



**POWER SOLUTIONS  
INTERNATIONAL**

**0.97L SSI**

**Owners Manual**



**PSI** INDUSTRIAL

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## Introduction

PSI International is pleased that you have selected our engine for your requirements. PSI International takes great pride in our tradition of quality products produced from our line of industrial gasoline and alternative fuel engines.

PSI International engines are inspected and tested before leaving the factory. However, certain checks should be made before placing the engine into regular service. Please read the Initial Start-Up inspection requirements in the Maintenance Section of this manual.

## How to Use this Manual

This manual contains instructions on the safe operation and preventive maintenance of your PSI International industrial engine. We urge you to read this manual prior to start up or operation of the engine.

The Table of Contents permits you to quickly open the manual to any section.

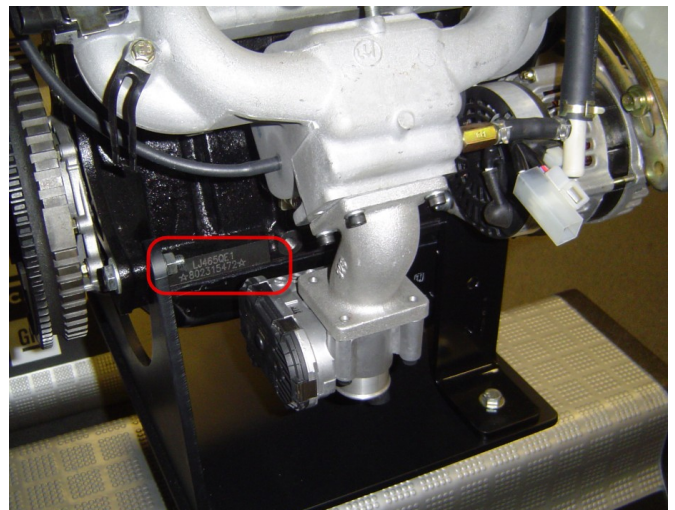
PSI International engines are built with a variety of standard and/or optional components to suit a broad range of customer requirements. This manual does not identify equipment as standard or optional. All the equipment described in this manual may not be found on your engine or power unit.

Please pay special attention to the NOTES, CAUTIONS, and WARNINGS. WARNINGS remind you to be careful in areas where carelessness can cause personal injury. CAUTIONS are given to prevent you from error that could cause damage to the equipment. NOTES give you added information designed to help you.

The descriptions and specifications contained in this manual were in effect at the time of publication. PSI International reserves the right to discontinue models at any time, or to change specifications or design without notice and without incurring obligation.

## Engine Identification

An identification label is affixed to the valve cover or label plate of the engine. The label contains the engine serial number which identifies the engine from other PSI International engines. The serial number is in the format of 9 digits and will be unique to the engine. The engine model and serial number are required when seeking information concerning the engine and/or ordering replacement service parts. The serial number is also stamped on the lower right side of the block next to the flywheel (See picture to the right).



## **Parts and Service**

Replacement parts can be obtained from PSI International by calling the Aftermarket Parts Department at 888-331-5769. The engine model and serial number will be required when seeking information and/or ordering parts.

Service and technical support for PSI engines can be obtained by contacting the Service Department at 888-331-5764 or via email at [service@powergreatlakes.com](mailto:service@powergreatlakes.com).

## **Service Literature**

Additional operator manuals and service manuals for specific PSI International engines can be obtained by contacting the Parts or Service Department at 888-331-5769.

## **Operating Instructions**

### **Safety Gauges**

PSI International industrial power units are equipped with instrument panels which contain shut down gauges for High Engine Water Temperature and Low Engine Oil Pressure. A push button 'Tattletale' relay is utilized with this system. When starting the engine it is necessary to 'depress' the safety switch override button, until the engine starts and engine oil pressure is obtained (usually 2 to 5 seconds). The engine will continue to run when the button is released.

**CAUTION:** If the engine does not continue to run when the button is released, it will be necessary to check the instrument panel fuse and/or the engine lubrication system (i.e. oil level, etc.) before restarting the engine.

**NOTE:** PSI International provides engines to many different original equipment manufacturers. Not all manufacturers use the PSI instrument panel. Please refer to the equipment Operators Manual for instructions on engine starting.

### **Fuel Systems**

Your PSI International supplied engine may have a Port Fuel Injected (PFI) gasoline injection system or diaphragm style variable venture dry fuel mixer. The type of fuel system is dependent on the application and the requirements of the application. Contact PSI with the engine serial number if you would like to know what specific fuel system is installed on your PSI International engine.

## Governors

PSI International engines have an isochronous governor installed. The governor controls the movement of the throttle plate via a 0-12 volt signal and a ground provided by the Engine Control Module. The throttle plate allows the correct amount of air to enter the engine; this movement is monitored by using 2 throttle position sensors located internal to the governor. The ECM monitors various engine sensors to determine what the correct throttle position should be.

## Instruments

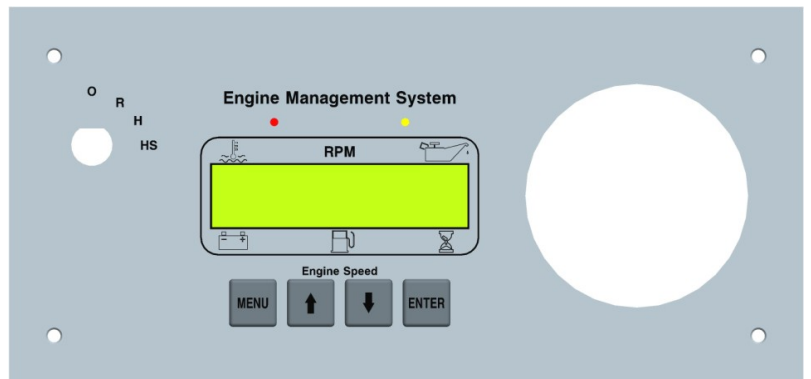
### PSI Closed Power Unit Instrument Panel

The instrument panel is used to increase and decrease the programmed governor set speeds. To change the engine speeds press the up arrow to increase and the down arrow to decrease.

In addition, the instrument panel can also be used to display engine operating parameters such as coolant temperature, oil pressure and engine speed and trouble codes.

To access the menu items press and hold the Menu button and then press the Enter button. Use the Up and Down Arrow to shift between menus. Press the Enter button to access a menu. Press the Menu button to back out of a menu.

Contact the PSI Service Department for any additional questions regarding the function of this panel.



## Oil Pressure Reading

The oil pressure reading shows the engine lubrication system pressure in pounds per square inch (psi) and should be checked frequently to ensure that the system is functioning correctly. Should the pressure fluctuate or drop, stop the engine and find the cause. Do not operate the engine at lower than normal oil pressure (see maintenance schedule for minimum engine oil pressure).

**CAUTION:** Do not continue to operate your engine below the normal operating range. Severe engine damage could occur.

## **Temperature Reading**

The coolant temperature reading will indicate overheating which may arise from low coolant level, plugged radiator, loose fan belt or faulty thermostat. Coolant level should be checked daily.

**CAUTION:** If the engine continues to overheat, have the cooling system checked and serviced.

## **Voltage Reading**

The voltage reading indicates the battery charging voltage. If the meter consistently indicates less than 13 volts or more than 15.7 volts under normal operating conditions, you should have the engine electrical system checked by a qualified service technician.

## **Tachometer/Hourmeter**

The tachometer indicates the engine speed in hundreds of revolutions per minute (rpm). It serves, as a guide to insure that engine speed is set correctly.

The hour meter records the hours of operation and is used to determine when periodic maintenance is required.

## **Starting the Engine**

**Warning:** All internal combustion engines give off various fumes and gases while running. Do not start or run the engine in a closed or poorly ventilated building where exhaust gases can accumulate. Avoid breathing these gases as they may contain poisonous carbon monoxide, which can endanger your health or life if inhaled steadily for even a few minutes.

If the engine is equipped with a manual clutch it must be disengaged prior to starting the engine. Starting the engine with the clutch engaged imposes unnecessary strain on the battery, starter, and driven components.

**CAUTION:** If the engine stalls or falters during starting, wait 3 to 4 seconds before re-engaging the starter. This will prevent possible damage to the starter or the engine. **DO NOT** operate the starter for periods longer than 30 seconds at a time. An interval of at least 1-minute should be observed between cranking periods to protect the starter from overheating.

## **LPG or NG Fuel Systems**

Turn on the gas supply to the engine. Turn the ignition key to the START position. After the engine starts release the key to the ON position.

## **PSI Fuel Injection (Gasoline)**

Turn the ignition key to the ON position, this energizes the electric fuel pump to charge the fuel system with fuel. Turn the ignition key to the START position. After the engine starts release the key to the ON position.

## **PSI Fuel Injection (Gasoline/LPG)(Dual Fuel)**

Select the desired fuel switch position for starting the engine (Gasoline/LPG). Turn the ignition key switch ON, then move ignition key to the START position. After the engine starts release the key to the ON position.

## **Stopping the Engine**

Return the engine to idle speed. If the machine is equipped with a clutch, move the clutch lever to the disengaged position. Run engine for a few minutes at idle to allow the coolant system to cool down before turning the ignition switch to the OFF position.

Note: Gasoline fuel injected engines will generally shut off immediately when the key is switched to the off position. When the key is switched off, power to the fuel injector(s), fuel pump and engine control module (ECM) is removed.

Note: LPG engines equipped with a distributorless ignition system (DIS) may run on several seconds after the key is switched to the off position. This may be a normal function of the engine control system running fuel out of the vapor hose to prevent engine backfiring on restart. The engine may run up to 5 seconds after the key is switched to off. Check with the Equipment Manufacture for proper shut down operation.

**WARNING:** Avoid injury when checking a Hot Engine. Allow the engine to cool down before removing the radiator cap.

**CAUTION:** Before restarting the engine ensure that both the coolant system and the engine oil level have been checked and re-filled if necessary.



## **Fuel Recommendations**

### **Fuel Quality**

Using a high quality unleaded gasoline will help maintain the power, fuel economy and emissions performance of your engine. A properly formulated gasoline will be comprised of well refined hydrocarbons and chemical additives and will perform the following functions:

- Minimize varnish, lacquer, and other induction system deposits.
- Prevent gum formation or other deterioration during storage.
- Protect fuel tank and other fuel system components from corrosion or degradation.
- Provide the correct seasonally and geographically adjusted volatility which should provide easy starting in the winter and summer.
- Avoid fuel system icing.

In addition, the fuel must be free of water, debris, and other impurities. It is recommended that the fuel supply be kept fresh when the engine is in storage (especially in hot weather). The fuel tank should be kept at least  $\frac{3}{4}$  full.

Fuel stored for more than two months should be drained, properly discarded, and the fuel tank re-filled.

LPG engines are designed to operate on HD-5 or HD-10 specification LPG fuel. Fuel other than HD-5 or HD-10 may cause harm to the engine's emission control system and a warranty claim may be denied on this basis if operators can readily find the proper fuel. Use of any other fuel may result in your engine no longer operating in compliance with CARB or EPA emissions requirements.

### **Anti-Knock Index (Octane Rating)**

This engine is designed to operate on unleaded 87 or 89 octane gasoline with an  $(R + M)/2$  minimum anti-knock index. Federal regulations require that each retail gasoline dispensing pump must display a label bearing the minimum index rating.

Use of unleaded gasoline with anti-knock index rating lower than 87 can cause persistent, heavy spark knock, which can lead to engine damage. If your engine knocks heavily when you use gasoline with an anti-knock index rating of 87 or higher, or if you hear continuous spark knock while maintaining constant operating speeds, consult a dealer or qualified technician.

### **Gasohol and Alcohol/Gasoline Fuels**

Gasohol, a mixture of gasoline and ethanol (grain alcohol), is available in some areas. PSI engines should operate satisfactorily on gasohol blends containing no more than 10% ethanol by volume and

having an anti-knock index of 87 or 89. CAUTION: In some cases, methanol (wood alcohol) or other alcohols may be added to gasoline. PSI engines should operate satisfactorily on blends containing up to 5% methanol by volume when cosolvents and other necessary additives are used. DO NOT USE blends containing more than 5% methanol by volume or blends that do not contain cosolvents and corrosion inhibitors.

CAUTION: Discontinue use of any gasohol or alcohol/gasoline blend if fuel system problems occur. Do not use such fuels unless they are UNLEADED.

### **Spark plugs**

Always use the recommended spark plugs for your engine. Hotter or colder plugs, or similar plugs that are not exact equivalents to the recommended plugs, can cause permanent engine damage, reduce the engine's useful life, and cause many other problems such as hard starting, spark knock and run-on. Installing new spark plugs regularly is one of the best ways to keep your engine at peak performance.

### **Power Loss at Higher Elevations**

All engines will experience power loss when operated at elevations above sea level, unless they are turbocharged or supercharged. Turbochargers and superchargers are mechanical pumps that put extra air into the engine to make up for the lower air density at higher elevations.

### **Fuel Injected Engines**

Fuel injected engines will lose 3.5% power for every 1000 feet the engine is operated above sea level. All fuel injection systems installed by PSI International are equipped with a "manifold absolute pressure sensor" (MAP Sensor). The MAP sensor senses barometric pressure and automatically corrects the fuel system calibration for changes in altitude. This means the air/fuel mixture will always be optimized, regardless of elevation (or barometric pressure), however, the engine will still lose 3.5% power for every 1000 feet increase in elevation.

## **MAINTENANCE INSTRUCTIONS**

### **Initial Start Up Maintenance**

The initial start-up checks must be made before putting the engine into service. Please refer to the Maintenance Schedule and perform the initial start-up operations in the sequence shown in column 1.

## **Routine Maintenance**

Routine maintenance provides the best solution for making sure that the engine is ready when you are. The following are some routine service points:

- Keep the fuel tank filled. A full tank of fuel reduces the possibility of condensation forming in the fuel tank and moisture entering the fuel system
- Make daily checks of the engine oil and coolant levels
- Repair any oil or coolant leaks immediately
- Check battery condition and cables frequently
- Keep the engine air filter clean
- Monitor engine coolant temperature
- Monitor engine oil pressure
- Check voltmeter and charging system

## **Scheduled Preventive Maintenance**

Refer to the Maintenance Schedule to ensure that all of the maintenance items listed are checked and replaced as recommended at the hours shown.

## **Engine Oil Level Check**

The engine oil level should be checked daily. It is recommended that the oil be checked just before the engine is started for the first time for that day. The oil level should be between the 'Add' and the 'Full' marks on the dipstick.

**CAUTION:** Do not operate the engine with the oil level below the bottom or 'Add' mark on the dipstick, or above the top or 'Full' mark on the dipstick.

## **Adding Engine Oil**

It is normal to add some oil in the period of time between oil changes. The amount will vary with the severity of operation. When adding or replacing engine oil, be sure the oil meets or exceeds the recommended specification.

## **Changing Engine Oil and Filter**

The engine oil and filter must be changed every 150 hours or every 3 months whichever occurs first. Under normal operating conditions, you do not need to change them more often if you use oil and filters of the recommended quality.

The oil and filter should be changed more often if the engine is operating in dusty or extremely dirty areas, or during cold weather. No oil additives or break-in oil change is required.

## Engine Oil Quality

To achieve proper engine performance and durability, it is important that you use only engine lubricating oils of the correct quality in your engine. Proper quality oils also provide maximum efficiency for crankcase ventilation systems, which reduces pollution.

Important: use only engine oils displaying the American Petroleum Institute (API) “Starburst” Certification Mark ‘FOR GASOLINE ENGINES’ on the container.



Gasoline engines that are converted for LPG or NG fuels **MUST** use oils labeled ‘FOR GASOLINE ENGINES’. Do not use oils that are specifically formulated for Diesel Engines only. CC or CD classifications oils, even when labeled Heavy Duty or for Natural Gas Engines, **ARE NOT ACCEPTABLE**.

## Engine Oil Recommendation

### **15w40 Viscosity engine oil is recommended**

## Oil Filter

The filter protects your engine from harmful, abrasive, or sludgy particles without blocking the flow of oil to vital engine parts.

To replace the filter, use a proper filter wrench to remove the filter.

Clean the filter mounting base and lightly coat the gasket surface of the new filter with engine oil. Hand tighten the filter until the gasket contacts the base, then tighten another ½ turn. Fill the engine with the correct amount of oil and run the engine. Verify oil pressure is okay and check for oil leaks

at the drain plug and oil filter gasket. Tighten as necessary to stop any oil leakage noted.

## **Engine Air Cleaner**

The engine air cleaner filters air entering the engine intake system and acts as a silencer and flame arrester when assembled to the intake system. Air that contains dirt and grit produces an abrasive fuel mixture and can cause severe damage to the cylinder walls and piston rings. Damage to the cylinder walls and piston rings will cause high oil consumption and shorten engine life. A restricted or dirty air cleaner will also cause a rich fuel mixture. Thus, it is extremely important that the air cleaner be serviced properly at the recommended intervals.

**CAUTION:** Service the air cleaner more frequently under severe dusty or dirty conditions.

Remove the primary air cleaner element from the air cleaner assembly and inspect the element for foreign material restrictions or signs of excessive wear or damage. Replace the element if necessary. Remove all dust and foreign matter from the air cleaner housing. Reinstall the air cleaner element. Reinstall the air cleaner cup, and securely fasten the retaining clips.

## **Safety Element**

If your engine is equipped with an air cleaner which utilizes a safety element, ensure that the element is properly in place before installing the primary element.

Change the safety element annually.

## **Cooling System**

### **Coolant Level**

Check the coolant level of the radiator daily and only when the engine is cool. Generally a good time to do this is just prior to starting the engine for the first time each day.

Maintain the coolant level at  $\frac{3}{4}$  to  $1\frac{1}{2}$  inches below the filler neck seat of the radiator when the coolant is cold. When ever coolant level checks are made inspect the condition of the radiator cap rubber seal. Make sure it is clean and free of any dirt particles which would keep it from seating on the filler neck seat. Rinse off with clean water if necessary. Also make sure that the filler neck seat is free of any dirt particles.

**WARNING:** Never remove the radiator cap under any conditions while the engine is operating. Failure to follow these instructions could result in damage to the cooling system, engine, or cause personal injury. To avoid having scalding hot coolant or steam blow out of the radiator, use extreme caution when removing the radiator cap from a hot radiator. If possible, wait until the engine has cooled, then wrap a thick cloth around the radiator cap and turn slowly to the first stop. Step back

while the pressure is released from the cooling system. When all the pressure has been released, press down on the cap and remove it slowly.

DO NOT add coolant to any engine that has become overheated until the engine cools. Adding coolant to an extremely hot engine can result in a cracked block or cylinder head.

The engine manufacturer recommends the cooling system be filled with a 50/50 mixture of antifreeze and water. The use of “Long Life” Ethylene glycol type coolant is required. This antifreeze is typically a bright orange in color and should meet the requirements issued by PSI. Coolant should have a minimum boiling point of 300F (149c) and a freezing point no higher than -34F (-37c).

Plain water may be used in an emergency (except in freezing temperatures), but replace it with the specified coolant as quickly as possible to avoid damage to the system.

## **Radiator**

Inspect the exterior of the radiator for obstructions. Remove all bugs, dirt or foreign material with a soft brush or cloth. Use care to avoid damaging the core fins. If available, use low pressure compressed air or a stream of water in the opposite direction of the normal air flow. Check all hoses and connections for leaks. If any of the hoses are cracked, frayed, or feel spongy, they must be replaced.

## **Fan Belts**

The water pump is belt driven. The same belt may also drive the fan and/or the alternator. The drive belts should be properly adjusted at all times. A loose belt can cause improper alternator, fan and water pump operation, in addition to overheating.

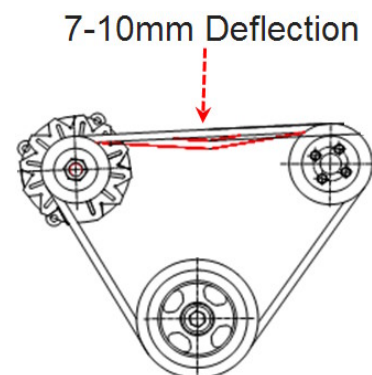
## **Serpentine Belt**

Some PSI International engines utilize serpentine belts on the front of the engine. This type of belt system incorporates a belt tensioning device which keeps the belt at the proper tension.

This belt should be checked routinely for cracks or ‘checking’ on the groove side of the belt. If cracks or ‘checking’ are apparent the belt must be changed.

## **V-Type Belt**

V-Type belts are generally tensioned by adjusting the alternator, or through a mechanical belt tensioner. The belt is generally correctly tensioned when there is 7-10mm of deflection on the belt between the water pump and alternator.



## **Fuel Filter**

## **Fuel Injected Engines**

On some PSI Fuel Injection or Fuel Injection/Dual Fuel as many as two fuel filters may be used in the gasoline fuel supply line to the engine. A coarse fuel filter may be located in the supply line between the fuel tank and the electric fuel pump. This filter protects the fuel pump from debris in the fuel tank. This filter must be changed every 200 hours or every 6 months which ever occurs first.

A primary fuel filter is located between the fuel pump and the engine. This filter protects the injectors from microscopic particles in the fuel which can cause plugging of the injectors. This filter **MUST** be changed every 500 hours or annually which ever occurs first.

**CAUTION:** Failure to change the fuel system filters as recommended can result in premature failure of the fuel system components.

**NOTE:** Some original equipment manufacturers install their own fuel systems. Please refer to the manufacturers manual if the gasoline fuel system is different than described here.

**WARNING:** Use extreme care when changing the fuel filters on gasoline engines. Gasoline is highly flammable and should not be exposed to open flame, sparks, or hot engine components. Allow the engine to cool to ambient temperatures prior to changing fuel filters. Insure that all pressure has be removed from the fuel system prior to opening any lines.

## **Ignition Systems**

### **Types of Ignition Systems**

The ignition systems used on these engines are a distributor-less electronic ignition controlled by an ECU. The ignition system is using a “waste spark” ignition system which means it will ignite two spark plugs during every stroke. One cylinder will be on the combustion stroke and one will be on the exhaust stroke.

### **Ignition Timing**

Proper adjustment of the ignition timing must be obtained to provide the optimum engine power output and economy. Ignition timing is controlled by the ECU and is not adjustable.

## **Spark Plugs**

Spark plugs should be replaced at the recommended intervals described in the Maintenance Schedule. Use only the recommended spark plug or an equivalent as described in the General Specifications.

Spark plug gap, should be adjusted as recommended in the General Specifications.

When removing spark plugs, always note which cylinder each plug came out of. Look at the porcelain around the center electrode of each plug. You can detect many engine problems from the color and type of deposits that have built up on the white porcelain. For example, if the deposits are a glossy brown, that cylinder is burning excess oil. If the deposits are a very dark gray or sooty black color, your engine is running rich, and you are burning excess fuel. The optimum color of the deposits on the porcelain is light tan or light brown. This shows optimum fuel mixture and proper engine running conditions. If the deposits are almost white, the engine may be running excessively lean. Lean running is very detrimental to your engine life, and should be corrected immediately. If one or more cylinders are burning oil, the smoke from the engine will be a blue-gray color. Most common causes are piston rings (worn out or not broken in) and valve stem seals (cut, nicked, or worn out). If the engine is running rich the exhaust smoke will be a sooty black color and it will smell like gasoline (on gasoline engines).

## **Storage**

### **One to Six Months**

If the engine or machine is to be placed in storage for a period of one to six months it is recommended that the following steps be followed:

- Add 'Stabil' or equivalent fuel conditioner to the fuel tank as recommended on the bottle. Run the engine for approximately 10 to 15 minutes to insure that the treated fuel is completely through the fuel system.
- Fill the fuel tank with fuel
- Protect the air cleaner inlet from water entry
- Protect the exhaust outlet or muffler outlet from water entry
- Check the coolant protection and top off radiator
- Store indoors if possible

### **For Extended Periods**

Follow the above recommended procedures, plus do the following:

- Drain the engine crankcase and refill with recommended oil
- Change the oil filter
- Disconnect and remove the battery



- Clean exterior surface of the engine
- If the engine is equipped with an automotive type clutch or PTO clutch, make sure that the clutch is disengaged

### **Removing the Engine From Extended Storage**

When removing the engine from extended storage:

- Install a fully charged battery
- Remove all protective coverings from the air inlet, air cleaner, exhaust, and muffler openings
- Check the coolant level in the radiator and verify the protection level of the coolant
- Check the engine oil level.
- Start the engine and allow it to run at slow idle. Verify engine oil pressure
- Run the engine at idle until the coolant temperature approaches 120 degrees F (49 degrees C)
- Run the engine a various speeds for approximately 15 minutes
- Shut the engine down, drain the oil, change the oil filter, and re-fill with the recommended grade of oil

## REQUIRED PREVENTATIVE MAINTENANCE SCHEDULE

Perform the following maintenance on the engine at the hours indicated and at equivalent hour intervals thereafter.								
	Interval Hours							
	Daily	35	100	200	400	800	2000	As Req.
<b>General Maintenance Section</b>								
Visual check for fluid leaks	X							
Check engine oil level	X							
Check coolant level	X							
Change engine oil and filter	<b>Every 150 hours or 120 days of operation</b>							
Check LPG system for leaks	<b>Prior to any service or maintenance activity</b>							
Inspect accessory drive belts for cracks, breaks, splits or glazing			X		X		X	
Inspect electrical system wiring for cuts, abrasions or corrosion					X			
Inspect all vacuum lines and fittings for cracks, breaks or hardening					X			
PCV Valve				Clean		Replace		
<b>Engine Coolant Section</b>								
Clean debris from radiator core	<b>Every 100 hours or 60 days of operation</b>							
Change coolant						X		
Inspect coolant hoses for cracks, swelling or deterioration			X		X		X	
<b>Engine Ignition System</b>								
Replace spark plugs			X		X		X	
Check spark plug wires for cuts abrasions or hardening						X		
Replace spark plug wires								X
<b>Fuel System Maintenance</b>								
Inspect air cleaner	<b>Every 200 hours, or every 100 hours in dusty environment</b>							
Replace filter element	<b>Every 400 hours or as required in dusty environment</b>							
Replace fuel filter					X			
Leak check fuel lines					X			
Check air induction for leaks					X			
Check manifold for vacuum leaks			X		X		X	
Drain Vaporizer oil build up	<b>Every engine oil change</b>							
<b>Engine</b>								
Cylinder Head Bolt Torque -- 40.5 ft/lbs		X			X			
Timing Belt				Inspect			Replace	
Intake / Exhaust Valve Clearance Adjustment		X			X			
Check All bolts and nuts for tightness								X

## GENERAL SPECIFICATIONS

### PSI International Engines

<b><u>Engine</u></b>	<b><u>0.79</u></b>	<b><u>0.97</u></b>
Type	.79L - L4	.97L - L4
Displacement	.797L	.97L
Compression Ratio	8.7: 1	8.8: 1
Valve Configuration	Overhead Camshaft	Overhead Camshaft
Valve lifters	Rocker arm shaft	Rocker arm shaft
Bore x Stroke (mm)	62.0 X 66.0	65.5 X 72.0
Inches	2.44 X 2.60	2.58 X 2.84
Main Bearing Caps	2 Bolt	2 Bolt
Balance Method	External	External
Intake Manifold	PFI, Mixer	PFI, Mixer
Firing Order	1-3-4-2	1-3-4-2
Oil Capacity	3 liter	3 liter
With Filter	3.2 liter	3.2 liter
Minimum Oil Pressure	35 psi @ 3000 RPM	35 psi @ 3000 RPM
Coolant Capacity	Application Specific	Application Specific
Fuel Type	Gasoline, LPG, NG	Gasoline, LPG, NG
Engine Rotation (viewed from rear)	Counter clockwise	Counter clockwise
Ignition System	Distributor-less (DIS)	Distributor-less (DIS)
Ignition Timing	Controlled by the ECM	Controlled by the ECM
Spark Plugs	101722	101722
Spark Plug Gap	1 - 1.2 mm	1 - 1.2 mm
Valve Clearance (Cold)	.13mm - .18mm	.13mm - .18mm
Valve Clearance (Warm)	.23mm - .28mm	.23mm - .28mm