DIESEL GENERATOR
DOUBLE PURPOSE SET
(single-phase/three-phases)
OPERATION MANUAL

3GF/5GF/6GF/7GF-M/ME/ME3
3GF/5GF/6GF/7GF-M-F3/ME-F3/ME3-F3
5GF /6GF /7GF-LDEM/LDEM3
5GF /6GF /7GF-LDE/LDE3
5GF /6GF /7GF-LDEX/LDEX3
5GF /6GF /7GF-LDEG/LDEG3

DIESEL

GENERATORS

PREFACE

Thank you very much for choosing this product.

This diesel generator uses the extremely light type, air-cooled，four-stroke and direct injection diesel engine. It is consist of two forms of starting (the recoil hand drawing start and the electric start), big fuel tank, automatic voltage stabilization capacitor or AVR device, NFB circuit protector, AC and DC double output device, low oil pressure alarm and automatic stop device. All these make it easier for you to use the set.

This operation manual describes how to correctly operate and maintain your welder and generator set. Please read it thoroughly to guarantee correct operation before using the set. Following the operation requirements in the operation manual will keep your set in the best operation state so as to extend the life of the set. If you have any suggestion or problem related to the operation manual, please contact the company or the agency.

With the increasing improvement and enhancement of the products made by the company, there may be some differences between the contents described in the operation manual and the practical products. Please pay attention to these differences while referring to this manual.

The generator set has passed CE, and is in accordance with ISO8528, fire protection, and ISO6826 Standard.

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Note: L series generator set is the common type. For the operation, maintenance and repair, please refer to M/ME type and LDE type.

Chapter 1 Main Technical Specifications and Data

1.1. Main Technical Specifications and Data

		3GF	5GF	6GF	7GF
Generator Set	Rated Frequency (Hz)	50/60Hz	50/60Hz	50/60Hz	50/60Hz
	Rated Power(kW)	2.8/3.3	4.4/5.0	5.8/6.0	6.3/6.5
	Max. Power (kW)	3.0/3.6	4.8/5.5	6.3/6.5	6.8/7.0
	DC Output (V-A)	12V 8.3A	12V 8.3A	12V 8.3A	12V 8.3A
	Rated Voltage (V)	220/380			
	Power Factor (Φ)	1.0/0.8			
	Phase	Single-phase / Three-phase			
	Excitation System	Self-excitation			
	Dimension (LXWXH)mm	690*470*570	760*500*650	760*500*650	760*500*650
	Net Weight (kg)	69	120	160	163
	Type	Single-cylinder, vertical, 4-stroke, air-cooled, direct-injection			
	Displacement (cc)	296	406	455	498
	Fuel Tank Capacity (L)	15	15/16	15/16	15/16
	Lube. Oil Capacity (L)	1.65	1.65	1.65	1.65
Engine	Power type	178F	186F	188FD	192FD
	Bore x stroke (mm)	78X62	86X70	88X75	92X75
	Engine Speed (rpm)	3000/3600	3000/3600	3000/3600	3000/3600
	Maximum Output (HP)	7	10	11	13
	Power Take Off	Crankshaft or camshaft (camshaft PTO rpm is 1/2)			

1.2. Basic Parameters

1.2.1. Under the following conditions, the set should output the rated power:

Altitude height (m)	Environment temperature (℃)	Relative humidity
0	+20	60%

1.2.2. Under the following conditions, the set should output the stipulated power and work reliably.

Altitude height(m)	Environment temperature (℃)	Relative humidity
<1000	5-40	90%

1.3. Sound Level

	2GF-M	3GF-ME	5GF-LDE
Sound pressure level dB (A)	97.9	98	86.6
Sound power level dB (A)	110.9	111	99.6

The figures quoted are emission levels and are not necessarily satisfactory working levels. Whilst there is a correlation between the emission and exposure levels, this cannot be used reliably to determine whether or not further precautions are required. Factors that influence the actual level of exposure of work force include the characteristics of the work room, the other sources of noise, the number of machines and other adjacent processes, and the length of time for which an operator is exposed to the noise. Also, the permissible exposure level can vary among countries. This information, however, will enable the user of the machine to make a better evaluation of the hazard and risk.

Chapter 2 Use for the Generator Set

2 . 1 Use Essentials and Cautions

In order to ensure that your safety while operating the generator set, be sure that you read and understand the operation manual, especially the attention should be paid to the main points listed below. Otherwise, personal accidents and equipment damages may occur.

2.1.1. Fire prevention

The combustion oil used in the diesel engine is light diesel oil. Gasoline, kerosene and other oils should not be used.

Use a clean cloth to wipe off the overflowed oil. Gasoline, kerosene, and other inflammable and explosive substances should not be put near the set because the temperature around the exhaust noise suppressor is very high while the diesel engine is running. Operating the general set while smoking or near an open flame is forbidden.

In order to prevent fire and to provide sufficient ventilation, the set shall be at least 1.5m away form the building and other equipment during operation.

Operation the welder and generator set should be carried out on a smooth floor. If the set is tilted, oil will overflow.

2.1.2. Prevent the suction of exhaust gas

The exhaust gas includes poisonous carbon monoxide. At places with poor ventilation, the welder and generator set should not be used. If it is necessary to operate the set indoors, suitable ventilation condition should be supplied to prevent people and livestock from being affected.

2.1.3. Prevent burns

When the diesel engine is running and is hot, it is not allowed to touch the noise suppressor and its housing.

2.1.4. Electric shock and short-circuit

In order to avoid the electric shock or the short -circuit, when the generator set is wet or when your hand is wet, it is not allowed to contact the welder and generator set. This welder

and generator set is not waterproof, so it should not be used at places in rain , snow and water mist.

In order to prevent electric shock, the generator set should be grounded. Connect the grounding terminal of the generator with the external grounding device by using a conductor. Before start, do not connect other equipment to the generator set.

2.1.5. Other safety precautions

In order to know how to quickly stop the set, the operator should be familiar with all the switches. Anyone without passing through the correct guidance should not carry out the operation. The operator should wear safety shoes and suitable clothes. Children and livestock should be kept far from the welder and generator set.

2.1.6. Charge the battery

The electrolyte of the battery contains sulphuric acid. In order to protect your eyes, skin and clothes, it is necessary to rinse with water if you come into contact with it. If it comes into your eyes, go to a clinic for wash.

The hydrogen produced from the battery is explosive. Don't smoke around the battery, especially during charging time. No spark is allowed to be splashed near the battery.

Charge the battery at places with good ventilation.

2.1.7. The general set makes loud noise. To protect your health, please wear an ear cover while operating.

2.1.8. Any movement of the general set should be effected by more than 2 persons. Vehicles should be used when long distance transportation is required.

2 . 2 Preparation before Start

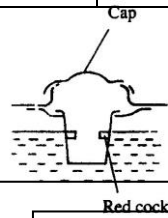
2 . 2 . 1 . Select and fill with combustion oil

Combustion oil tank

Only use light diesel oil. The combustion oil should be filtered clean. Don't let any dust or water to be mixed into the combustion oil and the oil tank. Otherwise the high-pressure pump and the oil nozzle may be blocked up.

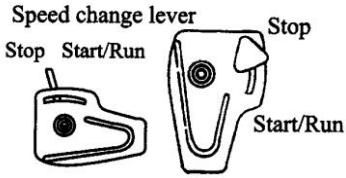
Type / Volume	2GF-L 2GF-ME 2GF-M	3GF-L 3GF-ME 3GF-M	5GF-L 5GF-ME 5GF-M	5GF-L3 5GF-ME3 5GF-M3	3GF-LDE	5GF-LDE
Effective volume of fuel tank (L) English gallon	**2.5 15**	**3.5 15**	**15**	**15**	**16**	**16**

Attention: Oil overflowing is very dangerous.
The oil level should not exceed
the top of the red cock inside the filter.

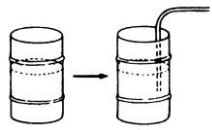


Attention:
Do not smoke at places where oil is filled or stored. Do not let any spark get into this area. Do not allow oil overflow. After finishing filling the oil, be sure to fasten the cover nut on the oil inlet.

Air filter core
Don't wash the air filter core because it is a dry type. When the diesel engine output is not good or the colour of the exhaust gas is abnormal, change the filter core immediately. Never start the diesel engine without the filter core.



a. After purchasing the fuel, put it in the barrel for 3-4 days.
b. After 3-4 days, put the suction pipe into the barre1 at a half depth of the barrel (water and foreign matter is sunk onto the lower position in the barrel.)

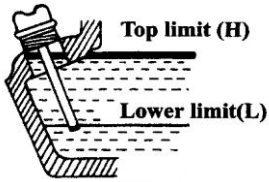


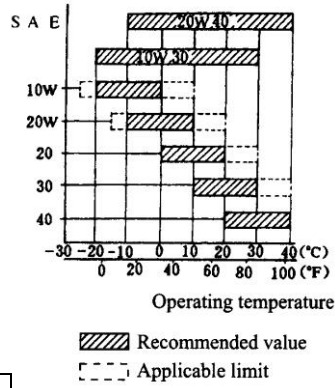
c. When replacing the fuel or oil, use a container and treat the waste oil according to local regulations.

2.2.2. Filling the Machine oil

Lubrication Oil Inlet

Put the generator set on a level place. Fill the oil into the oil-filling inlet. At the time of checking the oil level, it is necessary only to lightly insert the oil ruler. Please pay attention not to rotate the oil ruler.

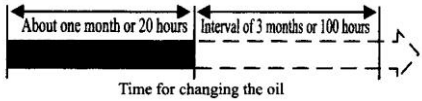




Type / Volume	170FG	178FG	186FG
Volume(L)	0.75	1.1	1.65

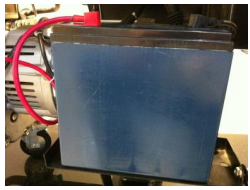
A.P.I. Diesel engine maintenance classification: The lubrication oil should be CC or CD grade.

The effect of lubrication oil to the performance and reliability of the diesel engine is bigger than other factors. If you use poor quality machine oil or if you don't change the oil for your diesel engine according to the manual, it is easy to block up the piston. It will also quicken the wearing of the cylinder, bearings, and other moving components so that the life of your diesel engine is shortened.



Although there is low oil pressure alarm system to stop the device, it is still necessary to check the oil quantity at the starting. If there's no sufficient oil, please add some oil first. Drain the machine oil whi1e the diesel engine is hot. After the engine cools, it is very difficult to drain the oil thoroughly.

The waste oil should be processed according to local regulations without polluting the environment.



WARNING: Don't fill the machine oil into the diesel engine when the diesel engine is running.

2.2.3 Check the air filter

(1) Unfasten the butterfly nut, open the filter cover, and take out the filter core. Never wash the filter core by using any detergents. When the output is reduced or the colour of the exhaust gas is abnormal, change the filter core. Never start the generator set without the air filter core. Otherwise the diesel engine will soon be worn out.

(2) After mounting the filter core, cover the air filter housing and fasten the butterfly nut.

2.2.4 Inspect the generator set

Before starting the set, be sure the air switch is turned to OFF position. If the switch is not turned to OFF position, when the engine starts, sudden loading is very dangerous.

The generator should be grounded to prevent the electric shock.

Blow the dust out of the generator control box by using dry compressed air (air pressure should be less than 1.96X105Pa) or manually.

If the alternator doesn't start well, check the clean condition on the slide rings, check the carbon brush pressure, and check whether the position on the slide rings are correctly fitted. Check whether the fixing is reliable and whether the contact is good.

According to the electric wiring diagram, check whether the wiring lines are correct and whether the connection joints are firm.

Use a 500V megameter to measure the insulation resistance of the electric devices. The resistance should be no less than 2 megohms. Otherwise, it is necessary to carry out a dry treatment. While measuring, disconnect AVR, or it may be burned out. (For the noise quieting type, it is possible not to carry out this check.)

2.2.5 Before delivering the diesel engine from factory, discharge fuel oil and machine oil.

Before filling fuel oil and starting the diesel engine, it is necessary to check whether there is any air mixed into the oil circuit. If there is, discharge the air by unfastening the connecting nut between the oil injection pump and the oil transmission pipe, until there is no air bubble appearing. Then fasten the connecting nut again.

2.3. Inspection and Operation of the Diesel Engine

2.3.1 Low oil pressure alarm system / stopping device

This diesel engine possesses low oil pressure alarm system / stopping device. When the oil pressure goes down, the device will automatically stop the diesel engine to avoid the blocking-up of the diesel engine. If the diesel engine keeps running under this condition, the lubrication will be insufficient. As a result, the oil temperature will go up high.

On the other hand, too much oil is also dangerous, because the machine oil may be burned, which will make the revolution speed of the engine increases suddenly and result in 'abnormally fast running'.

2.3.2 Trial run operation

If your diesel engine is a new set, a large loading will reduce the engine's life. Within the first 20 hours, it is necessary to carry out the trial run.

(1) Avoid overload. During the trial run stage, it is necessary to avoid large load, better use only 75% of the rated load.

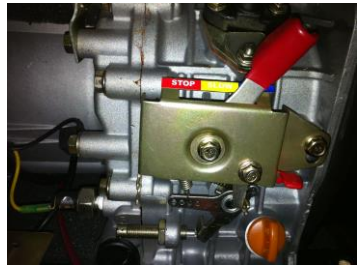
(2) Fill the machine oil according to the requirement. At the beginning of the use, change the oil once each 20 hours or once a month. After that, change the oil once each 3 months or once each 100 hours.

2. 4 Starting the Generator Set

2.4.1. Recoil start (manual start)

Start the engine according to the following procedures:

(l) Switch on the fuel switch (in ON position).



(2) Set the speed handle of the engine at RUN position.

(3) Pull the recoil handle.

(3.1) Pull the handle till you feel the resistance force. Then release it and return it to its initial position.

(3.2) Press down the decompression handle (when the recoil handle is pulled, it will automatically be restored.)

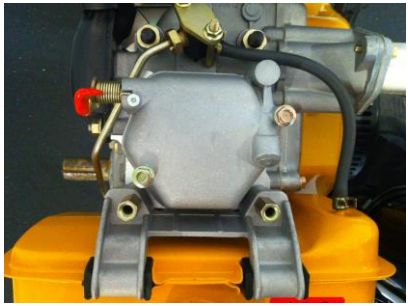
(3.3) Quickly pull the recoil handle by two hands.

While operating (or after start), don't let the handle fly out of your hand so as to avoid it to smash onto the diesel engine. Slowly and gently let the handle return to its position to avoid damaging the starter.

Caution: When the diesel engine is running, never pull the recoil handle, otherwise it will damage the diesel engine.

(3.4) In cold days, when it is difficult to start the diesel engine, unscrew the plastic cock on the rocker arm and fill in 2ml machine oil.

Unscrew the plastic cock before start. The plastic cock should never be unscrewed except filling the oil. Otherwise, rain, water, dust and other dirt may enter into the diesel engine, thus causing fast wearing of the inside components, which will result in serious problems.



2.4.2 Electric Start

2.4.2.1 Start

(1) Insert the electric switch key in OFF position.

(2) Set the speed handle in RUN position.

(3) Turn the electric switch clockwise to START position (for noise quieting set, firstly turn the switch clockwise to RUN position for 1 to 2 seconds, where the switch magnet sucks up, then turn the switch clockwise to START position.)

(4) After the diesel engine starts, release the switch handle. Let it return to ON position automatically.

(5) If the diesel engine doesn't start after 10 seconds, please wait for another 15 seconds and start again.

If the start motor rotates for a long time, the voltage of the battery will go down, causing running hysteresis.

When the diesel engine is in operation, always leave the start key in ON position.

Caution: If the start motor rotates for a long time, the voltage of the battery will go down, causing running hysteresis.
When the diesel engine is in operation, always leave the key in ON position.

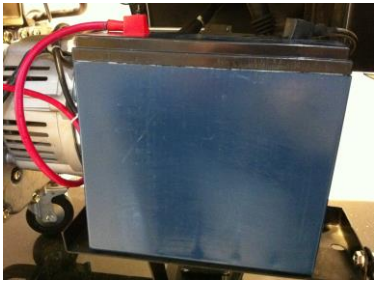
2.4.2.2. Battery

Check the electrolyte level of the battery once a month. When the liquid level goes down to the lower mark, add some distilled water until it goes up to the higher mark.

If there's not enough electrolyte in the battery, the diesel engine will not start as the electric power is insufficient. Therefore, it is necessary to keep the liquid level between the higher limit and the lower limit.

If there's too much e1ectrolyte in the battery, the liquid may overflow and corrode its surrounding components.

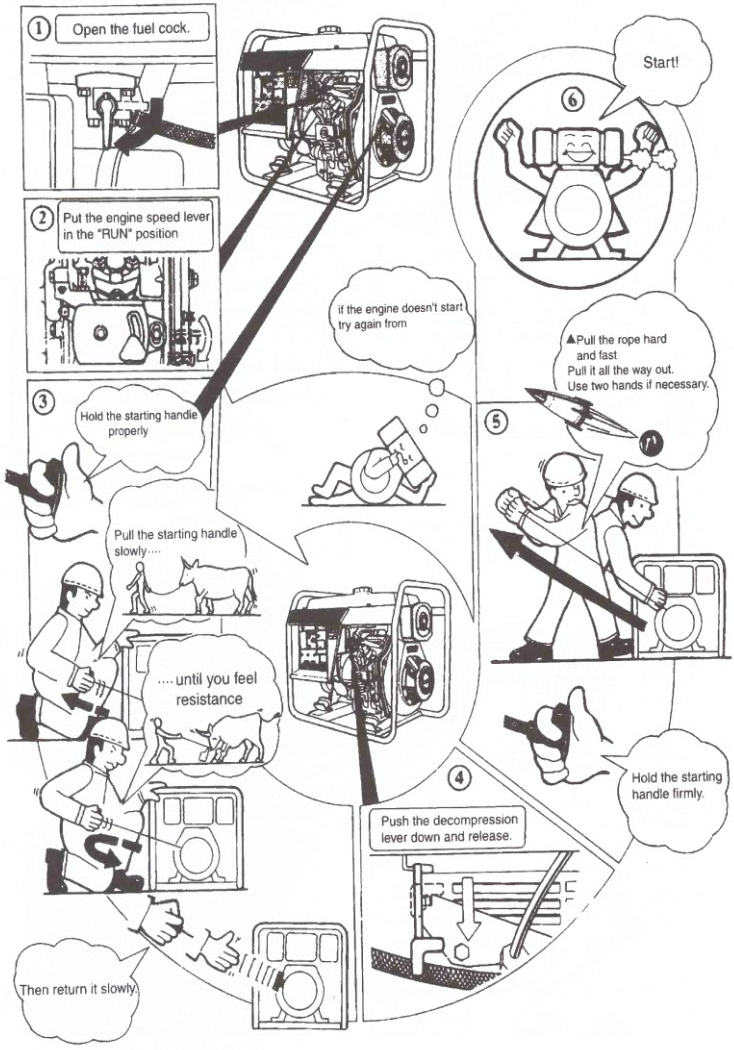
Check the battery once a month.

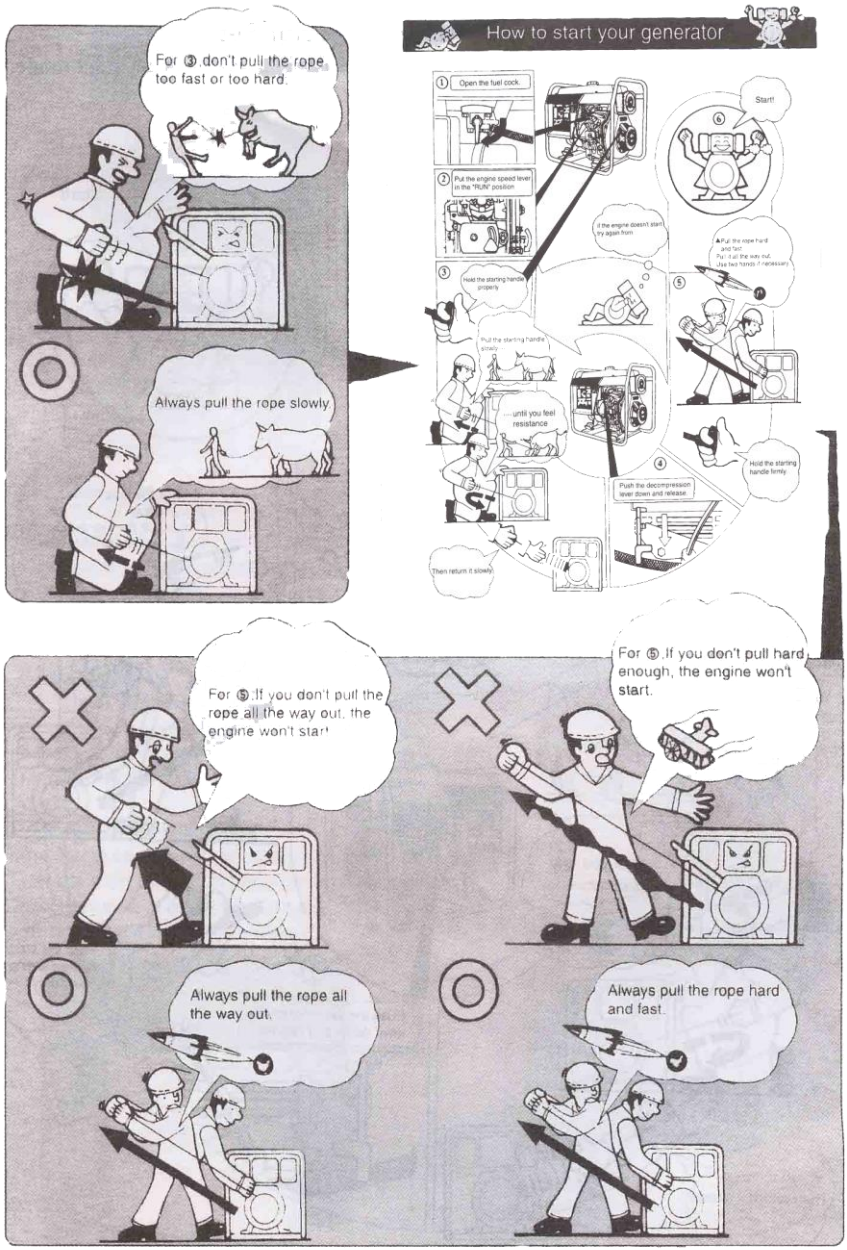


Attention: For the noise quieting set, at the start time, firstly turn the switch key to RUN (ON) position, where switch magnet sucks up, then turn the switch to START position.

2.5. Operation procedure for starting generator set

The operation procedure is suitable only for L series recoil hand start mode.




For ③ don't pull the rope too fast or too hard.
Always pull the rope slowly.
How to start your generator
① Open the fuel cock.
② Put the engine speed lever in the "RUN" position
③ Hold the starting handle properly
④ Push the decompression lever down and release.
⑤ ▲Pull the rope hard and fast. Pull it all the way out. Use two hands if necessary.
⑥ Start!
If the engine doesn't start, try again from ①
Pull the starting handle slowly
until you feel resistance
Then return it slowly
Hold the starting handle firmly
For ⑤ If you don't pull the rope all the way out, the engine won't start.
Always pull the rope all the way out.
For ⑤ If you don't pull hard enough, the engine won't start.
Always pull the rope hard and fast.

2.6 How to Correctly Operate Generator Set

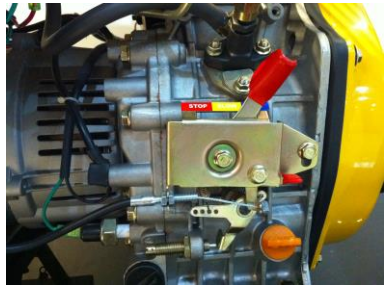
2.6.1 Operating the Diesel Engine

(1) Preheat the diesel engine for three minutes under the condition without any load.

(2) For diesel engine with low oil pressure alarm system, check whether the oil pressure signal indicator lights up.

For diesel engine with low oil pressure alarm system, the lubrication oil alarm indicator will light up when the oil pressure is low or when the lubrication oil is insufficient, and the diesel engine will stop automatically. If no lubrication oil is added and you make a restart, the diesel engine will still stop immediately. It is necessary to check the oil level and add some oil.

(3) Do not unfasten the adjustment bolt used for adjusting the speed limit of the diesel engine or do not unfasten the high-pressure pump limit bolt (they were well-adjusted when delivered from factory). Otherwise their performance will be affected.



2.6.2 Inspection during the Operation

(1) Check whether there is any abnormal sound or vibration.

(2) Check whether the diesel engine does not start or the operation is not good.

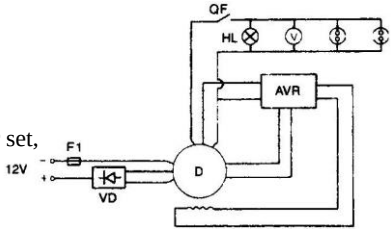
(2) Check exhaust gas colour (is it black or is it too white?)

If you find one of the above-mentioned phenomena, it is necessary to stop the set, find out the trouble cause and shoot the trouble. If the settlement can not be made, please contact the agency nearby or the authorized dealer.

2.7. Loading

2.7.1 Load according to the specified parameters.

For the electric principle diagram of the generator set, please refer to the following figure.



2.7.2. AC Application

(1) For open frame type, be sure the rotation speed of the generator set is increased to the rated speed (the speed handle should be turned to the top). Otherwise the automatic voltage adjustment device will produce forced excitation. If the set keeps running under such condition for a long time, AVR will be burned out. For the rated speed of the generator, please see 1.1 Main Technical Specifications and Data in Chapter 1.

(2) After switching on the air switch, observe the voltmeter on the panel of the control cabinet. It shall point to 230V±5% (50Hz) for single phase set, and 400V±5% (50Hz) for three phase set.

(3) When double voltage generator set changes the voltage, the air switch should be set at OFF position. Otherwise the generator set and electric devices may be burned out or damaged.

Caution: Do not start more than two machines at a time. The machines should be started one by one. Do not use floodlight while using other machines.

		Incandescence lamp, household electric device	Machines using rectifier type motors	Machines using induction type motors (capacity start type)		
		Projector, electric stove	Drilling machines grinding machines, etc.	Water pumps, air-compressor, etc.		
				Load	60Hz	50Hz
	3GF-M 3GF-ME 3GF-LDE	Not exceeding 2500/3050W	Not exceeding 1300/1500W	400W or 250W	4 4	4 4
	5GF-M 5GF-ME 5GF-LDE	Not exceeding 3700/4500W	Not exceeding 1800/2200W	400w or 250W	7 7	6 6
	5GF-M3 5GF-ME3 5GF-LDE3	Not exceeding 3700/4500W	Not exceeding 3700/4500W	Three-phase asynchronous generator 2KW	2	2

(4) Connect equipment in order to the generator. First connect large power motors. After the operation is normal, then connect small power motors. If you don't follow the order, it will cause running hysteresis or the generator will stop suddenly. In this case, unload immediately and turn off the generator. Check where the trouble appears.

If it is circuit overload that causes the air switch of AC circuit to trip, reduce the circuit load. Do not run the set under overloaded condition. Maximum output power should not exceed the specification in Table 1-1. Wait for several minutes before restoring the operation. If the indication on the voltmeter is too low or too high, adjust the revolution speed. If there is any trouble and any abnormal running condition, stop the generator for check.

(5) Three-phase generator set

During the operation, attention should be paid to the three-phase voltage. If the imbalance of three-phase voltage is over 20%, stop the machine for check.

Each phase load should not exceed the specified load, i.e. the rated power. The current should not exceed the rated current. A.B.C.O (or U.V.W.N) phase arrangement should be laid from left to right or clockwise. While starting three-phase asynchronous motor, firs start the large power motor, then start the smaller ones.

2.7.3. DC application

(1) DC terminals are used only for charging 12V battery.

(2) Before charging, set the air switch at OFF position. Connect a charge switch to the 12V output terminal so that the switch can be used to control on-and-off function.

(3) Connect the positive and negative poles of the battery to the positive and negative poles of DC terminals respectively. Do not misconnect the positive and negative poles of the battery, or the generator and battery will be damaged.

(4) Do not connect the positive pole of the battery with its negative pole, or the battery will be damaged.

(5) Do not connect the positive and negative poles of the DC together, or the generator will be damaged.

(6) Do not charge batteries with large current over 8A, or the fuse of DC power supply will be burned out easily.

(7) Charging the battery will produce flammable gas. Keep spark, flame and cigarette away. To avoid producing any spark near the battery, first connect the generator. When disconnecting, first disconnect the motor cable.

(8) Charge at a place with good ventilation. Before turning it on, open the battery cover. If the electrolyte temperature exceeds 45℃, stop charging.

(9) There's a fuse at the terminals of the generator to protect the motor. If the circuit is normal, but there is no DC output, please open the back cover of the motor. If the fuse is burned out, please check whether the rectification-bridge is normal and change the fuse in time. If the generator set is not in use for a long time, remove the battery connection lines to prevent electric leakage.

(10) Three-phase generator set does not supply 12V DC output externally and it only charges its own battery. When the battery is connected to the start circuit, start the diesel engine and it enters into the running state. At this time, the 12V circuit will charge the battery automatically.

Caution: When two poles of the generator are connected with the battery, do no try to add illuminations or power load. Using DC 12V and AC at the same time is not allowed.

2.8.1. Remove the load of the generator set.

2.8.2. Turn off the air switch of the generator set.

2.8.3. Set the speed handle of the engine to STOP position. Let the engine run unloaded for three minutes. Do not stop the engine suddenly, because this may cause the temperature to rise abnormally and result in the blocking-up of oil nozzle and the damage of diesel engine.

(1) Press the stop handle leftwards.

(2) With electric starter, turn the key to OFF position.

(3) Set the fuel switch handle to S position.

(4) Slowly pull the recoil handle till you feel the resistance (at this point of the compression stroke, the suction and exhaust valves are closed.). Stop the handle at this position so as to prevent rusting when the engine is not in use.

Caution:

1. When the speed handle is set at STOP position, but the diesel engine is still in operation, it is possible to stop the diesel engine either by setting the fuel switch to OFF position or by unfastening the high pressure oil pipe nut. Do not stop the diesel engine by using the decompression handle.
2. It is not allowed to stop the set with load. Remove the load before stopping the set.

Chapter 3 Maintenance of Generator Set

Remark: Important installation and maintenance should be processed by technician.

3.1. Regular Maintenance

To keep the generator set in good state, regular inspection and maintenance is very important. This set is composed of diesel engine, welder generator, control cabinet, frame and so on. For details about inspection and maintenance, please read the operation and maintenance manual for each assembling section.

Before carrying out maintenance, please turn off the diesel engine. If it is necessary to run the diesel engine, place it in places with good ventilation to release exhaust gas that contains poisonous carbon monoxide.

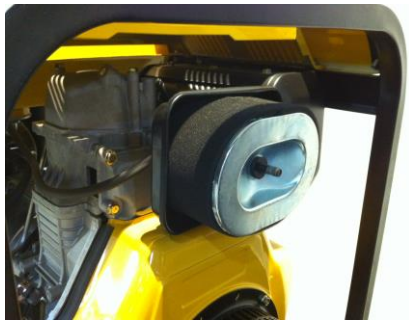
After using the set, wipe off dirt with clean cloth to prevent corrosion and remove sunk substances.

	Daily check	First month or 20Hrs	Every 3 months or 100Hrs	Every 6 months or 500Hrs	Every year or 100Hrs
Check and refill fuel	○				
Drain fuel from F.O. tank		○			
Check and refill lube oil	○				
Check for oil leakage	○				
Check and tighten each parts of the engine	○			● (Tighten head bolts)	
Change lube oil		○ (1st time)	○ (2nd and thereafter)		
Clean oil filter				○ (Replace if necessary	
Replace air cleaner element	(Service more frequently when used in dusty areas)			○ (Replace)	
Clean fuel filter				○	● (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)				●
Check commutator brush and slip ring				●	

The chart above indicates what and when to check. The mark "●" indicates that special tools and skills are required. Please consult your dealer.

3.1.1. Change engine oil (every 100Hrs)

Remove the oil filter cap. Remove drain plug and drain the old 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 recommended oil.



3.1.2. Clean oil filter

Clean	Every 6 months or 500 hours
Replace if necessary	

3.1.3. Change air cleaner element

Do not wash air cleaner element with detergent because it's a dry-type element.

Change	Every 6 months or 500 hours (or earlier if dirty)

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

3.1.4. Clean and replace fuel filter

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

Clean	Every 6 months or 500 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 fuel tank. Wash the filter thoroughly with diesel fuel. Remove the lock nut, end cap and diffuser discs and clean the carbon deposit.

Clean times	Every 3 months or 100 hours

3.1.5. Tighten cylinder head bolts

It requires a special tool (refer to the manual of diesel engine). Don't try it yourself.

3.1.6. Check injection nozzle, injection pump etc.

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

(2) Lap intake and exhaust valves .

(3) Replace piston ring.

All these require special tools and skills. Do not perform the injection nozzle test near an open fire or any other kinds 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. Check and refill battery fluid and charge the 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 the electrolyte level. Refill with distilled water up to the upper mark if necessary. When actual damage is discovered, replace the battery.

Battery fluid check	monthly

3.1.8. Frequent check of the contact between carbon brush and slip ring of alternator

Check whether they are in good condition. If spark occurs, adjust properly.

3.2 Maintenance for long time storage

If your generator is to be stored for a long time, follow the below preparation:

3.2.1. Operate the diesel engine for about 3 minutes, then stop it.

3.2.2. Close the diesel engine when it is still hot. Drain old lubricant out, then refill with new one.

3.2.3. Unscrew the cover of diesel engine and add 2ml lubricant into the cylinder, then put the cock back.

3.2.4. Maintenance of starting position

(1) Manual starting: Press the decompression handle (Non-compression position), pull the recoil handle 2-3 times (without starting the diesel engine), then loose the handle and start it.

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

3.2.5. Pull the decompression handle out, pull the recoil starter slowly

When it is fastened, stop it. (At this time, the intake and drain valves are at the status of close, helpful to prevent rust).

3.2.6. Clean and store it in a dry place.

Chapter 4 Inspection, Repair and Troubleshooting for Generator Set

4.1 Maintenance and Remedy

Cause		Remedy
Engine	Oil fuel is not enough.	Add oil fuel.
	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 and repair it at test table.
	The speed control lever is not at RUN position.	Put the control level to RUN position.
	Check lubricant level.	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.
Generator	Main switch (NFB) is not closed.	Put the main switch to ON position.
	The carbon brush of generator is not good.	Change the carbon brush.
	The contact of socket is not good.	Adjust the feet of socket.
	The rated speed of generator can not be reached.	Adjust it according to the requirements.
	AVR auto-voltage regulator is damaged.	Change the AVR auto-voltage regulator.
	The potentiometer for adjusting the welder current is damaged.	Change the potentiometer.

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

4.2 Question and Problem

If you have any question or problem in your operation, please contact our company or your dealer, and inform us of the following information.

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

(2) State what problem had occurred during operation and explain the speed it is operated.

(3) Time of operation.

(4) Other detailed conditions, for example when the problem occured. For details, please fill the feedback form and send it to our company.

Appendix 1
Symbol Explains of Electric Wiring Diagram

EL—Electric Lock

YA—Electric Magnet

XS—Socket

FU—Fuse

SW—Single Phase Winding

L.0.P.S—Low Oil Pressure Switch

AW—Auxiliary Winding

RP—Potentiometer

WW—Welding Winding

SA—Selective Switch

VD—Diode

HL—Indicating Lamp

AVR—Automatic Voltage Regulator

LF—Smoothing Reactor

C—Capacitor

QF—Air Switch

GB—Battery

X—Terminal Plate

V—Voltmeter

MW—Main Winding

FG—Flywheel Generator

EW—Excitation Winding

OM—Start Motor

UR—Rectified Bridge

Appendix3 Symbol Explains of Generator Set Sign

NO.	SYMBOL	QTY	MEANING	POSITION
1		1	Dangerous & no touching, or you may get an electric shock.	The end cover of the alternator and the controlling panel
2		1	Dangerous & no touching, or you may get scalded.	Near the muffler and the exhaust
3		1	Fire is forbidden.	The outside of the shell and the fuel tank
4		1	Accelerograph control	Near accelerograph
5		2(1)	Oil-filling hole	Near the oil-filling hole
6		1	The inlet of the air cleaner	The inlet of the air cleaner
7		1	Oil filler	Near the oil filler
8		1	Diesel only	Near the fuel-filling hole
9		1	Flying rings	Near flying rings
10		1	Stop running	Near accelerograph
11		1	Study the operating manual before using.	Outside the shell of the set
12		1	Fuel indicator	The fuel indicator
13		1	Cock of the fuel tank	Near the cock of the lieu lank
14		1	Key starting	The key starter
15		1	No smoking	Outside the shell of the set

Appendix 3 User Feedback Form

Type / Item		Date of manufacture	
		Serial number	
Name of user		Profession	
Detailed address			
Place of purchase			
Condition of packing and unpacking			
Condition of use			
Condition of parts wear			
Malfunction or problem			
Improvement opinion or request for generator sets			

Date: