

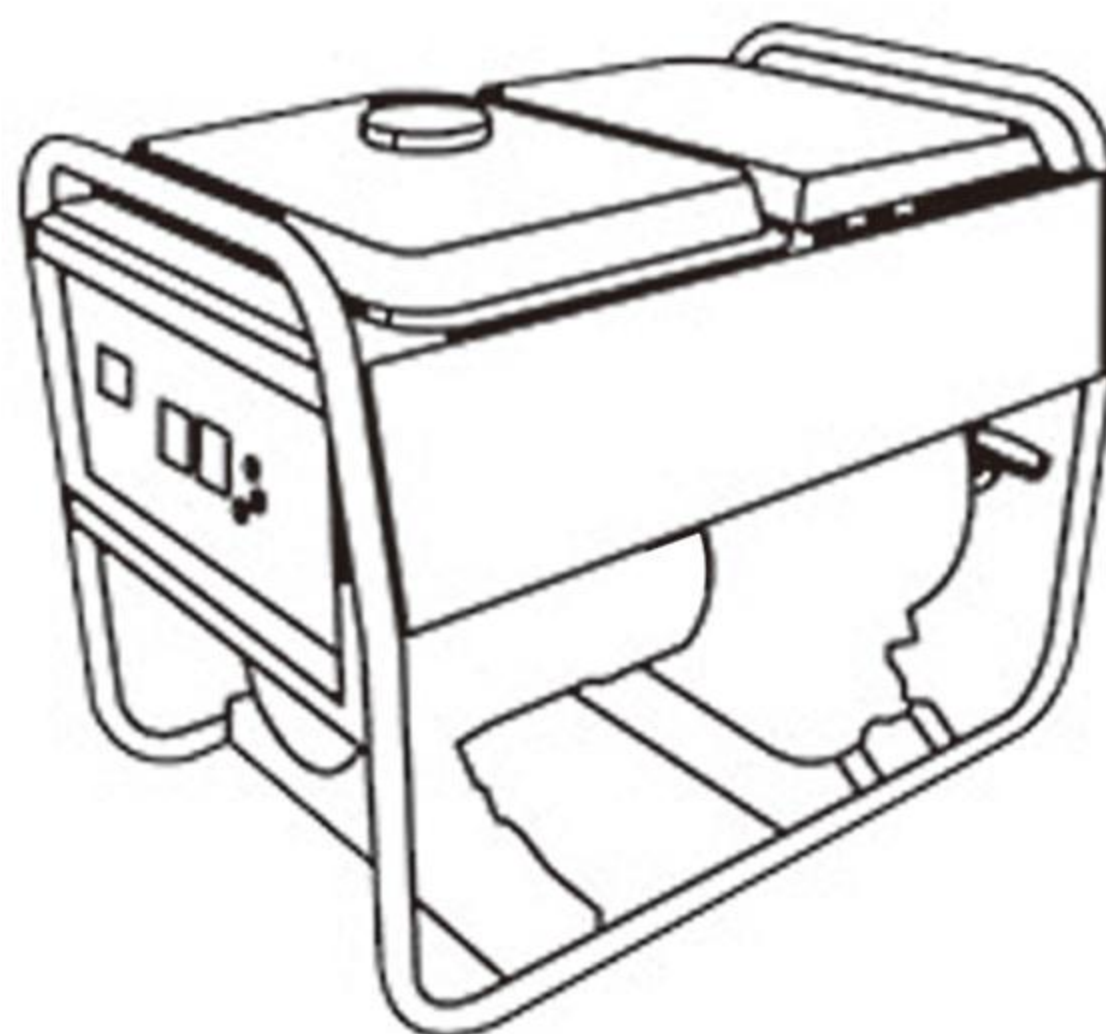
OWNER'S MANUAL

6000W Diesel Generator



OWNER'S MANUAL

Air-cooled diesel engine generator set



— — — — — Diesel Series Generator Set — — — — —

Thank you for purchasing our diesel series generator set.

This manual tells you how to operate and service your diesel generator. Please take time to read through it before operating your diesel generator. Everyone who operates the generator must read and understand this manual. The time you take before operating will ensure your safety and prolong your generator's life.

Pay special attention to statements preceded by the following words:

 **DANGER**

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

 **WARNING:**

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

 **CAUTION:**

Indicates a potentially hazardous situation which if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

NOTE:

Gives helpful information.

With the unceasing improvement and enhancement of products, We reserves the right to make improvements in design and/or change in specifications at any time without prior notice or obligation. User should pay attention to that may be some differences between the contents described in the operation instructron and the practical products.

 **WARNING:**

The diesel series generator is designed to give safe and dependable service provided that it is operated according to the instructions. Read and understand the operation manual before operating the set. Failure to do so could result in personal injury or equipment damage.

CAUTION:

Should no manufacturing standard be specially defined in the contract of order, all generator sets will be manufactured according to GB/T2820.3-1997 or ISO 8528-3:1993 standard.

----- **TIPS ON SAFETY** -----

 **WARNING:**

1.Preventing electrical shock:

The generator should be grounded to preventing electric shock.

Never operate the generator, or handle any electrical equipment while stand in water, while barefoot, while hands are wet or while in the rain or snow otherwise electric shock may result.

2.Preventing fires:

Never add fuel to the fuel tank while the engine is running.

Use a clean cloth to wipe off the spilled fuel. Keep the gasoline,kerosene,match and other inflammable and explosive matters away from the set because the temperature around the muffler is very high during operation.

To prevent the fire hazard, it is necessary to provide sufficient ventilation condition. During the period of operation, at least 1 m distance between the set and the building and other equipment should be kept.

3.Preventing burns:

Never touch hot muffler,hot exhaust manifold or engine cooling fins.

 **DANGER:**

4.Preventing to inhale exhaust gas:

Always provide adequate ventilation. Do not operate generator in any enclosed space or indoor. Engine consume oxygen and give off deadly carbon monoxide poisonous gas. Improper ventilation will cause damage to generator and possible injury to people.

If indoor operation is unavoidable, provide proper ventilation so that people and cattle will not be affected.

5.Charging battery:

Battery contain sulfuric acid which can cause blindness or severe burns:

Charging battery produce colorless explosive gases which can cause blindness or injury, No smoking, sparks, or flames should exist when charging battery.

In case of contact, flush through with water and seek medical help immediately, especially if your eyes are affected

6.Other safety tips:

Know how to operate all of the controls and to stop the engine quickly. Keep battery out of the reach of children, do not keep on tip object, keep vent caps tight and level. The operator should wear safe shoes and working clothes.

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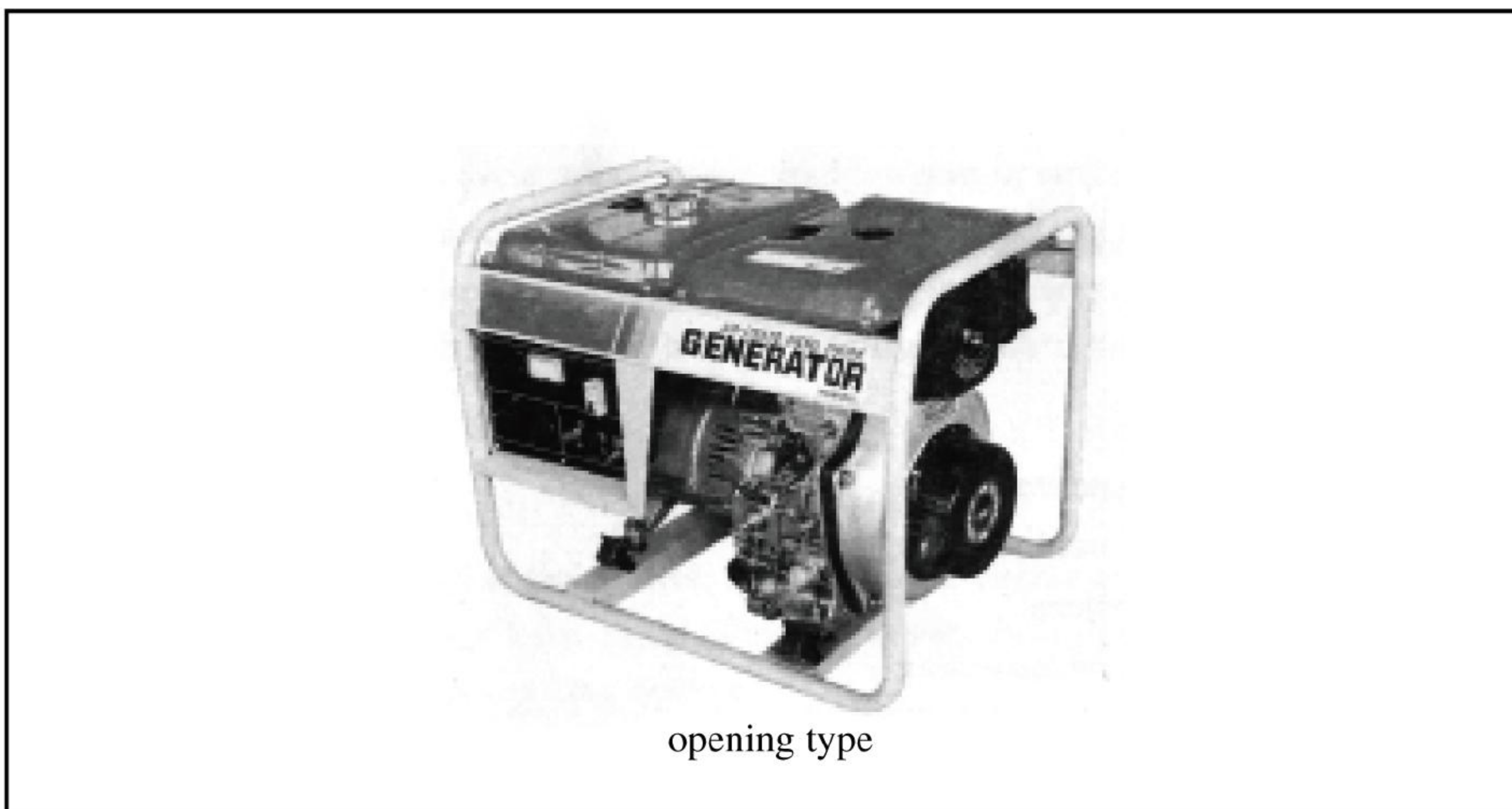
Appendixes:

List for comments from users

1. series appearance diagram



2. series appearance diagram



MAIN TECHNICAL SPECIFICATIONS AND OPERATION CIRCUMSTNCE

1.Main technical specifications and operation circumstance

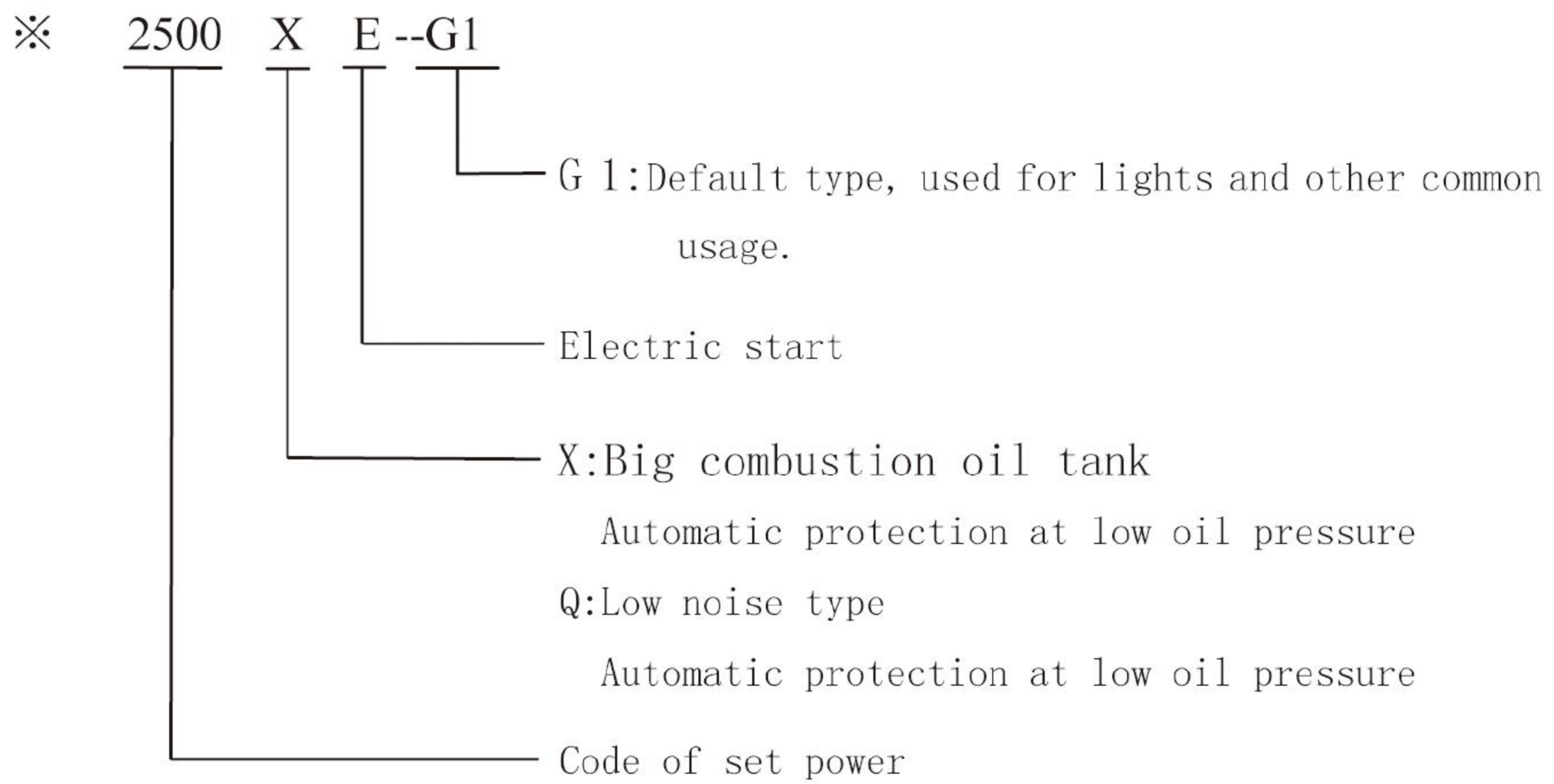
1.1Main technical specification

Item		Type of set		6700X(E)	7500X(E)	
		2500X(E)	4000X(E)	6700X(E)-3	7500X(E)-3	
Generator	Kind	Single-phase		Single-phase /Three-phase		
	Frequency (Hz)	50/60	50/60	50/60	50/60	
	Max Power (kVA)	2.0/2.2	3.0/3.3	Single-phase 5.0/5.5 Three-phase 6.25/6.87	Single-phase 5.5/6.0 Three-phase 6.87/7.5	
	Rated Power (kVA)	1.8/2.0	2.8/3.0	Single-phase 4.5/5.0 Three-phase 5.62/6.25	Single-phase 5.0/5.5 Three-phase 6.25/6.87	
	Rated voltage (V)	220; 230; 240; 110/220; 115/230; 120/240		220; 230; 240; 110/220; 115/230 120/240; 220/380; 230/400 240/415		
	Excitation mode	Constant self-motivation (AVR)				
	Power Factor(cos θ)	1.0		Single-phase 1.0/ Three-phase 0.8		
	Speed (rpm)	3000/3600				
	Steady-state voltage regulation rate (%)	± 7				
	optional generator grade	G1		G2		
	Insulation class	F				
	No load waveform distortion rate	≤10%		≤ 5%		
	Linear load waveform distortion rate	≤20%		≤ 15%		
Engine	Engine Model	170F	178F	186FA	188F	
	Engine Output (kW)	3000	2.5	3.7	5.7	6.6
		3600	2.8	4.0	6.3	7.5
	Bore×Stroke (mm)	70×55	78× 62	86×72	88× 75	
	Displacement (CC)	211	296	418	456	
	Oil Capacity (L)	0.75	1.1	1.65		
	Fuel	Diesel fuel				
	Lubrication system	Pressure splash				
	Cooling	Air-cooled				
Starting method	Recoil starter or electric start					
Set	Fuel tank capacity (L)	12.5				
	Working way	12 hours of continuous output				
	Dry weight (kg)	63	72	104	107	
	Dimensions(L x W×H) mm	640×460× 520	660×460×540	740×505×620		

Type of set		8500X(E) 8500X(E)-3	6700Q 6700Q-3	7500Q 7500Q-3	8500Q 8500Q-3	
Generator	Item					
	Kind	Single-phase /Three-phase				
	Frequency (Hz)	50/60	50/60	50/60	50/60	
	Max Power (kVA)	Single-phase 6.5/7.0 Three-phase 8.1/8.75	Single-phase 5.0/5.5 Three-phase 6.25/6.87	Single-phase 5.5/6.0 Three-phase 6.87/7.5	Single-phase 6.5/7.0 Three-phase 8.1/8.75	
	Rated Power (kVA)	Single-phase 6.0/6.5 Three-phase 7.5/8.1	Single-phase 4.5/5.0 Three-phase 5.62/6.25	Single-phase 5.0/5.5 Three-phase 6.25/6.87	Single-phase 6.0/6.5 Three-phase 7.5/8.1	
	Rated voltage (V)	220; 230; 240; 110/220; 115/230; 120/240; 220/380; 230/400; 240/415				
	Excitation mode	Constant self-motivation (AVR)				
	Power Factor(cos θ)	Single-phase 1.0/ Three-phase 0.8				
	Speed (rpm)	3000/3600				
	Steady-state voltage regulation rate (%)	±7				
	optional generator grade	G2				
	Insulation class	F				
	No load waveform distortion rate	≤5%				
	Linear load waveform distortion rate	≤15%				
Engine	Engine Model	192F	186FA	188F	192F	
	Engine Output (kW)	3000	7.6	5.7	6.6	7.6
		3600	8.2	6.3	7.5	8.2
	Bore×Stroke (mm)	92×75	86×72	88×75	92×75	
	Displacement (CC)	499	418	456	499	
	Oil Capacity (L)	1.65				
	Fuel	Diesel fuel				
	Lubrication system	Pressure splash				
	Cooling	Air-cooled				
Starting method	Recoil starter or electric start	Electric start				
Set	Fuel tank capacity (L)	14.5				
	Working way	12 hours of continuous output				
	Dry weight (kg)	112	172	175	180	
	Dimensions(L x W×H) mm	740×505×630	910×530×740			

MAIN TECHNICAL SPECIFICATIONS AND OPERATION CIRCUMSTNCE

Meanings of type symbols



Please confirm the model and functions of the generator set you ordered. For more detailed information, contact with the dealer or us.

1.2 Operation circumstance

Under the following conditions, the generator set should output the rated power and work reliably.

Altitude height	Ambient temperature(° C)	Relative humidity
<1000 (m)	-15 ~40(° C)	<90%

Please affirm your type of machine and understand its functions in order to operate and maintain it correctly.

INSTALLATION

2 Installaion of generator set

2.1 Outdoors operation

Choose a location where the generator will not be exposed to rain,snow or direct sunlight,position the gererator on secure and level ground so it will not tip or slide down on a hill.Place the generator so that the exhaust fumes will not be directed towards people.

The installation site must be free from water,moisture,or dust.All electrical components should be protected from excessive moisture or the insulation system will deteriorate and result in grounding or shorting out the generating system.

Foreign matters,such as dust,dirt,sand,lint,or abrasive materials can cause damage to the generator and engine and are not allowed into its cooling system.

2.2 Generator set grounding

The generator is equipped with a grounding terminal located on the rear of the opening type and at the low position of back side of the mute type (refer to figure 2-1).Always complete the grouning path from the generator to a 3/4 copper pipe/rod driven into moist earth to prevent electrical shock.

Do not connect to a water pipe or a ground used by a radio system.

⚠️ **WARNING:**

Always use electrical cords that are in good condition,worn,bare,frayed or other damaged cords can cause electric shock.

Before operation,the generator should be grounded to prevent electric shock.

Contact a licensed electrician to wire electrical plugs and/or cordsets.

Improper wiring could result in a fire or electrical shock.

⚠️ **DANGER:**

Never install your generator inside enclose areas or indoors.Engine consume oxygen and give off deadly carbon monoxide poisonous gas.Improper ventilation will cause damage to generator and possible injury to people.

If indoors operation is unavoidable,provide proper ventilation so that people and others will not be affected.



figure 2-1

PREPARE FOR STARTING

3 Preparation for starting

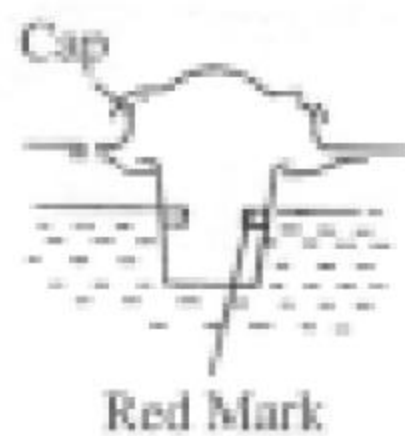
3.1 Diesel fuel,air filter element and lube oil.

Diesel fuel

Use the light diesel fuel only,If the fuel is dirty,it should be filtered cleanly.

⚠ Caution:Don't let any dust and water mix with the fuel and enter the fuel tank, otherwise the high-pressure pump and the injector nozzle may be blocked up.

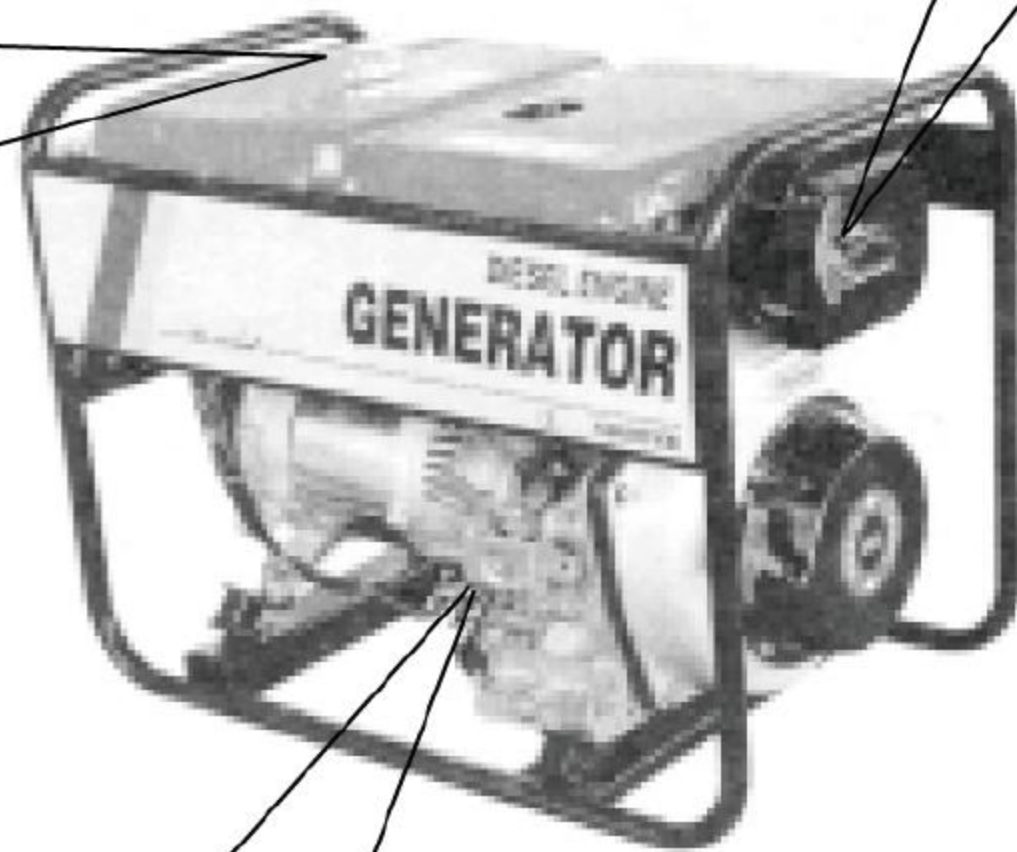
Type	2500 Series	4000 Series	6700 7500 8500 Series
Volume			
The effective volume of fuel tank: (L)	12.5		
(British gal)	(2.75)		
Type	6700Q 7500Q 8500Q Series		
Volume			
The effective volume of fuel tank: (L)	14.5		
(British gal)	(3.2)		



⚠ Caution:Do not let fuel level be higher than Red Mark

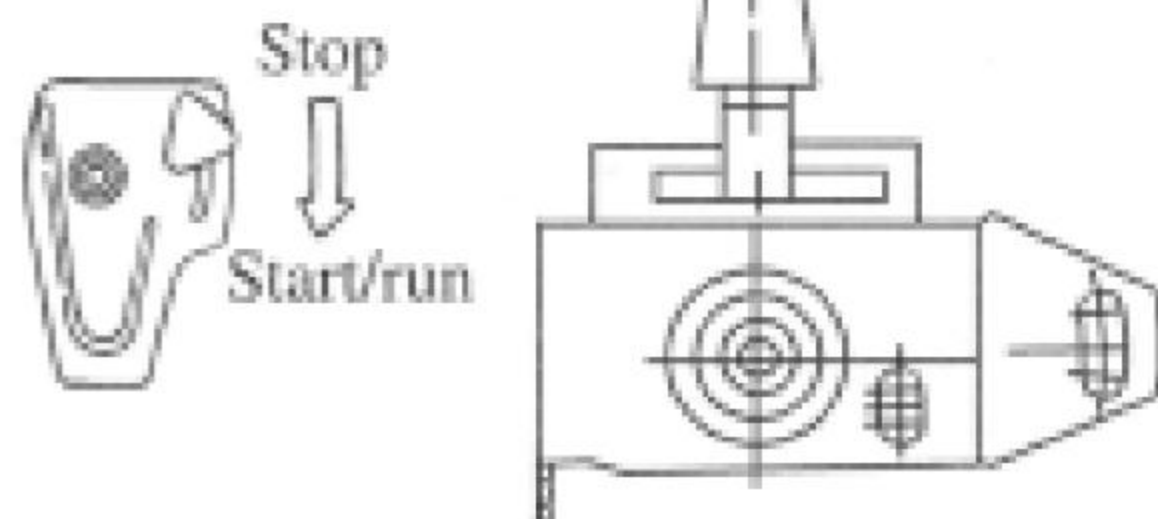
Air filter element

Don't wash the air filter element,because the component is dry type.When the output of diesel engine tends to drop or the color of the exhausted gas changes adversely, change the air filter element immediately. Never start the diesel engine without using the filter element.

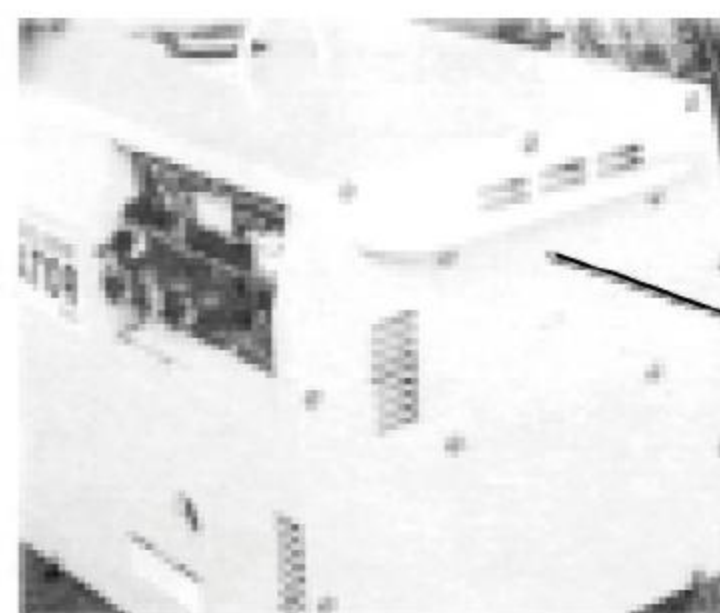


Speed change lever

Stop → Start/run



⚠ Caution:No smoking at the place where should fill or store oil.Don't let any spark splash to the area.When filling oil, don't let oil overflow.After refueling,make sure fastening the cover nut on the fuel inlet.



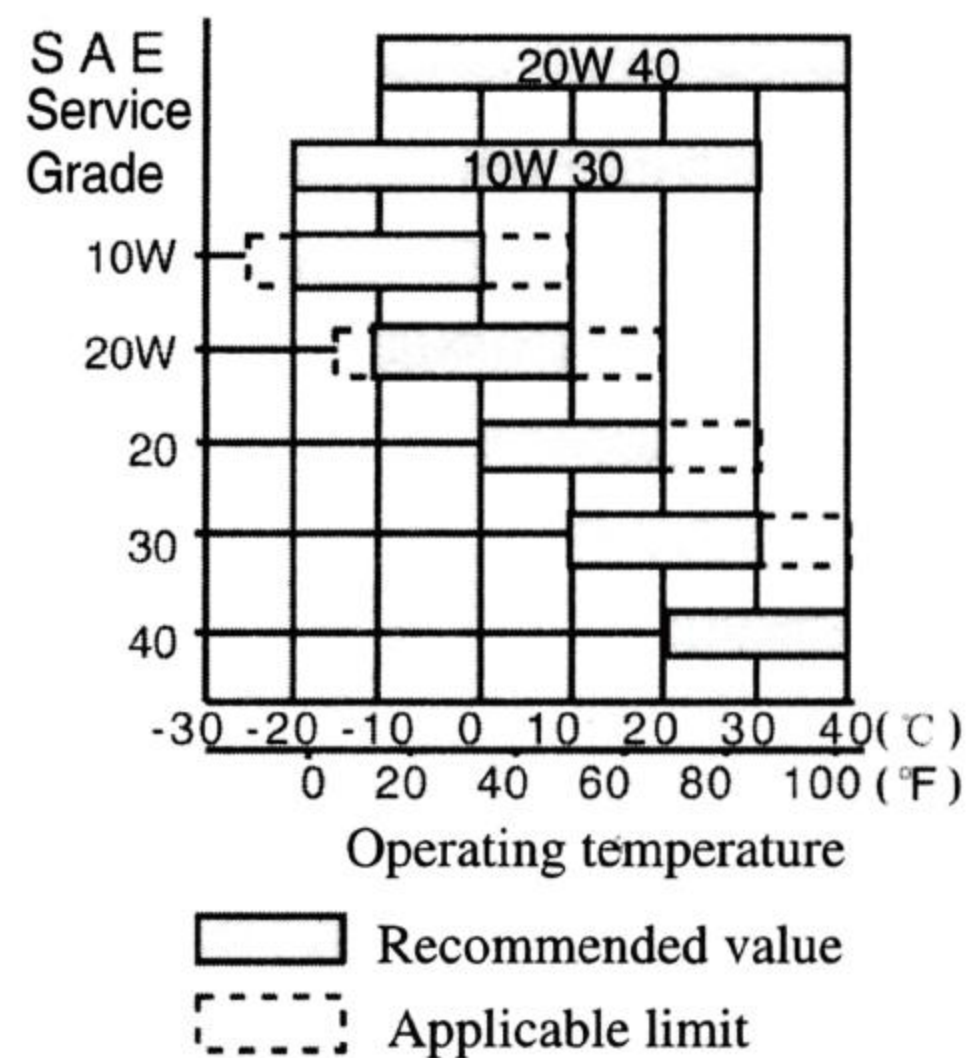
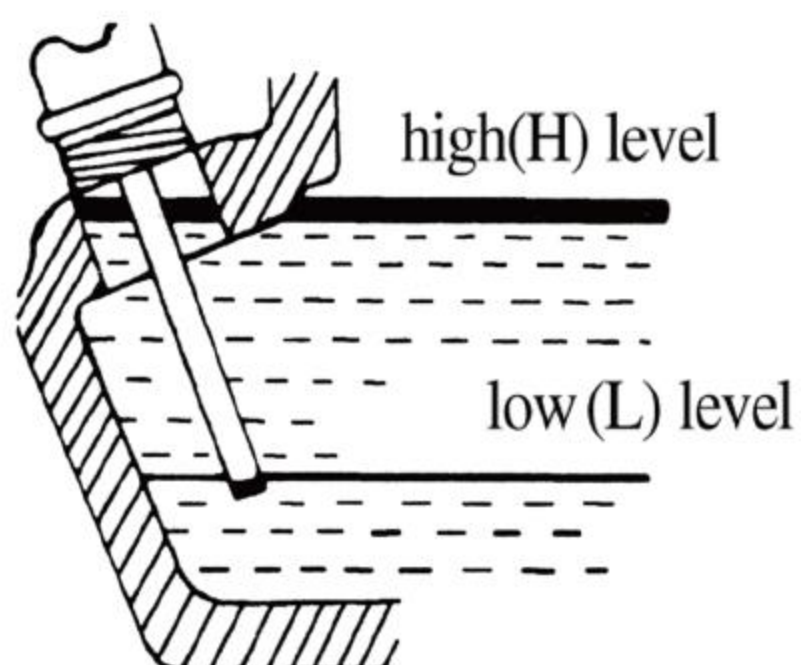
Cover of checking air filter

Loosen the four screw fixed the cover of checking mouth,open the cover of air filter for checking air filter element

PREPARE FOR STARTING

Lube oil

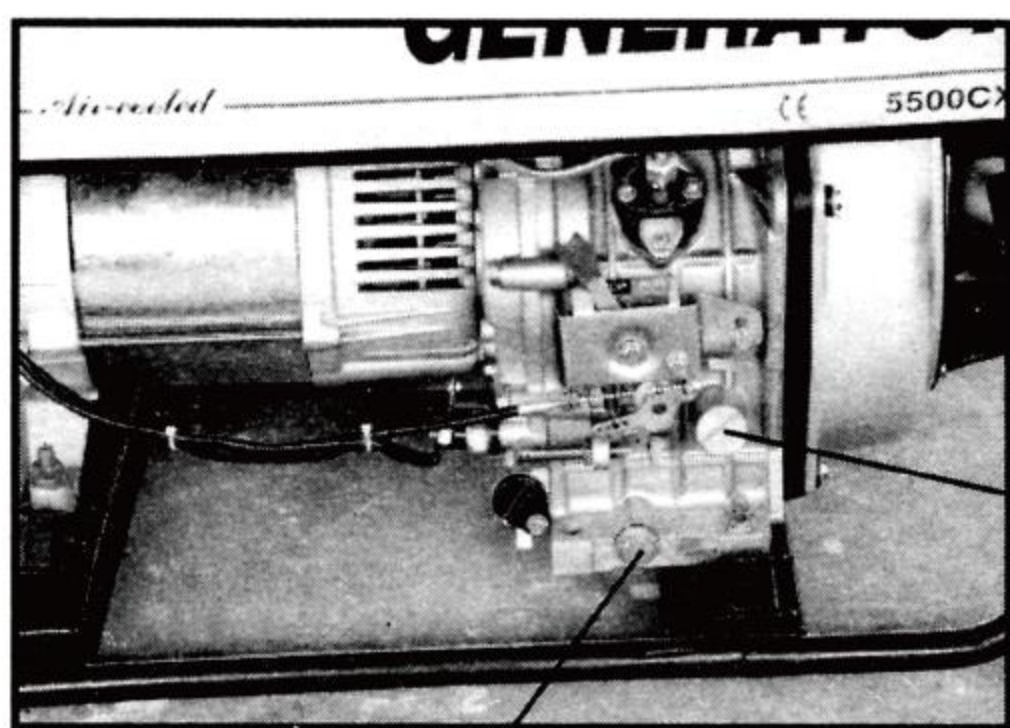
Put the generator set at level state. Fill lube oil into the inlet, check the oil level with dipstick by inserting the dipstick simply, don't screw in the dipstick. Keep oil level between high(H) and low(L) levels.



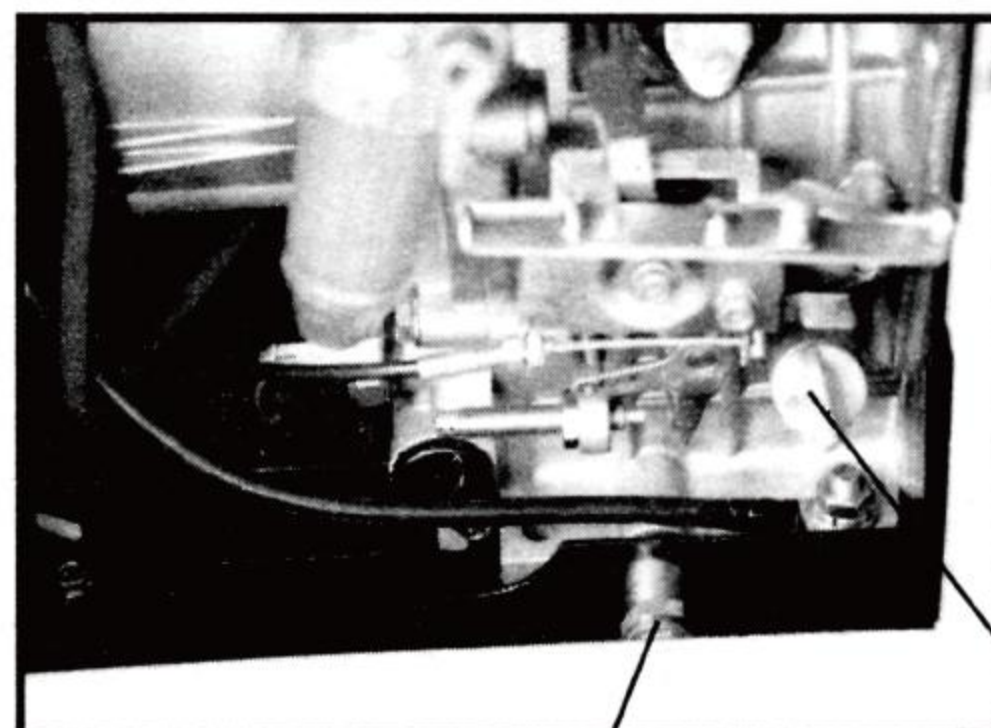
Type	2500 series	4000 series	6700 series 6700Q 7500Q series 8500Q
Volume(L)	0.75	1.1	1.65
(British gal)	(0.16)	(0.24)	(0.36)

A. P. I. Engine Service Classification.
We recommend A.P. I, CD grade.

NOTE: Nothing affects the performance and durability of your diesel engine more than the lube oil you used. If inferior oil is used, the risk piston seizure, piston ring sticking, and accelerated wear of the cylinder liner and other moving components significantly increases, your engine life may be seriously shortened. We recommend CD grade oil of API engine service classification. Always use oil with the right viscosity for the ambient temperature. Use the above chart when choosing your engine oil.



Drain bolt



Drain bolt

Dipstick

Warning: Don't fill lube oil into the diesel engine when the diesel engine is running.

CAUTION: The machine has drained lube oil away when it is delivered from factory, fill the crankcase with oil before trying to start.

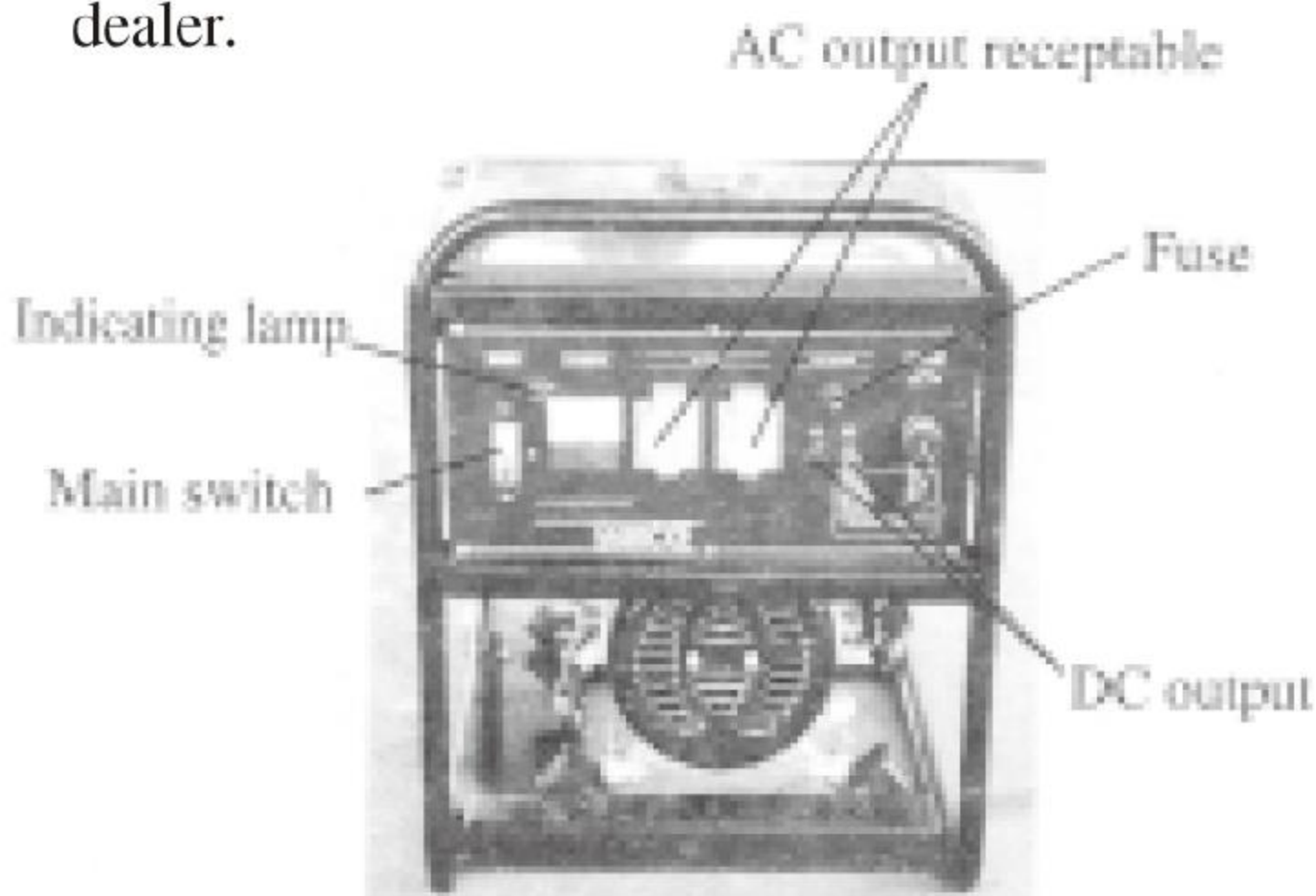
3.2 Inspection for the diesel generator set

3.2.1 The series X, XE type diesel generator equipped with low oil pressure protection. When the oil pressure goes down below safe level, the system will automatically shut off the

PREPARE FOR STARTING

engine to avoid damaging while the ignition key still in the 'ON' position. The engine will not be started till the oil refilled to proper level. If the diesel engine is running under the condition of insufficient lube oil, the oil temperature will raise very high. On the other hand, it is also dangerous if there is too much oil. This is because that the lube oil may be burned. It will make that the revolution speed of the diesel engine increases suddenly and results in 'abnormal fast running'. For this purpose, it is necessary to check the lube oil level and the level should maintained between the high level and the low level.

3.2.2 Turn off main switch and disconnect all load (for example: lamp and switch of motor) check for damaged parts, loose or missing nuts and bolts, if aforementioned problems occur, please do not start the engine and consult our dealer.



Before starting the generator set, be sure to turn the main switch to the 'OFF' position. If the switch is not at the 'OFF' position, or it can cause damage to generator and seize up the start motor with load to start.

⚠️ WARNING:

The generator should be started without load.

3.3 Bleed air from the fuel line

If the engine is having difficulty in starting and the fuel and oil level are acceptable, the problem can usually be traced to air bubbles

trapped in the fuel line. The air should be discharged. The correct method is:

Turn the fuel cock beneath the fuel tank to 'OFF' position, disconnect the fuel distributing pipe from high pressure pump, turn the valve to 'ON' position and allow fuel to drip from the fuel line to a small container, reattach the fuel line to the fuel pump when no air bubble appears.

3.4 Before starting the generator, make sure you have done:

- The generator is positioned on a firm level surface.
- The generator has been grounded.
- Check the lube oil level.
- Spill fuel has been wiped off.
- The ventilation is good.

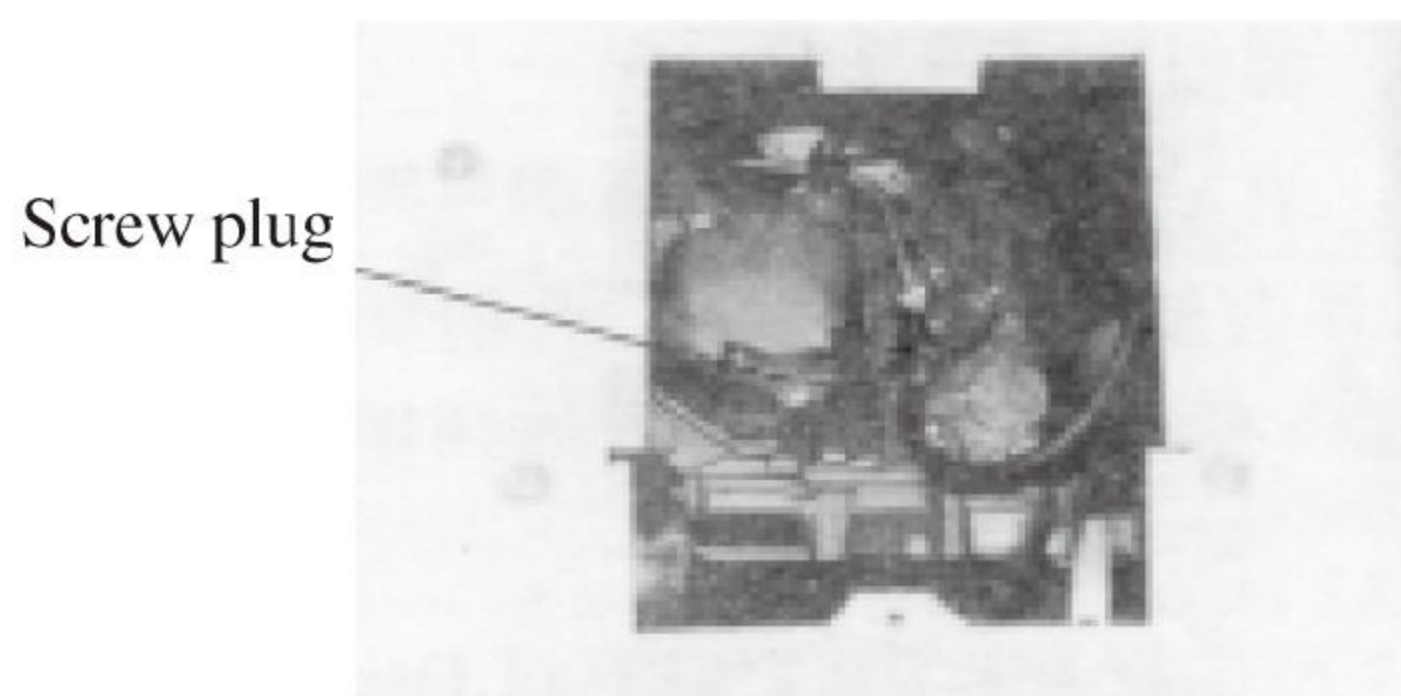
4 Start generator set

4.1 Recoil start

For the detailed start step, please refer to the operation diagram on the next page.

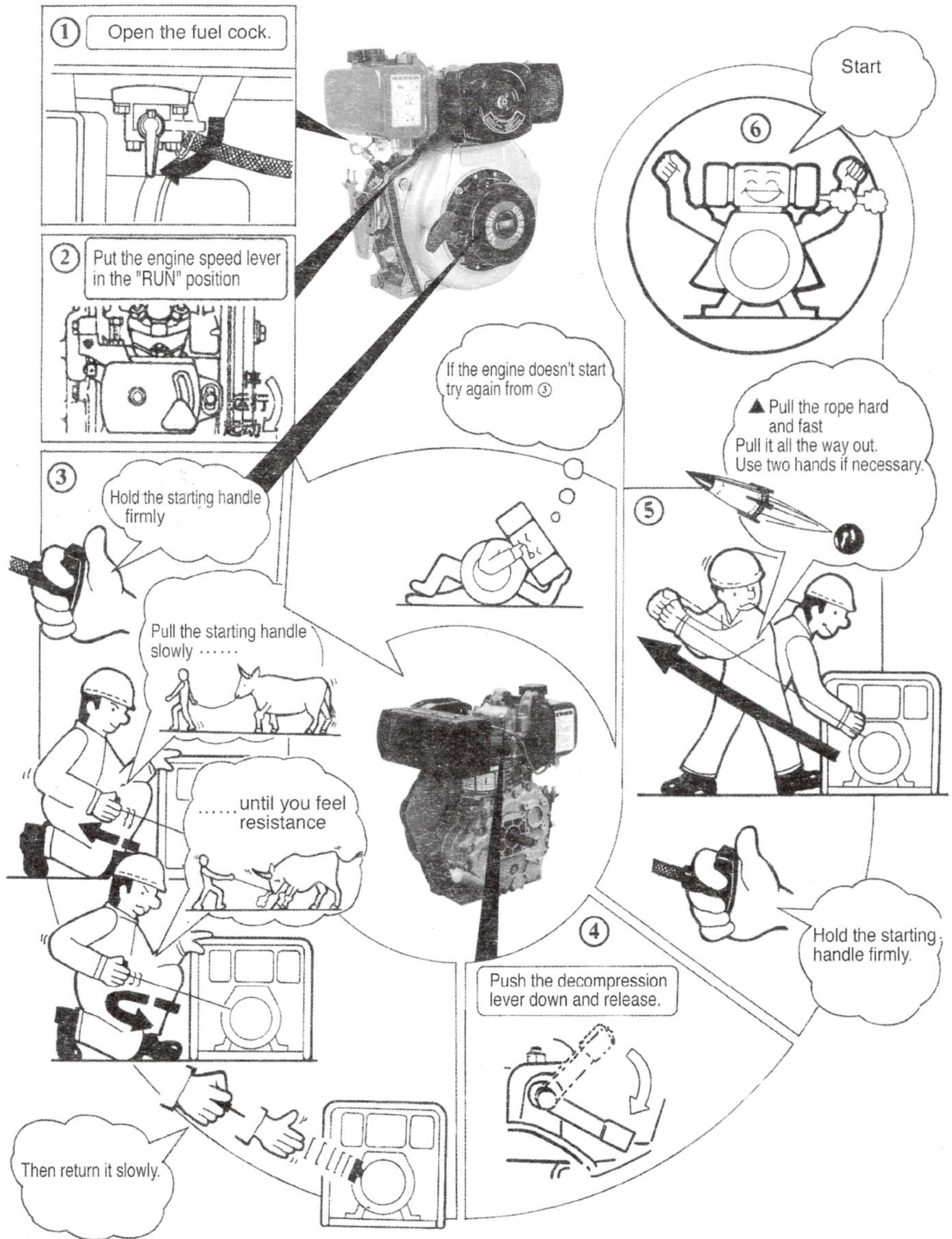
Note: In the cold days, when it is difficult to start the diesel engine, screw out screw plug on the cover of the diesel engine and fill in 2 ml of lube oil.

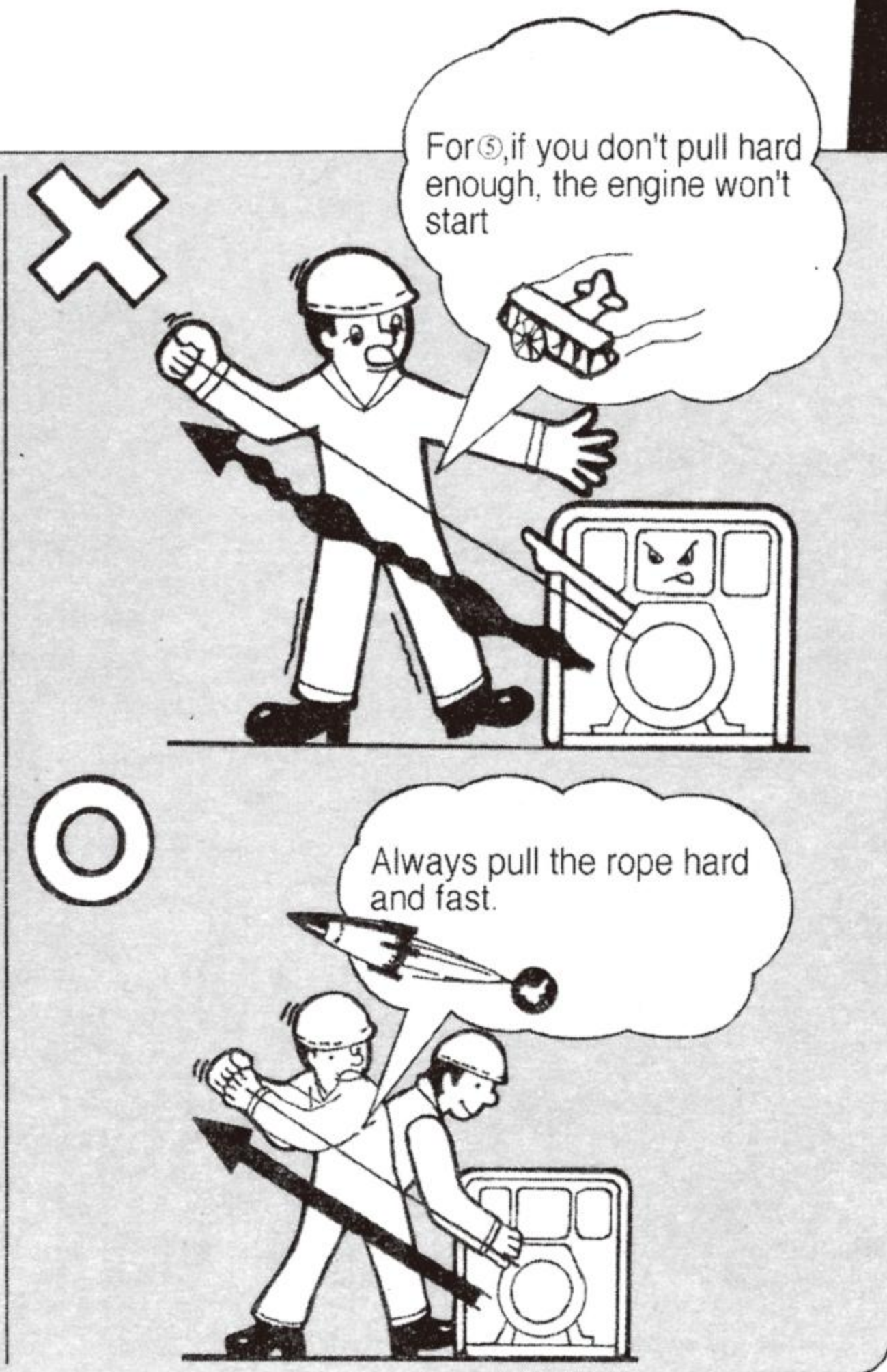
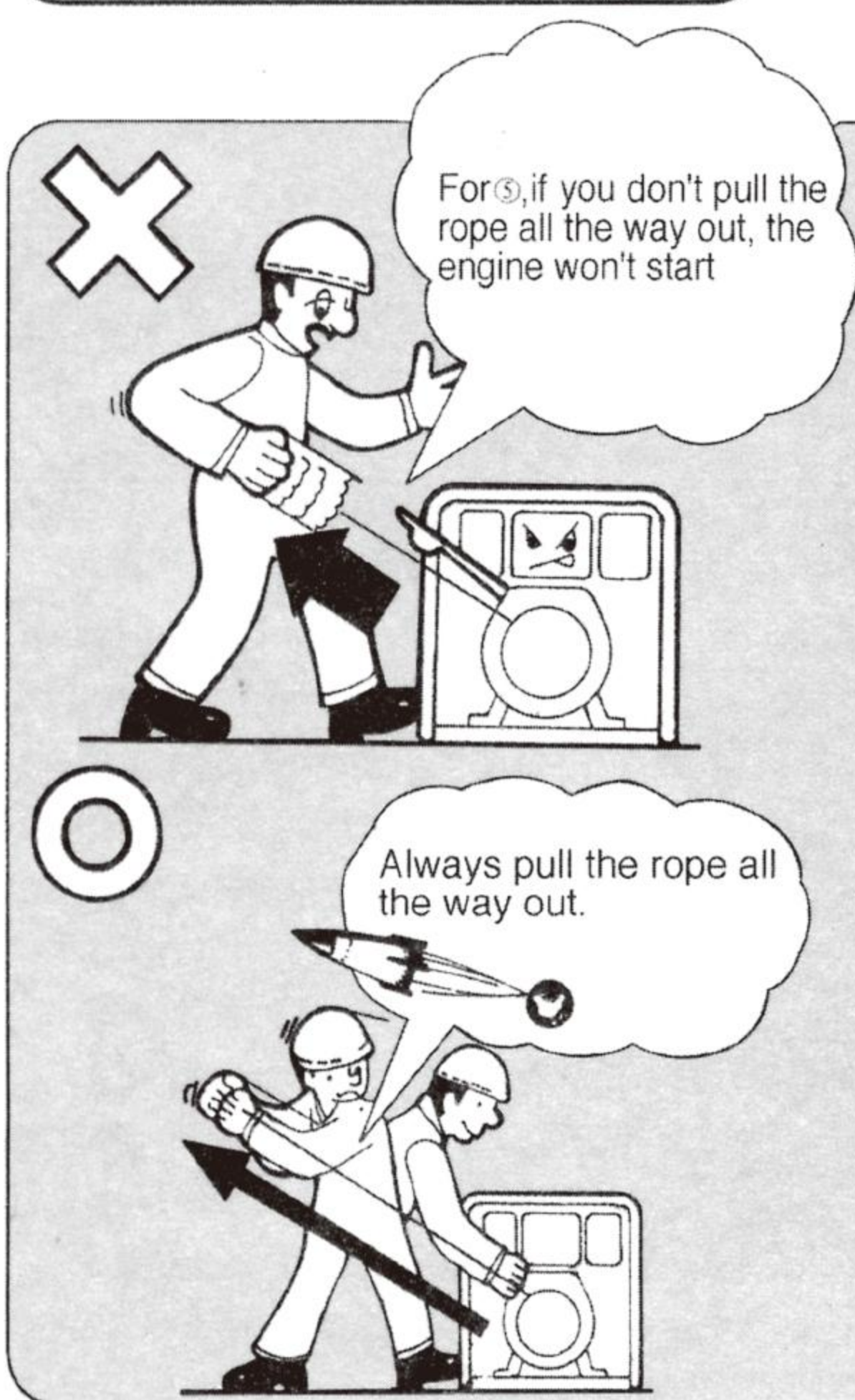
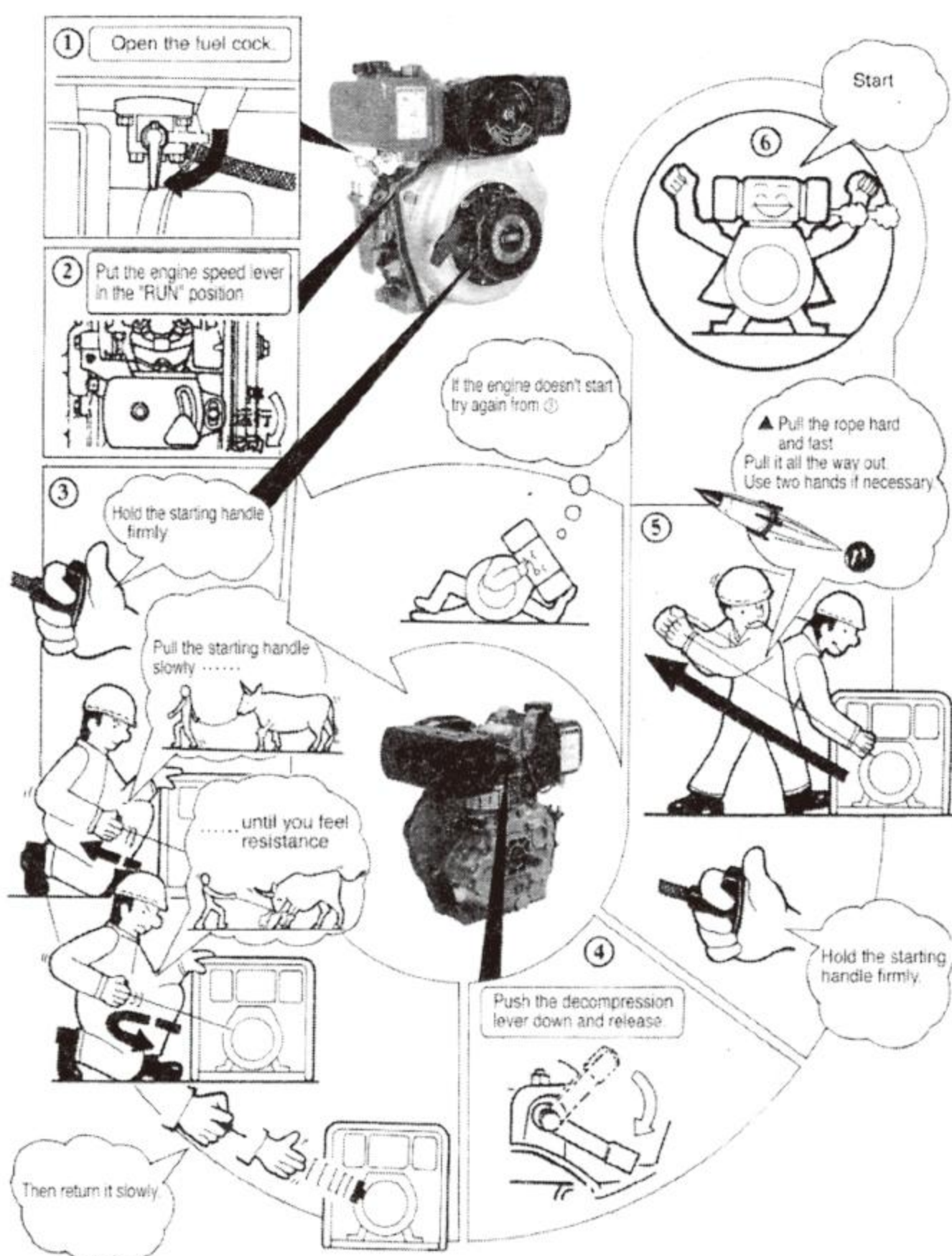
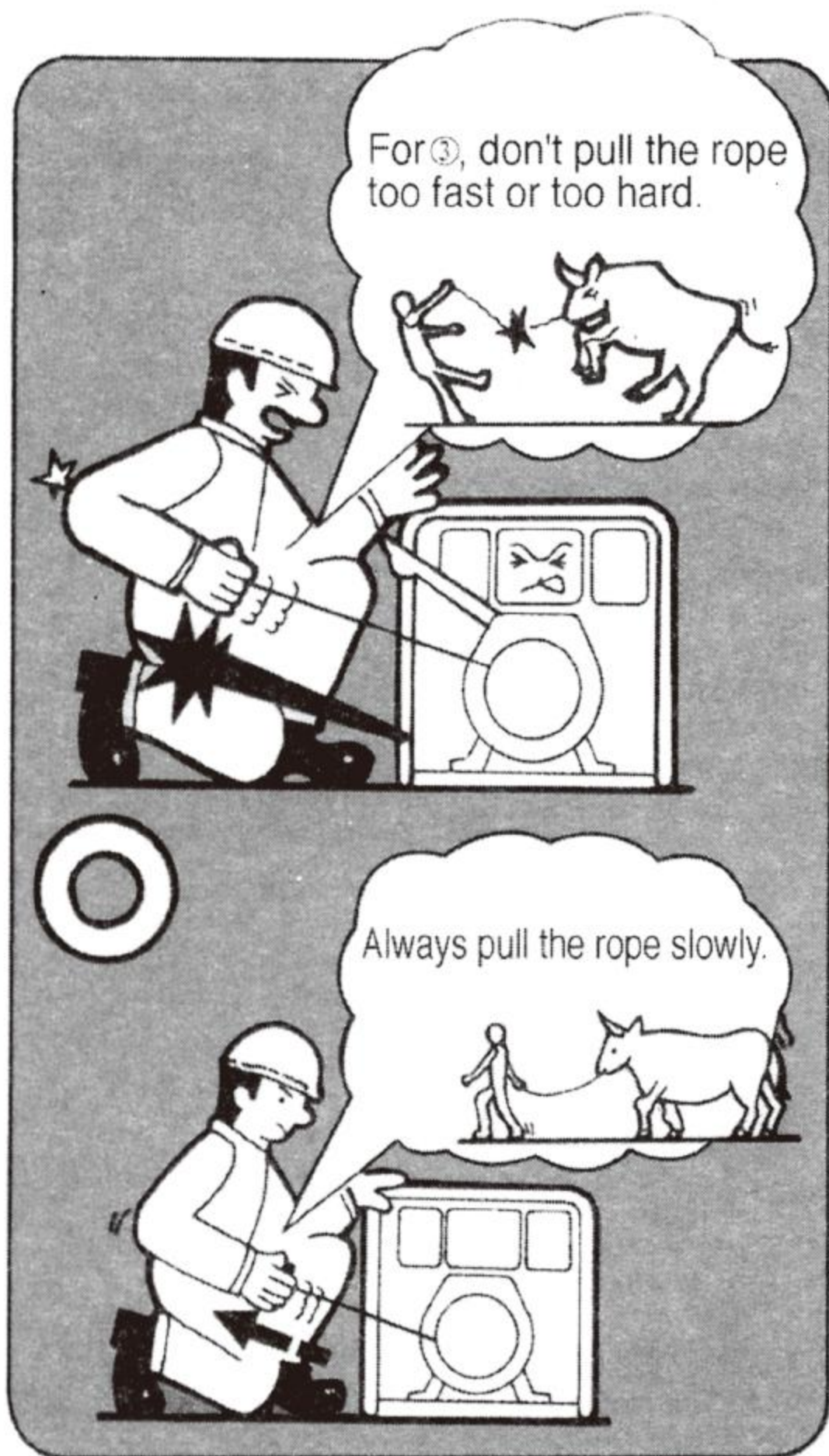
⚠️ CAUTION: Except filling oil, the plug screw should be screwed tightly in the cover to prevent dust and moisture sucked into cylinder and cause accelerated wear of internal parts.



Recoil start diagram for opening type generator set

⚠ CAUTION: Before starting, disconnect all load from the generator, turn the main switch to **OFF** position.





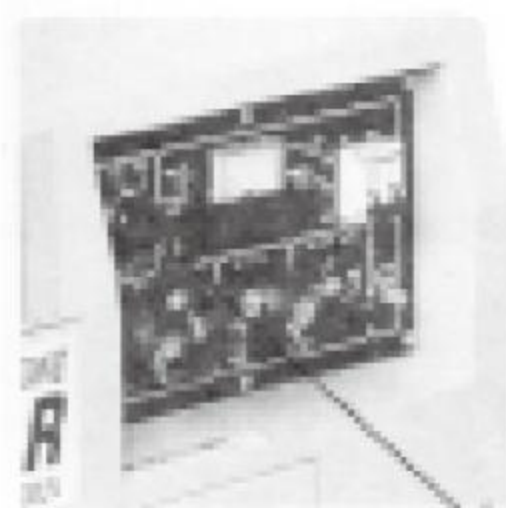
START GENERATOR

4.2 Electric start

4.2.1 Start of opening type

- (1) Disconnect all loads to generator.
- (2) Turn the main switch lever to 'OFF' position.
- (3) Turn the fuel cock to 'ON' position.
- (4) Set the speed lever of diesel engine at 'RUN' position.
- (5) Turn the ignition key to 'START' position clockwise.
- (6) After the diesel engine starts, relieve your hand from the ignition key. Let the switch restore to 'ON' position automatically.
- (7) If the diesel engine doesn't start after 10 seconds, please wait for another 15 seconds and then start it again.

⚠ CAUTION: Do not operate start motor for a long time, otherwise the voltage of accumulator will go down and result in the start motor sized up.



Ignition key

4.2.2 Start of mute type

- (1) Disconnect all loads to the generator.
- (2) Turn the main switch to 'OFF' position.
- (3) Turn the fuel cock to 'ON' position.
- (4) Turn the ignition key to 'ON' position. after a while then turn the key to START position.
- (5) After the diesel engine starts, relieve your hand from the ignition key. Let the switch restore to 'ON' position.

⚠ Caution: when the diesel engine is running, never draw out the start handle, otherwise it will damage the diesel engine.

4.3 Battery application

If your generator is for the first operation, you should fill electrolyte in the battery. For

detailed step, please refer to your battery instruction. Check the level of electrolyte of the battery once a month. Charging battery consumes electrolyte. When the liquid level goes down to lower mark, it is necessary to add some distilled water up to the upper mark.

If the electrolyte in the battery is less. The diesel engine may not be started, because the electric power is insufficient.

If the electrolyte in the battery is much, the liquid may spill and it may corrode its surrounding components.

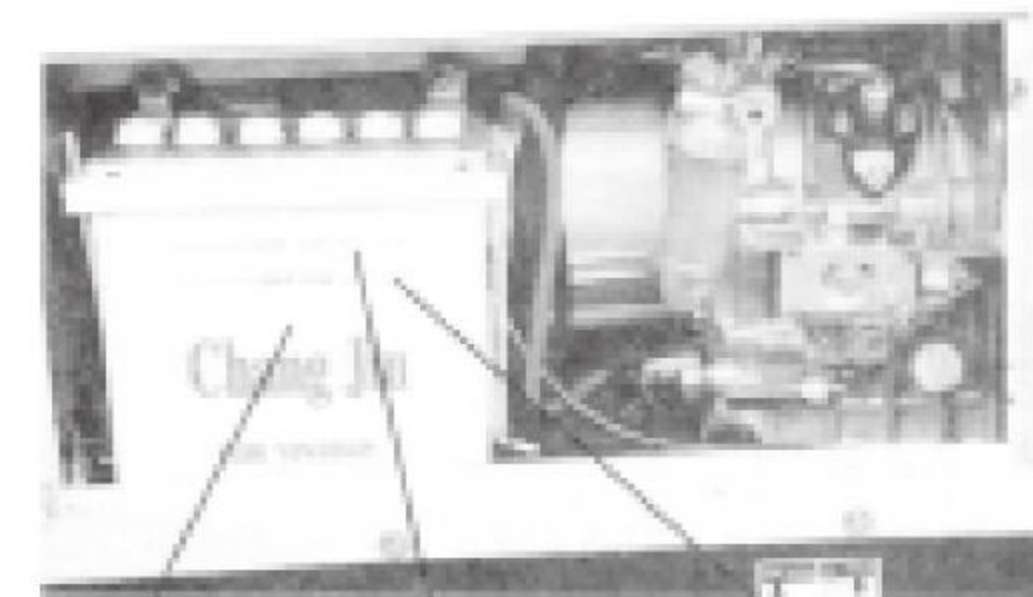
Charge the accumulator once a month. For electric start type generator, it can charge the accumulator automatically during the period of operation, so that it is not necessary to wire for it. If your generator is used for spare power supply and does not be used often, pay attention to charge it in time.

NOTE: Keep battery out of the reach of children, do not keep in tip, keep vent caps tight and level.

⚠ CAUTION: Keeping the liquid level of battery between the upper limit and the lower limit.

Battery electrolyte contains sulfuric acid which can cause blindness or burns.

⚠ DANGER: Charging battery produce colorless explosive gas which can cause blindness or injury. No smoking, sparks or flames should exist when charging battery. Never charge a visibly damaged or frozen battery.



battery upper limit lower limit

OPERATE YOUR GENERATOR

5 Operation for generator set

5.1 Handle the diesel engine

5.1.1 Avoid overload

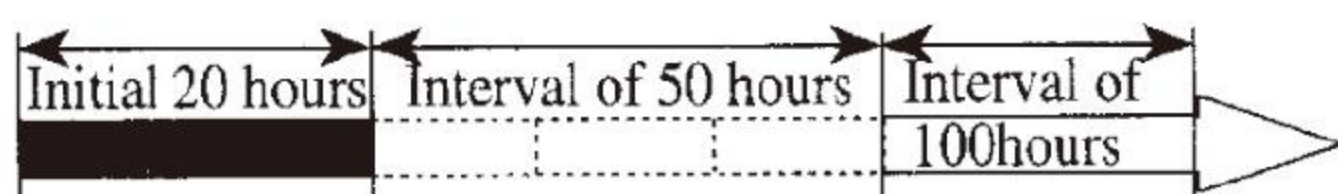
While your diesel engine is new, applications of heavy loading may shorten the engine's life. Within the first 20 hours, it must operate at light load.

(1) Avoid overload:

Avoid applying any heavy load during the initial 20 hours.

(2) Change the lube oil regularly:

Change the lube oil after 20 hours of initial operation or at the end of the first month, and then once every 50 hours for three times, every three months or every 100 hours thereafter.



Time to change lube oil

Note: The lube oil should be drained while the diesel engine is hot. If cooled, it is very difficult to drain the engine oil completely.

5.1.2 Warm up the diesel engine for five minutes without any load.

5.1.3 Check the indicator lamp

Though equipped with low oil pressure protection system, it is necessary to check whether the indicator lamp of oil pressure signal lights up. The lube oil alarm indicator will light when the oil pressure is low or the lube oil is insufficient, and the diesel engine will shut off automatically. The engine will not be started until refilling oil to safe level.

5.2 Inspection during the engine running.

- (1) Abnormal sound or vibration;
- (2) Color of exhausted gas black or white;
- (3) Excessive change in engine speed, slow or fast;
- (4) Sparking or arcs from generator;
- (5) Loss of electrical output;

(6) Engine got fire;

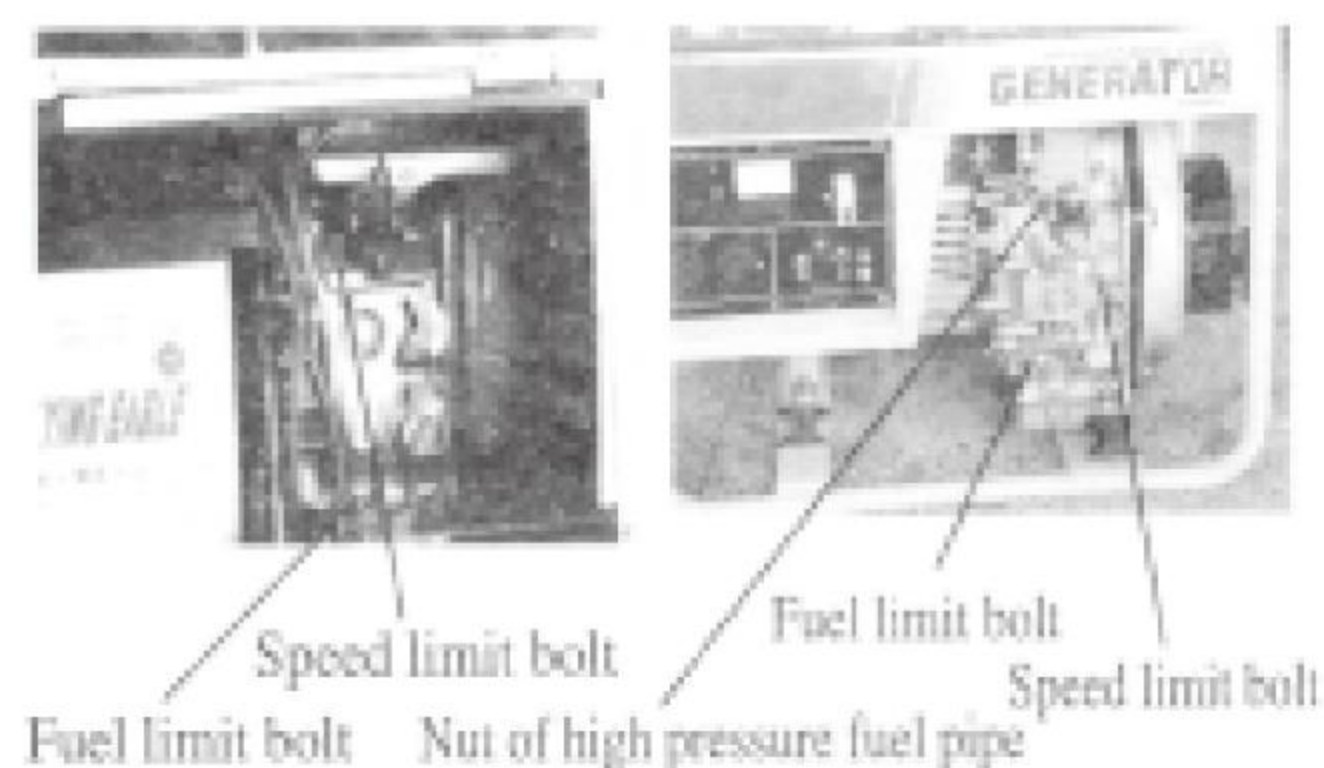
(7) Flame or smoke.

If you find one of the above-mentioned phenomena, it is necessary to stop the machine. Please contact agency nearby, or contact us directly.

5.3 Generator operating speed

The generator must be run at the correct speed to produce the proper electrical voltage and frequency. The speed of the engine was carefully adjusted at the factory so that the generator produces the proper voltage and frequency.

⚠ WARNING: Don't adjust the speed limit bolt of the diesel engine and the fuel limit bolt (they were adjusted well when delivered from the factory), otherwise the engine's performance will be affected



Before connecting a load to the generator, the pointer of voltmeter should be in the green area to ensure the generator is working properly. Failure to do so could result in damage to the equipment plugged into the unit and possible injury to the individual.

All engines have a tendency to slow down when a load is applied. When the electrical load is connected to the generator, the engine is more heavily loaded, and as a result the speed drops slightly. This slight decrease in speed, together with the voltage drop within the generator itself, results in a slightly lower voltage

OPERATE YOUR GENERATOR SET

when the generator is loaded to its full capacity than when it is running with no load. The slight variation has no appreciable effect in the operation of motors, lights and most appliances. Electronic equipment may be affected if correct speed is not maintained.

Output voltage should be checked periodically to ensure continued proper operation of the generating plant and appliances. It can be checked with a portable meter. Frequency can be checked by using an electric clock with a sweep second hand. Timed against a wrist watch or a stop watch the clock should be correct within +/-2 seconds per minute. All speed setting adjustments should be done by a qualified technician.

5.4 Exercising the generator

The generator should be operated every four weeks. Warm the unit up by starting the engine and letting it run for 10 to 15 minutes. This will dry out any moisture that has accumulated in the windings. If left, this moisture can cause corrosion in the winding. Frequent operation of the engine generator will also ensure that set is operating properly should it be needed in an emergency.

5.5 How to open the machine case door (Q series set)

Rotate the knob switch counterclockwise to open the door of mechanical case and carry out the daily check.



6 Load application

6.1 Determine total electrical load

It is important to determine the total electrical load before it is connected to the generator. The two major factors in determining the life of a generator head are: Heat build up, caused by overloading the generator and corrosive contaminants that attack the wiring insulation. If the generator is overloaded, the wires become excessively hot and cause the insulation to break down, reducing its ability to resist corrosive contaminants. Over time the effectiveness of the insulation is eliminated and a dead short can result.

Always compare the generator nameplate data with that of the equipment to be used to ensure that watts, volts, amperage, and frequency requirements are suitable for operating equipment. The wattage listed on the equipment nameplate is its rated output. However, some equipment may require three to ten times more wattage than its rating on the nameplate, as the wattage is influenced by the equipment efficiency and power factor.

NOTE: If wattage is not given on equipment nameplate, approximate wattage may be determined by multiplying nameplate voltage by nameplate amperage.

Example: VOLTS × AMPS = WATTS
120V × 5A = 600W

When connecting a resistive load such as incandescent lights, heaters or common electric power tools, a capacity of up to the generator full rated wattage output can be used.

When connecting a resistive-inductive load such as a fluorescent or mercury light, transformers or inductive coils, a capacity of up to 0.6 times of the generator's full rated output can be used.

LOAD APPLICATION

Use this chart to estimate the total load on your generator.

For Determining Generator Load Requirements	
Device	Running Watts
Air Conditioner(12,000Btu)	1700(a)
Battery Charger(20Amp)	500
Belt Sander(3î)	1000
Chain Saw	1200
Circular Saw (6-12î)	900
Coffee Maker	1000
Compressor(1HP)	2000(a)
Compressor(3/4HP)	1800(a)
Compressor(1/2HP)	1400(a)
Curling Iron	700
Dishwasher	1200
Edge Trimmer	500
Electric Nail Gun	1200
Electric Range(one element)	1500
Electric Skillet	1250
Furnace Fan(1/3)	1200(a)
Freezer	800(b)
Hair Dryer	1200
Hand Drill(1î)	1100
Hand Drill(1/2î)	875
Hand Drill(3/8î)	500
Hand Drill(1/4î)	250
Hedge trimmer	450
Home Computer	150
Impact Wrench	500
Jet Pump	800(a)
Lawn Mower	1200
Light Bulb	100
Microwave Oven	700
Milk Cooler	1100(a)
Oil Burner on Furnace	300
Oil fired space Htr(14,000Btu)	400
Oil fired space Htr(85,000Btu)	225
Oil Fired space Htr(30,000Btu)	150
Oven	4500
Paint Sprayer,Airless(1/3HP)	600(a)
Paint Sprayer,Airless(handheld)	150
Radio	200
Load Requirements,continued	
Refrigerator	600(b)
Slow Cooker	200
Submersible Pumb(1-1/2HP)	2800(a)
Submersible Pumb(1HP)	2000(a)
Submersible Pumb(1/2HP)	1500(a)
Sump Pump	600(a)
Table Saw(10î)	2000(a)
Television	500
Toaster	1000
Vacuum cleaner	250
VCR	70
Water Heater	3000
Weed Trimer	500

(a)hard-starting motos requir 3 to 5 times the rated running watts.

(b)These loads may require up to 15 minutes to restart due to its normal build up of compressor
CAUTION:Always allow the generator to reach operating speed before a load is applied.


6.2 Starting electric motors

Electric motors require much more current (amps) to start than to run. Some motors, particularly low cost split-phase motors, are very hard to start and require 5 to 7 times more current to start than to run. Capacitor motors are easier to start and usually require 2 to 4 times as much current to start than to run. Repulsion Induction motors are the easiest to start and require 1.5 to 2.5 times as much to start than to run.

Most fractional motors take about the same amount of current to run them whether they are of Repulsion-Induction(RI), Capacitor(Cap), or Split-Phase(SP) type. The following chart shows the approximate current required to start and run Cap type and sizes of 220 volt 50 cycle electric motors under various conditions.

220V,50Hz Motors		Starting Amps
Hp motor	Running Amps	Cap type
0.5	2.3	12-16
0.75	3.5	17-24
1.1	5	25-35
1.5	7	34-49
2.2	10	50-70
3	15	68-95

The figures given above are for an average load such as a blower of fan. If the electric motor is connected to a hard starting load such as an air compressor, it will require more starting current. If it is connected to a light load or no load such as a power saw, it will require less starting current. The exact requirement will also vary with the brand or deaign of the motor.

 **CAUTION:**To start the motor above 1.5kW power, the G2,G3 grade generator should be selected and method of drop voltage starting must be carried out. For detailed step, consult with our dealer or with us directly.

LOAD APPLICATION

To very hard starting load such as air compressor and air conditioner, consult with the dealer to determine the max power.


Generator responds to severe overloading differently than the power line. When overloaded, the engine is not able to supply enough power to bring the electric motor to operating speed. The generator responds to the high initial starting current, but the engine speed drops sharply. The overload may stall the engine, if allowed to operate at very low speeds, the electric motor winding will burn out in a short time. The generator head winding might also be damaged.

Running the generator under these conditions may result in damage to the generator stator as well as the rotor windings. Because the heavy surge of current is required for only an instant, the generator will not be damaged if it can bring the motor up to speed in a few seconds. If difficulties in starting a motor are experienced, turn off all other electrical loads and if possible reduce the load on the electric motor.

6.3 Extension cords

When electric power is to be provided to various loads at some distance from the generator, extension cords can be used. These cords should be sized to allow for distance in length and amperage so that the voltage drop between the set and point of use is held to a minimum.

Current/Power		cord cuts			
Amps at 240v	Load (watts)	cord length 80m	cord length 50m	cord length 30m	cord length 20m
10	2400	8	4	4	2.5
15	3600	10	8	6	4
20	4800	10	8	6	6
25	6000	12	10	8	6
30	7200	12	10	10	8


 **CAUTION:** Equipment damage can result from the voltage caused by using an extension cord with a small wire size.

6.4 AC application

(1) Observe the indication of voltmeter at the control panel, the pointer should be in the green area for load conditions.

(2) When connecting load to the generator, all kinds of equipment should be connected in order: First connect heavy load to the generator then the light; then connect resistive inductive load, then resistive load. If operation order is unproperly the engine speed may drop sharply and the load should be disconnected immediately and check where trouble occurs.

(3) Balance of three phase generator for load: When connect single phase load, each phase power can not exceed 1/3 of generator rated power, and difference between each phase amps value should not exceed 20% rated current.

 **CAUTION:** Serious disbalance load connected to each phase can cause burn out of generator set.


If the circuit overload makes the overload protection switch (main switch) of AC circuit trips, it is necessary to reduce the circuit load. It is necessary to wait for several minutes before restoring the operation. If the indication on the voltmeter is too high or too low, it is necessary to stop the generator for check.

6.5 DC application

Both DC terminals provide output: DC 12V, 7A. The red terminal is + (positive) pole of power supply. It can be used as load for rated voltage DC 12V and also used for charging 12V battery.

(1) In case to charge the battery with two lead connect to the start circuit, the negative lead should be disconnected from the generator.

(2) Connect the positive and negative poles of the battery with the positive and negative poles of DC terminal.

 **CAUTION:** Take care not to connect positive and negative leads adversely, otherwise the generator and the storage battery will be damaged severely. Do not make positive and negative leads to be touched each other, or the storage battery will be short

LOAD APPLICATION/STOP THE GENERATOR/MAINTENANCE

circuit.

NOTE:The DC output current should not be more than 8.3A ,when charging the large capacity battery,the fuse of DC power supply may be burned off and broken easily for large charging current.

⚠ DANGER:

Charging battery produce colorless explosive gases which can cause blindness or injury.Don't let any spark,flame and smoking approaching the place.In order to avoid producing sparks near the battery, first, connect the charging lead with the battery,then connect the lead with the generator.When disconnection,first disconnect the motor cable.

Charging the battery should be at the place where ventilation is good.Before charging,open the vent caps of battery.If the temperature of electrolyte is over 45 °C ,terminate the charging.

6.6 Treat machine with duplex voltages output.

Before the generator applies AC power supply,make sure the rated voltage of load, then choose the output voltage through the transform switch at output panel.It can be judged whether it is the voltage you needed through the voltmeter or indicating lamp of power supply at the output panel.

CAUTION:

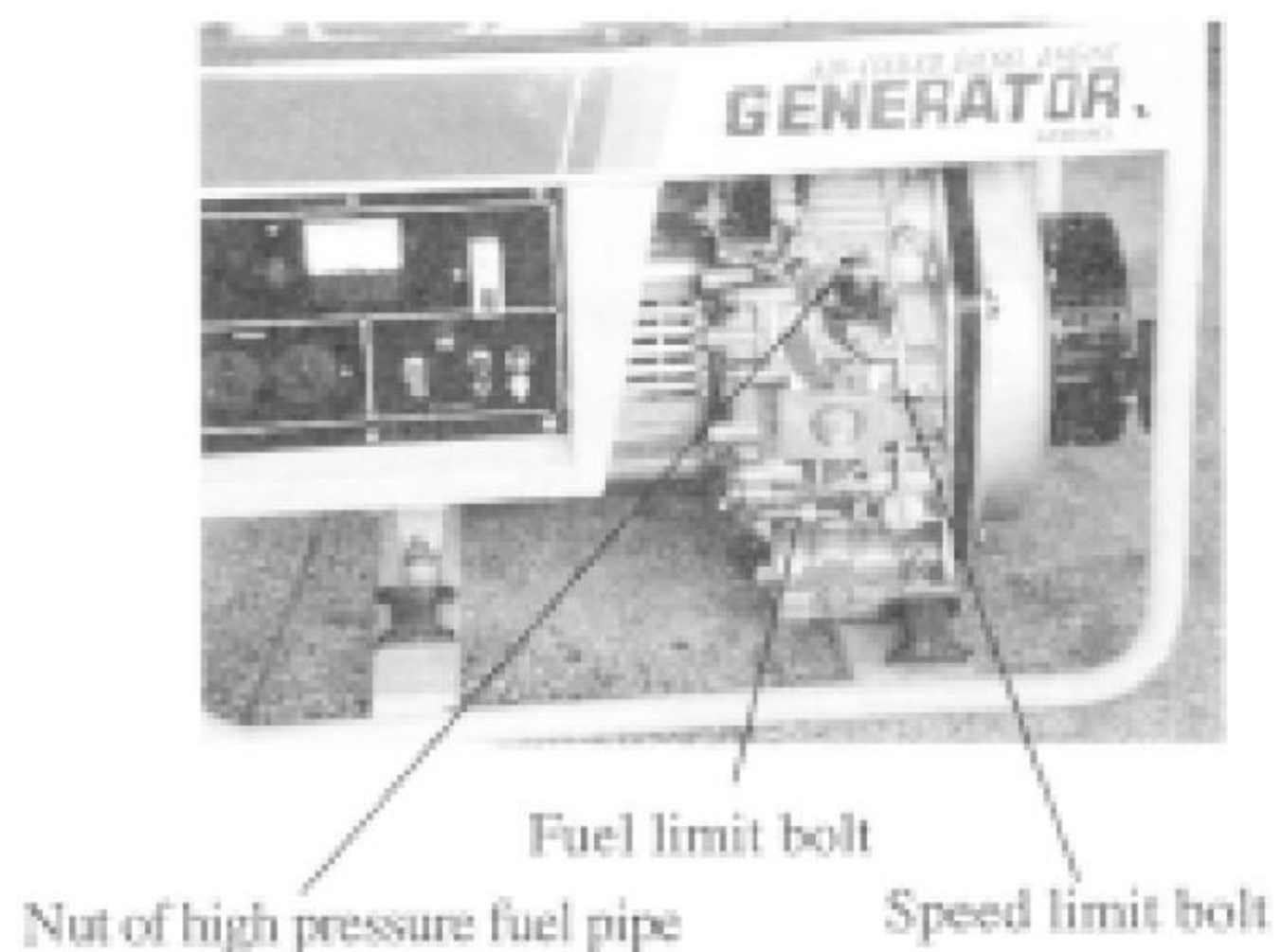
⚠ Before use the voltage transform switch, be sure to disconnect all load from the generator.

7 Stop the generator set

Disconnect all loads from the generator set, set the speed lever of the engine to 'RUN' position.Operate the diesel engine for about three minutes without load.Don't stop the diesel engine suddenly because this may cause the temperature of engine to raise up abnormal and result in the block-up of the injector nozzle and the damage of diesel engine.

Follow below step to stop engine:

- (1)Disconnect all loads from generator set.
- (2)After three minutes running without load, turn the ignition key to 'OFF' position.
- (3)Set the fuel cock lever to 'S' position.
- (4)Draw out slowly the recoil handle till you feel strongly resistance(at the point of the compression stroke,the intake and exhaust valves are closed),then return it slowly,In this way,when the engine is not in use,the rusting can be prevented.
- (5)Turn the fuel cock too OFF position.



⚠ Caution:when the speed lever is set at 'STOP' position and the diesel engine is still in operation,it is possible to stop the diesel engine either setting the fuel switch to 'OFF' position or by unfastening the high pressure fuel pump nut.Don't brake the diesel engine with the decompression lever.

MAINTENANCE

8 Maintenance

8.1 Regular maintenance

In order to keep the generator at good state, the periodic inspection and maintenance are very important. The generator set consists of diesel engine, generator, control panel and frame and so on. For details about the inspection or maintenance, please refer to the relative operation and maintenance instruction.

⚠ CAUTION: Before maintenance, please turn off the diesel engine, Disconnect the battery from your generator, first disconnect the negative cable then the positive.

After using the generator, it is necessary to wipe off the dirty on it with clean cloth in order to prevent corrosion and remove the precipitate.

Generator maintenance: The gingle phase generator is brushless and maintenance free, for three phase generator, consult with the dealer. Any major generator service including the installation or replacement of parts should be performed only by a qualified electrical service technician. Use only factory approved parts.

Service period regular	Daily	The first month or after 20 hours	The third month or after 100 hours	The sixth month or after 500 hours	Every year or after 1000 hours
Check and replenish fuel	○				
Drain fuel		○			
Check and replenish lube oil	○				
Check for fuel leakage	○				
Check and fasten every fastening parts	○			● fasten head bolts	
Change lube oil		○ (the 1st time) (the next three times change interval are 50 hours)	○ (the 5th time)		
Clean the filter of lube oil				○ (change it if necessary)	
Change air filter	(service more frequently when used at dusty areas)		○ (change)		
Clean fuel filter				○	● change
Check fuel injection pump				●	
Check fuel injection nozzle				●	
Check fuel pipe				● (change it if necessary)	
Adjust valve clearance for intake and exhaust valves		● (the 1st time)			
Mill intake and exhaust valves					●
Replace piston ring					●
Check electrolyte of battery	every month				

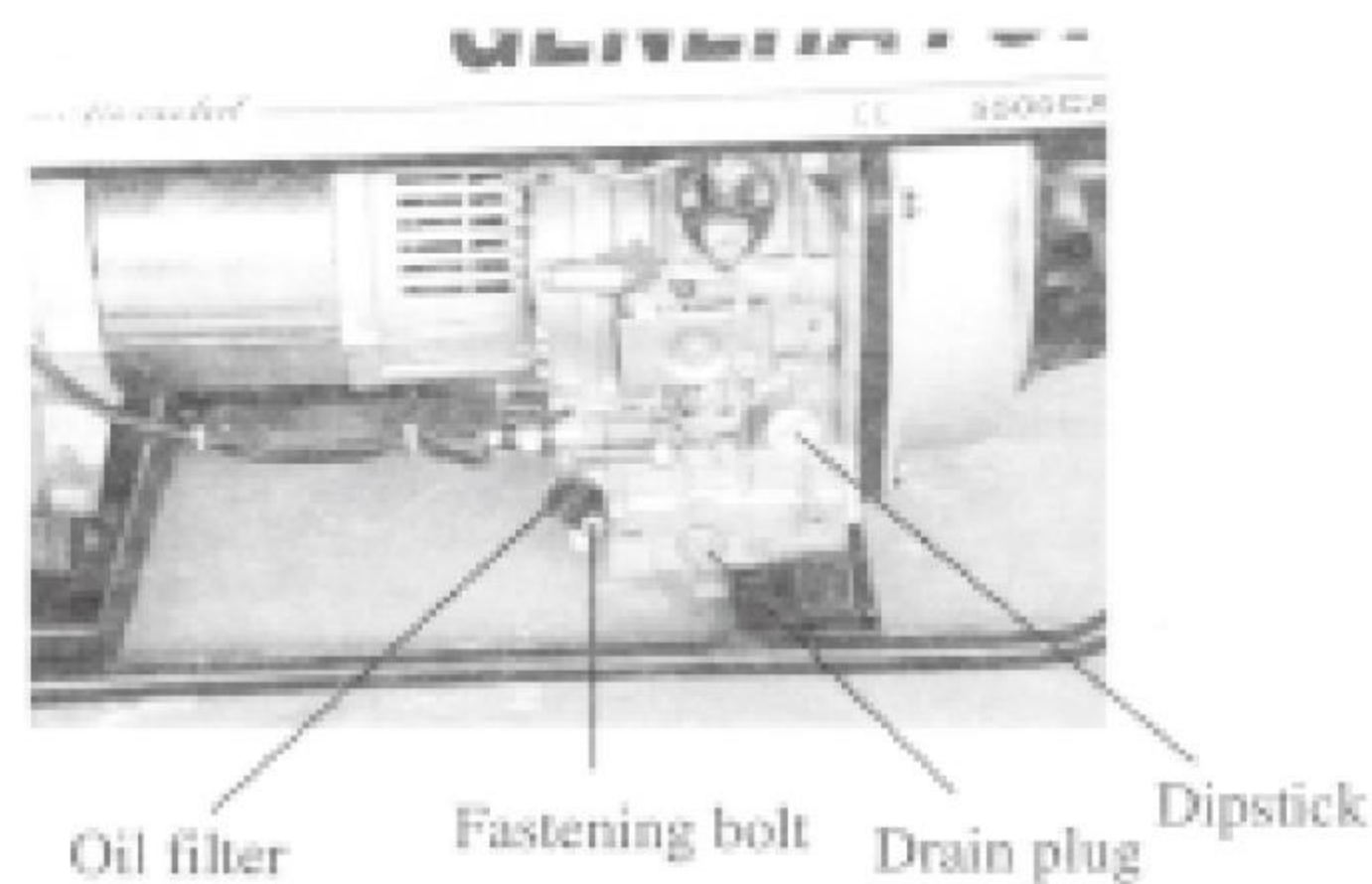
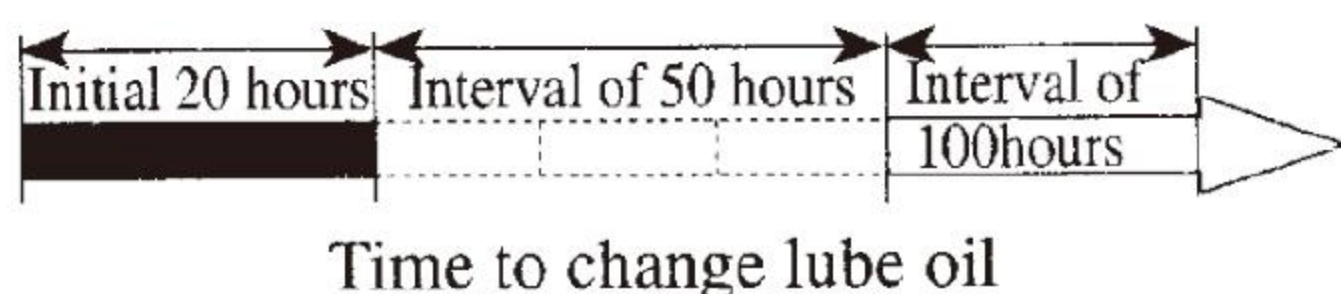
Note: ● mark means needing special wrench, please contact with the dealer of Us.

MAINTENANCE

8.1.1 Change lube oil

Screw out the dipstick and remove the drain plug and drain the old lube oil while the lube oil is still hot. The drain plug is located at the bottom of the cylinder block. Fasten the drain plug then fill the recommended lube oil.

Change the lube oil after 20 hours of initial operation or at the end of the first month, and then once every 50 hours for three times, once every three months or once every 100 hours thereafter.



8.1.2 Clean the lube oil filter

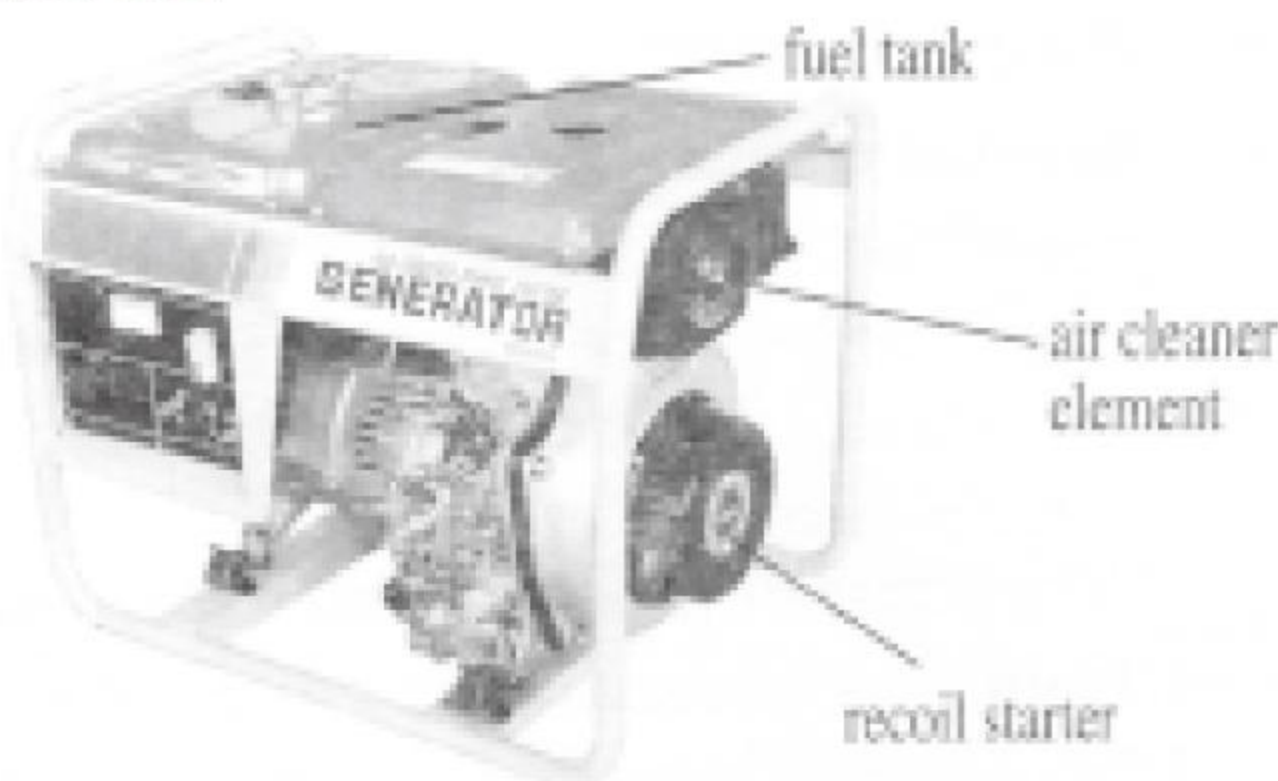
Loosen the fastening bolt and pull out oil filter to clean.

Time to be cleaned	Every 6 months or every 500 hours
Replace it if necessary	

8.1.3 Change the air filter

Don't clean the air filter or air filter element with detergent, use a soft brush clean dust accumulated on the external surface of element.

Time to be cleaned	Every 3 months or every 100 hours
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⚠ Caution:
Without the filter element or it is in disorder, never start the diesel engine. Change the damaged filter element in time.

8-1.4 Clean and replace the fuel filter

The fuel filter should be cleaned regularly in order to insure maximum output power.

Time to be cleaned	Every 6 months or every 500 hours
Time to be replaced	Every year or every 1000 hours

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

(2) Loosen the small screw of the fuel cock and pull out the filter from fuel filling mouth. Wash it thoroughly with diesel oil.

(3) Fuel filter of mute type set locate beneath the fuel tank, open the case door you can see it and disassemble it to clean or change

Time to be cleaned	Every 3 months or every 1000 hours
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8.1.5 Fasten cylinder head bolts (refer to Operation Instruction of Diesel Engine)

8.1.6 Check the injection nozzle and injection pump and so on.

8.1.7 Adjust the valve clearance for the intake and exhaust valves.

8.1.8 Replace piston ring.

The operation from 8.1.5 to 8.1.8 require special tools and skills, don't try it yourself.

⚠ CAUTION: When operation, don't expose bare skin to the fuel spray. The fuel may

MAINTENANCE/INSPECTION,REPAIR AND TROUBLE SHOOTING

penetrte the skin and cause injury to the body

8-1.9 Check and replenish electrolyte of battery and charge it.

This generator set uses 12V battery.The electrolyte of accumulator will be loss through continuous charging and discharging.Before starting,check whether the battery is damaged and its electrolyte level is normal.If necessary, replenish distilled water in it.If damaged,replace the battery.

Check electrolyte of battery	once a month
Voltage of battery	12-14V

8-2 Maintenance for long time storage

If your generator should be storage for a long time,the following preparation should be done:

8.2.1 Operate the generator set about 15 minutes.

8.2.2 Stop the diesel engine.When the diesel engine is still hot,drain the old lube oil out and fill new one.

8.2.3 Pull out the screw plug at the cover of cylinder head and fill 2 ml lube oil in cylinder, and finally screw tightly the plug on its original position.

8.2.4 Maintenance of starting position.

(1) Recoil starting:

Set the fuel cock at 'OFF' position,press the decompression lever down and pull the recoil handle 2-3 times(Don't start the diesel engine).

(2) Electric starting:

Set the fuel cock at 'OFF' position,start the diesel engine about 2~3 seconds.Don't start the diesel engine.

8.2.5 Pull the decompression lever out and pull the recoil starter slowly.When fell it is fastening,the stop.(At this time,the intake and drain valve is at the status of close,it is suitable for preventing from rust).

8.2.6 Clean and store set at dry place.

9 Inspection,repair and trouble-shooting

9.1 Doubtful points and problems

If you have any question or problem during operation,please contact with our authorized dealer or us directly.Meanwhile provide the following information:

(1)The type and serial number of diesel generator set,the serial number and model of diesel engine.

The serial number and type of diesel engine is located at the side of oil draining bolt of cylinder block.The type and manufacturing date are located at the engine nameplate.

The number of diesel generator set is located at the chassis of framework for opening type and at the foundation beside battery for mute type.

(2)Status

What problem had been taken place when you operate the generator set and explain how much speed it is operated?

(3)How long did your unit have operated?

(4)The other detailed operation conditions and time.

For more detailed information,please fill the Letter of opinion from users and send it to us.

9.2 Inspection,repair and troubleshooting

If electricity can not be generated still after the generator set has been serviced following the chart of troubleshooting on next page,please contact with appointed dealer or us directly.

INSPECTION, REPAIR AND TROUBLE SHOOTING

Chart of troubleshooting

	Cause	Remedy
The diesel engine can not start	Fuel oil is not enough	Add fuel oil
	Fuel cock is not at 'ON' position.	Turn it to 'ON' position.
	High pressure pump and fuel nozzle can not inject oil or less fuel is injected	Remove the fuel nozzle and repair it on the test table.
	Speed control lever is not at 'RUN' position	Set the control lever to 'RUN' position.
	Check the level of lube oil	Standard level of lube oil should be between upper line 'H' and lower line 'L'.
	Speed and force to pull the recoil starter is not enough.	Start the diesel engine as per requirements of 'start procedures of operation'.
	Fuel nozzle has dirty.	Clean fuel nozzle
	Storage battery exhausted.	Charge or replace storage battery.
The generator can not generate.	Main switch is not turned on.	Turn the switch to 'ON' position
	Bad contact of socket	Adjust the legs of socket.
	The rated speed of generator can not be reached	Adjust to rated speed as per requirements.
	Fuse broken	Replace fuse
	Leakage of load	Remove leaking load
Too lower voltage	Rated speed of generator cannot be reached	Slightly adjust speed lever to rated speed (suitable for Model X, XE, Q generator set)
	Voltage meter is broken and pointer indicates too low	Confirm voltage meter is broken by AC range and replace it.
	AVR broken or connecting wire disconnected, voltage is at about 80V	Replace AVR or connect wires well
Stop automatically when running for a period of time	Less lube oil, low oil pressure protect system of Model X, XE, Q generator set activated.	Add lube oil and make the level of lubricant oil between 'H' and 'L' of dipstick
	Speed regulating lever of Model X, XE, Q generator set switched off easily.	Repair simply and adjust hook surface

Appendixes: List for comments from users

Item \ Type		Date of Manufacturing	
		Series Number of Manufacturing	
Name of User		Occupation	
Detailed Address of User			
Detailed Name of Purchase Place			
Condition of Packing and Unpacking			
Conditions of Operation			
Conditions of Parts Wear			
Malfunction or Problem			
Improvement Opinion or Request for Generator Set			