Warrior POWERPRODUCTS

DIESEL GENERATOR

OPERATIONAL MANUAL

ORIGINAL INSTRUCTION

ATTENTION

1. Children should be kept at a safe distance from the generator.
2. Don't touch the engine or muffler while generator is in operation. Please pay attention to warning stickers on the generator.
3. Electrical equipment (including cable and plug connecting component) should be in good condition before starting.
4. If replacing circuit breaker it must be equivalent or better in specification of the one to be removed.
5. Due to high mechanical stress, only rubber sheathed cables are recommended to be used.
6. When using extension cords or mobile distribution cabinet, the wire with 1.5mm2 cross section should not be longer than 60 metres; and for 2.5mm2 cross section wire should not be longer than 100 metres in length.
7. With manual starting, always use decompression lever.
8. On standard working ambient conditions, the generator can be operated at normal running loads. If the working condition of circumstance are not normal either too high or too low, the generator should be run at a lower output. When temperature, altitude and humidity is higher than standard working condition, the generator MUST reduce the output load.
9. Before any inspection or maintenance of the generator, the engine must be stopped and allowed to cool. Check and maintain the generator according to the period table and schedule sheet in the manual.
10. Except the daily maintenance or cleaning, any inspection or readjustment should be conducted by authorized professional person and source the requested components by them from the supplier. (Contact with local dealers).
11. Your new or just overhauled machine must endure a breaking-in period of at least 10 hours, the output should not exceed 75% of the maximum load.

CONTENTS

INTRODUCTION

Thank you for purchasing our product.

This product is guaranteed against faulty manufacture for a period of 24 months from the date of purchase. Please keep your receipt as proof of purchase.

This guarantee is invalid if the product is found to have been abused or tampered with in any way, or not used for the purpose for which it was intended. Faulty goods should not be returned to the place of purchase, the generator should be returned to the supplier of the product. No product can be returned without prior permission. This guarantee does not affect your statutory rights.

PLEASE SEE ENGINE MANUAL FOR WARRANTY

Diesel generator possesses the following features:

This series diesel generator adopts super-light type, air cooled, 4-stoke direct injection diesel engine and has two starting ways for option, this is, 1. Recoil start and 2. Electric start. They are equipped with large capacity fuel tank, circuit protector, A.C and sometimes D.C voltage outputs, low oil pressure alarm and automatic stopping device.

The diesel generator serves as an UPS stand-by power supply in many different applications including open working site, construction and field army. Emergency power of poultry farm, fishery, forestry, garden, hotel, shop, and office. This operation manual tells you how to operate and service your new diesel generator. Please read it before using the diesel generator to ensure proper handing and operation. Follow these instructions carefully will keep your diesel generator in the best working condition, allowing to prolong the life of your diesel generator.

If you have any questions concerning your new product or any of the information given in this manual, please contact our supplier on +44 (0)1942 715407.

Appearance picture of diesel generator series

1-1 Open frame type

1-2 Silent type

CHAPTER 1 Main technical specifications and data

1-1 Main technical specifications and data of generator set series

	Item \ Genset Type	2200C(E) 2200CL(E)	3600C(E) 3600CL(E)	5000C(K)(E) 5000CL(E)	6000C(E) 6000CL(E)	6500C(E) 6500CL(E)	7500C(E) 7500CL(E)
Generator	Type	Single phase A.C generator					
	Frequency (Hz)	50/60					
	Rated power (kW)	1.7/2.0	2.7/3.0	4.2/4.6	4.5/5.0	5.0/5.3	5.5/6.0
	Max. power (kW)	1.9/2.2	3.0/3.3	4.6/5.0	5.0/5.5	5.5/5.8	6.0/6.6
	Voltage (A.C) (V)	110, 115, 120, 220, 230, 240, 110/220, 115/230, 120/240					
	Voltage (D.C) (V)	12					
	Current (D.C) (A)	6					
	Power factor	1.0					
	Phase number	Single phase					
	Pole number	2					
	Excitation	Self-excitation type					
	Insulation	G1					
	Voltage regulation system	Condenser compensating system					
Engine	Engine type	170FG	178FG	186FG	186FAG	188FG	188FG
	Type	4-stroke, single cylinder, air cooling, direct injection diesel engine					
	Speed (rpm/min)	3000/3600					
	Continuous output (hp)	3.4/3.8	5.0/5.5	7.8/8.6	7.8/8.6	9.0/9.8	9.0/9.8
	Bore x Stroke (mm)	70x55	78x62	86x70	86x72	88x78	88x78
	Displacement (L)	0.211	0.296	0.406	0.418	0.474	0.474
	Cooling system	Forced air- cooled system					
	Lubrication system	Forced lubrication					
	Lube oil capacity (L)	0.75	1.10	1.65	1.65	1.65	1.65
	Start system	Recoil start / Electric start					
	Fuel oil	Diesel oil					
	Fuel oil tank capacity (L)	2.5	3.5	5.5	5.5	5.5	5.5
		12.5					
	Low oil pressure alarm system	Have					
Unit	Operation capacity (hr)	2.8/2.0	2.6/2.3	2.7/2.5	2.5/2.3	2.5/2.3	2.5/2.3
		14/12	9/8	6.0/5.5	5.5/5.2	5.5/5.2	5.5/5.2
	Net weight (kg)	66	75	90	90	94	94
		70	80	95	95	99	99
	Outline dimensions (LxHxW)(mm)	610x450x500	680x455x545	740x475x590	740x475x590	740x475x590	740x475x590
	Acid battery capacity (AH)	24~36					
	Care free battery capacity (AH)	17~36					

CHAPTER 1 Main technical specifications and data

1-1 Main technical specifications and data of generator set series

Item \ Genset Type		2200C(E)-3 2200CL(E)-3	3600C(E)-3 3600CL(E)-3	5000C(K)(E)-3 5000CL(E)-3	6000C(E)-3 6000CL(E)-3	6500C(E)-3 6500CL(E)-3	7500C(E)-3 7500CL(E)-3
Generator	Type	Three phase A.C generator					
	Frequency (Hz)	50/60					
	Rated power (kVA)	2.12/2.50	3.37/3.75	5.2/5.7	5.6/6.2	6.2/6.6	6.8/7.5
	Max. power (kVA)	2.37/2.75	3.75/4.13	5.7/6.3	6.2/6.8	6.8/7.2	7.5/8.2
	Voltage (A.C) (V)	127/220,220/380,230/400,240/415					
	Voltage (D.C) (V)	12					
	Current (D.C) (A)	6					
	Power factor	0.8					
	Phase number	Three phase					
	Pole number	2					
	Excitation	Self-excitation type					
	Insulation	G1					
	Voltage regulation system	Condenser compensating system					
Engine	Engine type	170FG	178FG	186FG	186FAG	188FG	188FG
	Type	4-stroke, single cylinder, air cooling, direct injection diesel engine					
	Speed (rpm/min)	3000/3600					
	Continuous output (hp)	3.4/3.8	5.0/5.5	7.8/8.6	7.8/8.6	9.0/9.8	9.0/9.8
	Bore x Stroke (mm)	70x55	78x62	86x70	86x72	88x78	88x78
	Displacement (L)	0.211	0.296	0.406	0.418	0.474	0.474
	Cooling system	Forced air- cooled system					
	Lubrication system	Forced lubrication					
	Lube oil capacity (L)	0.75	1.10	1.65	1.65	1.65	1.65
	Start system	Recoil start / Electric start					
	Fuel oil	Diesel oil					
	Fuel oil tank capacity (L)	2.5	3.5	5.5	5.5	5.5	5.5
		12.5					
	Low oil pressure alarm system	Have					
Unit	Operation capacity (hr)	2.8/2.0	2.6/2.3	2.7/2.5	2.5/2.3	2.5/2.3	2.5/2.3
		14/12	9/8	6.0/5.5	5.5/5.2	5.5/5.2	5.5/5.2
	Net weight (kg)	66	75	90	90	94	94
		70	80	95	95	99	99
	Outline dimensions (LxHxW)(mm)	610x450x500	680x455x545	740x475x590	740x475x590	740x475x590	740x475x590
	Acid battery capacity (AH)	24~36					
	Care free battery capacity (AH)	17~36					

Item \ Genset Type		3600S	4600S 4600SA	6000S 6000SA	6500S 6500SA
Generator	Type	Single phase A.C generator			
	Frequency (Hz)	50/60			
	Rated power (kW)	2.7/3.0	4.2/4.6	4.5/5.0	5.0/5.3
	Max. power (kW)	3.0/3.3	4.6/5.0	5.0/5.5	5.5/5.8
	Voltage (A.C) (V)	110, 115, 120, 220, 230, 240, 110/220, 115/230, 120/240			
	Voltage (D.C) (V)	12			
	Current (D.C) (A)	6			
	Power factor	1.0			
	Phase number	Single phase			
	Pole number	2			
	Excitation	Self-excitation type			
	Insulation	G1			
	Voltage regulation system	Condenser compensating system			
Engine	Engine type	178FG	186FG	186FAG	188FG
	Type	4-stroke, single cylinder, air cooling, direct injection diesel engine			
	Speed (rpm/min)	3000/3600			
	Continuous output (hp)	5.0/5.5	7.8/8.6	7.8/8.6	9.0/9.8
	Bore x Stroke (mm)	78x62	86x70	86x72	88x78
	Displacement (L)	0.296	0.406	0.418	0.474
	Cooling system	Forced air- cooled system			
	Lubrication system	Forced lubrication			
	Lube oil capacity (L)	1.10	1.65	1.65	1.65
	Start system	Electric start			
	Fuel oil	Diesel oil			
	Fuel oil tank capacity (L)	16			
	Low oil pressure alarm system	Have			
Unit	Operation capacity (hr)	11.5/10.5	7.8/7.2	7.2/7.0	7.2/7.0
	Net weight (kg)	130	140	150	154
	Outline dimensions (LxHxW)(mm)	820x520x700	900x520x700	900x520x700	900x520x700
	Acid battery capacity (AH)	24~36			
	Care free battery capacity (AH)	17~36			

Item \ Genset Type		3600S-3	4600S-3 4600SA-3	6000S-3 6000SA-3	6500S-3 6500SA-3
Generator	Type	Three phase A.C generator			
	Frequency (Hz)	50/60			
	Rated power (kVA)	3.37/3.75	5.2/5.7	5.6/6.2	6.0/6.6
	Max. power (kVA)	3.75/4.13	5.7/6.3	6.2/6.8	6.6/7.2
	Voltage (A.C) (V)	127 / 220 , 220 / 380 , 230 / 400 , 240 / 415			
	Voltage (D.C) (V)	12			
	Current (D.C) (A)	6			
	Power factor	0.8			
	Phase number	Three phase			
	Pole number	2			
	Excitation	Self-excitation type			
	Insulation	G1			
	Voltage regulation system	Condenser compensating system			
Engine	Engine type	178FG	186FG	186FAG	188FG
	Type	4-stroke, single cylinder, air cooling, direct injection diesel engine			
	Speed (rpm/min)	3000/3600			
	Continuous output (hp)	5.0/5.5	7.8/8.6	7.8/8.6	9.0/9.8
	Bore x Stroke (mm)	78x62	86x70	86x72	88x78
	Displacement (L)	0.296	0.406	0.418	0.474
	Cooling system	Forced air- cooled system			
	Lubrication system	Forced lubrication			
	Lube oil capacity (L)	1.10	1.65	1.65	1.65
	Start system	Electric start			
	Fuel oil	Diesel oil			
	Fuel oil tank capacity (L)	16			
	Low oil pressure alarm system	Have			
Unit	Operation capacity (hr)	11.5/10.5	7.8/7.2	7.2/7.0	7.2/7.0
	Net weight (kg)	130	140	150	154
	Outline dimensions (LxHxW)(mm)	820x520x700	900x520x700	900x520x700	900x520x700
	Acid battery capacity (AH)	24~36			
	Care free battery capacity (AH)	17~36			

1-2. Basic parameter

1-2.1 The gen-set can generate rated power of output under following condition.

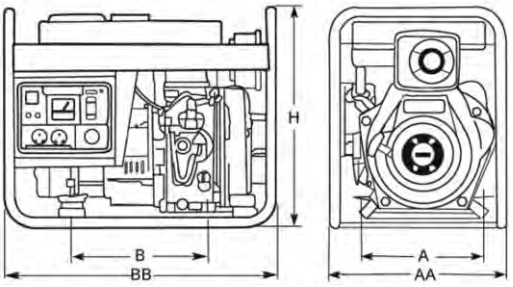
Altitude(m)	Ambient temperature (°C)	Relative humidity
0	+20	60%

1-2.2 The genset can generate specified power of output and work reliably under following condition.

Altitude(m)	Ambient temperature (°C)	Relative humidity
<1000	5~40	90%

1-3 Outline and installation dimensions

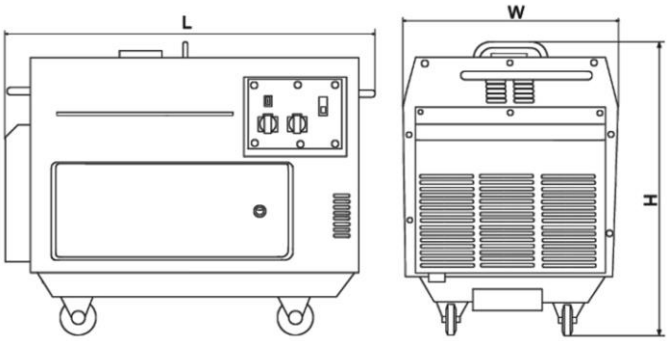
1-3.1 Outline and installation dimensions of diesel generator. (Open frame type)



Outline and data of diesel generator unit: mm

Type	Rated power (kW)	AA	A	BB	B	H
2200C(E) 2200CL(E)	1.7	450	264	610	317	500
3600C(E) 3600CL(E)	2.7	455	302	680	341	545
5000C(K)(E) 5000CL(E)	4.2	475	326	740	376	590
6000C(E) 6000CL(E)	4.5	475	326	740	406	590
6500C(E) 6500CL(E)	5.0	475	326	740	406	590
7500C(E) 7500CL(E)	5.5	475	326	740	411	590

1-3.2 Outline and installation dimensions of diesel generator. (Silent type)

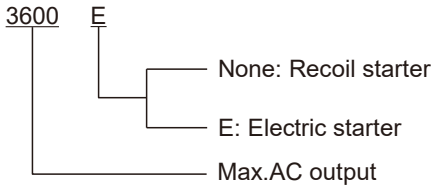


Outline and data of diesel generator unit: mm

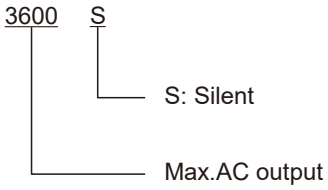
Type	Rated power (kW)	L	W	H
3600S	2.7	820	520	700
4600S	4.2	900	520	700
6000S	4.5	900	520	700
6000S3	5.0	900	520	700

1-3.3 Type and Code of diesel generator

Open frame type

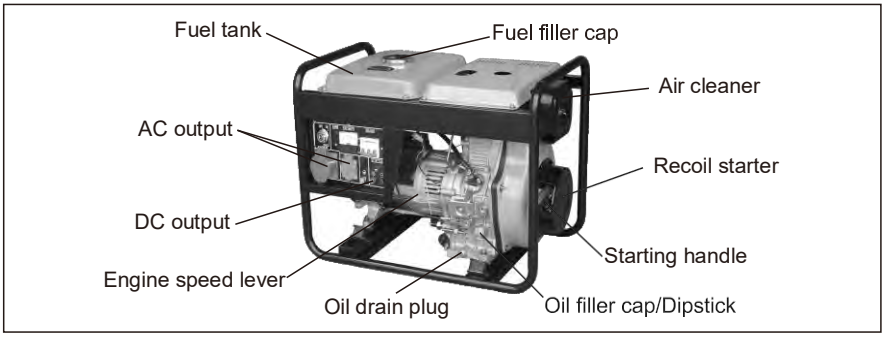


Silent type

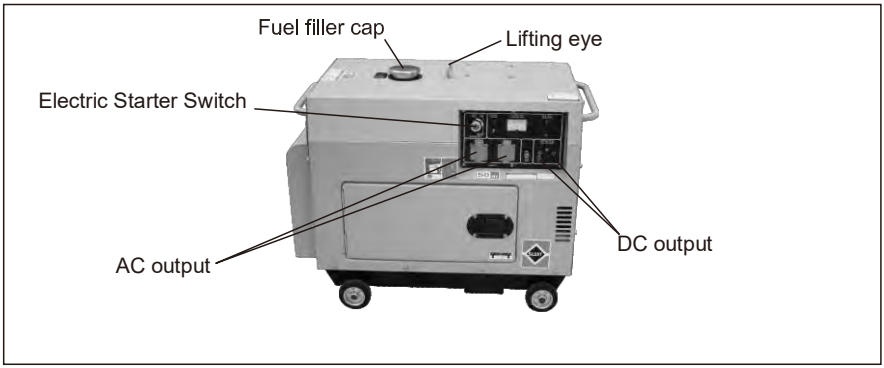


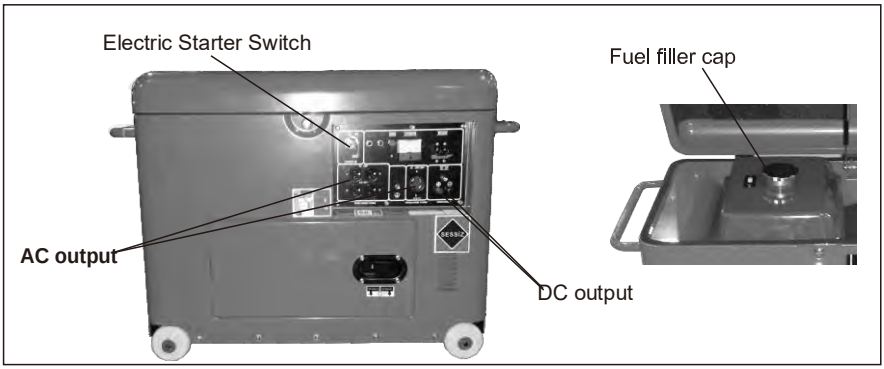
1-4 Parts names

1-4.1 Parts names of the open frame type diesel generator



1-4.2 Parts names of the silent type generator





CHAPTER 2 Operation of generator

2-1 Main points and attentions

Please read and understand this operation manual to insure safe operation, and pay high attention to the following main points of operation otherwise it may cause personal injury and damage to equipment.

2-1.1 Preventing fires

The fuel of diesel engine is light diesel fuel, so gasoline, kerosene etc. must not be used.

Wipe away all fuel spills with a clean cloth. Keep gasoline, kerosene, matches and other explosives and inflammables away from the generator, because the temperature around the exhaust muffler is very high during operation. To prevent fire hazards and to provide adequate ventilation, keep the generator at least 1.5 meter away from buildings and other equipment during operation.

Operate the generator on a level surface, there may be fuel spillage if the generator is tilted.

2-1.2 Preventing exhaust gas inhalation

Exhaust gas contains poisonous carbon monoxide. Never use the generator in poorly ventilated locations. If indoor operation is unavoidable, provide proper ventilation so that people and cattle will not be affected.

2-1.3 Preventing burns

Never touch the muffler, muffler cover while the engine is running or hot.

2-1.4 Electric shocks, short circuits

In order to avoid electric shocks or short circuit, do not touch the generator, when either it or your hands are wet.

This generator is not waterproof , so it should not be used in a place exposed to rain, snow or water sprays.

Caution: Most appliance motors require more than their rated wattage for start up. Do not exceeded the current limit specified for any one socket .

The generator should be ground to prevent electric shocks. Please connect a length of heavy wire between the generator's ground terminal and an external ground device. **Please see Fig2-1, Fig2-2.**

Fig2-1

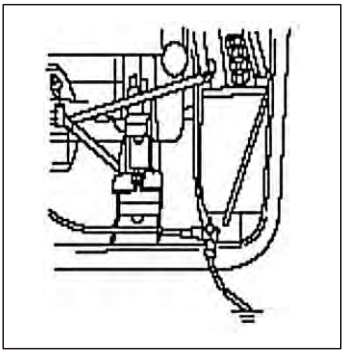


Fig2-2

Do not connect other equipment to the generator before start it.

2-1.5 Other safe main points

Know how to stop the generator quickly, and understand how operate all of the controls. Never permit anyone to operate the generator without proper instruction.

Always wear a helmet and safety shoes and proper clothes, keep pets and children away from the generator when it is in operation.

2-1.6 Charging the battery

Battery electrolyte contains sulphuric acid. Protect your eyes, skin and clothing. In case of contact, flush thoughly with water and get prompt attention, especially if your eyes are affected.

Batteries generate hydrogen gas, which can flames or sparks near a battery, especially during charging.

Chargethebatteryinafullyventilated pl.

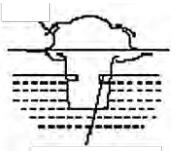
2-2 Preparation before start

2-2.1 Selection and handling fuel

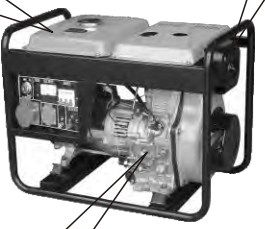
Fuel tank: Only light diesel fuel can be used. The fuel must be filtered. Fuel should be free of water or dust because these cause trouble in the fuel injection pump and nozzle.

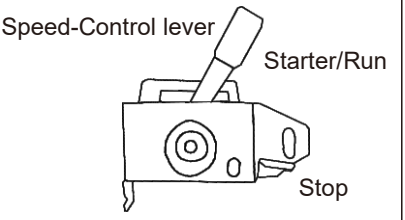
Type / Capacity	2200 3600 5000 6000 6500 7500 180	3600S 5000S 6000S 6500S 180AS
Fuel Tank Effective Capacity(L)	12.5	16

Caution: Over fill the tank beyond the top of the red plug inside the fuel tank filter.



Air cleaner element:
Don't wash the air cleaner element with detergent. Replace the element when its output decreases or a bad exhaust color is noticed.

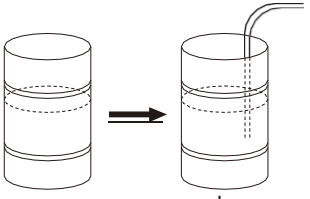




Caution

- Don't smoke and allow sparks in the area where the engine is refueled or where gasoline is stored.
- Don't spill fuel when refueling, make sure the filter cap is securely closed.

a. After purchasing fuel; Allow drum to stand 3~4 days.
b. After 3~4 days: Put a suction pipe halfway into the drum. (Water and dust accumulate in the lower portion of the drum.)

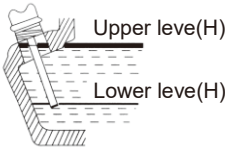


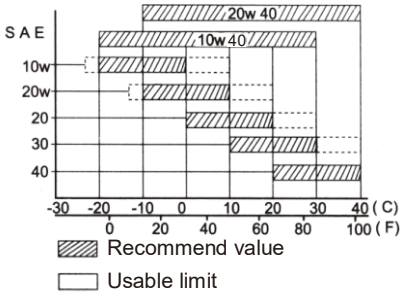
2-2.2 Selection and handling of lube oil

Inlet of lubricant:

Set the generator on the level, fill the engine oil into the inlet of lubricant.

To check the oil level, simply dip the dipstick into the pan. Do not screw the dipstick.

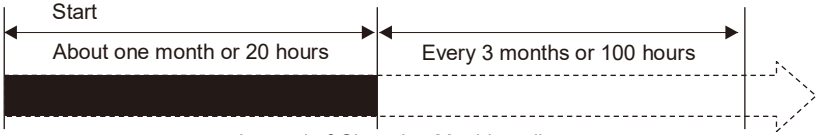




A.P.I. Maintenance classification for the diesel engine.
We recommend A.P.I. CC or CD

Type / Capacity	170	178	186	188
Capacity(L) UK gallon	0.75 (0.16)	1.1 (0.24)	1.65 (0.35)	1.65 (0.35)

Nothing affects the performance and durability of generator more than the lube oil you use. If inferior oil is used up or if your engine oil is not changed regularly, the risk of piston seizure, piston ring sticking and accelerated wear of the cylinder liner, bearing and other moving components increases significantly. Your generator's life may be seriously shortened.

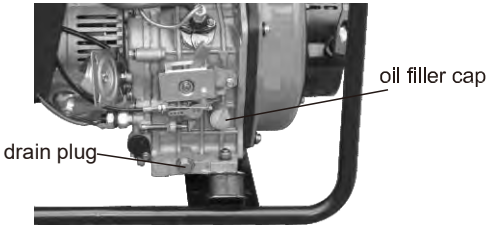


Interval of Changing Machine oil

Make sure to check the oil level and to refill with oil to the specified level before starting the generator, even though it is equipped with a low oil pressure warning system.

Be sure to drain the oil while the engine is warm. It is difficult to drain the oil completely after cooling.

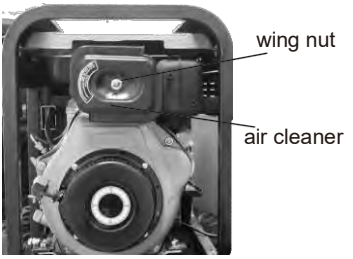
Caution: Do not add oil into the machine when the engine is running.



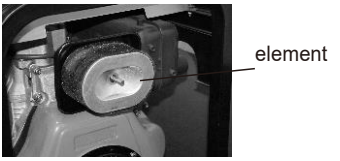
2-2.3 Check air cleaner element

(1) Loosen the wing nut, detach the cover of air cleaner and remove the element. Do not wash air cleaner element with detergent .

The air cleaner element must be changed when the output of engine decreases or the color of exhaust is abnormal.



Never run the generator without the air cleaner element. This may cause rapid engine wear.

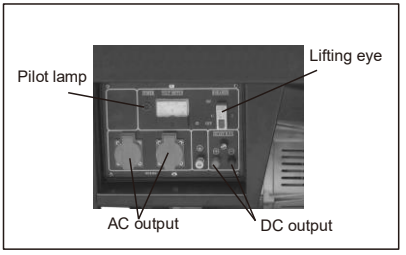


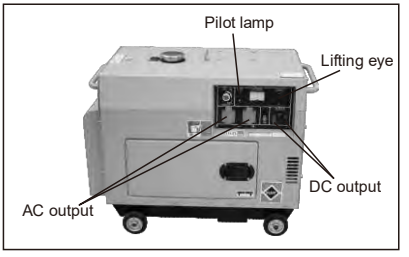
(2) Reattach the cover of air cleaner and tighten the wing nut.

2-2.4 Check generator

Turn off the main switch and any other loads

(Such as the light and motor switches)





Be sure to turn off the main switch before starting the generator. If the switch is not on the “off ” position, sudden application of load could be very dangerous, when the diesel engine is started.

The generator should be earthed to prevent electric shocks.

2-2.5 Handling of dual voltage type generator

Operation of change over switch.

The AC circuit breaker on the control panel must be set to ‘OFF’ position before running the machine. After starting the generator, allow the speed to reach rated RPM and then turn the AC circuit breaker to the "ON" position, so that the receptical sockets can be used for operating equipment.

Set the main AC circuit breaker to the “OFF" position when using the 12v DC power supply.

2-2.6 The fuel and engine oil are drained off by factory for transportation.

To check for airlock in fuel pipeline, and find whether there is air mixed into the pipeline, if yes, drain away the air from the pipeline before refuel and start the diesel engine. Fuel filter should be minimum 75% full, if not then air may be present in system.

The method to remove is, loosen the 17mm connection nut between injecting pump and brass pipeline, put run lever to “RUN” position and turn over the engine until fuel appears. Retighten 17mm gland and repeat if engine still does not start.

2-3 Inspection and operation of diesel engine

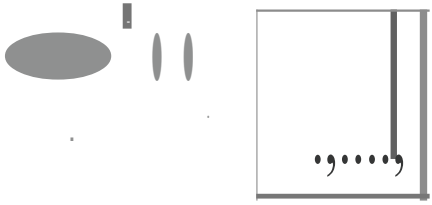
2-3.1 Low oil warning system / stop device.

Device works to stop the engine automatically when the oil pressure falls below the regulatory level and will prevent engine seizure when the engine oil is running low.

The oil temperature will rise high if the engine is operated with insufficient engine oil. On the other hand, too much oil is dangerous because the oil may combust and cause a sudden and excessive rise in engine rpm, so before operating the machine each day be sure to check the oil and fill oil to the specified level.

2-3.2 How to open the cabinet door and cover (diesel generator)

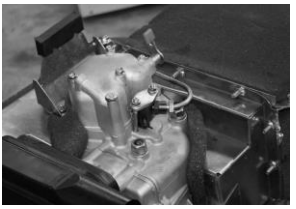
(1) Opening the cabinet door and raise the door and check daily.



GS

(2) Loosen the bolt & open the cover to check the air cleaner.

(3) Checking the outside cover of nozzle, loosen the thumb nut and open the cover.



2-3.3 Break-in operation

While your generator is still new, application of heavy loads may shorten the life of the engine. Follow the break-in procedures during the first 20 hours.

(1) Avoid applying any heavy load during the break-in period.

(2) Change engine oil regularly.

Change the engine oil every 20 hours or one month after the initial use, and every 3 months or 100 hours thereafter.

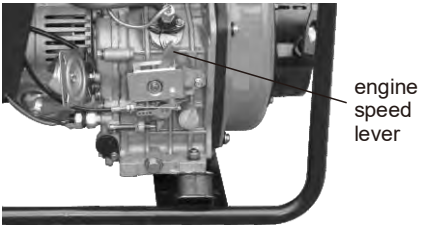
2-4 Starting the generator

2-4.1 Recoil starting (manual start)

The engine is started in the manner described below.

(1) Open the fuel cock (at the “ON” position).

(2) Put the engine speed lever in the “RUN” position.



(3) Pull out the recoil starting handle.

1. Pull out the handle to the point where your hands feel strong resistant and then return it to the initial position.

2. Push down the decompression lever. (It will return automatically when the recoil starter is pulled).

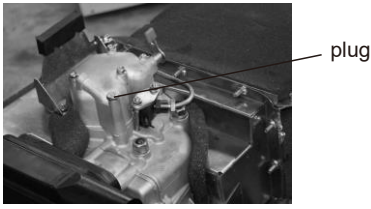
3. Pull out the recoil starting handle briskly with both hands.

Do not allow the handle grip to snap back against the engine. Return it gently to prevent damage to the starter, when starting (or after start).

Caution:	Never pull out the start handle when diesel engine is running, otherwise it will damage the engine.

4. In cold weather, when diesel engine is difficult to start, remove the plug from the rocker arm cover and add 2 cc of engine oil.

Replace the plug before starting.



Keep the plug in the cover except when adding oil, otherwise rain, dirt and other contaminants may enter the engine and cause accelerated wear of internal parts. This can cause serious problems.

2-4.2 Electric starting

1. Starting (The preparation for electric starting is same as recoil start).

(1) Open the fuel cock.

(2) Let the engine speed lever at “RUN” position.

(3) Turn the starting key at clockwise to “Start” position.

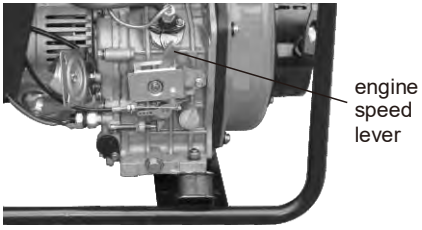
(4) Remove your hand from the key as soon as the engine starts and let the key return automatically to initial position.

(5) If the starting motor doesn't start after 10 seconds, please wait for about 15 seconds before attempting to start again.

Caution:

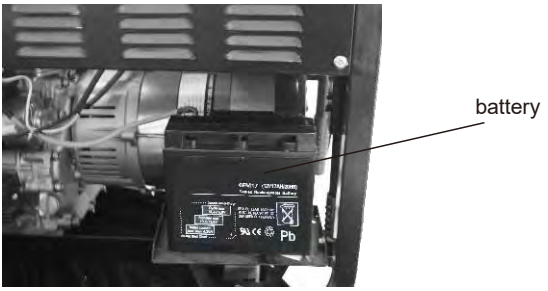
If the starting motor is run for too long, the battery will go fault.

Always leave the starting key turned on, in the “ON” position, while the engine is running.



2. Battery

Check the level of the fluid in the battery once every month. when the level has dropped to the lower upper mark, replenish with distilled water up to the upper mark.

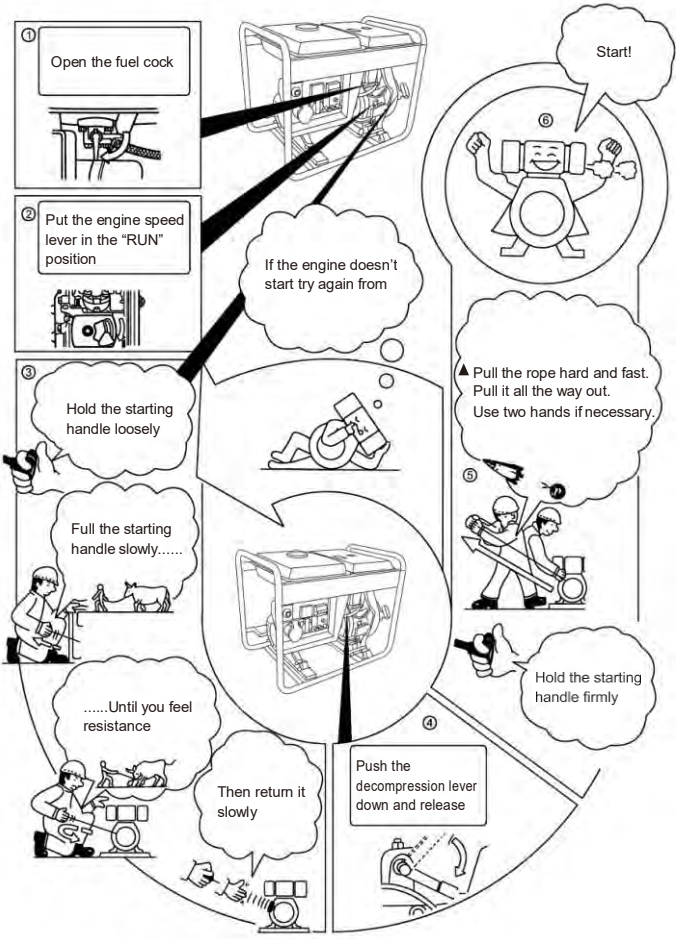


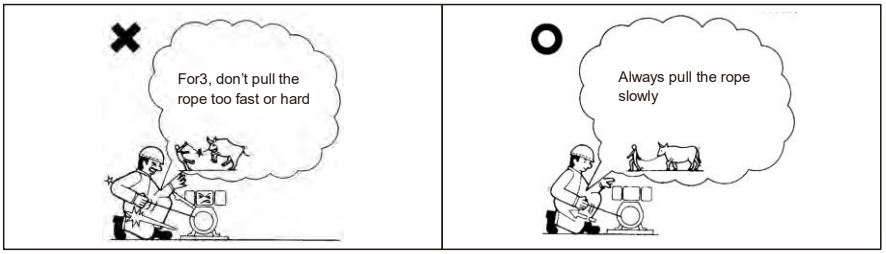
If battery fluid is short, the engine may fail to start because too little electricity is reaching the starter motor. Always keep the fluid level between the upper level and lower level.

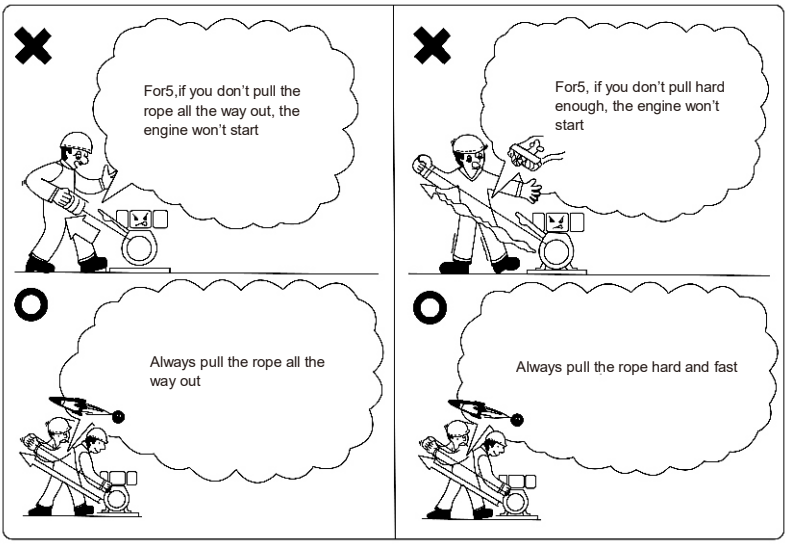
If too much battery fluid is supplied, the fluid may spill and corrode the surrounding parts.

2-5 Starting sequence of generator

This starting sequence is only suitable for open frame type diesel generator recoil start.







2-6 How to operate generator in correct way

2-6.1 Operating your generator

(1) Warm up the engine without load for about 3 minutes.

(2) Our generator is equipped with low oil warning system. The engine will stop automatically in case of low oil pressure or a lubrication oil shortage. The engine will stop immediately if restarted without a lubrication oil refill. To check the oil level and refill.

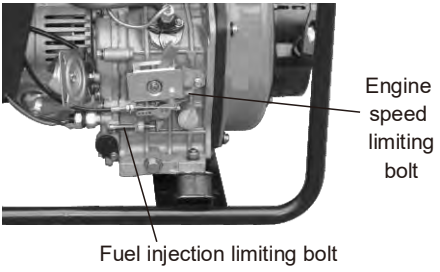
(3) Do not loosen or readjust either the engine speed limiting bolt or fuel injection limiting bolt (They had been already well adjusted before ex-factory) otherwise, performance may be affected.

2-6.2 Check during operation

(1) Any abnormal sound or vibration?

(2) The engine misfiring or running rough.

(3) What about the color of the exhaust gas? (Is it black or too white?)

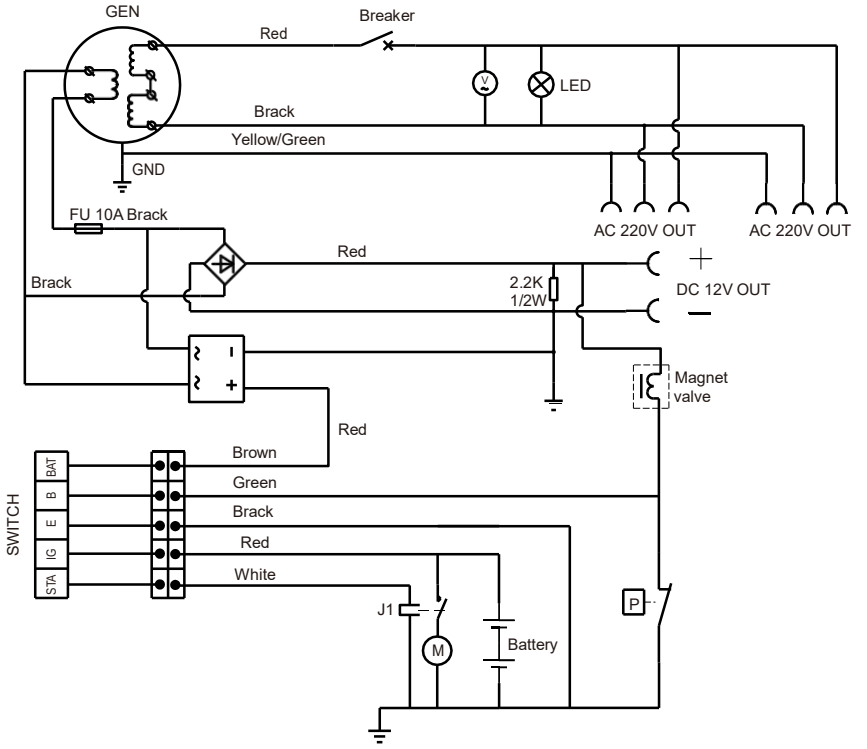


If you notice any of the above phenomenon, stop the engine and consult your nearest dealer or contact with our company.

2-7 Load

2-7.1 Load

To add load according to specified parameter. For electric principle diagram of generator, please refer to the following drawing.



SWITCH

	IG	BAT	STA	E	B
OFF				○—○	
ON	○—○				
START	○—○—○				

2-7.2 A.C application

(1) Start the engine and make sure the pilot lamp turns on. If it does not, the filament may be burnt out.

(2) The speed of generator must reach rated speed (lever at top). For rated speed of generator, please see main technical specifications and parameter at chapter 1 1-1. & 1-2. Section.

(3) Generator can load when the indicator of voltmeter shows at 230±10% (50Hz) on the panel of control box.

(4) Plug in the appliance.

Caution: Do not start two or more machines simultaneously. Start them one by one.Do not use floodlights together with other machines.

Load / Type		Incandescent lights electric appliances	The machine using commutator motor	The machine using an induction motor (Condenser start type) (1:3)		
		Electric heater (1:1) projector	Drills, grinder (1:2) etc.	Water pump, compressors etc.		
				Load	50Hz	60Hz
Single phase generator	2200C(E) 2200CL(E)	Within 1700/2000W	Within 850/1000W	400W or 250W	1 units 2	1 units 2
	3600C(E) 3600CL(E) 3600S	Within 2700/3000W	Within 1350/1500W	400W or 250W	2 3	2 4
	4600C(E) 4600CL(E) 4600S	Within 4200/4600W	Within 2100/2300W	400W or 250W	3 5	3 6
	6000C(E) 6000CL(E) 6000S	Within 4500/5000W	Within 2250/2500W	400W or 250W	3 6	4 6
	6500C(E) 6500CL(E) 6000S3	Within 5000/5300W	Within 2500/2650W	400W or 250W	4 6	4 7
	7500C(E) 7500CL(E)	Within 5500/6000W	Within 2750/3000W	400W or 250W	4 7	5 8

The speed of generator (50Hz) must reach the rated speed 3000 RPM

(5) Be sure that all appliances are in good working condition before connecting them to the generator, if an appliance begins to operate abnormally. Becomes sluggish, or stops suddenly, turn off the generator immediately. Then disconnect the appliance and examine it for signs of malfunction.

If overloading of the circuit trips the AC circuit protector, reduce the electrical load on the circuit, and wait a few minutes before resuming operation.

If the indication of voltmeter is too low or too high, stop the machine and examine it for cause of malfunction.

2-7.3 DC application

The DC terminal may be used for charging 12 volt automative-type batteries only.

(1) When using automotive-type batteries with battery cables, be sure to disconnect the minus pole battery cable from the battery before charging.

(2) Start the engine.

(3) Connect the charging cable to the battery terminals and the DC terminals of generator.

Connect the positive battery terminal to the positive generator terminal. Do not reverse the charging cables, or serious damage to the generator and/or battery may occur.

Do not allow the free ends of the cable to touch each other. If this occurs, it will be short circuit the battery.

When a large capacity battery is charged, excessive current flows(the value varies depending on the discharging condition), and the fuse for the direct current will burn out.

(4) Batteries produce explosive gases. Keep sparks, flames and cigarettes well away. To prevent the possibility of creating a spark near the battery, always connect the charging cables to battery first and only then to the generator. When disconnecting, you should disconnect the cables at the generator first.

(5) Charge the battery in a well ventilated place. Before charging, remove the cap from each cell of the battery.

Discontinue charging if the electrolyte temperature exceeds 45°C.

Caution: Do not attempt to start an automobile engine while the generator is still connected to the battery.
Do not use D.C 12 volt and A.C at the same time.

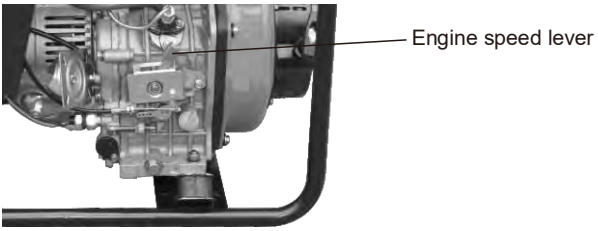
2-8 Stopping generator

2-8.1 Turn off the main switch of the generator

2-8.2 Set the engine speed lever at the "RUN" position, operate the engine without load for about 3 minutes, do not stop the engine suddenly because this may cause the temperature to rise abnormal and cause the nozzle to seizure, finally damage the engine.

(1) Push down the stop lever.

(2) Turn the key to "OFF" when using the electric starter.



(3) Set the fuel cock lever to the "S"(closed) position

(4) Slowly pull out the recoil handle until pressure is felt (that is, to the point in the compression stroke where the intake and exhaust valves are closed), and leave the handle in this position. This prevents rust from forming while the engine is not in use.

Caution: If the engine keeps on running even after the speed lever is laced at the "Stop" position, turn the fuel oil cock to the "Close" position to stop the engine. Do not stop the engine with the decompression lever.

CHAPTER 3 Periodic checks and maintenance

3-1 Periodic checks and maintenance

Periodic check and maintenance are very important for keeping the engine in good condition. Please read the detailed description of operating manual for each part.

Shut off the engine before performing any maintenance. If the engine must run, make sure the area is well ventilated. The exhaust contains poisonous carbon monoxide gas.

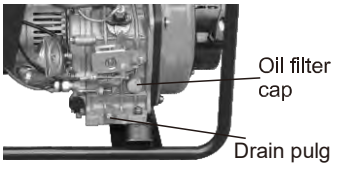
After the engine has been used, clean it immediately with a cloth to prevent corrosion and remove sediment.

Service period regular / Item	Daily check	First month or 20 Hrs	Every 3 months or 100 Hrs	Every 6 months or 300 Hrs	Every year or 1000 Hrs
Check and replenish fuel	○				
Drain fuel F.O. tank		○			
Check and replenish lube oil	○				
Check for oil leakage	○				
Check and tighten each parts engine	○			● Tighten head bolts	
Chang lube oil		○(1st time)	(2nd and thereafter)		
Clean oil filter			○○(Clean)	○(Replace)	
Air cleaner element replacement	Service more frequently when used in dusty areas			○(Replace)	
Clean fuel filter				○(Clean)	(Replace)
Check fuel injection pump				●	●
Check fuel injection nozzle				●	
Check fuel pipe				(Replace if necessary)	
Adjust valve clearance for intake and exhaust valves		(1st time)		●	
Lap intake and exhaust valves		●			●
Replace piston rings					●
Check battery fluid	(Monthly)				

"○" The chart above indicates what checks to make and when to make them, the mark (●) indicates that special tools and skills are required, consult your dealer.

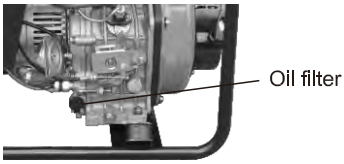
3-1.1 Changing engine oil (Every 100Hrs)

Remove the oil filler cap. Remove the drain plug and drain the used oil while the engine is still warm. The plug is located on the bottom of the cylinder block. Tighten the drain plug and refill with the recommended oil.



3-1.2 Cleaning the oil filter

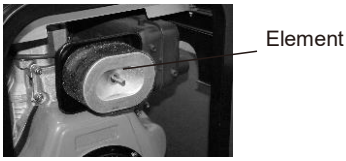
Clean	Every 6 months or 300 hours
Replace if necessary	



3-1.3 Changing the air cleaner element

Do not wash the air cleaner element with detergent because this is a dry type element.

Change	Every 6 months or 300 hours (or earlier if dirty)



Caution: Never start the engine without the element, or with a defective element. Change the element in time.

3-1.4 Cleaning and replacing the fuel filter

The fuel filter also has to be cleaned regularly to insure maximum engine output .

Clean	Every 6 months or 300 hours
Replace	Every year or 1000 hours

(1) Drain the fuel oil from the fuel tank.

(2) Loosen the small screws of the fuel cock and pull out the filter from the F.O. tank. Wash the filter thoroughly with diesel fuel .Remove the lock nut, end cap and diffuser discs and clean the carbon deposit.

3-1.5 Tightening cylinder head bolts (Refer to the manual of diesel engine) requires a special tool. Don't try it yourself

3-1.6 Checking the injection nozzle, injection pump, etc.

(1) Adjusting the valve head clearance for the intake and exhaust valves.

(2) Lapping of intake and exhaust valve.

(3) Replacing piston ring.

All these require special tools and skills. Do not perform the injection nozzle test near an open fire or any other kind of fire. The fuel spray may ignite. Do not expose bare skin to the fuel spray. The fuel may penetrate the skin and cause injury to the body. Always keep your body away from the nozzle.

3-1.7 Checking and replenishing battery fluid and charging and battery

This diesel engine uses a 12v battery. The battery fluid will be lost through continuous charging and discharging.

Before starting, check for physical damage to the battery and also the electrolyte level, and replenish with distilled water up to the upper mark if necessary. When actual damage is discovered, replace the battery.

Battery fluid check	Monthly

3-2 Maintenance for a long time storage

If your generator should be stored in long time, the following preparation should be made.

3-2.1 Operate the diesel engine about 3 minutes, and stop it

3-2.2 Stop the diesel engine when the diesel engine is still hot, drain old lubricate of diesel engine oil out, then refill new one

3-2.3 Pull out the plug at the cover of diesel engine and add 2ml of lubricate in cylinder, and finally put the plug on its original place

3-2.4 Maintenance of starting position

(1) Manual starting

Press the pressure-reduce handle (non-compression position), pull the recoil handle 2-3 times. (Don't start diesel engine).

(2) Electric starting

When the starting handle is in the position of non-compression position, operate the diesel engine 2-3 seconds. When the switch is in the position of start, don't start the diesel engine.

3-2.5 Pull the pressure-reduce handle out, pull the recoil starter slowly

When you feel the fastness, stop the pulling. (At this time the intake and exhaust valve is at the status of close, it is suitable to prevent from rust).

3-2.6 Clean and store it in a dry place.

Chapter 4 Maintenance and remedy of generator set

4-1 Trouble Shooting

	Cause	Remedy
The diesel engine can not start	Fuel oil is not enough	Add fuel oil
	The switch is not at “ON” position	Turn it to “ON” position
	The pump of high pressure and oil nozzle can not inject oil or the oil amount is not enough	Remove the oil nozzle out and repair it at test table
	The control lever of speed is not at “RUN” position	Put the control level to “RUN” position
	Check the level of lubricant	The specified oil level should be between upper level “H” and lower level “L”
	The speed and force to pull the recoil starter is not enough	Start the diesel engine according to the requirements of operating procedure of start
	The oil nozzle is dirty	Clean the oil nozzle
	The battery has no electricity	Charge it or replace it with a new one
The generator can not generate	Main switch is not closed	Put the main switch to the “ON” position
	The contact of socket is not good	Adjust the feet of socket
	The rated speed of generator cannot be reached	Adjust it according to the requirements

When welding, if find the electricity is too big to be welded,or the engine is shutdown by overload during welding, it may cause by the AVR's regulator damage or short circuit.

If electricity is not generated, take the generator to dealer.

4-2 Question and problems

If you have any question or problem when you meet in your operation, please contact with our company or our dealer and tell the following information:

(1) The type of diesel generator sets, the No. and type of diesel engine and the No. and type of generator.

(2) Status.

What problem had taken when operation and explain how much speed it is operated.

(3) Time of operation

(4) The other detailed condition, for example, when the problem took and how often, etc.

For details, please fill the sheet of soliciting opinions from the customers and send it to our company.

APPENDIX

1.List of accessory and spare parts with this machine

No.	Name	Unit	Qty	Remarks
1	Diesel generator	Set	1	
2	Kit	Piece	1	
3	Plastic cover	Piece	1	
4	Certificate of quality	Piece	1	

2. Technical documents

No.	Name	Unit	Qty	Remarks
1	Manual of diesel engine series	Set	1	
2	Manual of generator set series	Piece	1	
3	Bag of plastic document	Piece	1	

3. Service Part Kit (Optional)

No.	Name	Unit	Qty	Remarks
1	Wrench 8-10	Set	1	
2	Wrench 12-14	Piece	1	
3	Wrench 17-19	Piece	1	
4	Screw	Piece	1	
5	Plastic Bag	Piece	1	

“Original Instructions”, “the business name and full address of the manufacturer and the authorized representative within EU” are added on cover page.

Intended use:

1) This product is only intended for use outdoors in a well ventilated area.

2）The product is intended for generating electricity.

3）The product should not be used underground.

4）The product should not be used in a potentially explosive atmosphere.

5) The product cannot be connected directly to power supply.

Noise Declaration

Sound power level = 95LWA

Sound measurement uncertainty = 1.5dBs

Measured in accordance with ISO 8528-10 and EN ISO 3744.

NOTE

When operating the engine, ear protection shall be worn.