperature switch (engine)

SCHEMATIC DIAGRAM FOR EUROPEAN CE LIGHTING SYSTEM - 7 PINS



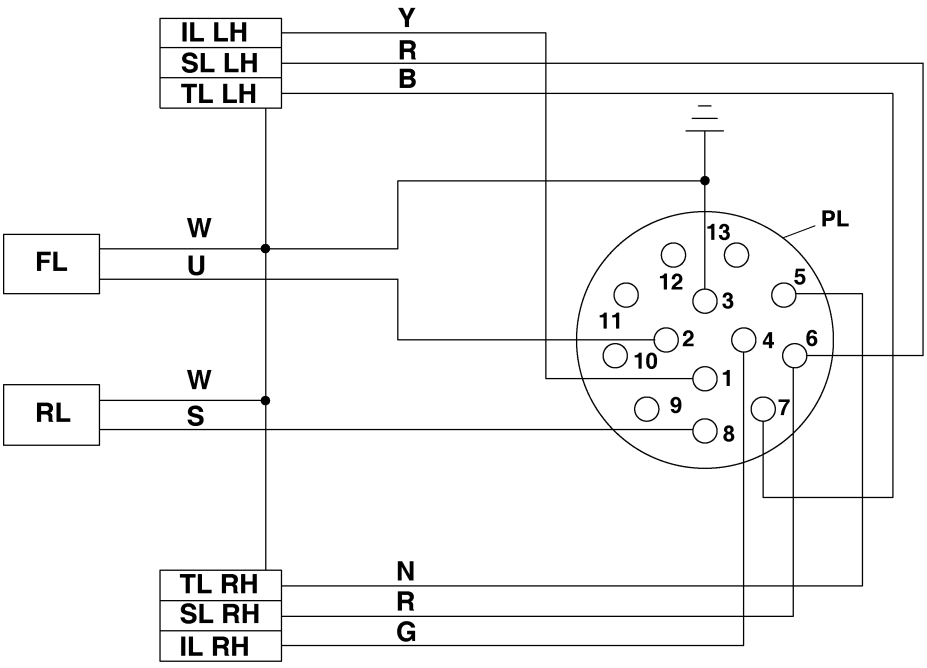
T2404
Revision 00
09/08

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

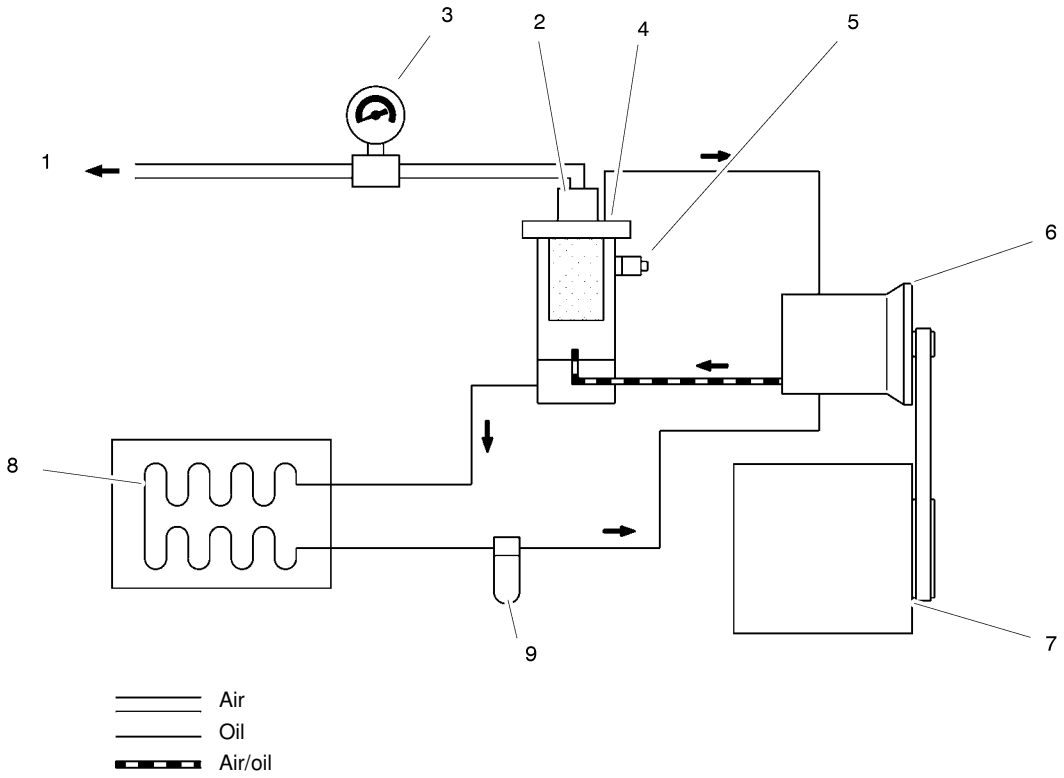


T2405
Revision 00
09/08

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

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 *MAINTENANCE section of this manual.*		

FAULT	CAUSE	REMEDY
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.
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.

OPTION - 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%.

OPERATING INSTRUCTIONS

When fitted with bund, the machine must only be operated when level.

Drains for engine coolant, engine oil and compressor oil are located at the front corner of the machine.

Bunded base must be drained daily.

The rear air intake is covered to prevent rainwater ingress. Ensure that the cover is not prevented from moving.

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.

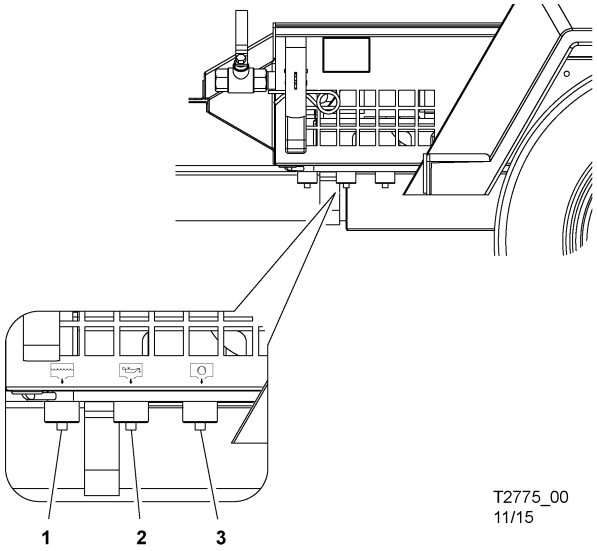
DRAINING OF MACHINE FLUIDS

During maintenance operations drain machine fluids using the drain ports indicated

Remove fuel tank to drain.

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

DRAIN LOCATIONS



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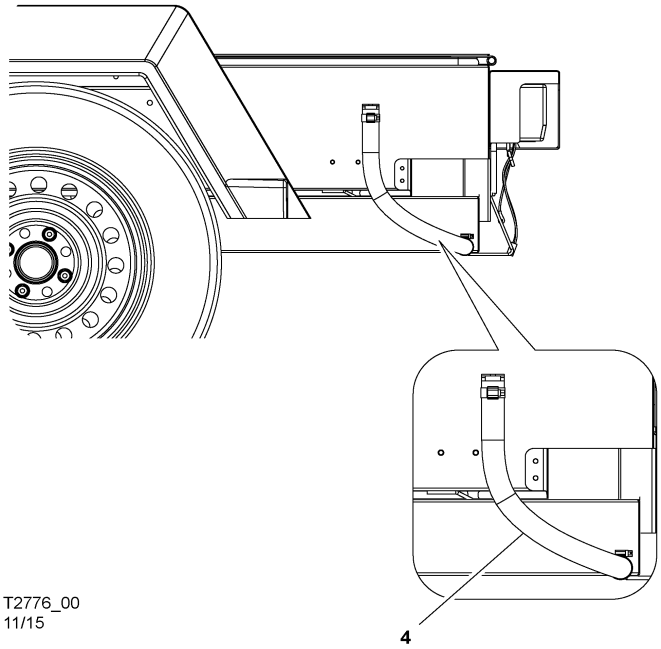

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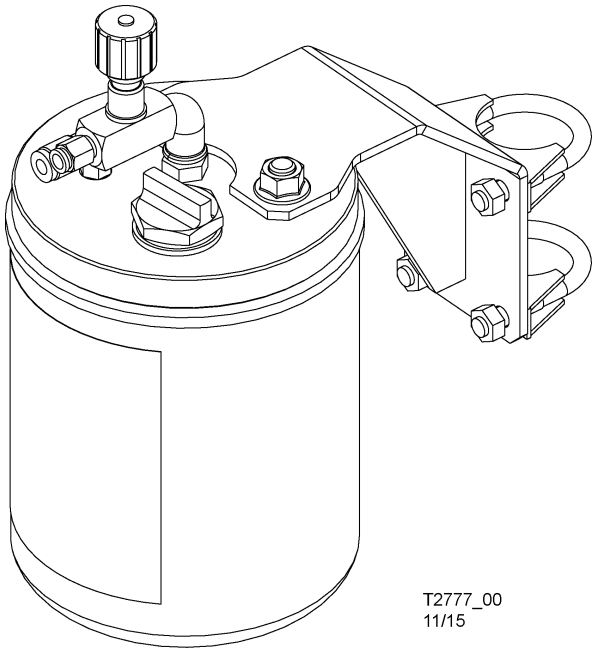
1. Engine coolant drain.
2. Engine oil drain.
3. Compressor oil drain.
4. Bunded base drain.

OPTION - LUBRICATOR



DESCRIPTION

The internal air line lubricator is used to release a lubricant into the internal compressed air piping before it exits the compressor, from there the air/oil mixture will flow to the compressed air operated appliance; one that requires an external source of pneumatic oil for proper operation.

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 replenish 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.

GENERAL

This publication, which contains an illustrated parts breakdown, has been prepared as an aid in locating those parts which may be required in the maintenance of the unit. All of the compressor parts, listed in the parts breakdown, are manufactured with the same precision as the original equipment. For the greatest protection always insist on genuine Doosan parts for your compressor.

NOTICE

Doosan can bear no responsibility for injury or damages resulting directly from the use of non-approved repair parts.

Doosan Infracore service facilities and parts are available worldwide.

There are Authorised Distributors or Company Sales offices in principal cities of many countries.

Special order parts may not be included in the manual. Contact Doosan Parts Department with the unit serial number for assistance with these special parts.

DESCRIPTION

The illustrated parts breakdown illustrates and lists the various assemblies, subassemblies and detailed parts which make up this particular machine. This covers the standard models and the more popular options that are available.

A series of illustrations show each part distinctly and in location relative to the other parts in the assembly. The part number, the description of the part and the quantity of parts required are shown on each illustration or on adjacent page. The quantities specified are the number of parts used per one assembly and are not necessarily the total number of parts used in the machine. Where no quantity is specified the quantity is assumed to be one.

Each description of a part is based upon the "noun first" method, i.e., the identifying noun or item name is always the first part of the description. The noun name is generally followed by a single descriptive modifier. The descriptive modifier may be followed by words or abbreviations such as upper, lower, inner, outer, front, rear, RH, LH, etc. when they are essential.

In referring to the rear, the front or to either side of the unit, always consider the **drawbar end** of the unit as the **front**. Standing at the rear of the unit facing the drawbar (front) will determine the right and left sides.

FASTENERS

Both SAE/inch, ISO/metric hardware have been used in the design and assembly of these units. In the disassembly and reassembly of parts, extreme care must be taken to avoid damaging threads by the use of wrong fasteners. In order to clarify the proper usage and for exact replacement parts, all standard fasteners have been identified by part number, size and description. This will enable a customer to obtain fasteners locally rather than ordering from the factory. These parts are identified in tables that will be found at the rear of the parts illustrations. Any fastener that has not been identified by both part number and size is a specially engineered part that must be ordered by part number to obtain the exact replacement part.

MARKINGS AND DECALS

NOTICE

Do not paint over safety warnings or instructional decals. If safety warning decals become illegible, immediately order replacements from the factory.

Part numbers for original individual decals and their mounting locations are shown within Parts List Section. These are available as long as a particular model is in production.

HOW TO USE PARTS LIST

a. Turn to Parts List.

b. Locate the area or system of the compressor in which the desired part is used and find illustration page number.

c. Locate the desired part on the illustration by visual identification and make note of part number and description.

HOW TO ORDER

The satisfactory ordering of parts by a purchaser is greatly dependent upon the proper use of all available information. By supplying your nearest sales office, autonomous company or authorised distributor, with complete information, you will enable them to fill your order correctly and to avoid any unnecessary delays.

In order that all avoidable errors may be eliminated, the following instructions are offered as a guide to the purchaser when ordering replacement parts:

a. Always specify the model number of the unit as shown on the general data decal attached to the unit.

b. Always specify the serial number of the unit. THIS IS IMPORTANT. The serial number of the unit will be found stamped on a plate attached to the unit. (The serial number on the unit is also permanently stamped in the metal of the frame side rail.)

c. Always specify the number of the parts list publication.

d. Always specify the quantity of parts required.

e. Always specify the part number, as well as the description of the part, or parts, exactly as it is given on the parts list illustration.

In the event parts are being returned to your nearest sales office, autonomous company or authorised distributor, for inspection or repair, it is important to include the serial number of the unit from which the parts were removed.

TERMS AND CONDITIONS ON PARTS ORDERS

Acceptance: Acceptance of an offer is expressly limited to the exact terms contained herein. If purchaser's order form is used for acceptance of an offer, it is expressly understood and agreed that the terms and conditions of such order form shall not apply unless expressly agreed to by Doosan Company ("Company") in writing. No additional or contrary terms will be binding upon the Company unless expressly agreed to in writing.

Taxes: Any tax or other governmental charge now or hereafter levied upon the production, sale, use or shipment of material and equipment ordered or sold is not included in the Company's price and will be charged to and paid for by the Purchaser.

Shipping dates shall be extended for delays due to acts of God, acts of Purchaser, acts of Government, fires, floods, strikes, riot, war, embargo, transportation shortages, delay or default on the part of the Company's vendors, or any other cause beyond the Company's reasonable control.

Should Purchaser request special shipping instruction, such as exclusive use of shipping facilities, including air freight when common carrier has been quoted and before change order to purchase order can be received by the Company, the additional charges will be honoured by the Purchaser.

Warranty: The Company warrants that parts manufactured by it will be as specified and will be free from defects in materials and workmanship. The Company's liability under this warranty shall be limited to the repair or replacement of any part which was defective at the time of shipment provided Purchaser notifies the Company of any such defect promptly upon discovery, but in no event later than three (3) months from the date of shipment of such part by the Company. The only exception to the previous statement is the extended warranty as it applies to the special airend exchange program.

Repairs and replacements shall be made by the Company F.O.B. point of shipment. The Company shall not be responsible for costs of transportation, removal or installation.

Warranties applicable to material and equipment supplied by the Company but wholly manufactured by others shall be limited to the warranties extended to the Company by the manufacturer which are able to be conveyed to the Purchaser.

Delivery: Shipping dates are approximate. The Company will use best efforts to ship by the dates specified; however, the Company shall not be liable for any delay or failure in the estimated delivery or shipment of material and equipment or for any damages suffered by reason thereof.

The company makes no other warranty or representation of any kind whatsoever, expressed or implied, except that of title, and all implied warranties, including any warranty of merchantability and fitness for a particular purpose, are hereby disclaimed.

Limitation of Liability:

The remedies of the Purchaser set forth herein are exclusive, and the total liability of the Company with respect to this order whether based on contract, warranty, negligence, indemnity, strict liability or otherwise, shall not exceed the purchase price of the part upon which such liability is based.

The Company shall in no event be liable to the Purchaser, any successors in interest or any beneficiary of this order for any consequential, incidental, indirect, special or punitive damages arising out of this order or any breach thereof, or any defect in, or failure of, or malfunction of the parts hereunder, whether based upon loss of use, lost profits or revenue, interest, lost goodwill, work stoppage, impairment of other goods, loss by reason of shutdown or non-operation, increased expenses of operation or claims of customers of Purchaser for service interruption whether or not such loss or damage is based on contract, warranty, negligence, indemnity, strict liability or otherwise.

AIREND EXCHANGE PROGRAM

Doosan offers an airend exchange program to benefit portable compressor users.

Your nearest sales office, autonomous company or authorised distributor must first contact the Parts Service Department at the factory at which your portable air compressor was manufactured for further instructions.

For parts, service or information regarding your local distributor (Europe, Middle East, Africa) please contact:

Facility:	Telephone:	Fax:
Doosan Portable Power EMEA Aftermarket Drève Richelle 167 B-1410 Waterloo Belgium	+32 (2) 404 0811	+32 (2) 371 6915

For Service information contact:	service_emea@dii.doosan.com
For Parts information contact:	parts_emea@dii.doosan.com
Office hours:	Monday to Friday 8:30 a.m. to 5:15 p.m. (GMT)

For parts, service or information regarding your local distributor (U.S, Latin America or Asia Pacific) please contact:

Facility:	Telephone:	Fax:
Doosan International USA, Inc 1293 Glenway Drive Statesville North Carolina 28625-9218	800-633-5206 (US & Canada) 305-222-0835 (Latin America) 65-860-6863 (Asia Pacific)	336-751-1579 (US & Canada) 336-751-4325 (Latin America) 336-751-4325 (Asia Pacific)

Office hours:	Monday to Friday 8:00 a.m. to 5:30 p.m. (EST)

Portable Power

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