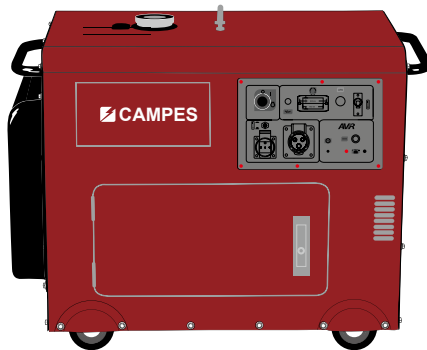


Diesel Portable Generator

Owner's Manual



MODEL: _____

SERIAL: _____

DATE PURCHASED: _____

SAVE THIS MANUAL FOR FUTURE REFERENCE



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⚠ WARNING

Inhalation of diesel exhaust may cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to our website or your nearest Independent Authorized Service Dealer.

Section 1 Introduction and Safety

Introduction

Thank you for purchasing a CAMPES Power Systems Inc. product. This unit has been designed to provide high-performance, efficient operation, and years of use when maintained properly.



⚠️WARNING

Consult Manual. Read and understand manual completely before using product. Failure to completely understand manual and product could result in death or serious injury

If any section of the manual is not understood, contact your nearest Independent Authorized Service Dealer (IASD), or contact CAMPES Customer Service, or <https://campespower.com/> with any questions or concerns.

The owner is responsible for proper maintenance and safe use of the equipment. Before operating, servicing or storing this generator:

- Study all warnings in this manual and on the product carefully.
- Become familiar with this manual and the unit before use.
- Refer to the Assembly section of the manual for instructions on final assembly procedures. Follow the instructions completely. Save these instructions for future reference. ALWAYS supply this manual to any individual that will use this machine.

The information in this manual is accurate based on products produced at the time of publication. The manufacturer reserves the right to make technical updates, corrections, and product revisions at any time without notice.

Safety Rules

The manufacturer cannot anticipate every possible circumstance that might involve a hazard. The warnings in this manual, and on tags and decals affixed to the unit are, therefore, not all inclusive. If using a procedure, work method or operating technique that the manufacturer does not specifically recommend, verify that it is safe for others. Also make sure the procedure, work method or operating technique utilized does not render the equipment unsafe.

Throughout this publication, and on tags and decals affixed to the generator, DANGER, WARNING, CAUTION and NOTE blocks are used to alert personnel to special instructions about a particular operation that may be hazardous if performed incorrectly or carelessly. Observe them carefully. Their definitions are as follows:

⚠️DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠️WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠️CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

Note:

Notes contain additional information important to a procedure and will be found within the regular text of this manual.

These safety warnings cannot eliminate the hazards that they indicate. Common sense and strict compliance with the special instructions while performing the action or service are essential to preventing accidents.

Safety Symbols and Meanings

⚠️DANGER	
Using a generator indoors CAN KILL YOU IN MINUTES. Generator exhaust contains carbon monoxide. This is a poison you cannot see or smell.	
 NEVER use inside a home or garage, EVEN IF doors and windows are open.	 Only use OUTSIDE and far away from windows, doors, and vents.



⚠️DANGER

Asphyxiation. Running engine produce carbon monoxide, a colorless, odorless, poisonous gas. Carbon monoxide, if not avoided, will result in death or serious injury.

- If you start to feel sick, dizzy, or weak after the generator has been running, move to fresh air **IMMEDIATELY**. See a doctor, as you could have carbon monoxide poisoning.



⚠ DANGER

Asphyxiation. The exhaust system must be properly maintained. Do not alter or modify the exhaust system as to render it unsafe or make it noncompliant with local codes and/or standards. Failure to do so will result in death or serious injury.



⚠ DANGER

Electrocution. Water contact with a power source, if not avoided, will result in death or serious injury.



⚠ DANGER

Electrocution. Turn utility and emergency power supplies to OFF before connecting power source and load lines. Failure to do so will result in death or serious injury.

⚠ WARNING

Equipment and property damage. Do not alter construction of, installation, or block ventilation for generator. Failure to do so could result in unsafe operation or damage to the generator.



⚠ WARNING

Asphyxiation. Always use a battery operated carbon monoxide alarm indoors and installed according to the manufacturer's instructions. Failure to do so could result in death or serious injury.

⚠ WARNING

Equipment and property damage. Do not operate unit on uneven surfaces, or areas of excessive moisture, dirt, dust or corrosive vapors. Doing so could result in death, serious injury, property and equipment damage.



⚠ WARNING

Moving Parts. Keep clothing, hair, and appendages away from moving parts. Failure to do so could result in death or serious injury.

⚠ WARNING

Hot Surfaces. When operating machine, do not touch hot surfaces. Keep machine away from combustibles during use. Hot surfaces could result in severe burns or fire.

⚠ WARNING

Personal injury. Do not insert any object through the air cooling slots. Generator can start at any time and could result in death, serious injury, and unit damage.

⚠ WARNING

Risk of injury. Do not operate or service this machine if not fully alert. Fatigue can impair the ability to service this equipment and could result in death or serious injury.

⚠ WARNING

Injury and equipment damage. Do not use generator as a step. Doing so could result in falling, damaged parts, unsafe equipment operation, and could result in death or serious injury.



- For safety reasons, it is recommended that the maintenance of this equipment be performed by an IASD. Inspect the generator regularly, and contact the nearest IASD for parts needing repair or replacement.

Exhaust and Location Hazards



⚠ DANGER

Asphyxiation. Running engines produce carbon monoxide, a colorless, odorless, poisonous gas. Carbon monoxide, if not avoided, will result in death or serious injury.



⚠ DANGER

Asphyxiation. The exhaust system must be properly maintained. Do not alter or modify the exhaust system as to render it unsafe or make it noncompliant with local codes and/or standards. Failure to do so will result in death or serious injury.



⚠ WARNING

Asphyxiation. Always use a battery operated carbon monoxide alarm indoors and installed according to the manufacturer's instructions. Failure to do so could result in death or serious injury.

⚠ WARNING

Equipment and property damage. Do not alter construction of, installation, or block ventilation for generator. Failure to do so could result in unsafe operation or damage to the generator.

- If you start to feel sick, dizzy, or weak after the generator has been running, move to fresh air IMMEDIATELY. See a doctor, as you could have carbon monoxide poisoning.
- NEVER run a generator indoors or in a partly enclosed area such as garages.
- ONLY use outdoors and far away from windows, doors, vents, crawl spaces and in an area where adequate ventilation is available and will not accumulate deadly exhaust gas.
- Using a fan or opening a door will not provide sufficient ventilation.

- Point muffler exhaust away from people and occupied buildings.

Electrical Hazards



⚠ DANGER

Electrocution. Contact with bare wires, terminals, and connections while generator is running will result in death or serious injury.



⚠ DANGER

Electrocution. Water contact with a power source, if not avoided, will result in death or serious injury.

- National Electric Code (NEC) requires the frame and external electrically conductive parts of the generator be properly connected to an approved earth ground. Local electrical codes may also require proper grounding of the generator. Consult with a local electrician for grounding requirements in the area.
- Use a ground fault circuit interrupter (GFCI) in any damp or highly conductive area (such as metal decking or steel work).



⚠ DANGER

Electrocution. In the event of electrical accident, immediately shut power OFF. Use non-conductive implements to free victim from live conductor. Apply first aid and get medical help. Failure to do so will result in death or serious injury.

- Once generator has been started outside, connect electrical loads to extension cord(s) inside.

Fire Hazards



⚠ DANGER

Explosion and Fire. Fuel and vapors are extremely flammable and explosive. Add fuel in a well ventilated area. Keep fire and spark away. Failure to do so will result in death or serious injury.



⚠ DANGER

Explosion and Fire. Do not overfill fuel tank. Fill to 1/2 inch from top of tank to allow for fuel expansion. Overfilling may cause fuel to spill onto engine causing fire or explosion, which will result in death or serious injury.



⚠ DANGER

Risk of fire. Allow fuel spills to completely dry before starting engine. Failure to do so will result in death or serious injury.

⚠ WARNING

Personal injury. Do not insert any object through the air cooling slots. Generator can start at any time and could result in death, serious injury, and unit damage.

- Allow at least 5 feet of clearance on all sides of the generator when operating to prevent overheating and fire.
- Do not operate the generator if connected electrical devices overheat, if electrical output is lost, if engine or generator sparks, or if flames or smoke are observed while unit is running.
- Keep a fire extinguisher near the generator at all times.

Standards Index

1. National Fire Protection Association (NFPA) 70: The NATIONAL ELECTRIC CODE (NEC) available from www.nfpa.org
2. National Fire Protection Association (NFPA) 5000: BUILDING CONSTRUCTION AND SAFETY CODE available from www.nfpa.org
3. International Building Code available from www.iccsafe.org
4. Agricultural Wiring Handbook available from www.rerc.org, Rural Electricity Resource Council P.O. Box 309 Wilington, OH 45177-0309
5. ASAE EP-364.2 Installation and Maintenance of Farm Standby Electric Power available from www.asabe.org, American Society of Agricultural & Biological Engineers 2950 Niles Road, St. Joseph, MI 49085 6. CSA C22.2 100-14 Electric motors and generators for installation and use, in

IMPORTANT NOTE: This list is not all inclusive. Check with the Authority Having Jurisdiction (AHJ) for any local codes or standards which may be applicable to your jurisdiction.

Section 2 General Information and Setup

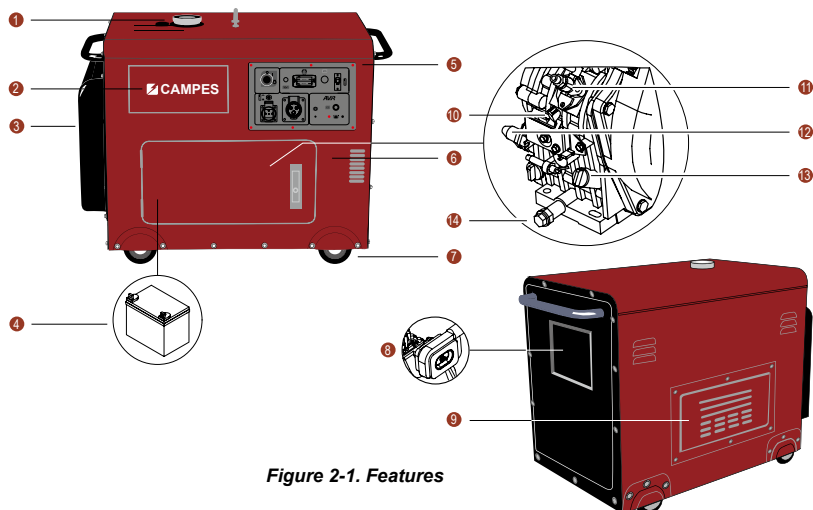


Figure 2-1. Features

Generator Components

- ❶ Cover of fuel tank
- ❷ Label
- ❸ Muffler(inside)
- ❹ Battery(inside)
- ❺ Control panel
- ❻ Engine(inside)
- ❼ Wheel
- ❽ Air filter(inside)
- ❾ Back cover
- ❿ Control handle
- ⓫ Fuel injection pump
- ⓬ Low oil Sensor
- ⓭ Oil filter cap
- ⓮ Oil drain cap
- ⓯ Electric start switch
- ⓰ Digital meter
- ⓱ Overheat socket protection
- ⓲ Socket SCHUKO 230V 16A
- ⓳ Socket CEE 230V 32A
- ⓴ Connect 7 contacts
- ⓵ Circuit Breaker(3 phase product: 3P circuit breaker)
- ⓶ Low oil protection indicating lamp(12V)
- ⓷ Fuse 10A
- ⓸ Bolt to the grounded
- ⓹ Black wire holder(107)
- ⓺ Red wire holder(107)

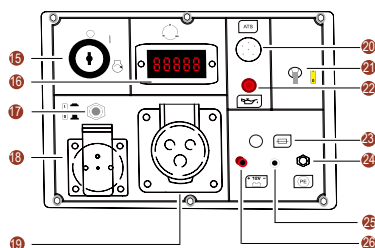


Figure 2-2. Control Panel

Know Your Generator

Emissions Information



⚠ WARNING

Consult Manual. Read and understand manual completely before using product. Failure to completely understand manual and product could result in death or serious injury.

Product Specifications

Type Item		PMD 5000s		PMD 5050s	
Generator	Kind	Single phase		Three phase	
	Frequency(Hz)	50	60	50	60
	Rated power (KVA)	4.5	5.0	4.5	5.0
	Voltage (A.C)(V)	220V,230V,240V,110/220V,120/240V,115/230V		400/230V,420/240V,380/220V,127/200V	
	Excitation mode	Self-excitation brushless or Self-excitation constant voltage(AVR)		Self-excitation constant voltage(AVR)	
	Revolution (r/min)	3000	3600	3000	3600
	Voltage (D.C)(V)	12			
	Current (D.C)(A)	8.3			
	Noise level dB(A)/ @4m@3/4 rated load	77			
	Power factor cos ϕ	1		0.8	
	Insulation grade	F		F	
Diesel engine	Model of power	SR186FADE			
	Kind	4-stroke single-cylinder air cooled direct injection			
	Max power (kW/rpm)	6.5	8.6	6.5	8.6
	Bore × stroke (mm)	86 x 72			
	Cylinder displacement (ml)	418			
	Cooling system	Force air-cooled			
	Lubricating system	Pressure splash, duplex type lubrication			
	Volume of lube oil (L)	1.65			
	Start system	Electric start			
	Fuel	Diesel fuel			
	Set	Fuel tank volume (L)	14.5		
Low oil pressure protection		Have			
Total weight (kg)		161			
Overall dimensions (mm)		950 x 570 x 765			

Connection Plugs

Remove Contents from Carton

1. Open carton completely by cutting each corner from top to bottom.
2. Remove and verify carton contents prior to assembly. Carton contents should contain the following:

Item	Qty.
Main unit	1
Owner's Manual	1
Liter Oil SAE 30	1
Product Registration Card	1
Service Warranty	1
Muffler Extension	1
Battery Bracket Assembly	1
Item	1

Assembly



⚠ WARNING

Consult Manual. Read and understand manual completely before using product. Failure to completely understand manual and product could result in death or serious injury.

Call your nearest Independent Authorized Service Dealer (IASD), or contact CAMPES Customer Service, or <https://campespower.com/> with any questions or concerns.. Please have model and serial number available. The following tools are required to install the accessory kit.

- Ratchet with 10mm and 13mm sockets
- 13mm box wrenches

NOTE: The wheels are not intended for over-the-road use.

Install wheels as follows. See Figure 2-8.

1. Insert cotter pin (A) to one end of axle (B).
2. In this order; slide washer (C), wheel (E), washer, (D), and cotter pin (E) onto axle.
3. Place wheel assembly under frame so axle mounts align with holes in cradle frame.

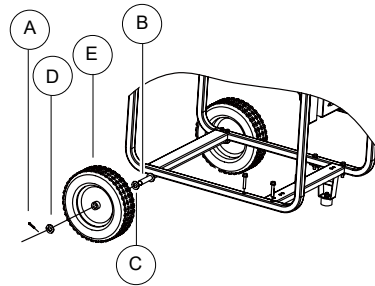


Figure 2-8. Wheel Assembly

Battery Installation

The following tools are required to install the battery.

- 7/16" (11mm) ratchet, socket and wrench
- Install the battery as follows. See Figure 2-11.

1. Place battery onto battery tray with the positive terminal on the right.
2. Connect red battery wire to positive (+) terminal with a bolt, washer and nut.
3. Slide red battery terminal post cover over terminal and hardware.
4. Connect black battery wire to negative (-) terminal with a bolt, washer and nut.
5. Slide black battery terminal post cover over terminal and hardware.
6. Reinstall battery hold-down(A, **Figure 2-11**) onto battery.
7. Tighten nuts(B, **Figure 2-11**) until battery hold-down is tight. Do not over-tighten nuts.

NOTE: The battery charges while the engine is running.

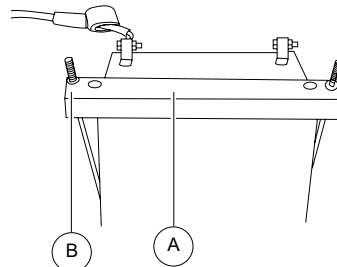


Figure 2-11. Battery Installation

Add Engine Oil

CAUTION

Engine damage. Verify proper type and quantity of engine oil prior to starting engine. Failure to do so could result in engine damage.

1. Place generator on a level surface.
2. Verify oil fill area is clean.
3. Remove oil fill cap and wipe dipstick clean. See Figure 2-12.

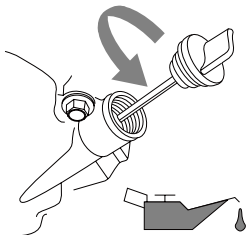
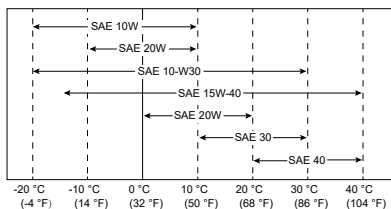


Figure 2-12. Remove Dipstick

4. Add recommended engine oil as shown in the following chart.



5. Thread dipstick into oil filler neck. Oil level is checked with dipstick fully installed.
6. See Figure 2-13. Remove dipstick and verify oil level is within safe operating range.
7. Install oil fill cap/dipstick and hand-tighten.

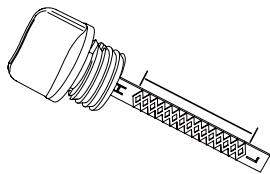


Figure 2-13. Safe Operating Range

8. Oil capacity refer to below table.

Oil capacity	Upper level
3500 series	1.1 L
5000 series	1.65 L

9. Maintenance recommendations

a. Engine oil is the most important factor in determining the life of your generator engine. If you use poor engine oil or if you don't change the oil regularly, the piston and cylinder will wear easily or seize up. Also, the life of the other parts in your engine such as bearings, and other rotating parts will shorten considerably.

b. Interval of Changing Machine Oil

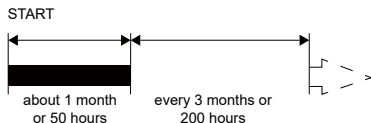


Figure 2-14. Interval of Changing Machine Oil

Note: Although there is an alarm system to check for low oil pressure, it is always a good idea to check the amount of oil inside the engine. If the oil level is low, fill it before starting the engine.

Note: A good time to drain the oil from the engine is when the diesel engine is still hot. If the engine is fully cooled, it is more difficult to drain all the oil out or some impurities will remain in the engine.

WARNING

DO NOT fill engine oil when the machines are running

Fuel

⚠ DANGER



Explosion and Fire. Fuel and vapors are extremely flammable and explosive. Add fuel in a well ventilated area. Keep fire and spark away. Failure to do so will result in death or serious injury.

⚠ DANGER



Explosion and Fire. Do not overfill fuel tank. Fill to 1/2 inch from top of tank to allow for fuel expansion. Overfilling may cause fuel to spill onto engine causing fire or explosion, which will result in death or serious injury.

IMPORTANT NOTE: DO NOT use Home Heating Oil or Bio-Diesel Fuel.

- Use only light diesel fuel. Otherwise it will be difficult to start the generator.
- The fuel should be filtered clean. Never let dust and water mix with fuel in the fuel tank. Otherwise it will clog the fuel lines and oil nozzles. It may also damage your pressure pump.

NOTE: It is dangerous to overfill the fuel tank. Never exceed the red piston in the filter.

Type	Silent Series
The effective volume of fuel tank	14.5L

• Fuel Maintenance

- After purchasing fuel, put it into a drum and let it sit for 3-4 days. Otherwise it contains granule, which will result to clog the fuel lines.
- 3-4 days later, insert half of the fuel sucker into the drum, (water and impurities stay in the lower portion of the drum). Otherwise they will be taken in. Contaminated fuel will cause accelerated wear to fuel system part.

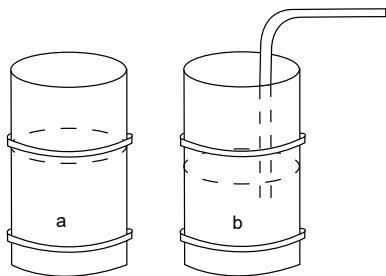


Figure 2-15. Fuel maintenance

Checking the air filter

1. See **Figure 2-16 Air Filter check**, Open the cover of generators, you will see the air filter assembly.
2. Loosen the butterfly nut of air filter, take the air filter cover (C) off and take the filter element (B) out.
3. After replacing the air filter element, fix the air filter cover (C) and tighten the butterfly nut firmly.

Note:

- If not replace the air filter immediately, the dust in the air will not be adsorbed. In that case, it stands a good chance to block the air way.
- Do not use detergent to wash the air filter element.
- When the performance of the engine decreases or when the color of the exhaust gases is bad, exchange the filter element.

Never start the engine without the air filter as foreign objects may enter the intake and damage the engine.

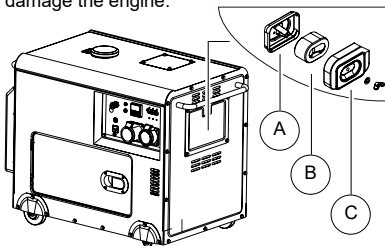


Figure 2-16. Air filter check

Check the oil way

The fuel and oil in a new engine is drained before sold. Before you start the engine, please fill the fuel tank and engine oil first. Then, check to see if there are air bubbles in the engine. If there are, follow these procedures. Loosen the connecting nut between the oil injection pump and oil pipe. Bleed the air from the system until there are no more bubbles. Then replace the connecting nut and tighten it.

Check the generators

1. Close the power switch and disconnect from any load. Otherwise it may cause electric shock. Even make injuries or death.
2. How to use double voltage generators push the voltage switch to the right voltage you will use.

WARNING

Make sure to close the power switch.
Make sure to ground the generators.

WARNING

Make sure to disconnect any load before starting the generators. It is very dangerous if not.

Checking the operation of the diesel engine

1. Low-pressure alarm system: Diesel engines have a low-pressure sensor system where if the oil pressure drops too low, the sensor will shut the engine off. The purpose of having this system is to ensure that the engine does not seize up. If there is not enough oil in the engine, the temperature of the oil will be raised too high. On the contrary, if there is too much oil in the engine, the engine oil can slow the engine down considerably.

2. How to open the case door/cover

- a. Open the case door: Pull the handle outward and open the door. Do these checks daily.
- b. Loosen the outer cover bolt of the air filter and outer cover of the oil nozzle, and then check the air filter.
- c. Check the outer cover of the oil nozzle. Loosen the butterfly nut and open the outer cover.

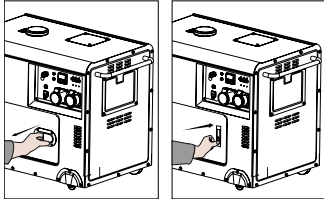


Figure 2-17. Air filter check

3. Engine break in

When you purchase a brand new engine, the engine must be properly broken in. The break in period is about 20 hours.

- a. Avoid overloading the engine when brand new
- b. Change the engine oil according to specifications. An oil change for a brand new engine is about 20 hours or every month, an older engine, the oil change is about 100 hours or three months.

If not breaking in, it will reduce the serving life, reliability and cost performance of the engine. At last, the life of the generator also be shortened.

Know Generator Limits

Overloading a generator can result in damage to the generator and connected electrical devices. Observe the following to prevent overload:

- Add up the total wattage of all electrical devices to be connected at one time. This total should NOT be greater than the generator's wattage capacity.
- The rated wattage of lights can be taken from light bulbs. The rated wattage of tools, appliances, and motors can be found on a data label or decal affixed to the device.
- If the appliance, tool, or motor doesn't give wattage, multiply volts times ampere rating to determine watts (volts x amps = watts).
- Some electric motors, such as induction types, require about three times more watts of power for starting than for running. This surge of power lasts only a few seconds when starting such motors. Make sure to allow for high starting wattage when selecting electrical devices to connect to the generator:

1. Figure the watts needed to start the largest motor.

2. Add to that figure the running watts of all other connected loads.

The Wattage Reference Guide is provided to assist in determining how many items the generator can operate at one time.

NOTE: All figures are approximate. See data label on Appendix II: General power list of appliance

Transporting/Tipping of the Unit

Do not operate, store or transport the unit at an angle greater than 15 degrees.

Section 3 Operation

Operation and Use Questions

Call your nearest Independent Authorized Service Dealer (IASD), or contact CAMPES Customer Service, or <https://campespower.com/> with questions or concerns about equipment operation and maintenance.

Before Starting Engine

1. Verify engine oil level is correct.
2. Verify fuel level is correct.
3. Verify battery is installed.

NOTE: The generator will not start without the battery installed.

4. Verify unit is secure on level ground, with proper clearance and is in a well ventilated area.

Prepare Generator for Use



⚠ DANGER

Asphyxiation. Running engines produce carbon monoxide, a colorless, odorless, poisonous gas. Carbon monoxide, if not avoided, will result in death or serious injury.



⚠ DANGER

Asphyxiation. The exhaust system must be properly maintained. Do not alter or modify the exhaust system as to render it unsafe or make it noncompliant with local codes and/or standards. Failure to do so will result in death or serious injury.



⚠ WARNING

Asphyxiation. Always use a battery operated carbon monoxide alarm indoors and installed according to the manufacturer's instructions. Failure to do so could result in death or serious injury.



⚠ DANGER

Risk of fire. Do not use generator without spark arrestor installed. Failure to do so could result in death or serious injury.



⚠ DANGER

Risk of Fire. Hot surfaces could ignite combustibles, resulting in fire. Fire could result in death or serious injury.



⚠ WARNING

Hot Surfaces. When operating machine, do not touch hot surfaces. Keep machine away from combustibles during use. Hot surfaces could result in severe burns or fire.

⚠ CAUTION

Equipment and property damage. Disconnect electrical loads prior to starting or stopping unit. Failure to do so could result in equipment and property damage.

Starting the generator set

1. Turn the Fuel Valve to the " ON " position. Otherwise fuel will be not enough to start the generator.
2. See **Figure 3-2**, Move the engine control level (A, **Figure 3-2**) to " RUN " Position (B, **Figure 3-2**).

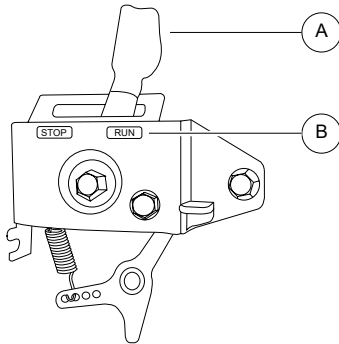


Figure 3-2.Engine control level

3. Insert the ignition key to the " off " position.
4. Electric Start: Turn the key clockwise to the " START " position (B, **Figure 3-3**), release the key as soon as the engine starts. It will return to the On position (A, **Figure 3-3**)

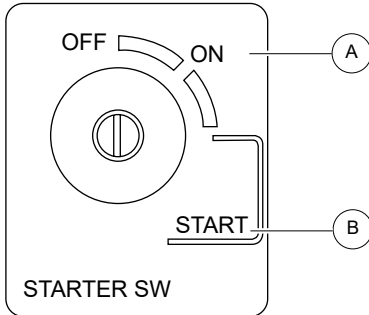


Figure 3-3.Engine Run/Stop Switch

CAUTION

Never Hold the key in the START position for longer than 15 seconds or the starter motor will overheat.

5. If the engine fails to start: Wait until the engine comes to a complete stop before you attempt to start it again.

CAUTION

Engaging the starter while the engine is still rotating will result in damage to the starter motor and flywheel.

CAUTION

Waiting 30 seconds will allow the battery voltage to recover to prevent damage to the starter motor due to the low battery voltage.

Proper operation of the generator set

1. Operating the diesel engine

- a. Pre-heat the diesel engine for 3 minutes under no load conditions.
- b. First check the low oil pressure indication light in the panel. If the light is red, please fill into enough oil.
- c. Do not adjust the speed limit regulation bolt or the fuel adjustment bolt. These bolts have been set by the factory already, changing them will affect the properties of the engine performance.

2. Checks during engine operation

- a. Check to see if there are abnormal noises. Check the joint of oil passages, fuel passages, water passages and air passages frequently to find out whether there is any leakage. If any, remove at once. Otherwise serious troubles may be caused.
- b. Check to see if the performance is good or bad.
- c. Check the color of the exhaust gases (whether it is too black or too white). If any of these conditions exist, stop the engine and find the cause of the problem. If no problems are found, please contact your local dealer or our nearest company branch.

Loading

1. Connecting Electrical Loads

- a. Let the engine stably and warm up for a few minutes after starting.
- b. Plug in and turn on the desired VOLTAGE AC Output with electrical loads.

CAUTION

DO NOT connect 3-phase loads to SINGLE PHASE Diesel Generator.
Do not overload this generator

To prolong the life of your generator and , please follow these steps to add electrical load:

- c. Start the generator with NO ELECTRICAL LOAD ATTACHED.
- d. Allow the engine to run for several minutes to STABILIZE.
- e. Plug in and turn on the first item. It is best to attached the item with the LARGEST LOAD first.
- f. Allow the engine to stabilize.
- g. Plug in and turn on the next item.
- h. Allow the engine to STABILIZE.
- i. Repeat step c-d for each capacity when adding loads.

CAUTION

Do not start more than two devices simultaneously. Each device should be started one by one to prevent overloading the generator.

The generator should be running at 3600 revolution per minute in order to achieve the frequency. The speed of the engine can be adjusted from the speed governor.

2. Output of electricity

a. Raise the revolutions per minute (turn the speed handle to the max setting) of the generator to get the maximum power out of the generator. If not, the automatic voltage regulator device will excite and doing this for long periods of time will cause the AVR to burn. For the rated speed of the generator, please refer to Chapter 1, item 1-1 technical specification and data.

b. Observe the pointer of the voltmeter, it should point to the voltage you need 5%. Meanwhile put the switch in the GEN (generator) position. The AC voltage from the socket of the power supply can be output.

3. Charging the battery

a. For the electric starter on the generator sets, the 12V battery is automatically charged through the regulator on the side of the engine when it is running.

b. If the generator is not used for long periods of time, the battery should be disconnected to avoid energy loss from the battery.

c. Do not connect the negative and positive terminals of the battery together at any time. Doing so will damage the battery and cause serious injuries.

d. Do not reverse the polarities when attaching the battery cables to the battery. Doing so will damage both the battery and the electric starter.

e. When charging the battery, the battery produces flammable gases. Do not smoke, let flames, and sparks get near the battery while it is charging as this may cause a fire.

To avoid sparking while connecting the cables to the battery, first, connect the cables to the battery then to the motor. To disconnect battery cables, first disconnect the motor end of the cable.

3. Stopping the generator

a. Take the electrical load off the generator, when you want to stop the generators.

b. Move the air switch to "off "position. If not, the short circuit will appear.

c. Put the speed handle in the "RUN" position and let the engine run for 3 minutes after unloading. Do not stop the diesel engine immediately let it warm down. Stopping the diesel engine suddenly may raise the temperature of the engine abnormally and lock the nozzle and damage the diesel engine.

Note:

- If you cannot stop the engine with a load on it, then remove the load first than stop the engine.

- Press down on the brake handle

- If equipped with an electric starter, turn the key to the " off " position

- Put the fuel handle to the "S" position

d. Put the ignition key to "off " position. Then the generators will stop.

e. Move the engine control level(A, **Figure 3-5**) to "STOP" position (B, **Figure 3-5**), which make sure to cut off the fuel way. Or push down on the stop lever(C, **Figure3-5**), and the speed control level(A, **Figure3-5**), which is spring-loaded, will move back to the stop position.

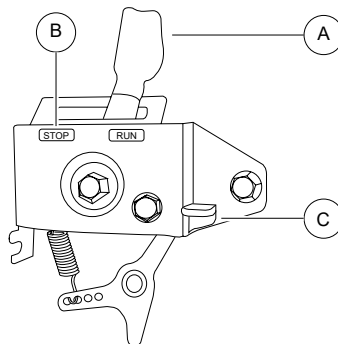


Figure 3-5.Engine Control Level

f. Close the fuel valve. But don't stall the generator by turning off the cock of the fuel tank in case air enters fuel passages to cause difficult starting next time.

Section 4 Maintenance

Maintenance schedules

Keeping your generator well maintained will prolong the life of your generator. Everything needs to be checked including the diesel engine, generator, control cabinet, and frame. For overhauling procedures, please refer to the instruction manual of the relative subassembly. Before starting the maintenance, make sure the diesel engine is off.

Please refer to the Table 3-1 for the proper maintenance schedule.

Note: The quality period of the injector and injection pump is 1500 hours or two years.

Time Item	Every Day	First month or 50 Hrs	3 month or 200 Hrs	6 month or 400 Hrs	Every year or 1000 Hrs
Check the fuel level and refill	○ Before starting				
Drain the fuel tank		○			
Check and fill enough engine oil	○				
Clean the fuel filter			○		
Check fuel oil leakage	○ After every operating				
Check and screw each fastened part	○			● Screw the bolt of cylinder head firmly	
Check injector				●	
Check injection pump					●
Check fuel pipe				●Exchange it if necessary	
Check the lube oil level in the oil pan and refill	○ Before starting				
Replace the lube oil		○ The first time	○The second time and afterward		
Clean the lube oil filter					
Clean the air cleaner element					
Change the core of air filter	○ If damaged or smeary, change it in time				
Adjusting the intake and exhaust valve clearance		● The first time		●The second time and afterward	
Grind air intake and air exhausted gate					●
Exchange piston ring					●
Check electrix brush and slide ring				●	
Check insulation resistance	○The time of stop over 10 days				

Note: ● Means it should operate with special tools.

Changing the engine oil (every 100 hours)

See **Figure 3-6. Changing Engine Oil**, Take the oil cover (A) off. Remove the oil drain plug (B) when the diesel engine is still hot. Be careful of hot oil and hot engine as you may get burned. The oil drain bolt (B) is located at the bottom of the cylinder. After draining the oil, put the bolt back and tighten it. Then fill with the proper engine oil to the proper level.

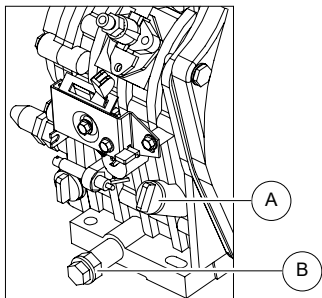


Figure 3-6. Changing Engine Oil

Air filter maintenance

1. Clean air-filter every 6 months or 500 hours of operation.
2. If necessary, exchange it.
3. Do not use detergent to clean air filter element (B).
4. See **Figure 3-7 Air Filter check**, Open the cover of generators, you will see the air filter assembly.
5. Loosen the butterfly nut of air filter, take the air filter cover (C) off and take the filter element (B) out.
6. After replacing the air filter element, fix the air filter cover (C) and tighten the butterfly nut firmly.

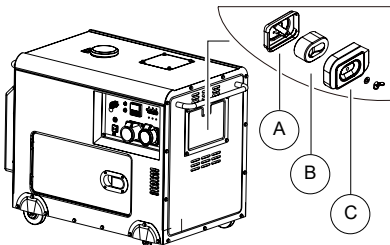


Figure 3-7. Air filter check

Fuel filter maintenance

1. The fuel filter should be cleaned often to keep the engine running at maximum performance.
2. The recommended time period for cleaning the fuel filter is 6 months or 500 hours of operation.
 - a. To do this, first drain the fuel from the fuel tank
 - b. Loosen the small screws on the fuel switch and remove the fuel filter from the port. Use diesel fuel to clean the fuel filter. Also, remove the fuel injector and clean the carbon deposit around it. The recommended time period for this is 3 months or 100 hours.

Cylinder head bolt tensions

The cylinder head bolts should be tightened to specifications please refer to the diesel engine manual for specifications and the special tools required to do this.

Storing for long periods of time

If your generator needs to be stored for long periods of time, the following preparations should be made.

1. Start the diesel engine for 3 minutes then stop it.
2. When the engine is still hot, change the engine oil with new engine oil of the proper grade.
3. For electric started generator, press the decompression handle down and crank the engine for 2-3 seconds. To do this, put the starter switch in the "Start" position. (Do not start the diesel engine)
4. Clean the engine and store it in a dry place.

Section 5 Troubleshooting

PROBLEM	CAUSE	CORRECTION
Engine is running, but AC output is not available	<ol style="list-style-type: none"> 1. Circuit breaker OPEN. 2. Poor connection or defective cord set. 3. Connected device is bad. 4. Fault in generator. 5. Main breaker switch is OFF. 6. Voltage selector switch is OFF. 7. Generator is overloaded. 8. GFCI outlet has tripped. 	<ol style="list-style-type: none"> 1. Reset circuit breaker. 2. Check and repair. 3. Connect another device that is in good condition. 4. Contact Authorized Service Dealer. 5. Switch main breaker ON. 6. Switch voltage selector switch to desired voltage output. 7. See Know Generator Limits 8. Correct ground fault in circuit and reset GFCI.
Engine runs well at no-load, but bogs when load is applied.	<ol style="list-style-type: none"> 1. Short circuit in a connected load. 2. Generator is overloaded. 3. Engine speed is too slow. 4. Shorted generator circuit. 	<ol style="list-style-type: none"> 1. Disconnect shorted electrical load. 2. See Know Generator Limits 3. Contact Authorized Service Dealer. 4. Contact Authorized Service Dealer.
Engine will not start; or starts and runs rough.	<ol style="list-style-type: none"> 1. Incorrect start sequence. 2. Fuel valve is OFF. 3. Dirty air filter. 4. Out of fuel. 5. Stale or contaminated fuel. 6. Low oil level. 7. Excessive rich fuel mixture. 8. Dirty fuel filter. 9. Air in fuel system. 10. Engine is under electrical load. 11. Battery not installed. 12. Battery weak or dead. 	<ol style="list-style-type: none"> 1. Review & follow starting procedure. 2. Turn fuel valve ON. 3. Clean or replace air filter. 4. Fill fuel tank. 5. Drain fuel tank and fill with fresh fuel. 6. Fill crankcase to correct level. 7. Contact Authorized Service Dealer. 8. Replace fuel filter. 9. Repeat priming procedure. If no start condition persists Contact Authorized Service Dealer. 10. Remove all equipment from receptacles. Make sure the main breaker switch is OFF. 11. Install battery. 12. Charge or replace battery.
Engine shuts down during operation.	<ol style="list-style-type: none"> 1. Out of fuel. 2. Low oil level. 3. Fault in engine. 4. Ambient temp too high. 5. Battery weak or dead. 	<ol style="list-style-type: none"> 1. Fill fuel tank. Prime fuel system. See Starting Pull Start Engines or Starting Electric Start Engines 2. Fill crankcase to correct level. 3. Contact Authorized Service Dealer. 4. Move unit to cooler location and allow engine to cool before running again. 5. Charge or replace battery.

PROBLEM	CAUSE	CORRECTION
Engine lacks power.	<ol style="list-style-type: none"> 1. Load is too high. 2. Dirty air filter. 3. Engine needs to be serviced. 4. Excessive valve lash. 5. Dirty fuel filter. 6. Fuel injector clogged. 	<ol style="list-style-type: none"> 1. Reduce load. See Know Generator Limits 2. Clean or replace air filter. 3. Contact Authorized Service Dealer. 4. Contact Authorized Service Dealer. 5. Replace fuel filter. 6. Contact Authorized Service Dealer.
Engine surges or stumbles.	<ol style="list-style-type: none"> 1. Governor/throttle assembly is not adjusted properly. 2. Air in fuel system. 3. Battery weak or dead. 	<ol style="list-style-type: none"> 1. Contact Authorized Service Dealer. 2. Contact Authorized Service Dealer. 3. Charge or replace battery.

