



Doosan Infracore
Portable Power

OPERATION and MAINTENANCE MANUAL

COMPRESSOR MODELS

HP1300WCU-T3 (B84)

HP1600WCU-T3 (B83)

10/370 (B37)

10/455 (B38)

HP1600WCU-FX-T3 (E09)

HP1600WCU-FX-T3 (E10)

HP1600WCU-EU-FX-T3 (E67)

HP1600FCU-EX-T3 (E49)

HP1600FCU-T3 (E68)



This manual contains important safety information.

Do not destroy this manual.

This manual must be available to the personnel who operate and maintain this compressor.

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

Book: 22523815 (9/2013) Rev F

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Foreword

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

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

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

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

- of good quality, procured from a reputable manufacturer and, wherever possible, be of a type approved by Portable Power.
- clearly rated for a pressure at least equal to the 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 Portable Power Service departments. The use of repair parts other than those included within the Portable Power approved parts list may create hazardous conditions over which Portable Power has no control. Therefore, Portable Power cannot be held responsible for equipment in which non-approved repair parts are installed.

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

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

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

This machine should not be used:

- A. For direct or indirect human consumption of the compressed air.
- B. Outside the ambient temperature range specified in the general data section of this manual.
- C. When an actual or foreseeable risk of hazardous levels of flammable gases or vapors exists.

- D. With other than Portable Power approved components.
- E. With guards, or controls or switches missing or disabled.
- F. For storage or transportation of materials inside or on the enclosure.

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

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

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

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

To enable proper maintenance records, Portable Power provides a Noise Emission Control Maintenance Log Book (PCD Form 685) with each compressor shipped from the factory. This Log Book contains a recommended schedule and space so that the serviceman can note what service and maintenance was done, by whom, where, and when.



Safety

Safety

Safety Precautions

General Information

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Compressed Air

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

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

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

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

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

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

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

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

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

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

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

Avoid bodily contact with compressed air.

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

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

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



Avoid ingestion, skin contact and inhalation of fumes

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

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

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

Consult a physician if compressor lubricant is inhaled.

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

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

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

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

Battery

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

WARNING

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

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

Radiator

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

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

NOTICE

Machine is equipped with a containment base and multiple drains. New machines come from the factory with the drain plugs shipped loose. Drain plugs must be installed when containment is required. Keep base clean. Drain or pump waste from the base whenever it accumulates. Identify and repair any leaks. Dispose of waste in accordance with federal, state and local laws and regulations.

Transport

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

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

Do not exceed gross vehicle weight rating.

Before towing the machine, ensure that:-

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

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

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

Safety chains/connections and their adjustment where fitted:

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

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

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

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

Decals

Decals are located on the machine to point out potential safety hazards. Read and follow these instructions. If you do not understand the instructions, inform your supervisor.

Note that there are different decal headings:



(Red Background)

Indicates the presence of a hazard which **WILL** cause serious injury, death or property damage, if ignored.



(Orange Background)

Indicates the presence of a hazard which **CAN** cause serious injury, death or property damage, if ignored.



(Yellow Background)

Indicates the presence of a hazard which **WILL** or can cause injury or property damage, if ignored.



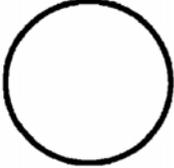
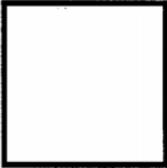
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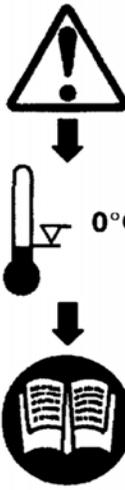
Indicates important set-up, operating or maintenance information.

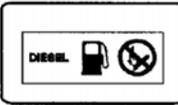
DECALS

Look for these signs on machines manufactured in Europe, which point out potential hazards to the safety of you and others. Read and understand thoroughly. Heed warnings and follow instructions. If you do not understand, inform your supervisor.

GRAPHIC FORM AND MEANING OF ISO SYMBOLS

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

 <p>WARNING – Flammable liquid.</p>	 <p>WARNING – Before connecting the tow bar or commencing to tow consult the operation and maintenance manual.</p>	 <p>WARNING – For operating temperature below 0°C, consult the operation and maintenance manual.</p>
 <p>WARNING – Do not undertake any maintenance on this machine until the electrical supply is disconnected and the air pressure is totally relieved.</p>	 <p>WARNING – Consult the operation and maintenance manual before commencing any maintenance.</p>	 <p>Do not breathe the compressed air from this machine.</p>
 <p>Do not remove the Operating and Maintenance manual and manual holder from this machine.</p>	 <p>Do not stack.</p>	 <p>Do not operate the machine without the guard being fitted.</p>

 <p>Do not stand on any service valve or other parts of the pressure system.</p>	  <p>Do not operate with the doors or enclosure open.</p>	 <p>Do not use fork lift truck from this side.</p>
 <p>Do not exceed the trailer speed limit.</p>	 <p>No naked lights.</p>	 <p>Do not open the service valve before the airhose is attached.</p>
 <p>Use fork lift truck from this side only.</p>	 <p>Emergency stop.</p>	 <p>Tie down point</p>
 <p>Lifting point.</p>	 <p>On (power).</p>	 <p>Off (power).</p>
 <p>Read the Operation and Maintenance manual before operation or maintenance of this machine is undertaken.</p>	 <p>When parking use prop stand, handbrake and wheel chocks.</p>	 <p>Compressor oil filling</p>
 <p>Diesel fuel No open flame.</p>	 <p>Parking brake.</p>	 <p>Rough Service Designation. Wet Location Operation.</p>



⚠ DANGER



Discharged air can contain carbon monoxide or other contaminants. Will cause serious injury or death. Do not breathe this air.



⚠ WARNING

Hot pressurized fluid. Can cause serious burns. Do not open radiator while hot.



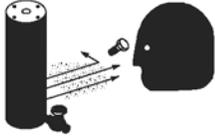

⚠ WARNING

Trapped air pressure. Can cause serious injury or death. Close service valve and operate tool to vent trapped air before performing any service.




⚠ WARNING

High pressure air. Can cause serious injury or death. Relieve pressure before removing filler plugs/caps, fittings or covers.



Look for these signs on machines manufactured in North America, which point out potential hazards to the safety of you and others. Read and understand thoroughly. Heed warnings and follow instructions. If you do not understand, inform your supervisor

 **WARNING**

**Improper operation of this equipment.
Can cause serious injury or death.**
Read Operator's Manual supplied with this machine before operation or servicing.

**Modification or alteration of this machine.
Can cause serious injury or death.**
Do not alter or modify this machine without the express written consent of the manufacturer.

 **WARNING**

**Falling off machine.
Can cause serious injury or death.**



Access lifting bail from inside machine.

 **WARNING**

**Rotating fan blade.
Can cause serious injury.**



Do not operate without guard in place.

 **WARNING**

**Disconnected air hoses whip.
Can cause serious injury or death.**



When using air tools attach safety device (OSHA Valve) at source of air supply for each tool.

 **WARNING**

**Door under pressure.
Can cause serious injury.**



Use both hands to open door when machine is running.

 **WARNING**

**Combustible gas.
Can cause serious burns, blindness or death.**



Keep sparks and open flames away from batteries.

 **CAUTION**

**DO NOT WELD.
ELECTRONIC DAMAGE
WILL OCCUR.**

This engine is equipped with an electronic engine controller and other electronic components.



CAUTION

**DO NOT USE ETHER.
ENGINE DAMAGE WILL OCCUR.**

This engine is equipped with an electric heater starting aid.



WARNING

High pressure air. Can cause serious injury or death.

Relieve pressure before removing filler plugs/caps, fittings or covers.



USE DIESEL FUEL ONLY



NOTICE

COOLANT FILL INSTRUCTIONS

Adding:
Do NOT remove radiator cap. Top off at overflow reservoir. Use same anti-freeze mixture as in radiator.

Replacing:
With system cool, remove radiator cap. Drain coolant and close drain. At radiator, refill system. Replace radiator cap. At reservoir, fill to "Hot" level. Run for 30 minutes. Stop and allow to cool. At reservoir, add coolant as necessary to reach "Cold" level.

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.

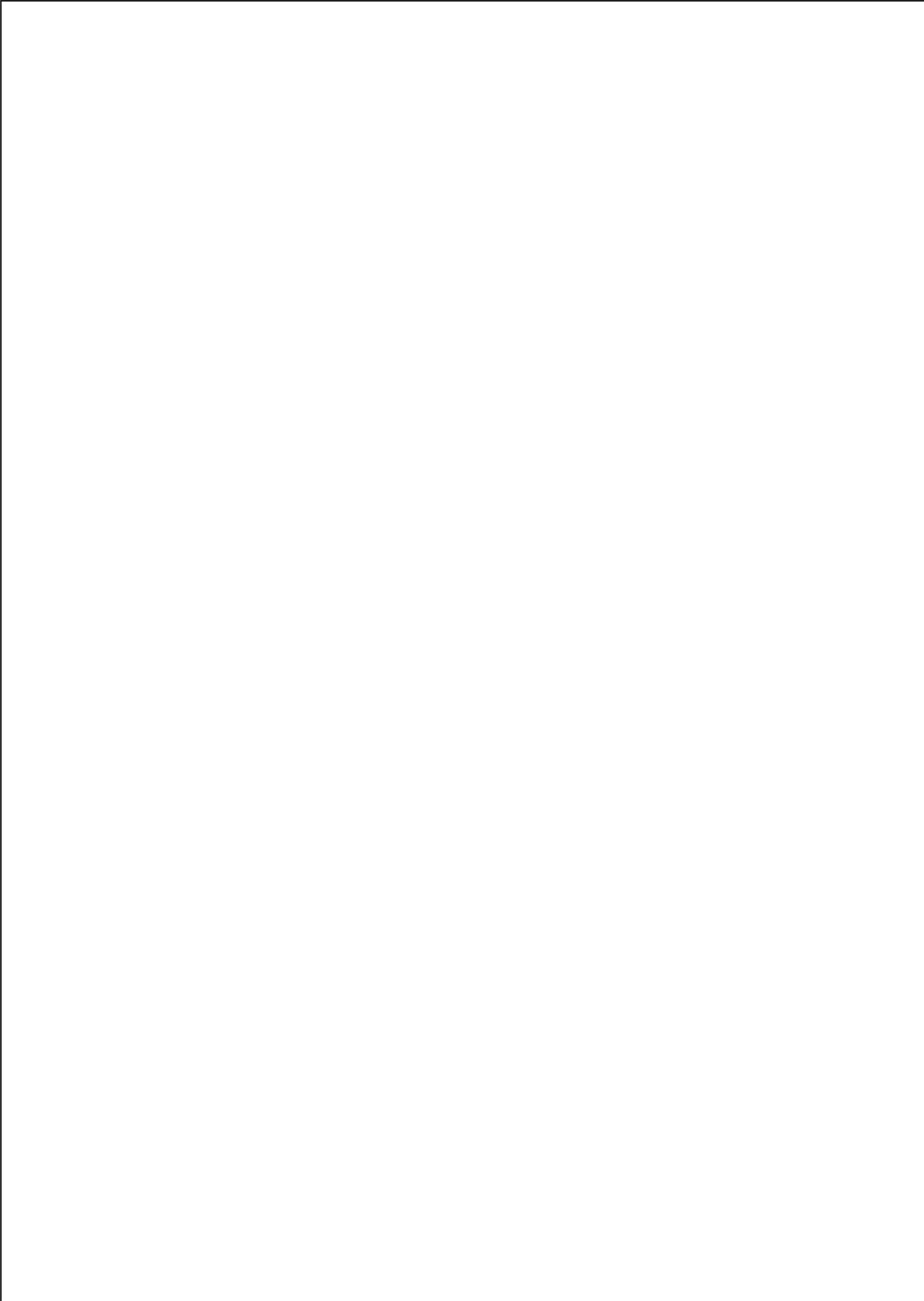
NOTE: the above information applies only to units that are built in compliance with the U.S. Environmental Protection Agency.

Portable Power 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.

FREE SAFETY DECALS

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





Noise Emission

Noise Emission

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



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.

Portable Power 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 new compressor for the purpose of noise control prior to its sale or delivery to the ultimate purchaser or while it is in use; or (2) the use of the compressor after such device or element of design has been removed or rendered inoperative by any person.

Noise Emission Warranty

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

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

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 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. The Maintenance Schedule and detailed instructions on the maintenance items are given on following page.

Maintenance Schedule

Item	Area	Period
A.	Compressed Air Leaks	As Detected
B.	Safety and Control Systems	As Detected
C.	Acoustic Materials	Daily
D.	Fasteners	100 hours
E.	Enclosure Panels	100 hours
F.	Air Intake & Engine Exhaust	100 hours
G.	Cooling Systems	250 hours
H.	Isolation Mounts	250 hours
I.	Engine Operation	See Operator's Manual
J.	Fuels & Lubricants	See Operator's Manual

A. Compressed Air Leaks

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

B. Safety and Control Systems

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

C. Acoustic Materials

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

D. Fasteners

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

E. Enclosure Panels

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

F. Air Intake and Engine Exhaust

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

G. Cooling Systems

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

H. Isolation Mounts

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

I. Engine Operation

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

J. Fuels and Lubricants

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



General Data

General Data

MODELS	HP1600WCU	HP1300WCU
Air Delivery - cfm (litres/sec)	1600 (756)	1300 (614)
COMPRESSOR		
Rated Operating Pressure - psi (kPa)	80-150 (552-1034)	
ENGINE (Diesel)		
Manufacturer	Cummins	Cummins
Model	QSX15	QSX15
Rated Horsepower at 1800 rpm	560	510
Electrical System	24VDC	24VDC
Full Load Speed - rpm	1800	1800
No Load Speed - rpm	1200	1200
FLUID CAPACITIES - U.S. Gallons (litres)		
Compressor Lubricant	55 (208)	55 (208)
Engine Lube (including filter)	12 (46)	12 (46)
Engine Coolant (radiator)	15.2 (57.5)	15.2 (57.5)
Fuel Tank (Clean DIESEL fuel)	230 (870)	230 (870)

UNITS MEASUREMENTS/WEIGHTS			
Feet (Meters)	HSRG	WAGON RG	LRG
Overall Length	24.2 (7.4)	19.0 (5.79)	19.9 (5.79)
Overall Height	8.33 (2.54)	8.33 (2.54)	7.25 (2.21)
Overall Width	7.5 (2.29)	7.5 (2.29)	7.5 (2.29)
Gross Weight - pounds (kg)	17,200 (7810)	17,200 (7810)	16,700 (7590)
(including fluids - no fuel)		est	est

RUNNING GEAR			
Tire Size	215/ 75R17.5H	215/ 75R17.5H	NA
Towing Speed (maximum) mph	65	20	NA
Inflation Pressure	125 psig	125 psig	NA

EXPENDABLE SERVICE PARTS

Part Number	Description	Where Used	Quantity
36897346	Filter, Oil	Airend	2
22402317	Separator, Oil HP	Airend	1
36864361	Filter, Inlet Primary	Engine & AE inlet	2
36864379	Filter, Inlet Secondary	Engine & AE inlet	2
54662028	Filter Oil, Engine	QSX15	1
54662051	Filter Coolant, Engine	QSX15	1
54662036	Filter Fuel Engine	QSX15	1

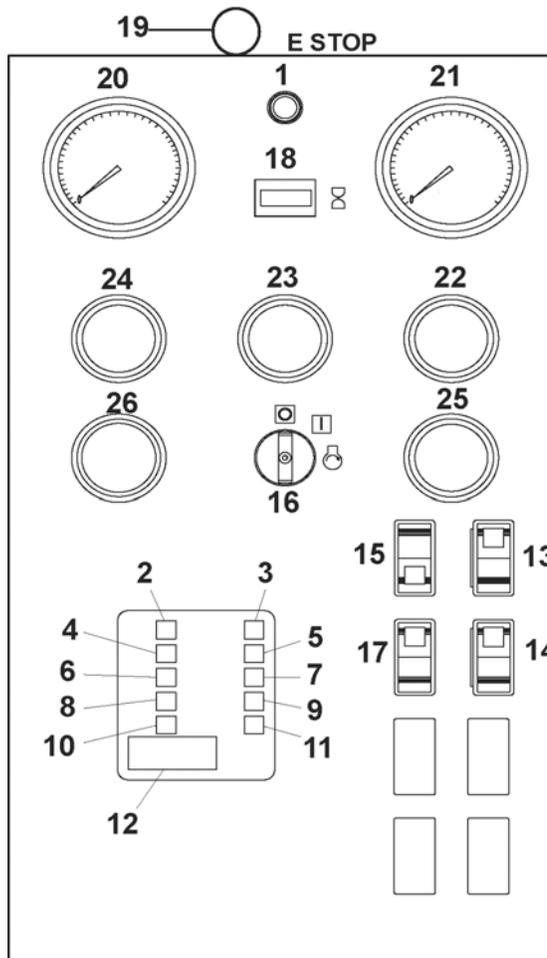


Any departure from the specifications may make this equipment unsafe.



Operating Instructions

Operating Instructions



Operating Controls and Instruments

The operating controls and instruments are arranged on the control panel as shown above. A description of each panel device is as follows:

1. **Panel Light:** Illuminates instrument and control panel. Controlled by Switch 14.
2. **High Compressor Temp:** Fault indicator lamp. Indicates shutdown due to high compressor temperature.
3. **Low Radiator Coolant Level:** Alarm indicator lamp. Indicates engine coolant needs service.
4. **Low Engine Oil Pressure:** Fault indicator lamp. Indicates shutdown due to low engine oil pressure.
5. **Restricted Air Filter:** Alarm indicator lamp. Indicates engine/compressor air inlet filters need service.
6. **High Engine Coolant Temp:** Fault indicator lamp. Indicates shutdown due to high engine water temperature.

7. **Restricted IQ Air Filters:** Fault indicator lamp. Indicates shutdown due to dirty IQ air filters (if equipped).
8. **Low Fuel Level:** Fault indicator lamp. Indicates shutdown due to low fuel level. Lamp blinks at low fuel warning.
9. **Compressor Malfunction:** Fault indicator lamp. Indicates shutdown due to compressor system fault. Refer to Fault Code List.
10. **Low Battery Voltage:** Alarm indicator lamp. Indicates battery or charging system requires service.
11. **Engine Malfunction:** Engine Fault code. Refer to service card or engine manual for codes and service requirements.
12. **Malfunction Code (4 Digit):** Compressor or engine fault. Refer to manual for list of codes and service requirements.
13. **Ether Inject:** Injects a measured shot of ether for aid in cold weather starting of engine.

**CAUTION**

Use Sparingly.

14. **Panel Light Switch:** Controls panel lamp # 1.
15. **Pressure Control:** Momentary contact switch. Allows engine to warm up at low compressor pressure.
16. **Main Power Control Switch:** ON/OFF Start Switch.
17. **Heaters:** ON/OFF Power Switch for regulation and IQ heaters. Prevents freeze up in cold weather.
18. **Hourmeter:** Indicates machine operating hours.
19. **E-STOP:** Emergency Stop Push Button (ESA units only). Push to stop, turn to release.
20. **Discharge Air Pressure Gage:** Indicates pressure in receiver tank, normally from 0 psi(kPa) to the rated pressure of the machine.
21. **Engine Tachometer:** Indicates engine speed in RPM from 0 when stopped to full speed.
22. **Engine Water Temp**
23. **Fuel Level Gauge:** Not used on "S" Models.
24. **Compressor Oil Temp**
25. **Engine Oil Pressure**
26. **Battery Voltage**

Lifting Unit

The central lifting bail can be reached through the roof door only from inside the machine. Use hoist or crane capable of lifting machine gross weight (see General Data).

Before Towing

Ensure that the tires, wheels and running gear are in good condition and secure.

Wagon Style Running Gear

- Do not tow this unit in excess of 20 mph (32km/hr).
- Use a tow vehicle whose towing capacity is greater than the gross weight of this unit. (see general data).
- Machine is not designed to be Highway Towable.
- Set parking brake or chock wheels before disconnecting from towing vehicle.
- Optional Parking Brake - located beside towbar on front of unit, if equipped.
- Push lever down to apply brake.

High Speed Running Gear

- Use jack to raise or lower lunette eye.
- Use tow vehicle whose towing capacity is greater than the gross weight of this unit (see general data).
- Do not tow this unit in excess of 65 mph.
- Place wheel chocks under tires before disconnecting from towing vehicle.
- When raising or lowering lunette eye, always stand to one side.

Wheel Chock - HSRG

- Located inside of front towbar
- Secure unit with chocks before disconnecting drawbar from tow vehicle.

Setting Up (All Units)

Place the unit in an open, well-ventilated area. Position as level as possible. The design of these units permits a maximum 10 degree limit on out-of-level operation.

When the unit is to be operated out-of-level, it is important: (1) to keep the engine crankcase oil level near the high level mark (with the unit level), and (2) to have the compressor oil level gauge show no more than mid-scale (with the unit running at full load). Do not overfill either the engine crankcase or the compressor lubricating oil system.

Chock wheels or set parking brake.

This unit is equipped with on-board fuel tanks with a total capacity of 230 gallons which provides 10 hours of full load operation.

Compressor Mounting

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

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

WARNING

Do not connect the air discharge on this unit onto a common header with any other unit of any description, or any other source of compressed air, without first making sure a check-valve is used between the header and the unit. If this unit is connected in parallel with another unit of higher discharge pressure and capacity, a safety hazard could occur in a back-flow condition.

WARNING

Unrestricted air flow from a hose will result in a whipping motion of the hose which can cause serious injury or death. A safety device must be attached to the hose at the source of supply to reduce pressure in case of hose failure or other sudden pressure release. Reference: OSHA regulation 29 CFR Section 1926.302 (b).

Air hose restraining cable installation:

Secure hose restraining cable at each end to prevent accidental hose whipping. At the machine-side of the air hose, install and secure one end of the hose restraining cable on the 3" nipple on the inlet side of the 3" service valve. Install the other end of the hose restraining cable over the main hose connector.

Install suitable 3" air hose between service valve on unit and point of air use. The air hose must be rated for outdoor use and for pressurized air service. Minimum rating is 250°F (121°C) and 200 psig (HP) or 425 psig (XHP).

Before Starting

Open manual blowdown valve to ensure the separator has been vented of all pressure. Close the valve before starting.

Inspect the complete installation including remote fuel lines (if any) and air hose routing and connections.

Check battery for proper connections and condition.

WARNING

Combustible gas can cause severe burns, blindness or death. Keep sparks and open flame away from battery.

- Check the compressor fluid level. Maintain the fluid level between bottom and midway of the sight glass on the separator tank.
- Check engine oil level. The proper level is labeled on the engine dipstick. Add oil when required. Do not overfill.
- To jump-start, connect the positive booster/charger cable to the 24VDC positive (+) terminal of the battery. Then connect the negative booster/charger cable to the engine block...Not to the negative (-) terminal of the weak battery. After starting, disconnect the negative (-) cable from engine block; then from the booster battery/charger. Disconnect positive (+) cable from both batteries.

WARNING

Do not remove the cap from a HOT engine radiator. The sudden release of pressure from a heated cooling system can result in a loss of coolant and possible severe personal injury.

WARNING

Hot pressurized fluid can cause serious burns. Do not open radiator while hot.

Check coolant to assure coolant level is at minimum level when the unit is cold.

Check engine coolant level on coolant recovery bottle on inside of rear door. Add coolant as required.

Insure that radiator cap is installed properly and tightened.

NOTE: This machine will not allow engine starting if engine coolant is low.

NOTICE

If the appropriate mixture of antifreeze is not used during freezing temperatures, failure to drain the engine may cause costly engine damage. Never use water only, as corrosion inhibitors are required in engine coolant fluid.

⚠ CAUTION

No smoking, sparks, or open flame near fuel.

Check the fuel level. Add only CLEAN DIESEL fuel for maximum service from the engine. Refer to the Engine Operator's Section for fuel specifications.

NOTICE

To minimize condensation (water) in the fuel tank, it is recommended to fill the tank at the end of each day.

NOTE: This machine will not allow engine starting if the fuel level is below the minimum fuel shut off level.

⚠ WARNING

This machine produces loud noise with doors open. Extended exposure to loud noise can cause hearing loss. Wear hearing protection when doors or valve(s) are open.

- Close the side doors to maintain a cooling air path and to avoid recirculation of hot air. This will maximize the life of the engine and compressor and protect the hearing of surrounding personnel.
- Make sure no one is IN or ON the compressor unit.

Starting

NOTICE

This unit is equipped with a battery disconnect switch which removes power from the machine controller for long term storage. The switch is located on the side of the engine near the battery.

This switch must be turned ON to provide power to the control panel for starting this unit.

Close the air service valve to isolate the compressor from the compressed air tool until the engine is warmed up.

1. Turn the keyswitch to the "ON" position (first position). All diagnostic lamps and the LED display will light for two (2) seconds. All lamps should then go off and ALTERNATOR NOT CHARGING and LOW ENGINE OIL PRESSURE lamps will flash.
2. In freezing weather (below 32°F/0°C), flip HEATERS switch "ON" and wait sixty (60 seconds). This applies heat to the control system components for easier starting. Leave this switch "ON" while operating at these temperatures.
3. When the keyswitch is turned to "START" the engine starter will be engaged. **Do not operate the engine starter motor for more than ten (10) seconds without allowing at least one minute cooling time between start attempts.**

Extended engine starter engagement will result in starter drop-out and generate a starter engagement time fault.

⚠ CAUTION

Ether is an extremely volatile, high flammable gas. Use Sparingly! If too much is injected, the uncontrolled explosion may result in costly damage to the engine.

4. In cold weather, as required, press the ETHER INJECT button once or twice only while the engine is cranking. This injects a measured amount of ETHER to the engine.
5. Following a successful start, the engine will accelerate to 1200 rpm initially, then 1500 rpm for warm-up. Compressor discharge pressure will be maintained at 60 psi during warm-up. After warm-up, rpm will maintain 1200 rpm idle.
6. Press the LOAD button. The engine will increase speed up to 1800 rpm until the pressure reaches the desired set point.

After the engine has warmed up, open the service air valve to supply air to compressed air tool.

Normal Operation

The Operator may observe and monitor operating parameters using the gages on the panel. In the event the machine controller detects a parameter outside normal operating limits, the unit will shutdown.

In the event the machine controller detects a parameter at a dangerously high or low level, the machine will be automatically be stopped with the cause of the SHUTDOWN shown on the diagnostic lights and display.

Delivered air volume at set point pressure is accomplished by two methods:

1. The compressor is loaded (inlet valve fully open or modulated partially open) or unloaded (inlet valve fully closed).
2. Engine speed varies between 1200 RPM and 1800 RPM while compressor is loaded to match the required volume flow.

Operation - Loaded

Assume engine has been started and is running in the unload state at 1200 RPM. If there is air demand (pressure falls below the load point pressure), compressor will load at 1200 RPM by opening the inlet valve. As air demand rises and falls, engine speed is controlled between 1200 RPM and 1800 RPM to match the required flow while maintaining rated pressure.

Operation - Unloaded

If there is no air demand at 1200 RPM (pressure rises above the unload point pressure), the compressor will unload by closing the inlet valve. The unit then runs at 1200 RPM unloaded with no air delivery. If air demand increases (pressure falls below the load point pressure), the compressor reloads to meet the required air demand.

Stopping

- Close air service valve(s).
- Allow the unit to run at "IDLE" for 3 to 5 minutes to reduce the engine temperatures.
- Turn the keyswitch to the "OFF" position.

NOTICE

Failure to allow turbo cool down prior to stopping can cause turbocharger damage.

**CAUTION**

Machines with EMERGENCY STOP BUTTON - Use the Emergency Stop Button only for emergency conditions. Do not use for normal machine stopping. Button must be reset before starting can be accomplished.

**NOTICE**

Once the engine stops, the automatic blowdown valve will relieve pressure from the separator tank.

**WARNING**

Even after pressure is relieved from the piping system, any air supply line from the compressor to a tool or machine could remain under pressure and cause serious personal injury or death. After the compressor stops, carefully open a valve at any tool or machine to exhaust the pressure in any line prior to removal or servicing.

**CAUTION**

Never allow the unit to sit stopped with pressure in the receiver-separator system. As a precaution, open the service valve.

IQ System

The IQ System is a complete, self-contained system which provides cooler, cleaner air than from a standard portable compressor. The system utilizes an integral aftercooler, high-efficiency filtration, and a patented condensate disposal system to provide the cool, clean air. The condensate disposal system injects all liquid condensed from the moisture separator and filters into the engine exhaust system where it is vaporized by heat. This eliminates the need for collecting the condensate, and the added cost of disposing of the condensate, which is often regulated by local, state, and/or federal regulations.

When equipped with the low ambient feature of the IQ System automatically adjusts movable louvers to control airflow through the aftercooler, ensuring that the compressed air temperature always remains above freezing temperatures (typically 45° F) at any ambient temperature down to -20° F. This prevents the need for 120V AC heat tracing systems, or any manual adjustment to prevent freezing of the compressed air system. All drain points for the condensate handling system are heated with 24V DC heat tracing, which is integral to the compressor control orifice heater system.

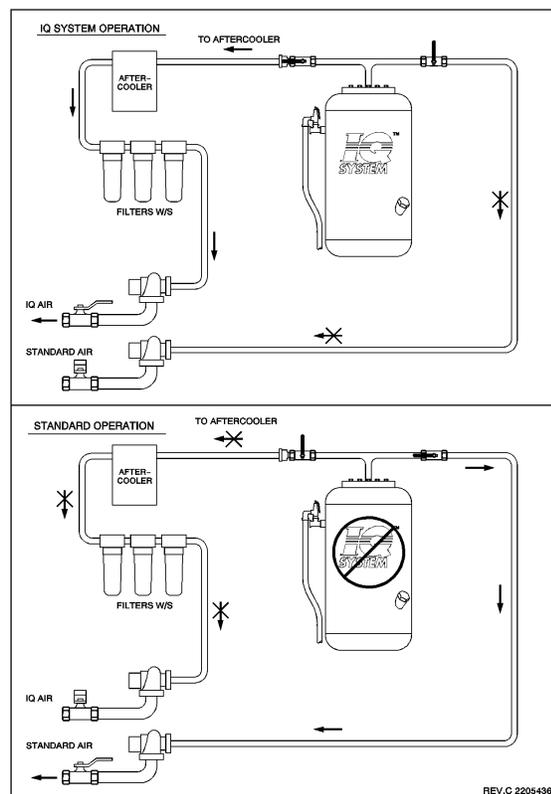
Theory of Operation

The compressed air exits the separator tank through the top cover piping, and can then travel along one of two paths, selectable via manual valving.

One path allows Standard Operation, which bypasses the IQ System, and delivers air quality equivalent to a standard oil-flooded portable compressor. If the IQ System is enabled by proper setting of the selector valve, the compressed air first enters the aftercooler.

The aftercooler is cooled by the incoming compressor package air, which is controlled by movable louvers mounted on the aftercooler (if equipped with low ambient option). At most conditions, the louvers are fully open, and maximum aftercooling is available. The compressed air and condensate (water with a small amount of compressor lubricant) exits the aftercooler and enters the moisture separator, where most of the condensate is removed.

The compressed air then flows through two stages of filtration, where the aerosol water and oil is removed down to approximately 0.01 ppm, and all particulates are removed down to 0.01 micron.



At the bottom of the moisture separator and both filters are strainers and constant-bleed orifices, which are sized to allow the maximum flow of condensate while minimizing compressed air loss.

The condensate lines are then piped together, and the condensate is injected at a single point into the engine exhaust piping. The compressed air then travels through the minimum pressure valve, and out through the service air valve. The air pressure gauge on the instrument panel indicates the pressure inside the separator tank. A service air pressure gauge is located inside the front door of the compressor on the filter support.

If the IQ System is bypassed (Standard Operation selected), the delivered air pressure will be approximately equal to the separator tank pressure. If the IQ System operation is selected, the delivered air pressure will be slightly less, depending on the restriction of the filters.

**CAUTION**

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

Low Ambient Option Operation

When the ambient temperature falls to the point that the aftercooler outlet temperature is approaching 45° F, the Temperature Control Unit (TCU), mounted on the rear of the control panel, will automatically adjust the louvers to control the cooling airflow through the aftercooler.

In the event that the unit is operating under abnormal conditions (i.e., an enclosure door open) which would cause excessive cooling of the aftercooler, a temperature sensor in the aftercooler outlet header will signal the TCU to further close the louvers if the compressed air temperature falls to approximately 36° F or lower.

There are no user selectable or serviceable components in the TCU. Contact Portable Power Service if any abnormal operation of the freeze protection control system occurs.

Daily Maintenance:

Verify, during full-load (maximum compressed air delivery) that the IQ System filter restriction indicators do not show excessive restriction. Restriction indicators for the filters are mounted inside the control panel, and will shut down the compressor if restriction exceeds recommended values.

**CAUTION**

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

Weekly Maintenance:

- Remove Y-strainer screens at the bottom of the moisture separator and both filters and clean out any residue.
- Verify that the orifices below the Y-strainers are not clogged.

- Verify that the piping from the orifice purge points to the exhaust system is not clogged.

**CAUTION**

Blockage of the Y-strainers, orifices, or piping can result in flooding of the vessels with condensate. If flooding occurs, excessive condensate may enter the air stream and could result in damage to downstream equipment.

Yearly Maintenance:

The normal maintenance interval on the primary and secondary IQ System filters is one year, or earlier if pressure drop becomes excessive. Restriction indicators for the filters are mounted on the filter support inside the front door, and will shut down the compressor if restriction exceeds recommended values.

**CAUTION**

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

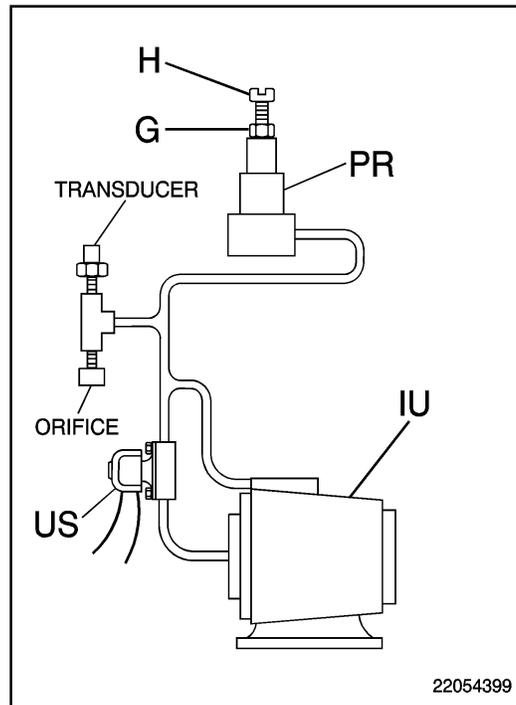
Filter Replacement

- With engine stopped, ensure pressure is relieved from air system.
- Remove all wires and hoses connected to drains on bottom of each filter housing. Inspect fittings and hoses for any blockage. Clean if necessary.
- Using a chain wrench or similar tool, loosen the housing. The housing should be removed by hand after loosening, taking care to prevent the housing from falling to the floor panel.
- Lower the housing to floor panel and lean it against the airend. Remove and replace the filter element, being careful not to damage outer wrap.

Verify the part number of new element vs. old element, as the two IQ filters are of different media.

- Put a small amount of petroleum jelly or other non-synthetic grease on the element O-Ring to aid installation into the filter head.
- Replace housing making sure to not overtighten.
- Repeat the above procedure on the remaining filter element.
- Reconnect all wires and hoses to drains on bottom of each filter housing.

Pressure Regulation



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

Before Starting Unit

1. Atop separator cover at pressure regulator (PR) loosen locknut (G) counterclockwise. Turn adjustment screw counter clockwise one full turn.

After Starting Unit

2. Allow unit to warm up, then push "Service Air Switch" on control panel.
3. Open and adjust service valve on outside of the unit to obtain the rated operating pressure on the discharge pressure gauge.

NOTE: If the rated operating pressure cannot be maintained with engine at full load speed, turn regulator adjustment screw (H) clockwise and adjust service valve until engine maintains rated full load speed.

4. Insure that pressure is maintained at rated pressure, then turn regulator adjustment screw (H) counter clockwise until engine speed just begins to be reduced.

NOTE: Turning regulator adjustment screw (H) clockwise will raise pressure at full speed.

5. Close service valve (engine will slow to no load or idle speed).
6. If necessary, repeat steps 3 and 4.
7. At pressure regulator (PR) tighten lock nut (G).
8. To adjust the unloaded pressure to any pressure between 80 psi (550 kPa) and the rated operating pressure, turn adjustment screw (H) of pressure regulator (PR) to obtain desired discharge pressure at full load engine speed. Always lock and protect pressure setting of adjusting screw (H) with locknut (G).
9. Ensure unloader solenoid (US) acts to hold pressure in inlet unloader (IU) after shutdown. After start-up, the compressor controller will open unloader solenoid (US).



Maintenance

Maintenance

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

*Disregard if not appropriate for this particular machine.

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

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

CBT = Check before towing.

CR = Check and report

D = Drain

G = Grease

R = Replace

T = Test

WI = or when indicated if earlier.

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

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

*Disregard if not appropriate for this particular machine.

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

(2) or as defined by local or national legislation

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

CBT = Check before towing.

CR = Check and report

D = Drain

G = Grease

R = Replace

T = Test

WI = or when indicated if earlier.

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

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

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

*Disregard if not appropriate for this particular machine.

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

(2) or as defined by local or national legislation

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

CBT = Check before towing.

CR = Check and report

D = Drain

G = Grease

R = Replace

T = Test

W I = or when indicated if earlier.

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

Routine Maintenance

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

The MAINTENANCE CHART indicates the various components' descriptions and the intervals when maintenance has to take place. Oil capacities, etc., can be found in the GENERAL DATA SECTION of this manual.

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

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

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

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

Prior to attempting any maintenance work, ensure that:-

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

 **WARNING**

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

This pressure must be relieved by :

(a) Disconnecting any downstream equipment.

(b) Opening the discharge valve to atmosphere.

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

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

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

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

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

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

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

Protective Shutdown System

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

Low engine fuel level switch.

Test the low engine fuel level switch circuit as follows:

- Start the machine.

NOTE: Do not press the load button.

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

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



Never remove or replace switches when the machine is running.

Scavenge Line

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

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

Compressor Oil Filter

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

Removal

WARNING

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

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

Inspection

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

CAUTION

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

NOTICE

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

Reassembly

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

CAUTION

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

Compressor Oil Separator Element

Refer to the MAINTENANCE CHART in this section for the recommended servicing intervals. If, however, the element has to be replaced, then proceed as follows:

Removal

WARNING

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

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

Inspection

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

Reassembly

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

WARNING

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

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

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

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

CAUTION

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

Compressor Oil Cooler and Engine Radiator

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

WARNING

Hot engine coolant and steam can cause injury. When adding coolant or antifreeze solution to the engine radiator, stop the engine at least one minute prior to releasing the radiator filler cap. Using a cloth to protect the hand, slowly release the filler cap, absorbing any released fluid with the cloth. Do not remove the filler cap until all excess fluid is released and the engine cooling system fully 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 element should be replaced regularly (refer to the MAINTENANCE CHART) or when the restriction indicator shows red, whichever comes first. The aircleaner precleaner dumps should be cleaned as indicated in the MAINTENANCE CHART (more frequently in dusty operating conditions).

Removal

 **CAUTION**

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

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

Reassembly

Assemble the new element into the filter housing ensuring that the seal seats properly. Secure element by tightening nut.

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

Ventilation

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

Cooling Fan Drive

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

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

Fuel Filter Water Separator

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

Charge Air Cooler Pipework

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

Engine damage will occur if the charge cooling system leaks.

Hoses

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

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

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

Electrical System



Disconnect the battery cables before performing any maintenance or service.

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

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

Battery

Keep the battery terminals and cable clamps clean and lightly coated with petroleum jelly to prevent corrosion. The battery restraint should be kept tight enough to prevent the battery from moving.

Pressure System

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

Tire Pressure

See the GENERAL DATA SECTION of this manual.

Running Gear/wheels

Check the wheel nut torque 20 miles (30 kilometres) after refitting the wheels. Refer to the TORQUE SETTING 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 CHART for frequency) and re-tighten where necessary. Refer to the TORQUE SETTING TABLE later in this section.

Lubrication



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

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

Engine Lubricating Oil

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

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

Compressor Lubricating Oil

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

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

WARNING

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

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

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

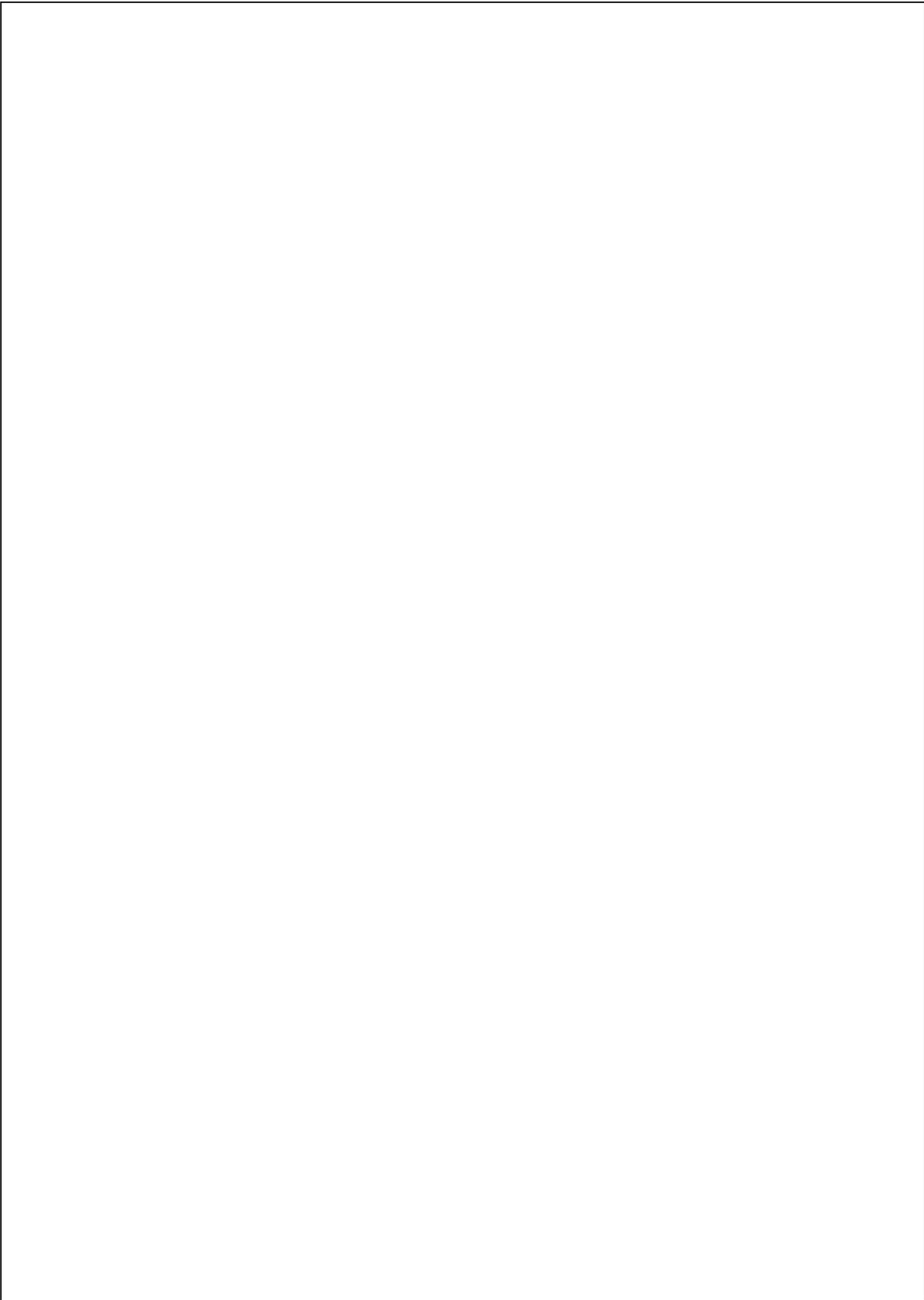
NOTE: If the oil is drained immediately after the machine has been running, then most of the sediment will be in suspension and will therefore drain more readily.

CAUTION

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

Running Gear Wheel Bearings

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





Lubrication

Lubrication

General Information

Lubrication is an essential part of preventive maintenance, affecting to a great extent the useful life of the unit. Different lubricants are needed and some components in the unit require more frequent lubrication than others. Therefore, it is important that the instructions regarding types of lubricants and the frequency of their application be explicitly followed. Periodic lubrication of the moving parts reduces to a minimum the possibility of mechanical failures.

The Preventive Maintenance Schedule shows those items requiring regular service and the interval in which they should be performed. A regular service program should be developed to include all items and fluids. These intervals are based on average operating conditions. In the event of extremely severe (hot, cold, dusty or wet) operating conditions, more frequent lubrication than specified may be necessary. Details concerning lubrication of the running gear are in Maintenance Section.

All filters and filter elements for air and compressor lubricant must be obtained through Portable Power to assure the proper size and filtration for the compressor.

Compressor Oil Change

These units are normally furnished with an initial supply of oil sufficient to allow operation of the unit for approximately 6 months or 1000 hours, whichever comes first. If a unit has been completely drained of all oil, it must be refilled with new oil before it is placed in operation. Refer to specifications in Lubrication Table.

NOTICE

Some oil types are incompatible when mixed and result in the formation of varnishes, shellacs, or lacquers which may be insoluble. Such deposits can cause serious troubles including clogging of the filters. Where possible, do NOT mix oils of different types and avoid mixing different brands. A type or brand change is best made at the time of a complete oil drain and refill.

If the unit has been operated for the time/hours mentioned above, it should be completely drained of oil. If the unit has been operated under adverse conditions, or after long periods in storage, an earlier change period may be necessary as oil deteriorates with time as well as by operating conditions.

 **WARNING**

High pressure air can cause severe injury or death from hot oil and flying parts. Always relieve pressure before removing caps, plugs, covers or other parts from pressurized air system. Ensure the following conditions are met:

- **Discharge air pressure gauge reads zero (0).**
- **No air discharging from an “open” manual blowdown valve.**

An oil change is good insurance against the accumulation of dirt, sludge, or oxidized oil products.

Completely drain the reservoir, piping, and cooler. If the oil is drained immediately after the unit has been run for some time, most of the sediment will be in suspension and, therefore, will drain more readily. However, the fluid will be hot and care must be taken to avoid contact with the skin or eyes.

After the unit has been completely drained of all old fluid, close the drain valve, install new oil filter elements. Add oil in the specified quantity at the filler plug. Tighten the filler plug and run the machine to circulate the oil. Check the oil level. **DO NOT OVERFILL.**

NOTICE

Portable Power provides compressor oil specifically formulated for Portable Compressors and requires the use of these fluids in order to obtain extended limited aircend warranty.

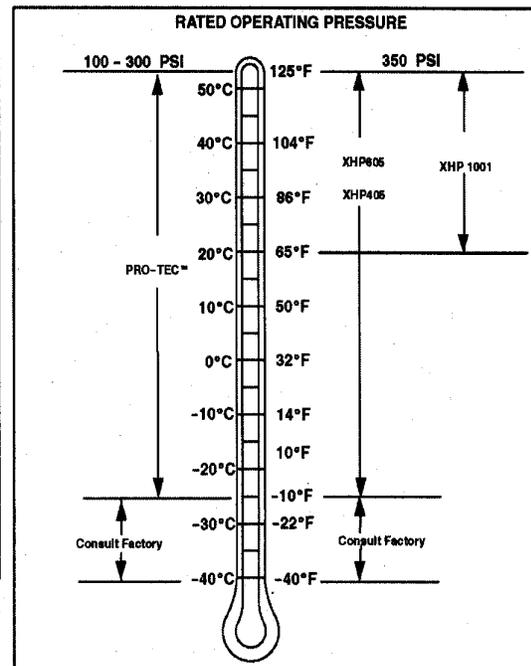
Portable Compressor Fluid Chart

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) 65°F to 125°F (18°C to 52°C)	Preferred: XHP 605 Alternate: XHP405 ISO Viscosity Grade 68 Group 3 or 5 with rust and oxidation inhibitors designed for air compressor service. Preferred: XHP605 XHP1001



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

Preferred Fluids	1 gal. (3.8 Litre)	5 gal. (19.0 Litre)	55 gal. (208.2 Litre)	220 gal. (836 Litre)
Pro-Tec™	36899698	36899706	36899714	36899722
XHP605	-	22252076	22252050	22252068
XHP1001	-	35612738	35300516	-
XHP405	-	22252126	22252100	22252118
Engine Oil	54480918	36875938	36866903	-



Troubleshooting

Trouble Shooting

Introduction

Troubleshooting for a portable air compressor is an organized study of a particular problem or series of problems and a planned method of procedure for investigation and correction. The troubleshooting chart that follows includes some of the problems that an operator may encounter during the operation of a portable compressor.

The chart does not attempt to list all of the troubles that may occur, nor does it attempt to give all of the answers for correction of the problems. The chart does give those problems that are most apt to occur. To use the troubleshooting chart:

- A. Find the “complaint” depicted as a bold heading.
- B. Follow down that column to find the potential cause or causes. The causes are listed in order (1, 2, 3 etc.) to suggest an order to follow in trouble shooting.

Action Plan

A. Think Before Acting

Study the problem thoroughly and ask yourself these questions:

1. What were the warning signals that preceded the trouble?
2. Has a similar trouble occurred before?
3. What previous maintenance work has been done?
4. If the compressor will still operate, is it safe to continue operating it to make further checks?

B. Do the Simplest Things First

Most troubles are simple and easily corrected. For example, most complaints are “low capacity” which may be caused by too low an engine speed or “compressor over-heats” which may be caused by low oil level.

Always check the easiest and most obvious things first; following this simple rule will save time and trouble.

NOTE: For troubleshooting electrical problems, refer to the Wiring Diagram Schematic found in Parts List Section.

C. Double Check Before Disassembly

The source of most compressor troubles can be traced not to one component alone, but to the relationship of one component with another. Too often, a compressor can be partially disassembled in search of the cause of a certain trouble and all evidence is destroyed during disassembly. Check again to be sure an easy solution to the problem has not been overlooked.

D. Find and Correct Basic Cause

After a mechanical failure has been corrected, be sure to locate and correct the cause of the trouble so the same failure will not be repeated. A complaint of “premature breakdown” may be corrected by repairing any improper wiring connections, but something caused the defective wiring. The cause may be excessive vibration.

General Information

The WEDGE controller records and displays diagnostic fault codes for the compressor system and the electronic engine. These codes are displayed on the 4-digit LED display on the machine control panel. Two of the ten LED diagnostic lamps on the control panel are used with fault codes display. One lamp is designated “Engine Fault” and the other “Compressor Fault”. When the engine fault lamp is on, all codes displayed are engine faults. When the compressor fault lamp is on, all codes displayed are compressor or package related faults.

A list of compressor and engine faults is attached with the placards inside the machine control panel and provided in this section. The table of Alert/Shutdown conditions in this section also lists the compressor fault codes and a list of the engine fault codes is provided.

The engine diagnostic fault codes can also be read with the manufacturer's service tool. A service tool connector is mounted on the engine. This connector provides a connection to the J1939 CAN network. For advanced engine troubleshooting, it is recommended that the manufacturer's service tools be used with accompanying service literature.

Fault Code	Description (QSX15 Engine Fault Codes)
111	Engine Control Module - Critical Internal Failure
115	Engine Speed/Position Sensor Circuit - Lost both signals from Magnetic Pickup Sensor
121	Engine Speed/Position Sensor Circuit - Lost one or two signals from Magnetic PU Sensor
122	Intake Manifold Pressure Sensor #1 Circuit - Shorted High
123	Intake Manifold Pressure Sensor #1 - Circuit - Shorted Low
135	Engine Oil Pressure Sensor Circuit - Shorted High
141	Engine Oil Pressure Sensor Circuit - Shorted Low

Fault Code	Description (QSX15 Engine Fault Codes)
143	Engine Oil Pressure Low - Warning
144	Engine Coolant Temperature Sensor Circuit - Shorted High
145	Engine Coolant temperature Sensor Circuit - Shorted Low
151	Engine Coolant temperature High - Critical
153	Intake Manifold Temperature Sensor #1 Circuit Shorted Low
154	Intake Manifold Temperature Sensor #1 Circuit Shorted High
155	Intake Manifold Temperature #1 High - Critical
187	Sensor Supply Voltage #2 Circuit - Shorted Low
212	Engine Oil Temperature Sensor Circuit - Shorted High
213	Engine Oil Temperature Sensor Circuit - Shorted Low
214	Engine Oil Temperature High - Critical
221	Ambient Air Pressure Sensor Circuit - Shorted High
222	Ambient Air Pressure Sensor Circuit - Shorted Low
223	Engine Oil Burn Valve Solenoid Circuit - Shorted Low
227	Sensor Supply Voltage #2 Circuit - Shorted High
234	Engine Speed High - Critical
235	Engine Coolant Level Low - Critical
241	Vehicle Speed Sensor Circuit - Data Incorrect
245	Fan Clutch Circuit - Shorted Low
254	Fuel Shutoff Valve Circuit - Shorted Low
255	Fuel Shutoff Valve Circuit - Shorted High
259	Fuel Shutoff Valve - Stuck Open
284	Engine Speed/Position Sensor #1 (Crankshaft) Supply Voltage Circuit - Shorted Low
285	SAE J1939 Multiplexing PGN Timeout Error
286	SAE J1939 Multiplexing Configuration Error
287	SAE J1939 Multiplexing Remote Throttle Error
295	Ambient Air Pressure Sensor Circuit - Data Incorrect
299	Engine Shutdown Commanded By J1939
311	Injector Solenoid Valve Cylinder #1 Circuit Grounded Circuit

Fault Code	Description (QSX15 Engine Fault Codes)
312	Injector Solenoid Valve Cylinder #5 Circuit Grounded Circuit
313	Injector Solenoid Valve Cylinder #3 Circuit Grounded Circuit
314	Injector Solenoid Valve Cylinder #6 Circuit Grounded Circuit
315	Injector Solenoid Valve Cylinder #2 Circuit Grounded Circuit
319	Real Time Clock - Power Interrupt
341	Engine Control Module - Data Lost
343	Engine Control Module - Warning Internal Hardware Failure
346	Engine Control Module - Warning Software Error
352	Sensor Supply Voltage #1 Circuit - Shorted Low
378	Fueling Actuator #1 Circuit - Open Circuit
379	Fueling Actuator #1 Circuit - Grounded Circuit
386	Sensor Supply Voltage #1 Circuit - Shorted High
394	Timing Actuator #1 Circuit - Open Circuit
395	Timing Actuator #1 Circuit - Grounded Circuit
396	Fueling Actuator #2 Circuit - Open Circuit
397	Fueling Actuator #2 Circuit - Grounded Circuit
398	Timing Actuator #2 Circuit - Open Circuit
399	Timing Actuator #2 Circuit - Grounded Circuit
415	Engine Oil Pressure Low - Critical
418	Water in Fuel Indicator High - Maintenance
422	Engine Coolant Level Sensor Circuit - Data Incorrect
426	SAE J1939 Datalink - Cannot Transmit
428	Water in Fuel Sensor Circuit - Shorted High
429	Water in Fuel Sensor Circuit - Shorted Low
433	Intake Manifold Pressure Sensor Circuit - Data Incorrect
434	Power Lost Without Ignition OFF
435	Engine Oil Pressure Sensor Circuit - Data Incorrect
441	Battery #1 Voltage Low - Warning
442	Battery #1 Voltage High - Warning

Fault Code	Description (QSX15 Engine Fault Codes)
449	Fuel Pressure High - Warning
451	Injector Metering Rail #1 Pressure Sensor Circuit - Shorted High
452	Injector Metering Rail 31 Pressure Sensor Circuit - Shorted Low
466	Turbocharger #1 Wastegate Control Circuit - Data Incorrect
482	Fuel Pressure Low - Warning
483	Injector Metering Rail #2 Pressure Sensor Circuit - Shorted High
484	Injector Metering Rail #2 Pressure Sensor Circuit - Shorted Low
485	Injector Metering Rail #2 Pressure High - Warning
486	Injector Metering Rail #2 Pressure Low - Warning
496	Engine Speed/Position Sensor #2 (Camshaft) Supply Voltage
546	Fuel Delivery Pressure Sensor Circuit - Shorted High
547	Fuel Delivery Pressure Sensor Circuit - Shorted Low
553	Injector Metering Rail #1 Pressure High - Warning
581	Fuel Supply Pump Inlet Pressure Sensor Circuit - Shorted High
582	Fuel Supply Pump Inlet Pressure Sensor Circuit - Shorted Low
583	Fuel Supply Pump Inlet Pressure Low - Warning Level
595	Turbocharger #1 Speed High - Warning Level
596	Electrical Charging System Voltage High - Warning Level
597	Electrical Charging System Voltage Low - Warning Level
598	Electrical Charging System Voltage Low - Critical Level
611	Engine Hot Shutdown
753	Engine Speed/Position #2 Cam Sync. Error
755	Injector Metering Rail #1 Pressure Malfunction
758	Injector Metering Rail #2 Pressure Malfunction
951	Cylinder Power Imbalance Between Cylinders

Wedge Diagnostic Display Codes

If the  fault indicator lamp is illuminated, refer to the  Alert/Shutdown List

If the  fault indicator lamp is illuminated, refer to the  Engine Diagnostic List

 ALERT/SHUTDOWN CONDITIONS					
Condition	Alert		Shutdown		
	Code	Light (Blinks)	Code	Light (Steady)	Delay (sec).
Engine Speed <min rpm			1	CPRSR Malf.	30
Engine Speed >max rpm			2	CPRSR Malf.	30
Engine Crank Time Exceeded			3	CPRSR Malf.	0
High Engine Oil Temperature	5	CPRSR Malf.			
High Intake Manifold Temp	6	CPRSR Malf.			
Water in Fuel	8	CPRSR Malf.			
Engine not responding to throttle command	10	CPRSR Malf.			
Too many start attempts during Autostart			11	CPRSR Malf.	0
Engine shuts itself down, reason unknown			29	CPRSR Malf.	0
Low AE Oil Pressure			31	CPRSR Malf.	20
Disch. Temp (RT2) Sensor Fault	33		32	CPRSR Malf.	10
Sep. Tank Pressure (PT1) Sensor Fault	33	CPRSR Malf.			
Sep. Tank Press >20 psi during start attempt (engine will not crank)			34	CPRSR Malf.	0
Machine Over Pressure			35	CPRSR Malf.	1
Safety Valve Open			36	CPRSR Malf.	2
Sep. Tank Temp >247°F			50	CPRSR Malf.	3
Machine ID not valid			51	CPRSR Malf.	0
Sep. Tank Temp. (RT1) Sensor Fault			53	CPRSR Malf.	10
Reg. Sys. Pressure (PT2) Sensor Fault	54	CPRSR Malf.			
ESTOP Button Pushed	55	CPRSR Malf.	55	CPRSR Malf.	3
Minimum Pressure not met	56	CPRSR Malf.			

ALERT/SHUTDOWN CONDITIONS					
Serial Comm. Problem	70	CPRSR Malf.			
CAN Bus Problem	71	CPRSR Malf.			
Condition	Code	Light (Blinks)	Code	Light (Steady)	Delay (sec).
Auto Start/Stop Module Failure - no comm for 17 sec.	73	CPRSR Malf.			
Low Fuel Level		fuel level		fuel level	3
Air Filter Restriction		soiled filter			
Low Battery Voltage		battery charging cond.			
Low Engine Oil Pressure		low engine oil press			
Low Coolant Level		engine coolant level			
High Engine Coolant Temp.		high engine temp.		high engine temp.	10
IQ Filter Restriction				IQ filter restriction	3
High Disch. Temp (RT2>247°F)				high comp. temp.	3

Troubleshooting Chart

Bold Headings depict the COMPLAINT - Subheadings suggest the CAUSE

NOTE: Subheadings suggest sequence to follow troubleshooting.

1. Unit Shutdown:

Out of Fuel
 Compressor Oil Temp. too High
 Engine Water Temp. too High
 Engine Oil Pressure too Low
 Broken Engine Fan Belt

 Loose Wire Connection

 Low Fuel Level Shutdown
 Defective Sensor
 Malfunctioning Relay
 Blown Fuse
 Engine Malfunctioning
 Airend Malfunctioning

Corrective Action

Add CLEAN diesel Fuel
 See Complaint 6
 Check coolant level. If necessary, Add.
 See Complaint 3 and Complaint 4.
 Replace fan belt.
 Wiggle wires at switches & connector blocks.
 Make repairs.
 Replace fuel sender.
 Replace sensor.
 Replace relay.
 Replace fuse.
 See Troubleshooting in Engine Manual.
 See Complaint 6.

2. Won't Start/Run:

Low Battery Voltage
 Blown Fuse
 Malfunctioning Start Switch
 Clogged Fuel Filters
 Out of Fuel
 Compressor Oil Temp. too High
 Engine Water Temp. too High
 Engine Oil Pressure too Low
 Loose Wire Connection
 Defective Sensor
 Malfunctioning Relay
 Engine Malfunctioning
 Airend Malfunctioning

Check electrolyte level. Check connections.
 Replace fuse.
 Replace switch.
 Service filters. See Engine Operator's Manual.
 Add CLEAN fuel.
 See Complaint 6.
 Check fluid level. If necessary, Add.
 See Complaint 3 and Complaint 4.
 Repair or replace connection.
 Replace sensor.
 Replace relay.
 See Troubleshooting in Engine Manual.
 See Complaint 10, 11.

3. High Engine Temperature

Broken Engine Fan Belt
 *Ambient Temp. > 115° F
 Dirty Operating Conditions
 Dirty Cooler
 *Out of Level > 15 degrees
 Operating Pressure too High
 Recirculation of Cooling Air
 Loose Wire Connection

Replace fan belt set.
 Above spec limit.
 Move unit to cleaner environment.
 Clean exterior of cooler.
 Relocate or reposition unit.
 Reduce pressure to spec.
 Close side doors.
 Repair or replace.

* : > = greater than, < = less than

4. Low Engine Oil Pressure

Low Oil Level
 Out of Level > 15 degrees
 Wrong Lube Oil
 Clogged Oil Filter Element(s)
 Engine Malfunctioning
 Loose Wire Connection.

Corrective Action

Add oil.
 Relocate or reposition.
 See Engine Oil Spec. Change oil.
 Replace element(s).
 See Troubleshooting in Engine Manual.
 Repair or replace.

5. Alternator Low Voltage

Loose or Broken Belts
 Loose Wire Connection
 Low Battery Voltage

Tighten or replace belt set.
 Repair or replace connection.
 Check electrolyte level. Add if necessary.
 Check connectors. Clean & tighten.
 Recharge battery.
 Repair or replace alternator.

Malfunctioning Alternator

6. High Compressor Discharge Temperature:

Ambient Temp. > 115° F
 Out of Level > 15 degrees
 Low Oil Level
 Wrong Lube Oil
 Dirty Cooler
 Dirty Operating Conditions
 Clogged Oil Filter Elements
 Loose or Broken Belts
 Operating Pressure too High
 Recirculation of Cooling Air
 Malfunctioning Thermostat
 Malfunctioning Fan
 Defective Oil Cooler Relief Valve
 Defective Minimum Pressure Valve
 Blocked or Restricted Oil Lines
 Airend Malfunctioning

Above spec limit.
 Relocate or reposition unit.
 Add oil. Look for any leaks.
 Check spec. in this manual.
 Clean exterior surfaces.
 Move unit to cleaner environment.
 Replace elements. Change oil.
 Tighten or replace belt set.
 Reduce pressure to spec.
 Close side doors. Replace belly pan.
 Replace thermostat in bypass valve.
 Check fan belt tension. Tighten or replace belt set.
 Replace valve.
 Repair or replace valve.
 Clean by flushing or replace.
 See Complaint 11, 12

7. Engine RPM Down:

Clogged Fuel Filter (primary)
 Operating Pressure too High
 Dirty Air Filter
 Wrong Air Filter Element
 Engine Malfunctioning
 Airend Malfunctioning

Replace primary filter. Replace final filter. Drain tanks. Add CLEAN fuel.
 Reduce pressure to spec limit.
 Clean or replace elements.
 Install correct element.
 See Troubleshooting in Engine Manual.
 Refer to Factory.

8. Excessive Vibration:

Rubber Mounts, Loose or Damaged	Tighten or replace.
Defective Fan	Replace fan.
Drive Coupling Defective	Replace coupling.
Engine Malfunctioning	See Troubleshooting in Engine Manual.
Airend Malfunctioning	See Complaint 7, 11, 12
Engine idle speed too low.	See Engine Manual.

9. Low CFM:

Dirty Air Filter	Clean or replace elements.
Incorrect Linkage Adjustment	Make adjustment per Section 6.
Malfunctioning Inlet Unloader/Butterfly Valve	Inspect valve. Make adjustment per Section 6.
Wrong Air Filter Element	Install correct element.

10. Short Air Cleaner Life:

Dirty Operating Conditions	Move unit to cleaner environment.
Inadequate Element Cleaning	Install new element.
Incorrect Stopping Procedure	Read procedure in this manual.
Wrong Air Filter Element	Install proper element.

11. Will Not Unload:

Malfunctioning Inlet Butterfly Valve	Inspect valve fit. Re-adjust per Section 6.
Ice in Regulation Lines/Orifice	Apply heat to line(s) and or orifice.
Load Solenoid Leak	Replace load solenoid.
Plugged Vent Leak	Clean and/or replace.

12. Safety Valve Relieves:

Operating Pressure too High	Reduce pressure to spec limit.
Malfunctioning Inlet Unloader/Butterfly Valve	Inspect valve fit. Readjust per Section 6.
Defective Safety Valve	Replace safety valve.
Unit will not Unload Fast Enough	Apply heat to lines and/or orifice.



Electrical

Electrical

General Information and Operational Theory

General

The machine has an electronic monitor and control system to provide discharge air pressure control and engine and package monitor functions. The system uses the WEDGE controller to perform these functions. The electrical system connects all the necessary switches, sensors and transducers to the WEDGE controller in order for it to perform the monitor and control functions.

Wedge Controller

The WEDGE controller is the heart of the machine monitor and control system. It provides data collection, alarming and control functions for compressor operations. It is a micro controller based unit with analog and digital inputs and outputs.

The WEDGE controller is attached to the back of the control panel. The LED annunciators are part of the front panel of the WEDGE. They can be seen through the laminate on the front of the control panel. The WEDGE is attached to the control panel with four #10 size nuts.

The first function of the WEDGE is to scan all analog and digital inputs at a fixed interval. These inputs are scanned every 50 milliseconds. The analog values are then compared against minimum and maximum values and an ALERT or SHUTDOWN is issued, if a value is out of range. The various ALERTS and SHUTDOWNS are listed in the trouble shooting section.

The second function of the WEDGE controller is machine discharge pressure control. The WEDGE monitors the regulation system air pressure and varies the engine throttle to maintain the setpoint discharge air pressure. The setpoint pressure is set using the regulator on the separator tank.

The third function of the WEDGE controller is to communicate with the diesel engine via the J1939 CAN network. The WEDGE controller provides the engine throttle setting to the engine controller and retrieves diagnostic information from the engine.

A PWM (Pulse Width Modulated) throttle is used to communicate with the CAT engine. The WEDGE controller receives diagnostic and run time data from the engine over the J1939 CAN network. A PWM throttle interface is used with the engine.

It has a base frequency of 500 Hz and the duty cycle varies from 10% to 90%.

Figure 8-2 shows the signals between the engine controller and the WEDGE controller.

Sensors and Transducers

The electronics system contains sensors and transducers that are used to collect process data from the compressor. The temperature is measured by a thermistor. This device exhibits a change in resistance as the temperature changes. The resistance causes an input voltage change to the WEDGE controller input and is interpreted as a temperature change.

The electronics system also uses pressure transducers to measure process pressure changes. These devices have an output signal of .45V DC to 4.5V DC, corresponding to 0 psi and the maximum measured psi for a particular device. The maximum pressure transducer ranges are 100 or 225 psi. The 100 and 225 psi devices are gauge pressure devices. These transducers are provided with 5V DC excitation to power the device. These are three wire devices: excitation, signal and ground (return) connections.

Digital Inputs and Outputs

The WEDGE controller scans digital inputs such as switch contacts. These are either "ON" (24V DC) or "OFF" (0 V DC). These digital inputs are connected to switches within the package such as the key start switch, air filter switches and IQ filter switches.

The WEDGE controller provides 24V DC digital outputs to control solenoids, start compressor and DC heaters. These are 24V DC "ON" and 0V DC "OFF". They are current limited and short circuit protected.

Controller Outputs:

The WEDGE controller has three different types of outputs: frequency, pulse width modulated (PWM) and 24V DC digital (ON/OFF). The frequency output is used as a throttle signal for the engine.

The PWM signal is used as a throttle signal for the Caterpillar engine. It has a base frequency of 500 Hz and the duty cycle varies from 10% to 90%.

Pressure Control

The discharge pressure is controlled by manipulating the engine speed and compressor inlet valve position. The inlet valve position is controlled pneumatically and the engine speed is determined by the WEDGE controller. The WEDGE measures the pneumatic system regulation pressure and computes an engine throttle setting. This throttle setting is sent to the engine via the frequency throttle, PWM or J1939 throttle, depending on which technique is used. The engine controller will control engine speed to this throttle setting.

Electronic Engine

The HP1300/1600 machine contains an emissions certified diesel engine. In order to meet the emissions requirements, the engine has an electronic control system.

The control system handles all the monitor, alarm and control functions for the engine. The WEDGE controller communicates with the engine controller over the J1939 CAN network.

J1939 Data Link - The CAN network is a single pair shielded cable located with the W1 main harness. Figure 8-3 shows a layout of the CAN harness or “backbone” as it is referred to. The termination resistors (Terminator) are important to prevent reflections on the transmission line and must be in place for the network to function properly. The shield from the cable is floating at the WEDGE controller end.

The engine diagnostics connector is located on the left side of the engine. This is used to connect the engine manufacturer’s service tools to the CAN network. This connector also provides 24V DC power to these service tools.

Electrical System

The electrical system consists of the wiring harnesses and associated electrical devices such as relays, switches, lights, solenoids and alarm horn. There are two wiring harnesses in the machines. They are as follows:

22614416 W1 Chassis Main Wiring Harness

22108690 Control Panel Wiring Harness

The schematic diagrams show the connections for these harnesses. Figure 8-1 is a system diagram showing harness connection with devices and controllers.

The electrical circuits are protected using ATC style fuses. A fuse should only be replaced with one of the same rating. Replacing a fuse with one of a larger rating could lead to harness damage. If a fault occurs and the circuit does not have the appropriate size fuse, wires could be burned in the harness and damage other circuits.

Software versions 1.60 and greater use software to set the machine ID. Versions less than 1.60 use an ID resistor plug, R2. The ID plug is located behind the control panel box on the W1 harness trunk. The resistor plugs are molded in colors for easy identification.

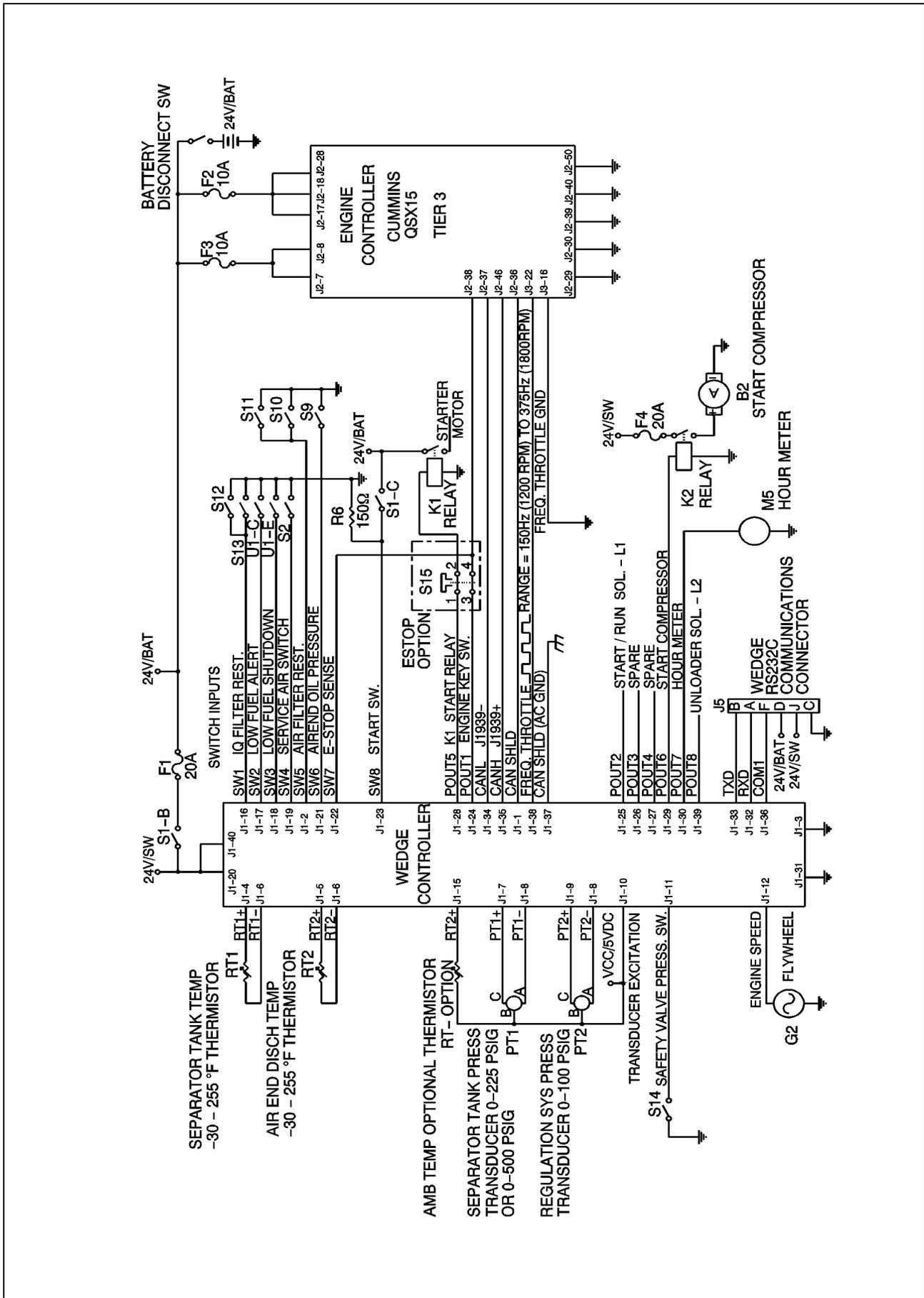
It is recommended that all machines be upgraded to version 1.60 or greater. The software set machine ID is much more reliable than the resistor plug.

Troubleshooting Flow Chart

PROBLEM	CHECK LIST
Control panel key is turned to "ON" position, WEDGE controller annunciator lamps and 4 digit LED display do not come on	Check F1 fuse Check operation of switch S1 Check wiring from S1 to WEDGE controller Checking battery voltage, ensure battery disconnect switch is turned ON
Wedge controller annunciator lamps & 4 digit LED display initialize OK but alternator lamp and engine oil pressure lamps do no blink.	J1939 CAN communications not working Check for 24FDC key switch at engine CAN network wiring problem Ensure 24VDC power to engine ECM Check connector pins
Engine cranks but will not start	Ensure key switch (24VDC) at engine Frozen fuel cooler or associated piping Estop button pressed (ESA units) or Estop jumpers not making connection Clear active engine fault code
Engines does not crank when key turned to crank position	Check switch S1 Check relay K1 Check starter solenoid Check starter motor Check WEDGE output to K1 relay Check battery voltage
Compressor fails to load when "Service Air" switch pressed	Check Run/Start valve operation Verify frequency throttle signal at engine Check "Service Air" switch operation



Electrical Schematics



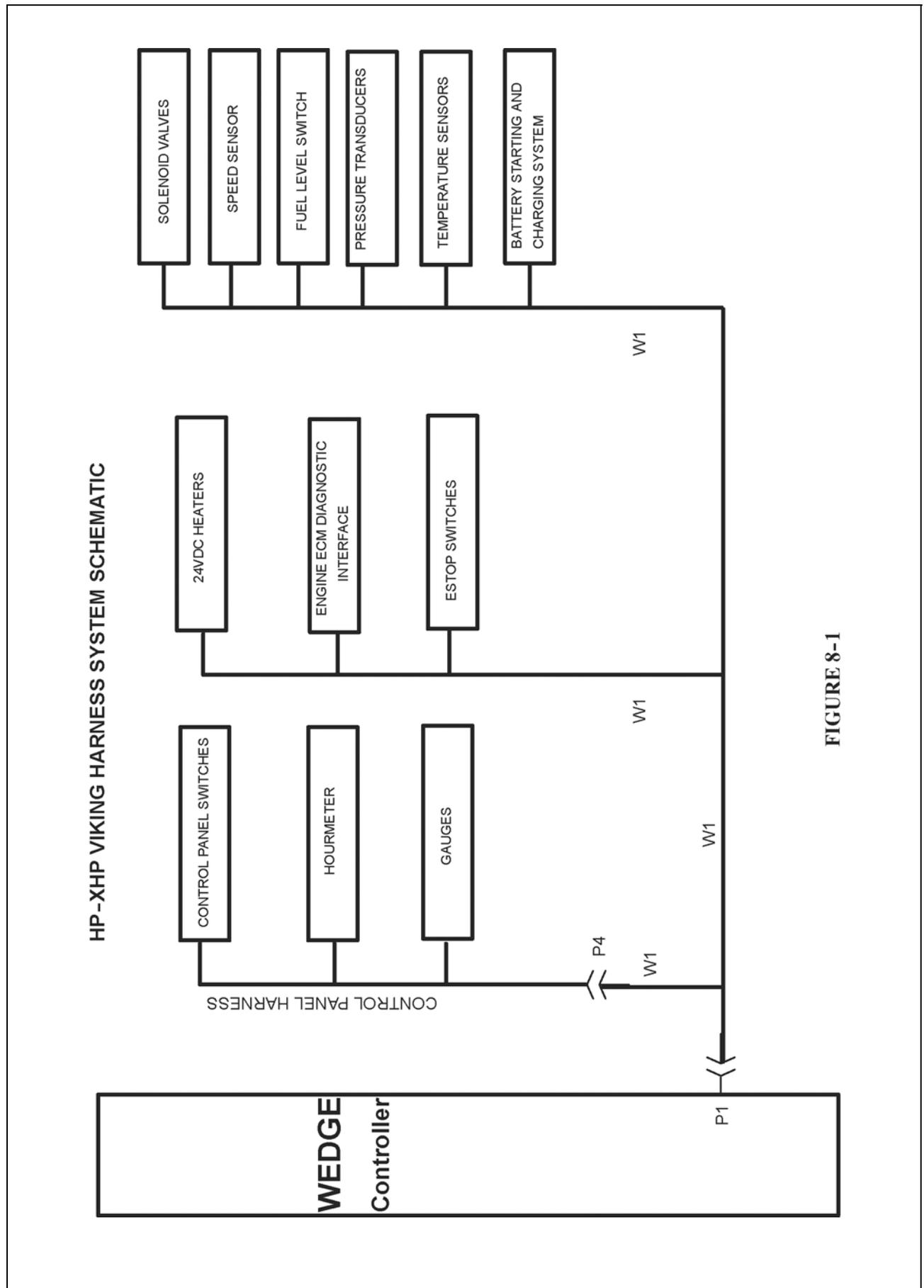


FIGURE 8-1

WEDGE TO ENGINE INTERFACE
CUMMINS ENGINE

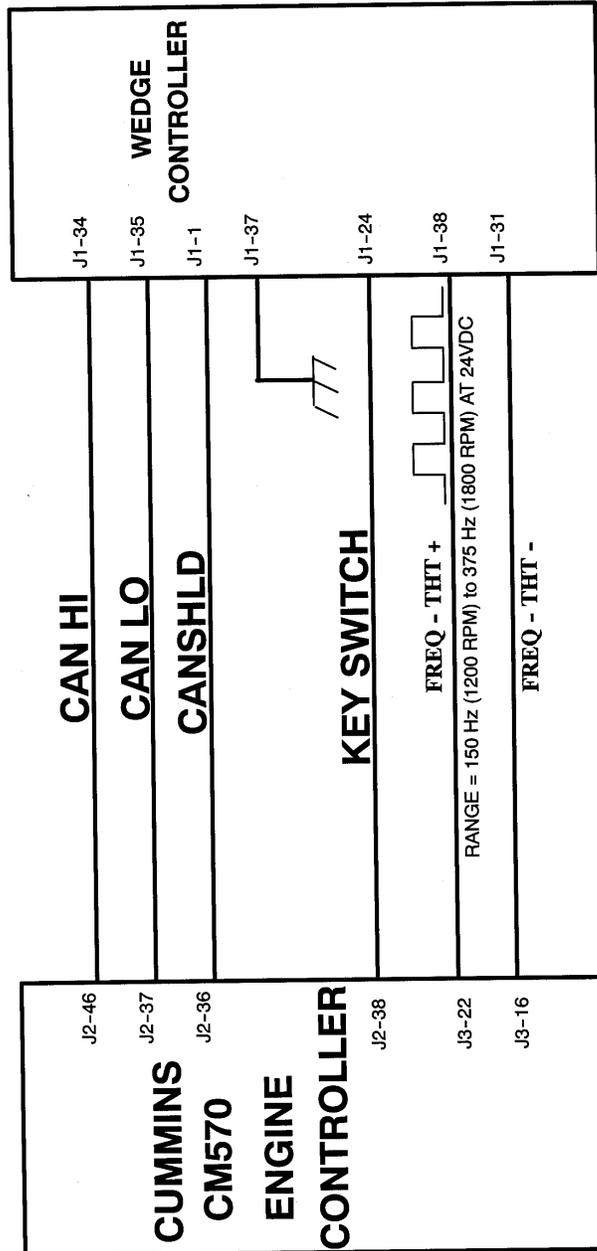


FIGURE 8-2

HP-XHP VIKING J1939 CAN COMMUNICATIONS SCHEMATIC

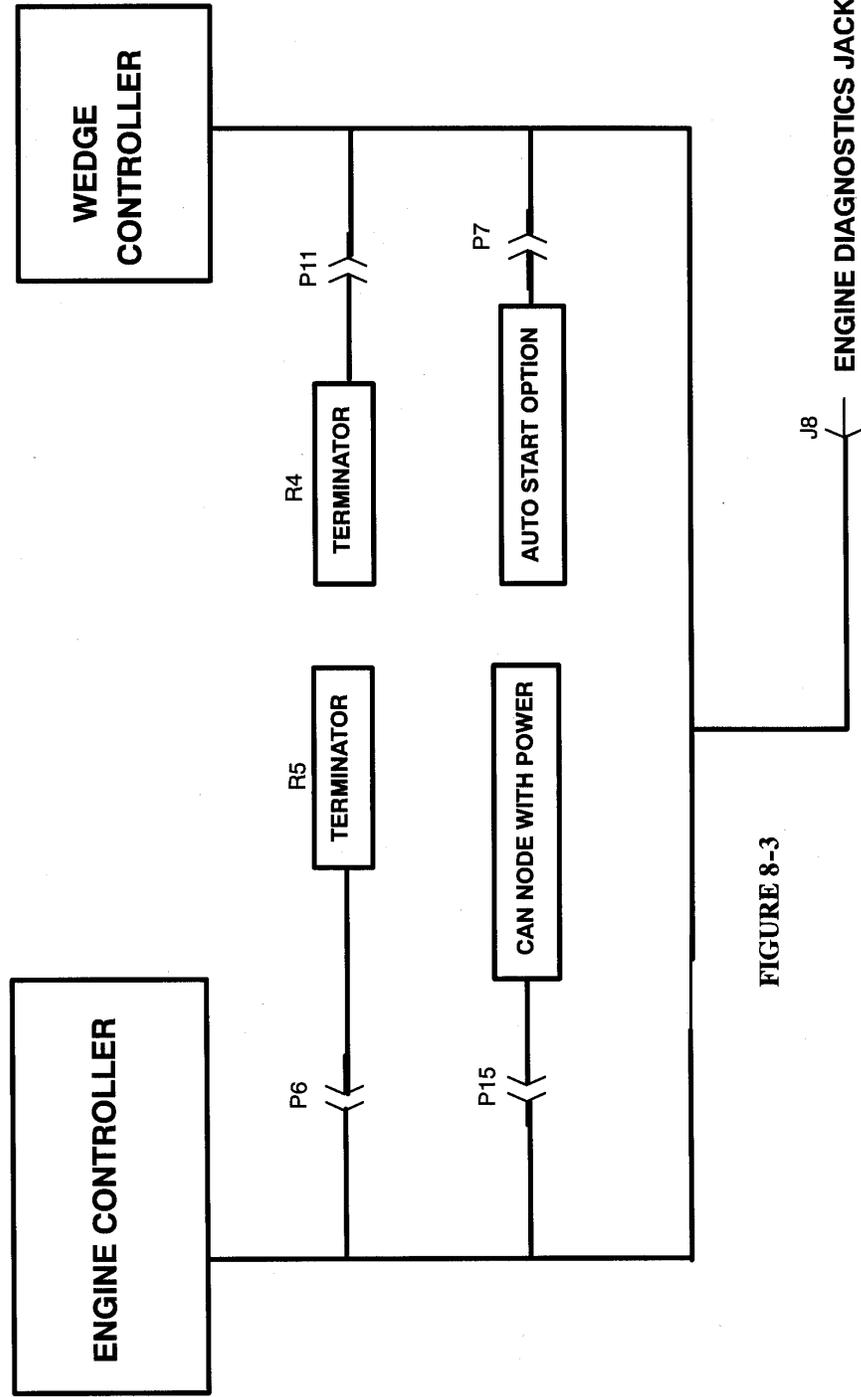


FIGURE 8-3



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

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Portable Power