



# DGW Welding Generator



# Installation & Operating Manual



# INDEX

<b>1. GENERATOR SPECIFICATIONS</b>	1
<b>2. SYMBOLS &amp; WARNINGS</b>	3
<b>3. OPERATION</b>	5
<b>4. MAINTENANCE</b>	17
<b>5. TROUBLE SHOOTING</b>	20
<b>6. WARRANTY</b>	22

**Congratulations on selecting a Dayliff DGW Welding Generator. They are manufactured to the highest standards and if installed and operated correctly will give many years of efficient and trouble free service. Careful reading of this Installation Manual is therefore important, though should there be any queries they should be referred to the equipment supplier.**

## **1. GENERATOR SPECIFICATIONS**



The Dayliff DGW welding generator is a dependable, quality product specially designed for welding and generating simultaneously or separately. Particular features include:

- Options of reliable and economical air-cooled 4 stroke OHV petrol engine (DGW 200P) or high efficiency diesel engines (DGW200D and 300D) equipped with large size exhaust and air cleaner for low noise operations.
- High efficiency square core alternator providing reliable power output.
- AC auxiliary current and DC welding current can be used simultaneously
- Strong tubular frame for protection and ease of handling.
- Integrated control panel with voltmeter, hourmeter and welding current adjuster for operational convenience.
- Fuseless type over current protection for AC with breaker on indicator
- Engine oil level sensor for protection in case of low oil level.
- High capacity fuel tank for extended operation.
- Supplied complete with electrode holder and 4m cable, welding clamp and 4m cable, output plugs and separate castor wheels for movable applications

DGW200 models are appropriate for use with welding rods up to 3.2mm while DGW300 is more suited for larger rods up to 5mm depending on the welding current requirement of a given application.

The DGW welding generator is of compact design and its advanced features make it suitable for all small scale welding and power generation applications.

## SPECIFICATIONS

Model	Engine			Output		Fuel Tank Capacity (litres)	Operating Period (Hrs)	Starter	Dimensions (mm)			Weight (kg)
	Engine Model	Capacity (cc)	Rated Power (HP)	Rated (kVA)	Max (kVA)				L	W	H	
<b>DGW 200P</b>	GK420	420	10.5	4.5	5	25	8	Electric	685	520	625	107
<b>DGW 200D</b>	LA186FA	418	7.7			12.5			6	800	525	600
<b>DGW 300D</b>	LA290F	954	17	3.0	3.3	25	1070			578	668	195

## WELDING DATA

Model	Welding Performance				Welding Rod Currents (A)			
	No Load Voltage (V)	Operation Voltage (V)	Operating Current (A)	Max. Arching Current (A)	2.5mmØ	3.2mmØ	4mmØ	5mmØ
<b>DGW200P</b>	62-68	22-26	50-130	200	50-100	100-160		
<b>DGW200D</b>				180				
<b>DGW300D</b>	75-80	22-32	50-270	300	-	-	160-180	180-300

## ELECTRICAL DATA

**Alternator:** self exciting, 2 pole

**Power Output:** 50Hz, 240V, single phase

**AC Power Output:** 2 No. Plug Socket+ DC Terminal Bindings for Welding Cables

**Voltage Regulator:** AVR

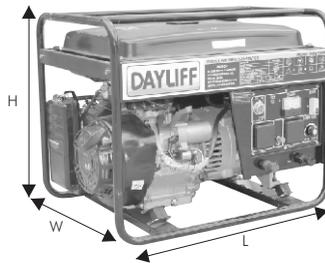
**Power Factor:** 1

**Speed:** 3000rpm

**DERATING:** Given outputs are sea level ratings. Sets should be derated at 1% for every 100m higher than 100m above sea level, and 2% for every 5°C temperature above 20°C.

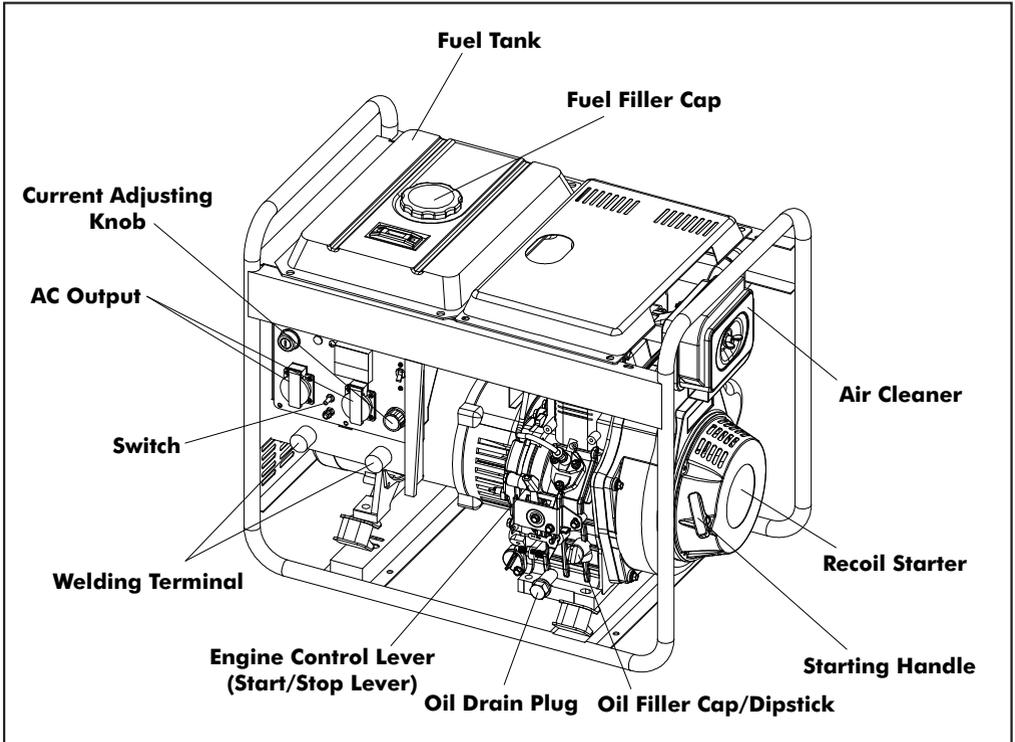
## DIMENSIONS & WEIGHTS

### Open Frame Type



Weight: 100kgs  
All dimensions in mm

## Part Names



## 2. SYMBOLS & WARNINGS



***Check the fuel requirements and use recommended fuel engine.***



***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 1.5m away from buildings and other equipment during operation.***



***Operate the generator on a level surface, to avoid fuel spillage***



***Exhaust gas contains poisonous carbon monoxide. Never use the generator in poorly ventilated locations. If indoor operation is unavoidable, provide proper ventilation.***



***Never touch the muffler or muffler cover while the engine is running as it may be hot.***



***In order to avoid electric shocks or short circuit, do not touch the generator, with wet hands.***



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



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



***The generator should be grounded to prevent electric shocks.***



***Do not connect other equipment to the generator before starting.***



***Installation should be done by a qualified person in accordance with local regulation.***



***The generator should be operated by qualified personnel only.***



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



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



**Batteries generate hydrogen gas, which can cause flames or sparks near a battery especially during charging. Charge the battery in a well ventilated place.**

## 3. OPERATION

### PREPARATION BEFORE START

#### Selection and Handling Fuel

**Fuel Tank:** Only light diesel or gasoline 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 carburetor.



**Do not over fill the tank beyond the top of the red plug inside the fuel tank filter.**

**Air Cleaner Element:** Do not wash the air cleaner element with detergent. Replace the element when its output decreases or a bad exhaust color is noticed



**Do not smoke or allow sparks in the area where the engine is refueled or where gasoline is stored.**



**Do not spill fuel when refueling, make sure filter cap is securely closed.**



**Do not refuel when the engine is running**

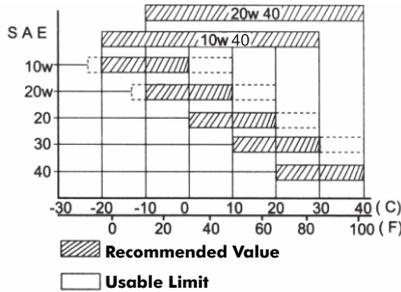


**After purchasing fuel, allow drum to stand 3-4 days. After wards, put a suction pipe halfway into the drum. (Water and dust accumulate in the lower portion of the drum).**

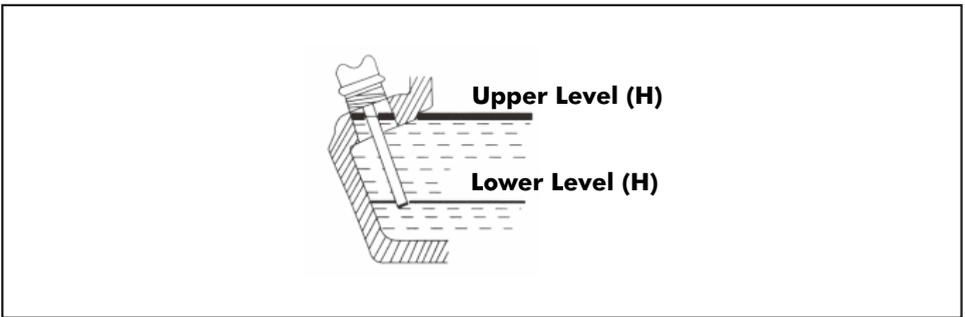
## Selection and handling of the lube oil

### Inlet of Lubricant

Set the generator on a level ground, fill the engine oil through the inlet of lubricant.



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



- Nothing affects the performance and durability of generator more than the lube oil used. If inferior oil is used or if it 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. The generator's life may be seriously shortened.



**Oil should first be changed after one month or after operating for 20 hours and thereafter every 3 months or 100 hours.**

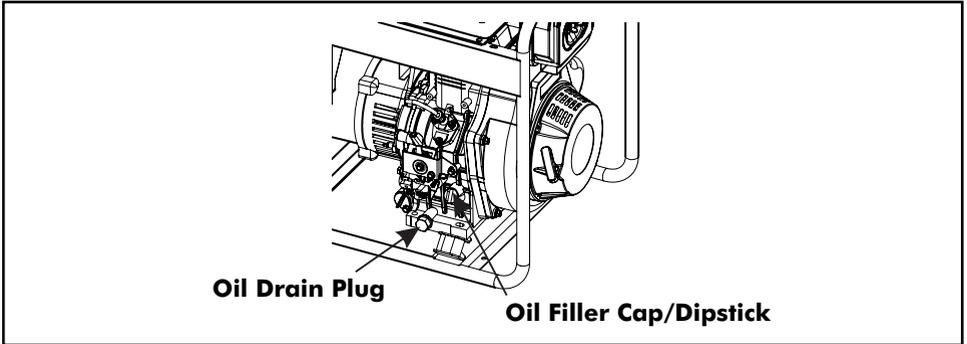
- Be sure to check the oil level and to refill with oil to the specified level before starting the generator, even though it is equipped with a low oil pressure warning system.
- Be sure to drain the oil while the engine is warm. It is difficult to drain the oil completely after cooling.



**The changed oil can not be used again, else damage will occur.**



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

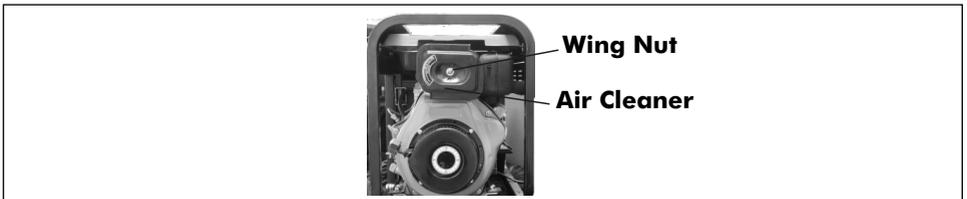


Check Air Cleaner Element

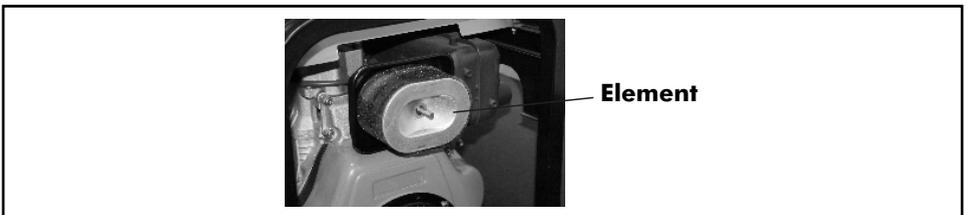
- Loosen the wing nut, detach the cover of air cleaner and remove the element.
- The air cleaner element must be changed when the output of engine decreases or the color of exhaust is abnormal.



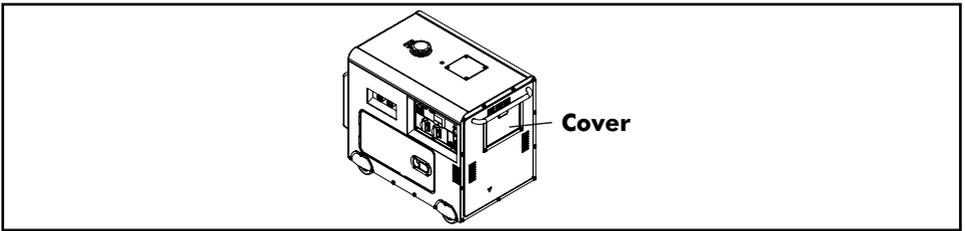
***Do not wash air cleaner element with detergent.***



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

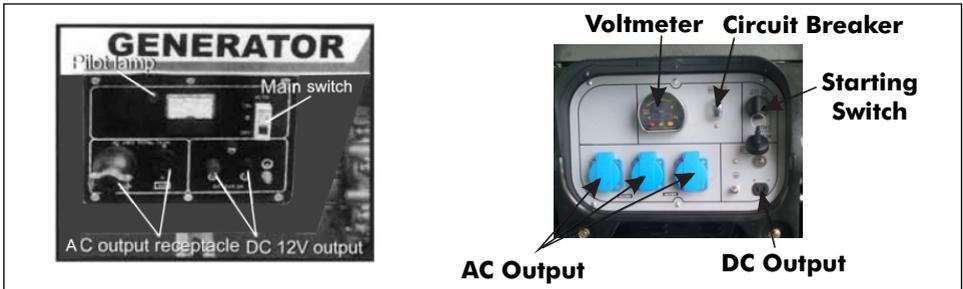


- Reattach the cover of air cleaner and tighten the wing nut.



## Check Diesel Welding Machine

- 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.

## Handling of dual voltage type diesel welding machine

### Operation of change over switch

- The circuit breaker on the control box must be used whenever AC power is to be used and must be set to 'OFF' position before running the machine.
- Start the genset and upon attaining the rated speed turn the switch to 'ON' position.
- The two sockets are ready to be used for output of rated voltage.
- Set the main switch at 'OFF' position when using 12V power for charge.
- The terminal of 12V output can be used for 12V voltage charge user can provide a charge switch for switch on and off.

## Bleeding Fuel Line

- Check fuel pipeline to find out whether there is air mixed into the pipeline. If yes, drain away the air from the pipeline before refueling and start the diesel engine.
- To do this, loosen the connection nut between injection pump and pipe line and then drain off the air until no air bubble comes from the fuel.

## Low Oil Warning System/Stop Device

- This device works to stop the engine automatically when the oil pressure falls below the recommended level and to prevent engine seizure when lube oil is running short
- The oil temperature will rise too high if the engine is operated with insufficient lubrication oil.

- On the other hand, too much oil is dangerous because the oil may combust and cause a sudden and excessive rise in engine revolutions, so before operating the machine, be sure to check the oil and supply oil to the specified level.

### **Break In Operation**

When the generator is still new, application of heavy loads may shorten the life of the engine.



***Avoid applying any heavy load during the break in period.***



***Change engine oil regularly.***



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

### **Starting the diesel welding machine**

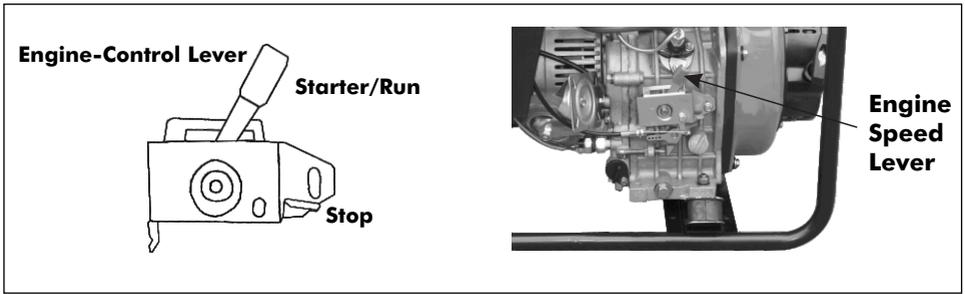
#### **Recoil starting (manual start)**

The engine is started in the manner described below

1. Open the fuel cock (to the 'ON' position).

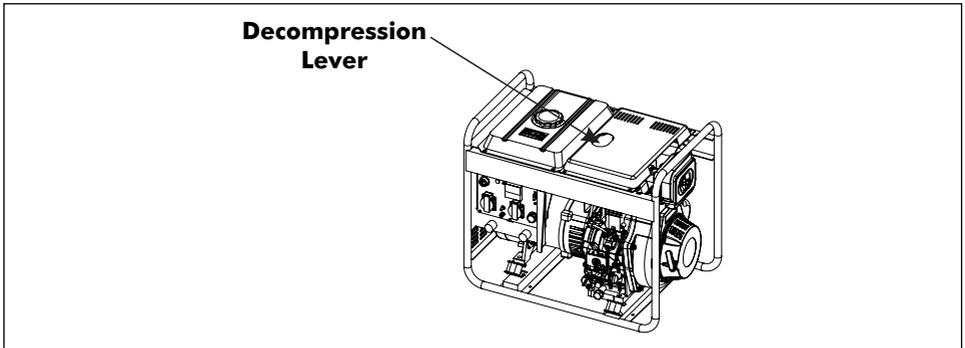


2. Put the engine speed lever in the 'RUN' position.



3. Pull out the recoil starting handle.

- Pull out the handle to the point where it feels resistant and then return it to the initial position.
- Push down the decompression lever (it will return automatically when the recoil starter is pulled).

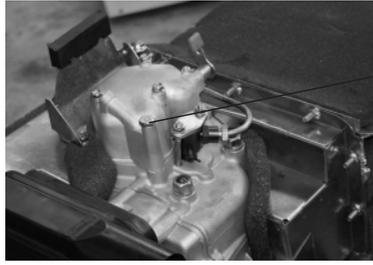


- Pull out the recoil starting handle again briskly with both hands
- Do not allow the handle grip to snap back against the engine. Ensure to return it gently to prevent damage to the starter when starting or after start



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

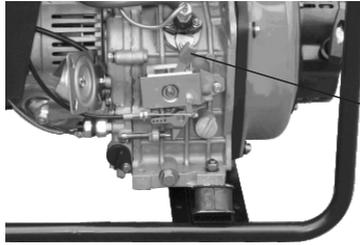
- In cold weather, when diesel engine is difficult to start, remove the plug from the rocker arm cover and add 2cc of engine oil.
- Replace the plug before starting. Keep the plug in the cover except when adding oil, otherwise rain, dirt and other contaminants may enter the engine and cause accelerated wear of internal parts which can cause serious problems.



**Plug**

## **Electric Starting**

- Open the fuel cock.
- Turn the engine control lever to 'RUN' position.
- Turn the starting key at clockwise to 'START' position.
- When the engine starts running the key returns automatically to initial position.
- If the starter motor doesn't start after a few seconds, wait for about 15 seconds before attempting to start again.



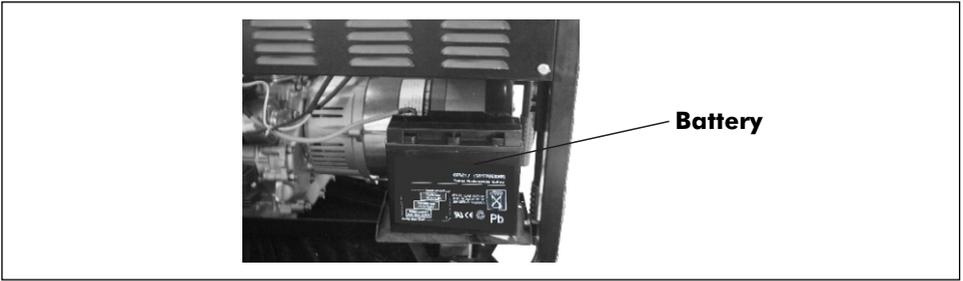
**Engine  
Speed  
Lever**



***If the starter motor is run for too long, the battery will malfunction. Always leave the starting key turned on, in the 'ON' position, while the engine is running.***

## **Battery**

- Check the condition of the battery whether sealed or not for cover surface damaged or not.
- Also check if Battery cable connection is sound and whether there is dust on the exhaust vent.
- Check the charging status and quality status from indicator lights, green means it's ok, black means there is electric loss while white means battery is damaged and needs to be replaced.



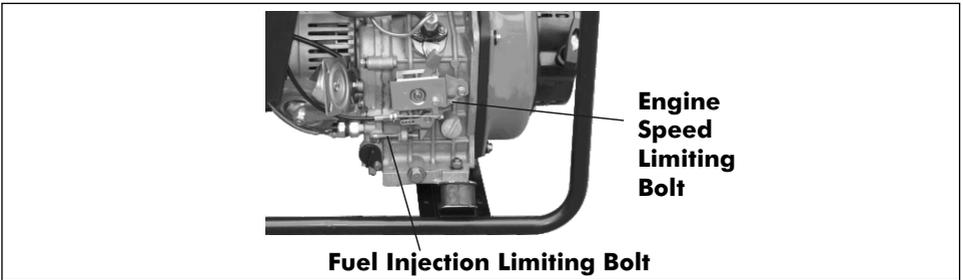
**Operating the generator**

- Warm up the engine without load for about 3 minutes.
- The generator is equipped with low oil warning system, and will stop automatically in case of low oil pressure or a lubrication oil shortage. The engine also will stop if restarted without lubrication oil . Check the oil level and refill as necessary.
- Do not loosen or readjust either the engine speed limiting bolt or fuel injection limiting bolt as these are well adjusted ex-factory otherwise, performance may be affected.

During operation look out for the following warning signs

- Abnormal sound or vibration.
- The engine misfiring or running rough.
- Color of the exhaust gas? (either black or white?)

If the above signs are observed stop the engine and consult the nearest Dayliff retailer.



**Operating the Diesel Welding Machine**



***The operator must be familiar with the structure, performance, working principle, operating procedures and precautions of the welding unit.***



***The operator must undergo technical and safety training.***

Pre-weld inspection;

- Check that the welding mask does not have light leakage, damage. Welding personnel and auxiliary personnel should wear the personal protection clothing.

- Welders, welding tongs, welding wires and joints should be well connected with good insulation. Ensure there is no overheating of the wiring, the wiring terminal must not be exposed, it requires cover with insulating tape.
- The length of the wire between the welding machine and the welding clamp should be less than 10 metres, maximum length should not exceed 20 metres. Broken or damp wires should be replaced immediately.

## Operating Procedures

- Select the appropriate welding process (welding rod, welding current and welding speed) and ensure it does not allow more current than maximum rated of welder during continuous welding.
- The working hours should not exceed the rated duty cycle (60%).
- Do not use the welding machine for metal cutting operation
- Ensure the welding workplace is dry and well ventilated.
- When moving the welding machine cut off the power supply and do not drag on the floor.
- In case of sudden power failure during welding, stop the generator immediately.
- During welding, do not adjust welding current. If required, stop welding and use adjustment knob to select current.
- When welding in wet conditions, operator must stand on the insulation board and should not touch the welding wire. Avoid using the arm clamp to hold welding clamp as it can cause electric shock.

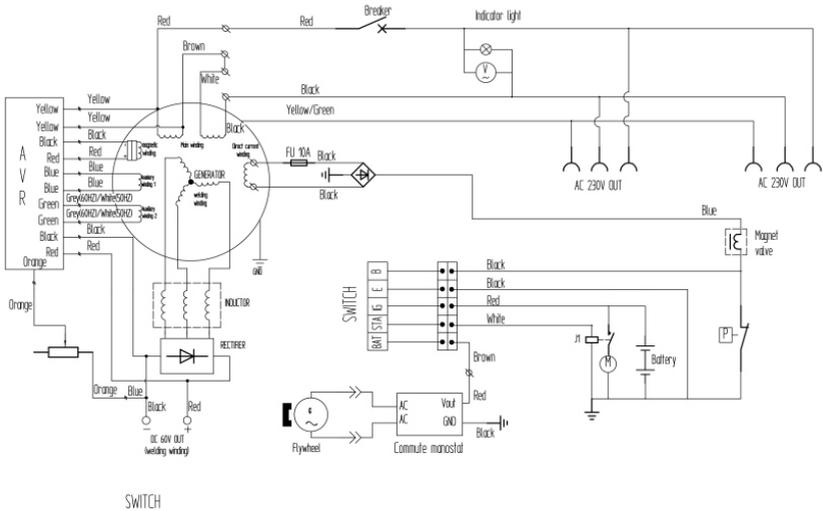
### Maintenance

- After the welding operation is completed, the welding power supply should be cut off immediately and the welding clamps and welding wires should be cleaned up to avoid short circuit.
- When cleaning the weld slag, wear goggles and pay attention to the head to avoid the direction of splashing the welding slag, so as not to stab the eyes.
- After the open operation is completed, cover the welder well for storage.



***Load should be added according to specified parameter in welding data guide.***

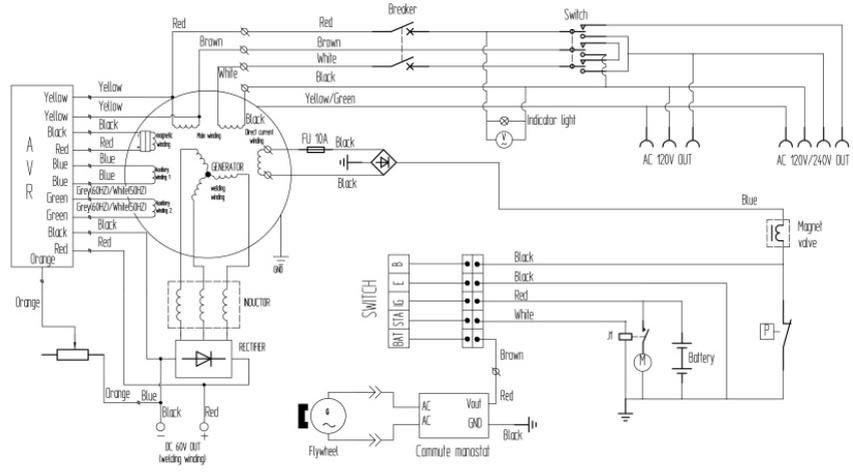
For electric principle diagram of generator, refer to the following drawing



SWITCH

	IG	BAT	STA	E	B
OFF				<input type="radio"/>	<input type="radio"/>
ON	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
START	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		

**Electrical Schematic Diagram**



SWITCH

	IG	BAT	STA	E	B
OFF				<input type="radio"/>	<input type="radio"/>
ON	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
START	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		

**Dual Voltage Electrical Schematic Diagram**

## AC Application

- Start the engine and ensure the pilot lamp turns on. If it does not, the filament may be burnt out.
- The speed of generator must reach rated speed.
- Generator is ready to take on load when the indicator of voltmeter reads  $230 + 10\%$  (50Hz) on the panel of control box.
- Plug in the appliance.



***Be sure that all appliance are in good working condition before connecting them to the generating set, if an appliance begins to operate abnormally, becomes sluggish or stops suddenly, turn off the generating set immediately and disconnect the appliance before examining 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 reading on the voltmeter is too low or too high, stop the machine and examine it for cause of malfunction.

## DC Application

The DC terminal may be used for charging 12V automotive-type batteries only

1. When using automotive-type batteries with battery cables, be sure to disconnect the negative 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.
4. 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 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 direct current may burn out.***



***Batteries produce explosive gases. Keep sparks, flames and cigarettes 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 disconnection, you should disconnect the cables at the generator first**



**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.**



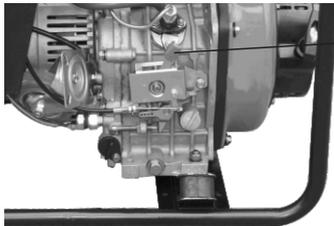
**Do not attempt to start an automobile engine while the generator is still connected to the battery.**



**Do not use DC 12V and AC at the same time.**

### **Stopping diesel welding machine**

- Turn off the main switch of the diesel welding machine
- Set the engine control 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 seize and damage the engine.



**Engine Control Lever**

- Set the fuel cock lever to the 'C' (closed) position.



**Fuel cock lever**

- 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.



**If the engine keeps on running even after the control lever is locked 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.**

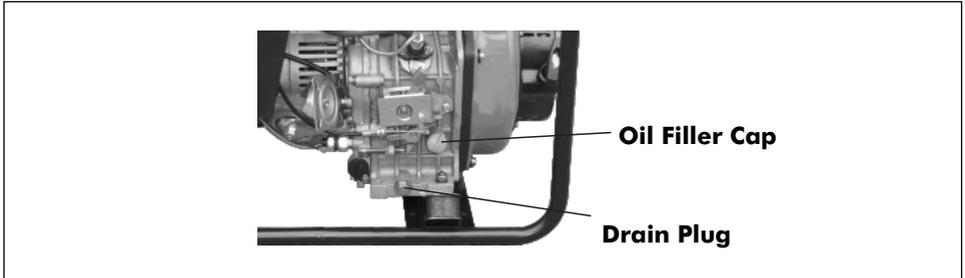
## 4. MAINTENANCE

- Periodic check and maintenance are very important for keeping the engine in good condition.
- The generator consists of diesel engine, alternator, control box and frame etc.
- 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 engine has been used, clean it immediately with a cloth to prevent corrosion and to remove sediment.

Item	Service Period	Daily	First month	Every 3months	Every 6months	Every year or
	regular	Check	or 20hrs	or 100hrs	or 300hrs	1000hrs
Check and replenish fuel		○				
Drain Fuel Tank			○			
Check and replenish lube oil		○				
Check for oil leakage		○				
Check and tighten each parts engine		○			● Tighten head bolts	
Change 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)				

## Changing Engine Oil (every 100hrs)

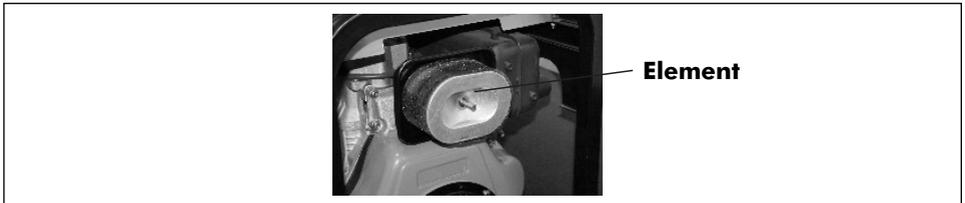
- Remove the oil filler cap.
- Remove the drain plug and drain the used oil while the engine is still warm. The plug is located on the bottom of the cylinder block.
- Tighten the drain plug and refill with the recommended oil.
- Put back the cap.



## Changing the Air Cleaner Element



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



***Never start the engine without the element, or with a defective element. Change the element in good time.***

## Cleaning and replacing the fuel filter

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

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 tank. Wash the filter thoroughly with diesel fuel. Remove the lock nut, end cap and diffuser discs and clean the carbon deposit.

## Tightening Cylinder Head Bolts

### Checking the injection nozzle, injection pump

1. Adjusting the valve head clearance for the intake and exhaust valves
2. Lapping of intake and exhaust valve
3. Replacing the 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 as it may penetrate the skin and cause bodily injury.***

### **Checking and replenishing battery fluid**

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.

### **Maintenance for a long time storage**

If the generator should be stored for a long time, the following preparation should be made.

- Operate the diesel engine about 3 minutes and stop it.
- Stop the diesel engine when still hot, drain old lubricate engine oil and refill with new one.
- Pull out the plug at the cover of diesel engine and add 2ml of lubricate in cylinder and replace the plug to its original place
- For Manual Start, press the decompression lever (non compression position), pull the recoil handle 2-3 times. (Don't start diesel engine).
- For Electric Start, with the decompression lever in non-compression position, operate the diesel engine for 2-3 seconds. When the switch is in the start position, don't start the diesel engine.
- Release the decompression lever and pull the recoil starter slowly, until there is resistance and stop pulling. (At this time the intake and exhaust valve is at the status of close, it is suitable to prevent from rust).
- Clean and store it in a dry place.

## 5. TROUBLE SHOOTING

Problem	Possible Cause	Solution
The diesel engine does not start	Fuel oil is not enough	Add fuel oil
	The switch is not at 'ON' position	Turn it to 'ON' position
	The high pressure pump 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	Start the diesel engine according to the requirements of operating procedure of start
	The oil nozzle is dirty	Clean the oil nozzle
The generator not working	The battery has no charge	Charge it or replace it with a new one
	Main switch is not closed	Put the main switch to the 'ON' position
	The contact os socket is faulty	Repair or replace
The rated speed of generator cannot be reached	Adjust it according to the requirement	

If electricity is not generated, take the generator to a Dayliff retailer.

Incase of question or problem, note the below parameters from the engine and report to a Dayliff retailer.

- Mode of diesel generator and serial number of engine and alternator.
- What problem was observed in operation and explain how much speed it is operating.
- Time of Operation
- The other detailed information, for example, when the problem took place and for how long.

## 6. TERMS OF WARRANTY

### i) General Liability

- In lieu of any warranty, condition or liability implied by law, the liability of Dayliff in respect of any defect or failure of equipment supplied is **limited to making good by replacement or repair** (at the Company's discretion) defects which under proper use appear therein and arise solely from faulty design, materials or workmanship within a specified period. This period commences **immediately after the equipment has been delivered to the customer** and at its termination all liability ceases. Also the warranty period will be assessed **on the basis of the date that the Company is informed of the failure.**
- **The warranty applies solely to equipment supplied and no claim for consequential damages**, however arising, will be entertained. Also the warranty specifically excluded defects caused by fair wear and tear, the effects of careless handling, lack of maintenance, faulty installation, incompetence on part of the equipment user, Acts of God or any other cause beyond the Company's reasonable control. Also, any repair or attempt at repair carried out by any other party **invalidates all warranties.**

### ii) Standard Warranty

If equipment failure occurs in the normal course of service having been competently installed and when operating within its specified duty limits warranty will be provided as follows:-

- **Up to 6 months - The item will be replaced or repaired at no charge.**
- **Over 6 months, less than one year - The item will be replaced or repaired at a cost to the customer of 50% of the Davis & Shirliff market price.**

The warranty on equipment supplied or installed by others is conditional upon the defective unit **being promptly returned free to a Dayliff retailer** and collected thereafter when repaired. No element of site repair is included in the warranty and any site attendance costs will be payable in full at standard chargeout rates. Also proof of purchase including the purchase invoice must be provided for a warranty claim to be considered.





**DAYLIFF** is a brand of **Davis & Shirtliff**

for enquiries contact

**Davis & Shirtliff, Ltd.**

P.O. Box 41762 - 00100, Nairobi, Kenya

Tel: 6968000/ 0711 079 000

or visit

**[www.dayliff.com](http://www.dayliff.com)**

for details of the nearest branch or stockist