SSD6000 – SSD6000S – SE6000D4 – SSD6000/3PH

6kVA Super Silent Diesel Generators

Handbook
&
Operation Manual

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Introduction

This document has been produced for the owner/user of a Stephill generator. Inside this manual you will find important safety, operating, maintenance and fault finding information.

The information contained within this manual is based upon the current data available before print. Due to constant improvements on our products some information contained within this manual may change without warning. Therefore Stephill Generators Ltd reserve the right to alter specifications as and when situations demand without warning or obligation.

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Warranty Statement

All equipment supplied by Stephill Generators Ltd carries a warranty of 12 months from date of despatch. During the warranty period, should the plant fail due to faulty design, materials or workmanship by Stephill Generators Ltd or it's sub-contractors, we undertake to rectify the fault. Stephill Generators Ltd will accept no responsibility whatsoever for equipment that has failed due to;

Operation with incorrect fuel, lubricating oil or coolant.

Improper repair or use of parts not supplied or approved by Stephill Generators Ltd.

Lack of, or incorrect maintenance.

Fair wear and tear, misuse, negligence, accidental damage, improper storage and incorrect starting / warm-up / run-in or shutdown.

No warranty claim will be considered by Stephill Generators Ltd unless any defective parts are available for inspection by us, or our nominees, to determine the reason or cause of failure, and Stephill Generators Ltd is given the option of repair or replacement.

Stephill Generators Ltd are not responsible for incidental or consequential damages, downtime, or other costs due to warrantable failure, and unauthorised alterations made to any product supplied by Stephill Generators Ltd.

Amendments

Issue	Amendment	Date	By

Identification

Each Stephill generator will have a Serial/Data plate fitted to the set. In most cases this can be found on the control/socket panel. Below is an example of the Serial/Data plate - **Fig.1**.

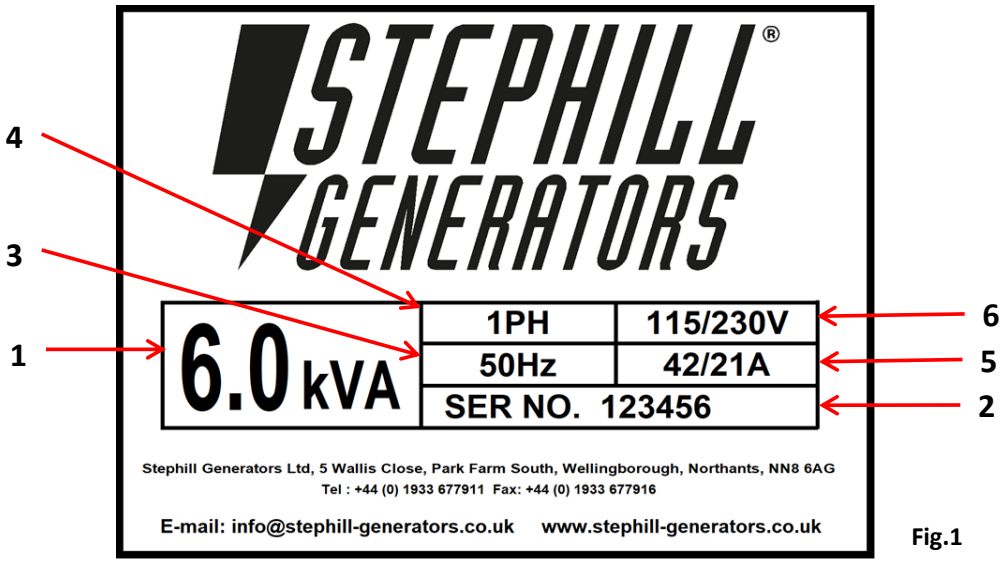


Fig.1

Item No.	Description
1	Rated power, kVA
2	Unique serial number
3	Rated output frequency
4	Number of phases
5	Relevant maximum Amp ratings at kW
6	AC voltage output(s)

Specification

	Model Type			
	SE6000D4	**SSD6000**	**SSD6000S**	**SSD6000/3PH**
kVA (COP)	6.0			
kW (COP)	4.8			
Frequency	50.0 Hz			
Voltage	115 / 230V AC			400V AC
Phase	1 Ph			3 Ph
LWA	96	91	84	91
dBA @ 7M	71	66	59	66
Fuel Tank Capacity	24 Litres			

(COP) Continuous Power: Applicable for supplying power to electrical load for unlimited hours in accordance with ISO 8528-1 under the agreed operating conditions with the maintenance intervals and procedures being carried out as prescribed by the manufacturers.

AC Output & Protection - SE6000D4/SSD6000/SSD6000S

Main alternator overload protected by double pole MCB.

115V - Thermal reset button overload protection for each individual socket.
230V - RCD protection & thermal reset button overload protection for each individual socket.

AC Output & Protection - SSD6000/3PH

400V - Main alternator and socket outlet protected by a 4 pole RCBO.

Note
MCB = Miniature Circuit Breaker
RCD = Residual Current Device
All are suitably rated for the generator model type.

AC Output Earthing Method

115V 1Ph CTE - Floating earth. **230V 1Ph** - Neutral bonded to earth.

400V 3Ph - Neutral (star point) bonded to earth.

Running Hours

75% Load with full fuel tank	17 hours @ 1.5 L/h

Engine

Type	Yanmar L100V
Emissions Certification	EU Stage V
Cylinders	1
Cooling	Air Cooled
Displacement	0.435 Litre
Rpm	3000

AC Alternator

	SE6000D4	SSD6000	SSD6000S	SSD6000/3PH
Type	NSM K100 G			NSM Z100 SB

Dimensions & Weights

	SE6000D4	SSD6000	SSD6000S	SSD6000/3PH
Trolley Mounted	L x W x H mm 1220 x 735 x 890	L x W x H mm 1270 x 785 x 890	L x W x H mm 1270 x 785 x 970	L x W x H mm 1270 x 785 x 890
Weight - Dry	174 KG	193 KG	210 KG	193 KG
Weight - Wet	195 KG	214 KG	231 KG	214 KG
Skid Mounted		L x W x H mm 980 x 640 x 890	L x W x H mm 980 x 640 x 970	L x W x H mm 980 x 640 x 890
Weight - Dry		180 KG	197 KG	180 KG
Weight - Wet		201 KG	218 KG	201 KG

Control Panel Identification

Dual Voltage - Standard

Fig.2 below shows a typical example of a standard dual voltage control panel.

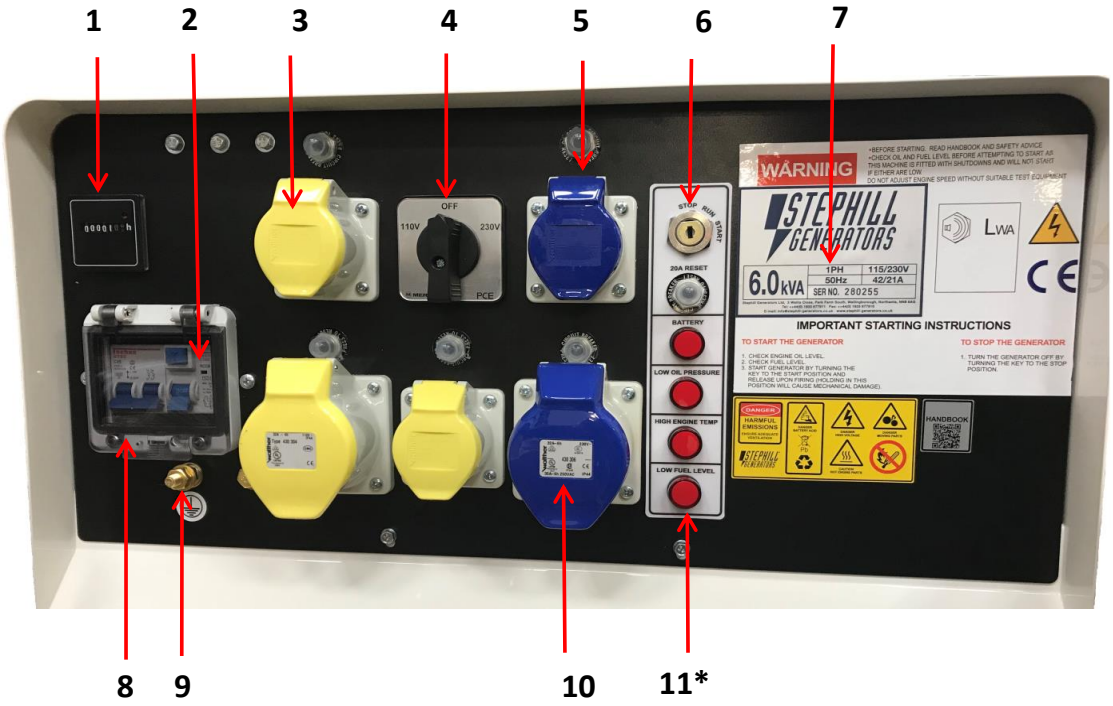


Fig.2

Item No.	Description
1	Hours Run Meter
2	230V RCD
3	115V Socket Outlets (Yellow)
4	AC Voltage Selector Switch
5	Socket Outlet Reset Button(s)
6	Key Switch & DC Reset Button

Item No.	Description
7	Serial Data Plate
8	Main 20A MCB
9	Earth Stud - M8
10	230V Socket Outlets (Blue)
11*	Warning & Shutdown Lamps

* The Warning & Shutdown Lamps description can be found in ***Operating Instructions*** . These are LED lamps.

Fig.3

Fig.3 shows the previous version of the Warning & Shutdown lamps. These operate exactly the same as the current versions shown in **Fig.2** & **Fig.4** but are not LED.

IMPORTANT: It is highly recommended to periodically check and test the 12V bulbs in the lamp holders as shown in **Fig.3.** A faulty bulb can inhibit basic fault finding.

3 Phase - Standard

Fig.4 below shows a typical example of a standard 3 Phase control panel.

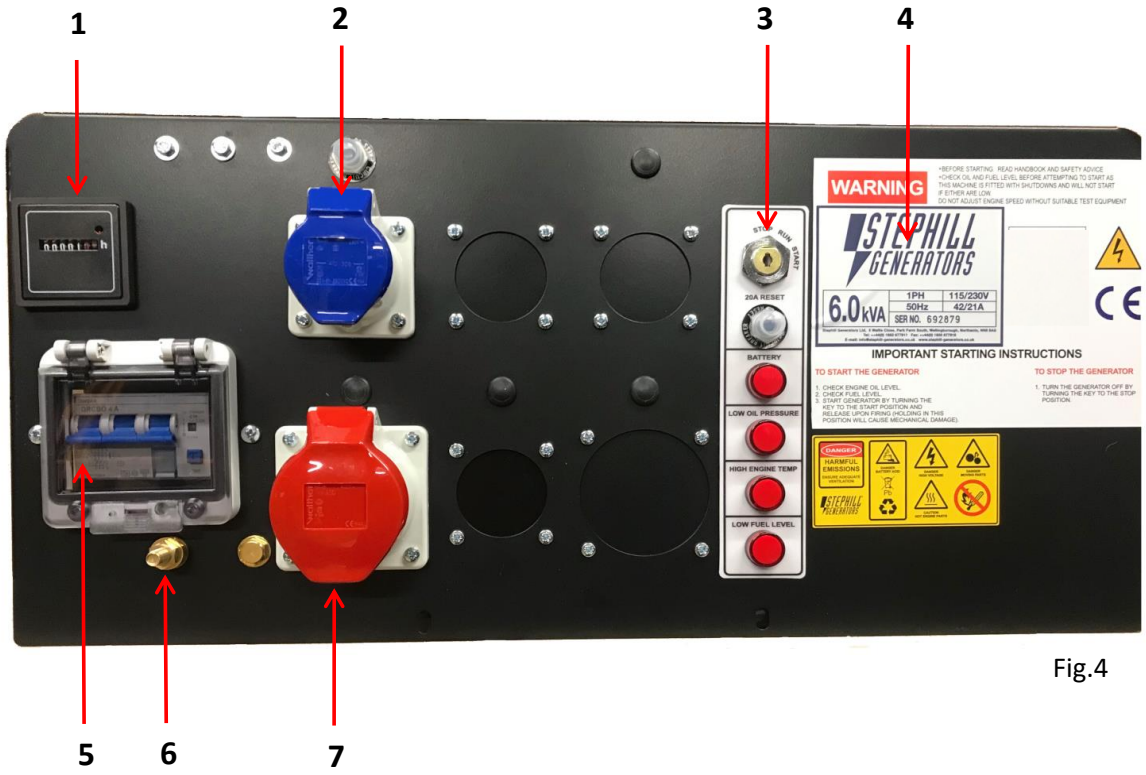


Fig.4

Item No.	Description
1	Hours Run Meter
2	230V 1Ph Socket Outlet (Blue)
3*	Key Switch & DC Reset Button
4	Serial Data Plate

Item No.	Description
5	RCBO - 4 pole
6	Earth Stud - M8
7	400V 3Ph Socket Outlet (RED)

* The Warning & Shutdown Lamps description can be found in ***Operating Instructions*** . These are LED lamps.

Fig.3

Fig.3 shows the previous version of the Warning & Shutdown lamps. These operate exactly the same as the current versions shown in **Fig.2** & **Fig.4** but are not LED.

IMPORTANT: It is highly recommended to periodically check and test the 12V bulbs in the lamp holders as shown in **Fig.3.** A faulty bulb can inhibit basic fault finding.

Generator Safety

Before using this equipment and to avoid personal injury, all warnings shown on the machine should be observed. The warning signage should be checked for legibility and any that have become damaged should be replaced.

Carefully read and understand the instructions provided. If there is anything you do not understand **DO NOT** attempt to use this generator. Contact your supplier for advice.

Information & Warning Signage

The generator will have the following information and warning signage labels displayed.

Fig.5 below can be found on the control panel.

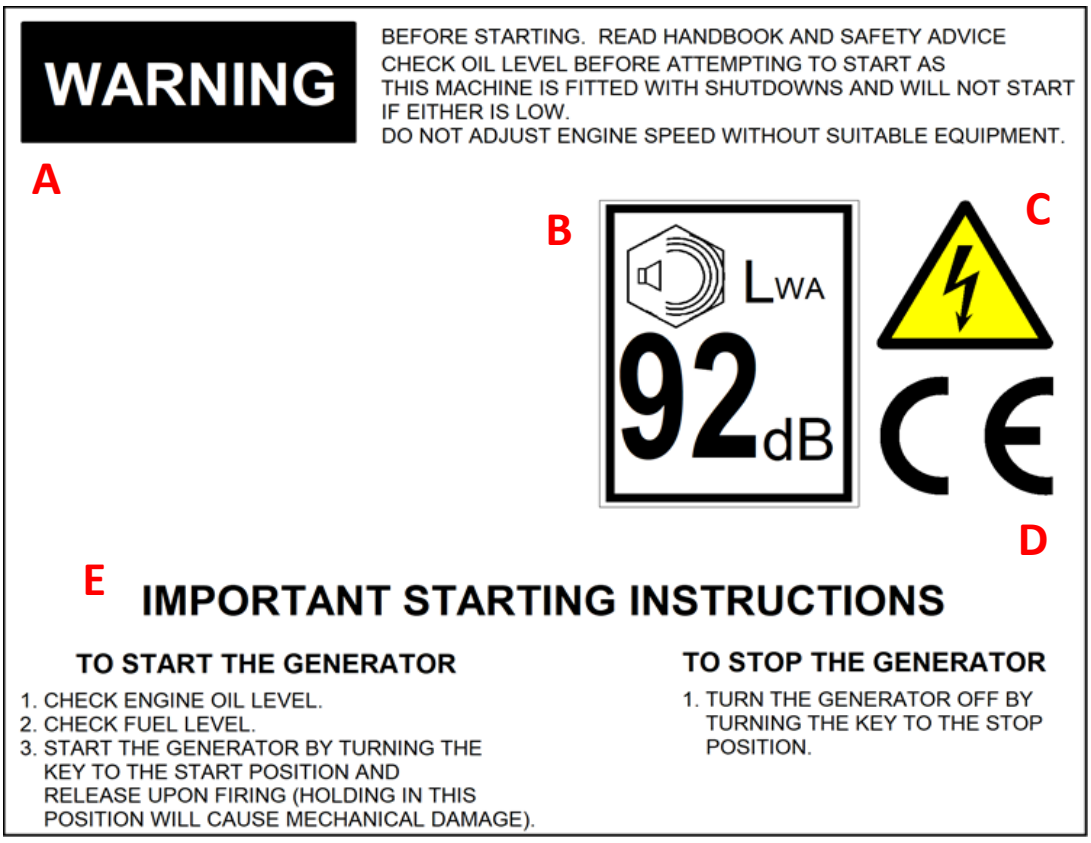


Fig.5

A - General information regarding the generator operation.

B - The guaranteed sound power level of the generator.

C - Danger Electricity. Generator output voltage is high and can cause serious injury or death.

D - CE marking is an administrative marking that indicates conformity with health, safety, and environmental protection standards for products sold within the European Economic Area.

E - Generator operation - starting and stopping information.

Fig.6 can be found inside the canopy near the silencer on the air intake/battery box.

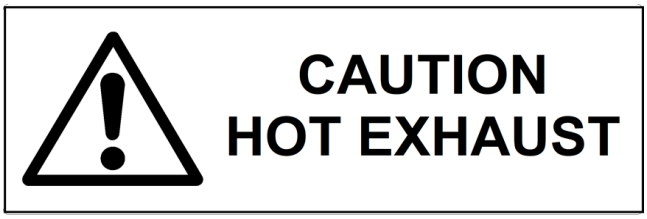


Fig.6

Fig.7 can be found on the canopy roof near the lifting handle.

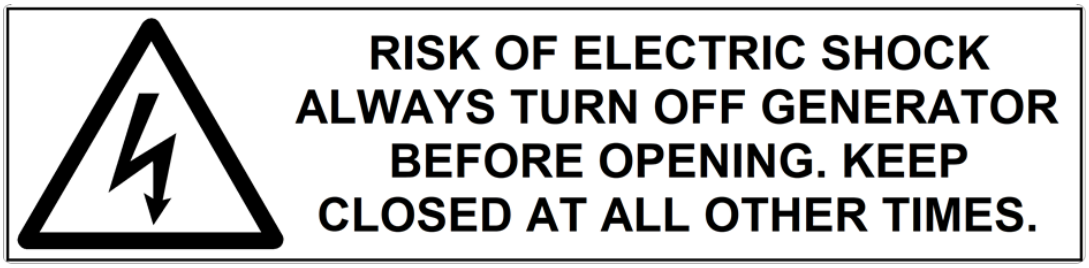


Fig.7

Fig.8 below can be found on the control panel.

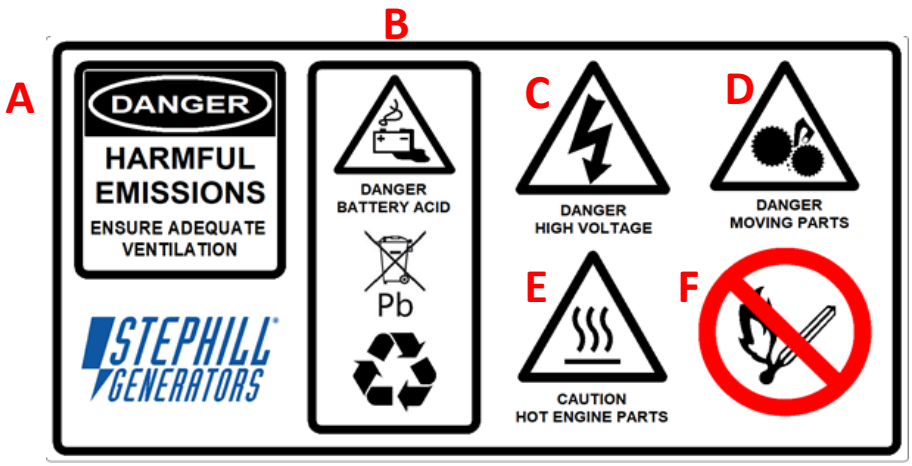


Fig.8

A - Exhaust fumes are extremely dangerous and can kill, ensure there is adequate ventilation for clean air into the generator and exhausted air to escape.

B - The battery contains lead and sulphuric acid. The battery must be disposed of at a approved recycling facility.

C - Danger Electricity. Generator output voltage is high and can cause serious injury or death.

D - Danger Moving Parts. When the generator is running there will be moving parts inside the canopy.

E - Caution Hot Engine Parts. The generator can be very hot while running and some time after stopping.

F - No Smoking or Naked Flames. The battery can under certain conditions give off small quantities of hydrogen gas. Do not smoke or use naked flames while working on a battery.

Personal Safety

- Do not climb on the generator - dents may cause overheating of the acoustic lining.
- Do not cover the generator as this can obstruct air inlet and outlets on the canopy which can cause the generator to overheat and cause permanent damage..
- Keep well clear of any moving parts on the generator at all times.
- Keep children and pets away from the generator and operating area.
- Test safety features often, emergency stop button and RCD (residual current device).
- Keep the generator canopy doors shut while running and locked if possible.

Auxiliary Power

The electricity produced by an engine driven generator is very similar to mains AC electricity and should be treated accordingly.
Do not remove covers and attempt to work on the generator while the engine is running.
Check the rating and electrical safety of the load before connecting the generator.
Equipment should never be connected that in total exceeds the specified rating of the generator.
Installation of the generator as a standby or secondary power source should only be undertaken by a fully qualified electrician using the appropriate means of isolation from the mains supply. Installation must comply with all applicable laws, electrical codes and wiring regulations.

Operating Environment

The generator should always be operated on level ground and be able to bear its weight. Ensure the generator canopy is not obstructed to allow cool air to enter the set and hot expelled air to escape.

Temperature Range

A temperature range between -15^{o}C and +45^{o}C are the normal limits of operation. Operating outside the range will require additional modifications.

Reference Relative Humidity

The standard reference condition for relative humidity is 30%. Above this value the rated power must be reduced.

Reference Barometric Pressure

The standard reference condition for total barometric pressure is 1 bar. This corresponds to an altitude of approximately 100m. Above 100m the rated power must be reduced.

Flammable Environment

Stephill generators must not be used in a flammable environment.

Saline Environment

Operation of the machine in a saline environment will require additional corrosion protection.

Safety Considerations

General

All Stephill generators comply with current EEC directives including:
2016/1628/EU Non-Road Mobile Machinery (NRMM).
2014/30/EU The Electromagnetic Compatibility Directive.
2006/42/EC The Machinery Directive.
2000/14/EC Noise emission in the environment by equipment for use outdoors.
2011/65/EU The Restriction of Hazardous Substances Directive.
EC 1907/2006 REACH.

Fuel

Fuels and lubricants are a potential source of fire. Be careful not to spill fuel, clean up any spillages. Inhalation or swallowing of diesel should be avoided. If in doubt seek medical advice. All other forms of contact are an irritant and therefore should also be avoided. If skin contact is made wash with soap and water.

Lubricating Oil

New oil presents no hazard following short term exposure. Lubricants in particular used engine oil, are potentially carcinogenic. Direct contact should always be avoided by wearing suitable rubber gloves when handling them. Used oil should not be allowed to contact the skin. If this does occur, wash off quickly with a proprietary hand cleanser.

Safe Lifting

Where mechanical assistance is used in lifting machines, ensure the lifting eye is used, and that all components used to lift the machine are within their Safe Working Load (SWL).
The integral lifting beam and associated lifting eye on the generator should be regularly checked for signs of damage or gross corrosion.
All nuts and bolts associated with the lifting beam should be regularly checked for tightness and corrosion.

Lifting equipment should never be attached directly to the engine and/or alternator to fully lift the generator except only if lifting engine and/or alternator.

DO NOT ATTEMPT TO LIFT THE GENERATOR WITHOUT PRIOR CHECKS TO THE LIFTING SYSTEM AS INDICATED ABOVE

Earth Connection

All Stephill products are fitted with an earth stud on the control panel this must be connected to an earthing system or spike. Any earth spike required is dependant on the local conditions of use. The size is determined by reference to current IEE regulations or to a competent electrician.

Fumes

Make sure that the Generator is at least 2 metres away from any building during operation. Operate in a well ventilated unconfined area, so that fumes can be properly dispersed. Silencer outlet should be facing an open area to prevent fumes being recirculated. There is the danger of asphyxiation due to exhaust gases. Inhalation of poisonous exhaust fumes can lead to serious injury or death. The generator must not be used in a poorly ventilated or enclosed area.

Noise

Ear protection may be required depending on the combined noise level of the Generator, auxiliary load and the operator's distance from it and the length of exposure. (Noise at Work Regulations 1989)

Battery Acid

This is corrosive and irritant by all forms of exposure. If skin contact is made wash with clean water.

Fire

Ensure that suitable fire extinguishers (AFFF or CO2) are kept within close proximity of the generator. Do not cover, enclose, or obstruct the airflow to the generator during or shortly after use, due to fire hazard or damage to the generator from overheating. Allow the generator to cool after use before storing away. Keep all inflammable objects clear of the generator.

Hot Parts

There is the danger of burns as parts of the generator will become very hot during use. No part of the engine, alternator or exhaust must be touched during or shortly after operation. Do not operate the generator unless all guards are in place. There is a risk of burns or serious mechanical injury.

Long Term Storage

For storage or long periods of inactivity, Stephill Generators recommend the following:

Generators should be stored with oil filled to the correct capacity; Storage periods of 18 months and over may require special lubricants and treatments. If so please seek further advice from the engine manufacturer.

Before the generator is used after long term storage, all fuels and oils should be replaced.

Generator mounts, pipes and hoses should be checked to ensure that they are un-perished following extended periods of storage.

The generator should be stored in a clean dry area, ideally having a reasonable constant ambient temperature, and ideally not below freezing.

Operating Instructions

STEPHILL GENERATORS LTD STRESS THAT THE ULTIMATE RESPONSIBILTY FOR THE SAFE USE OF THE GENERATOR RESTS WITH THE USER.

Pre-start Checks

Before any attempt to start the generator please follow these important guidelines.

Check Oil Level - How to

It is recommended to check the oil level BEFORE EVERY START OPERATION - Ref. **Fig.9**.

- Make sure the generator is on level ground.
- Remove the (either side of the engine) oil dipstick **(1)** from the engine and wipe with a clean cloth.
- Reinsert the oil dipstick into the crankcase **(4)** and turn clockwise for one half revolution to engage the first thread into the crankcase opening - ***Do not screw in*** .
- Remove the oil dipstick from the engine. The oil level should be between the upper **(2)** and lower **(3)** lines on the dipstick.
- Fully reinsert the dipstick and hand tighten.

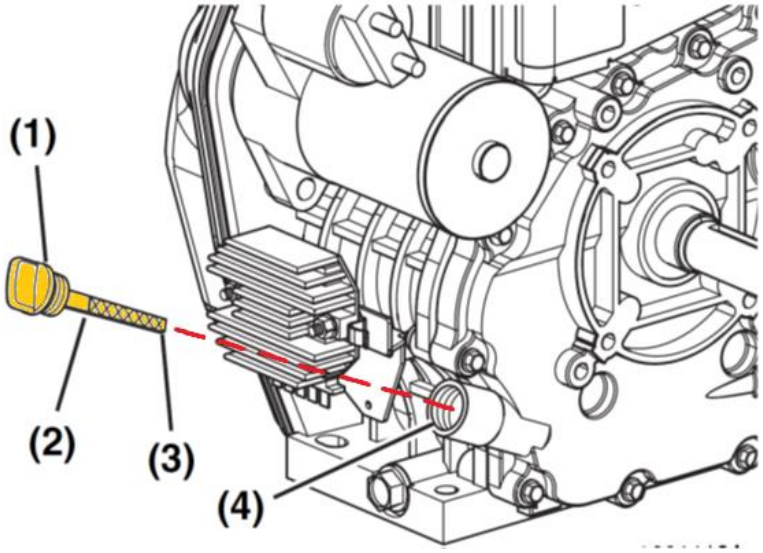


Fig.9

Adding Engine Oil

Add oil If the level is low. Do not fill past the high mark on the dipstick **(2)**. **WARNING** - NEVER overfill the engine with oil. Engine damage can occur.

Refer to engine owners handbook supplied with each generator for oil specification, viscosity and typical capacity. Alternatively navigate to the **Service** section at www.stephill-generators.co.uk

Check Fuel Level

Ensure there is enough fuel in the fuel tank. All the generator models in this handbook have a "Low Fuel Level" switch. When you turn the key switch to the first position "RUN" and the red "Low Fuel Level" LED is illuminated, this would indicate that there not enough fuel in the fuel tank and the generator will not be able to be started.

Filling the Fuel Tank

- Diesel fuel is extremely flammable and explosive under certain conditions.
- Only fill the fuel tank with diesel fuel.
- NEVER refuel with the generator running.
- Wipe up all spills immediately.
- Keep sparks, open flames or any other form of ignition (match,cigarette, static electric source) away when fueling / refueling.
- NEVER overfill the fuel tank.
- ALWAYS ensure the fuel cap is secure after refuelling.

Main Circuit Breaker - MCB, RCD & RCBO

Ensure the main double pole **MCB** and **RCD** (single phase and dual voltage versions) are in the **OFF** position (switch down). ***WARNING*** - **NEVER** try to start the generator with load connected.

On the 3 Phase version, ensure the main 4 pole **RCBO** is in the **OFF** position (switch down).

Key Start Controls

Fig.10 shows the key start controls for the generator.

No.	Description
1	**KEY SWITCH** - Used to start and stop the generator.
2	**20A RESET** - Thermal circuit breaker protecting the 12V system.
3	**BATTERY** - LED illuminates when the battery is not being charged from the engine charging system.
4	**LOW OIL PRESSURE** - LED illuminates when the engine oil pressure is low.
5	**HIGH ENGINE TEMP** - When illuminated, indicates the engine has overheated.
6	**LOW FUEL LEVEL** - Will illuminate when the fuel level is low in the fuel tank.

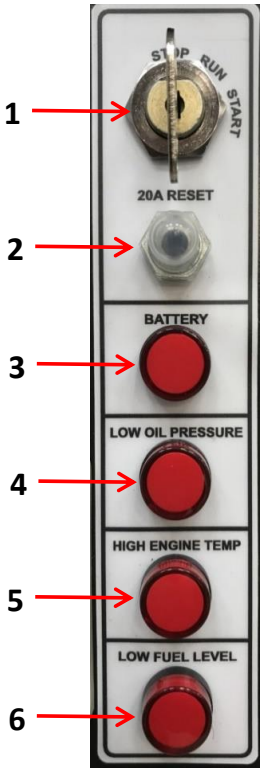


Fig.10

Key Switch - Starting Operation

Turn the key to the **RUN** position. The **BATTERY** and the **LOW OIL PRESSURE** red LED's will illuminate - **Fig.11**. If any other LED's are illuminated see the *Basic Trouble Shooting-Key Switch* section in this handbook.

Turn the key to the **START** position and the starter motor should begin to crank. Once the engine has started release the key to the **RUN** position and the generator will continue to run. The **BATTERY** & **LOW OIL PRESSURE** red LED's should have extinguished - **Fig.12**.

Key in the **RUN** position before starting.

Fig.11

Key in the **RUN** position when the generator has started and the engine is running.

Fig.12

Applying Load

Once the generator has started and has run for a few minutes you can then apply load to the generator.

- Ensure the equipment being used on the generator is safe to use.
- Ensure the equipment/load being used does not exceed the total rating of the generator and has the potential to overload the set.
- Plug the load into the appropriate socket outlet on the generator.
- Using the AC Voltage Selector Switch (if applicable) select the desired AC voltage.
- Turn the main **MCB** and **RCD** to the **ON** position (switch up). The generator should now operate the equipment/load plugged into it.

Key Switch - Stopping Operation

- Turn "OFF" the equipment and then turn "OFF" (switch down) the main MCB and RCD on the control panel.
- To stop the generator turn the key to the STOP position.

Deep Sea Electronics 3110 - Control Module

This range of generators have an option of a **DSE 3110** control module instead of a key switch. The DSE 3110 module is used to start/stop and monitor key elements of the engine and main AC alternator. The DSE 3110 also has an option of a remote 2-wire start function. This is ideal for "Auto" starting/stoppoing for charging and back-up systems.

DSE 3110 - Manual Start

Once all the *pre-start checks* have been made you can then start the generator. Follow the procedure below:

Press the button until the is displayed on the LCD screen.

A red LED flashes above the button.

Press the button once more, the icon rotating will be displayed on the LCD screen. The engine will then crank and start.

Applying Load

Once the generator has started and has run for a few minutes you can then apply load to the generator.

● Ensure the equipment being used on the generator is safe to use.

● Ensure the equipment/load being used does not exceed the total rating of the generator and has the potential to overload the set.

● Plug the load into the appropriate socket outlet on the generator.

● Using the AC Voltage Selector Switch (if applicable) select the desired AC voltage.

● Turn the main **MCB** and **RCD** to the **ON** position (switch up). The generator should now operate the equipment/load plugged into it.

DSE 3110 - Manual Stop

Before stopping the generator it is recommended to *switch off the load* from the generator by switching the main MCB on the control panel to the "OFF" position (switch down).

You can then safely stop the generator.

Press the button and the generator will immediately stop.

Emergency Stop

The *Emergency Stop* button (DSE 3110 only) is located on the control panel. It must be used for emergencies **ONLY**.

Warning Using the Emergency Stop button regularly for a standard stop request can cause the 12V battery to drain. This may effect the starting of the generator.

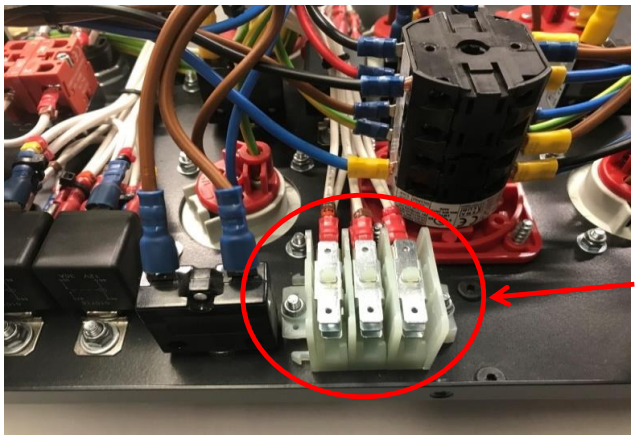
The icon will be displayed on the DSE 3110 module when an *Emergency Stop* request is made.

DSE 3110 - Remote Start/Stop

The DSE 3110 control module has an AUTO feature that allows a 2-wire remote Start/Stop function.
To use this function the generator must be switched to "AUTO" using the toggle switch located on the control panel. The DSE 3110 module will remain in a *sleep mode* (display screen not illuminated) until a remote start request is made.

2-Wire Remote and ATS Auto Start/Stop Connection Location

Behind the control panel there is a small push-on connector block for the remote and auto start/stop connections - **Fig.13**. Refer to the DC wiring diagram in this handbook for the relative terminal positions.



Undo the fixing bolts that hold the control panel into position.

Drop the control panel forward to gain access to the back of the control panel.

The remote/auto push-on connectors can be found at the top of the control panel.

Fig.13

Once the connections have been made the generator will be ready to receive a remote start request.

Automatic Start Operation

When a remote start signal is made (closed) to the generator the DSE 3110 control module display will light-up and the generator will automatically begin the starting procedure.

Once the generator has started it will continue to run while the start signal remains closed.

A red LED light will be illuminated above the 

button will indicate that DSE 3110 module in currently operating in "AUTO" mode.

Automatic Stop Operation

To stop the generator "open" the start signal. The generator will stop and the DSE 3110 will turn off.

DSE 3110 Control Module - Overview

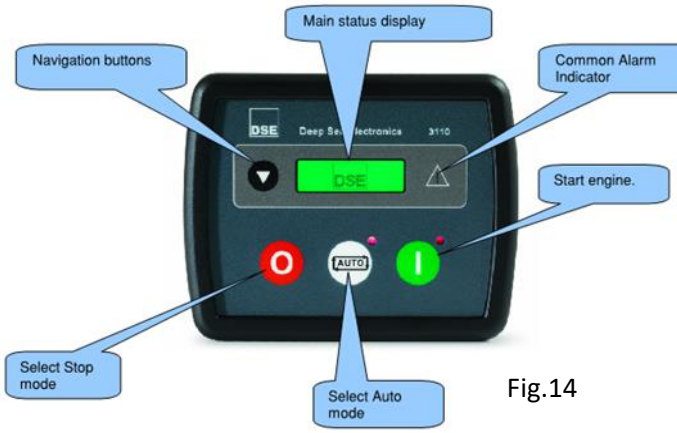


Fig.14

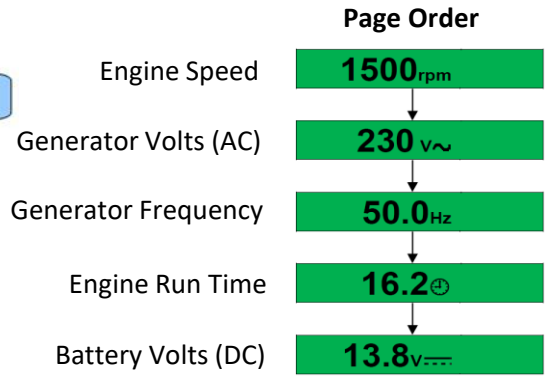


Fig.15

Description of Controls

Fig.14 show the layout and control buttons of the DSE 3110 control module.

Starting Sequence

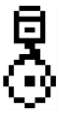
Once a start request is made the DSE 3110 will then attempt to crank the engine by operating the starter motor and fuel relay.
When the engine fires, the starter motor is disengaged. (The DSE 3110 de-energises the starter motor relay once it detects an output frequency (Hz) from the main alternator).

If the engine fails to fire during this cranking attempt then the starter motor is disengaged for the crank rest duration after which the next start attempt is made.
Should this sequence continue beyond 3 attempts, the start sequence will be terminated and the LCD screen will display;

Failed to Start

Engine Running

Once the engine is running and all starting timers have expired, the animated icon is displayed.



Engine Running

Viewing the Instruments

It is possible to scroll to display the different pages of information by repeatedly operating the navigation button.

Fig.15 above shows the page order when pressing the navigation button.

Once selected the page will remain on the LCD display until the user selects a different page or after an extended period of inactivity, the module will revert to the status display.

Fault Finding

WARNING - Please be aware of the potential hazards when working on a generator. Most basic fault finding can be completed with ease. Other aspects of fault finding may require a trained technician to undertake to ensure the safety to yourself and others.

Before Fault Finding

We strongly advise before attempting any fault finding is to check the health of the generator battery. It should measure around 12.4 to 12.6 Volts DC while the generator is at standstill.

Be aware of the service/maintenance schedule of the engine, ensuring the fuel filters are replaced regularly along with the oil topped up and oil filter etc. - See - ***Service and Maintenance***

Before carrying out any checks ensure all *Load* is unplugged from the generator and be aware of any potential exposed **Live** terminals while the generator is running! All checks and tests should only be carried out by a competent engineer.

Reference wiring diagram(s) in this handbook - The diagrams will correct as to the time of printing. Stephill reserve the right to change the wiring diagrams without prior warning.

Basic Trouble Shooting - Key Switch Type

Lamps	Fault Description	Checks & Tests
	**LOW OIL PRESSURE** The starter motor cranks when the key is in the **START** position and the engine runs but the **LOW OIL PRESSURE** lamp remains illuminated. When the key is returned to the **RUN** position the generator stops. The **BATTERY** and **LOW OIL PRESSURE** lamps are illuminated.	● Check the engine oil level. ● Check the correct engine oil has been used. ● Check the oil pressure switch operation - Switch normally closed when engine is at rest and open when engine running - Replace if necessary. ● Check the oil pressure relay operation - Replace if necessary. ● Check associated wiring with the oil pressure switch & relay.
	**LOW FUEL LEVEL** When the key is turned to the **RUN** position the **BATTERY** and **LOW FUEL LEVEL** lamps are illuminated.	● Check the fuel level - Fill the fuel tank with a minimum 10L of diesel. ● Check the fuel level switch operation - Disconnect to test and replace if necessary. ● Check the fuel level relay operation - Replace if necessary.
	**HIGH ENGINE TEMP** When the key is turned to the **RUN** position the **BATTERY** and **HIGH ENGINE TEMP** lamps are illuminated.	● Has the engine overheated? - Check the generator canopy has no obstructions over any vented areas - Also see *Operating Environment* in this handbook. ● Check the temperature switch operation - Disconnect both wires and link together to test - replace if necessary - DO NOT USE WITHOUT A TEMPERATURE SWITCH FITTED. ● Check the temperature relay operation - Replace if necessary.
	**BATTERY** Once the generator has started and is running the **BATTERY** lamp remains illuminated.	This could indicate that the battery charging system has a fault. ● Check the fuse next to the charge regulator (white fuse holder) or See Battery Charge System Fault Finding in this handbook for comprehensive testing.

Fault Finding - Key Switch Type

Fault	Possible Cause	Check
Starter motor not engaging when the key is turned to the **START** position	Battery	● Check the battery voltage, should be around 12.5V DC - Charge or Replace. ● Check the condition of the battery leads.
	If the battery needs charging or replacing, check the battery is being charged when the generator is running - *See* ***- Battery Charge System Fault Finding.***	
	Faulty Wiring	● Check the condition of wiring on the starter motor, key switch, 20A reset and the plug and socket between the engine and control panel DC loom.
	20A Reset Button	● Check for continuity on the reset button - Replace if necessary.
	Key Switch	● Check the key switch operation - Ref. wiring diagram key switch legend - Replace if necessary.
	Starter Motor	● Check the operation of the starter motor - Replace if necessary.

Fault	Possible Cause	Check
Starter motor engaging when the key is turned to the **START** position but the engine will not start/run	See - ***Basic Trouble Shooting - Key Switch***	● Low oil pressure, low fuel level or high engine temperature issue.
	Fuel Filter	● Check in-line fuel filter and replace if necessary.
	Fuel Tap	● Check the fuel tap is in the correct position.
	See - ***Basic Trouble Shooting - Key Switch***	
	Fuel Solenoid	● Check the fuel solenoid is receiving 12V DC and is operating - Replace if necessary.
	Fuel Lift Pump (12V DC)	● Check the fuel pump is receiving 12V DC and is operating - Replace if necessary.
	Contaminated Fuel	● If possible run the generator from a separate fuel source from the fuel tank.

Fault	Possible Cause	Check
Generator starts and runs but there is no output from the AC socket outlets	MCB & RCD	● Check the MCB & RCD are switched on (up).
	Voltage Selector Switch	● Check the voltage selector switch is in the correct position.
	Reset Button(s)	● Check the reset buttons for the output sockets.
	Drop the main control panel forward and check for any loose, broken, burnt wiring. Component test the MCB, RCD and voltage selector switch.	
	Capacitor	● Test and/or replace the AC alternator capacitor.
	Main AC Alternator	● AC alternator tests would be advisable - *See* - www.stephill-generators.co.uk

Fault Finding - DSE 3110

Most common faults can be Identified by the fault icon displayed on the right hand side of the LCD screen. The table below shows a fault description and/or the relevant icon together with a possible cause and checks related to the fault icon displayed.

Fault Icon	Possible Cause	Check
 ***Fail to Start*** Is activated after three attempts to start.	**Engine Not Starting/Running**	
	Battery	● Check the battery voltage, should be around 12.5V DC - Charge or Replace. ● Check the condition of the battery leads.
	If the battery needs charging or replacing, check the battery is being charged when the generator is running - *See* ***- Battery Charge System Fault Finding.***	
	Starter Motor	● Check the operation and wiring of the starter motor - Replace if necessary.
	20A Reset Button	● Check for continuity and wiring on the reset button - Replace if necessary.
	Fuel Filter	● Check in-line fuel filter and replace if necessary.
	Fuel Tap	● Check the fuel tap is in the correct position - On feed hose from the fuel tank.
	Fuel Solenoid	● Check the fuel solenoid is receiving 12V DC and is operating - Replace if necessary.
	Fuel Lift Pump (12V DC)	● Check the fuel pump is receiving 12V DC and is operating - Replace if necessary.
	Emergency Stop Button	● Check the operation of the switches on the back of the emergency stop button.
	DSE 3110 Control Module	● Check the plugs on the DSE 3110, wiring and output operation for the relays - Ref. diagram.
	Negative / Ground Connections	● Check No.1 wires on the control panel and engine DC loom(s) have a sound connection to battery negative.
	Air Filter	● Check the condition of the air filter - Replace if necessary.
	Contaminated Fuel	● If possible run the generator from a separate fuel source from the fuel tank.
	If none of the above solve the issue then a closer inspection of the engine would be advised e.g. injector etc.	
	Engine Starting/Running Then Stopping 3 Times	
	DSE 3110 Control Module	● DSE 3110 not showing Volts or Hz running? ● Check the green plug with a brown & blue wire is not loose. ● Start and run the generator and measure the AC voltage across the brown & blue wires - this should measure either approximately 115V or 230V AC.
	2A Reset Button	● Check for continuity and wiring on the reset button - Replace if necessary.
	Main AC Alternator	● Check or replace capacitor - AC alternator tests would be advisable.

Fault Icon	Possible Cause	Check
 **Emergency Stop**	Emergency Stop Button	● Check if the emergency stop button has been activated. ● Check the switches function and wiring on the back of the emergency stop.
	DSE 3110 Control Module	● Check that all the green plugs are fitted correctly and the wiring.
 **Low Hz/Frequency** Shutdown	**The no-load frequency/rpm should measure approximately *52.5Hz/3150rpm*** ***Low AC Voltage*** **and *Low Hz/Frequency*** **could indicate the engine is running too slow. Warning - It is not recommended to adjust the engine speed unless absolutely necessary.**	
	Fuel Filter	● Check in-line fuel filter and replace if necessary.
	Fuel Tap	● Check the fuel tap is in the correct position - On feed hose from the fuel tank.
	Air Filter	● Check the condition of the air filter - Replace if necessary.
	Fuel Lift Pump (12V DC)	● Check the fuel pump is receiving 12V DC and is operating - Replace if necessary.
	Contaminated Fuel	● If possible run the generator from a separate fuel source from the fuel tank.
	If none of the above solve the issue then a closer inspection of the engine would be advised e.g. check that no-one has adjusted the engine speed, replace an injector etc.	
 **Low AC Voltage** Shutdown	**The DSE 3110 is displaying the correct no-load frequency (approx. 52.5Hz) but the generator shuts down with the *Low AC Voltage*** **shutdown icon is displayed only.**	
	Capacitor	● Test and/or replace the AC alternator capacitor.
	Main AC Alternator	● AC alternator tests would be advisable.
 **High Hz/Frequency** Shutdown	**The no-load frequency/rpm should measure approximately *52.5Hz/3150rpm*** ***Low AC Voltage*** **and *Low Hz/Frequency*** **could indicate the engine is running too fast. Warning - It is not recommended to adjust the engine speed unless absolutely necessary.**	
 **High AC Voltage** Shutdown	**The DSE 3110 is displaying the correct no-load frequency (approx. 52.5Hz) but the generator shuts down with the *High AC Voltage*** **shutdown icon is displayed only.**	
	Capacitor	● Check the correct size capacitor is fitted to the AC alternator.
	Automatic Voltage Regulator (not a standard option - if applicable)	● Replace the AVR
 **Fail To Stop**	Oil Pressure Switch	● Check the oil pressure switch operation - Switch normally closed when engine is at rest and open when engine running - Remove, clean or replace if necessary.
	Faulty Wiring	● Check associated wiring from the oil pressure switch to the DSE 3110.
	Service	● Oil change and oil filter clean recommended.

Fault Icon	Possible Cause	Check
 **Low Oil Pressure** Fault occurs after the engine has fired	Low Oil Level	● Check oil level and top-up to the correct level if necessary.
	Oil Pressure Switch	● Check the oil pressure switch operation - Switch normally closed when engine is at rest and open when engine running - Remove, clean or replace if necessary.
	Faulty Wiring	● Check associated wiring from the oil pressure switch to the DSE 3110.
	Service	● Oil change and oil filter clean recommended.
 **High Engine Temperature** Fault occurs after the engine has fired	Canopy Obstructions	● Has the engine overheated? - Check the generator canopy has no obstructions over any vented areas - Also see ***Operating Environment*** in this handbook.
	Temperature Switch	● Check the temperature switch operation - Disconnect both wires and link together to test - replace if necessary - **DO NOT USE WITHOUT A TEMPERATURE SWITCH FITTED**.
	Faulty Wiring	● Check associated wiring from the temperature switch to the DSE 3110.
 **Charge Fail** Battery Flat & Not Charging	See ***BATTERY CHARGE FAULT FINDING - DSE 3110 TYPE***	
AC Output Fault Generator starts and runs but there is no output from the AC socket outlets	MCB & RCD	● Check the MCB & RCD are switched on (up).
	Voltage Selector Switch	● Check the voltage selector switch is in the correct position.
	Reset Button(s)	● Check the reset buttons for the output sockets.
	Drop the main control panel forward and check for any loose, broken, burnt wiring. Component test the MCB,RCD and voltage selector switch.	

Battery Charge System Fault Finding

When a battery charging fault has occurred the battery lamp on the control panel should be illuminated when the generator/engine is running.

Battery

Firstly measure the DC voltage directly at the battery while the generator is at standstill, this should be around 12.5v DC. Test the battery and replace if necessary.

Start and run the generator. Once the set is up and running the DC voltage at the battery should measure anything from 13.5 to 15.0v DC in normal operation - If the measured voltage is below 13.0V after 5 minutes of running continue with the fault finding.

Battery Leads
Check the condition of the battery terminals and the connections on the starter motor (positive) and the engine (negative). The leads should be flexible, if they feel stiff/rigid replace.

Charge Regulator Location
The charge regulator can be found inside the canopy roof below the control panel. Access is made by lifting the canopy roof up and leaning into the generator towards the control panel end.

Earth Connection
Ensure there is continuity between the body of the charge regulator and an earth point on the engine or the battery negative terminal. The resistance should measure below 1.0Ω.

Battery Charge Fault - Key Switch Type

Reference will be made using the *Key Switch* DC wiring diagram contained within this handbook.

Dynamo Test
Check the stator coil of the dynamo, this can be found under the starter motor - two green/white wires from the engine.

- Disconnect the white wires from the main engine loom labelled No.18 & 19 from the green/white stator wires. Check continuity between the two green/white wires, if no continuity is detected replace the stator coil on the engine.

- If continuity is present, start and run the generator/engine and measure the AC voltage between the green/white wires. This should be around 38V AC if the engine is running at the correct no-load speed (52.5Hz). If no AC voltage is detected replace the starter coil on the engine.

- Reconnect the wires No.18 & 19 back onto the green/white stator coil wires.

Charge Regulator Wiring
- Remove white wires No.18 & 19 from the charge regulator and again start and run the generator/engine and measure the AC voltage at these wires, not at the regulator. You should have the same reading as the last test, around 38V AC. Reconnect wires No.18 & 19 to the charge regulator.

- Check the 20Amp fuse in the white fuse holder near the charge regulator. A spare fuse can be found inside the fuse holder.

- Check wires No. 11 & 12 are still connected in the white 4-way plug and socket attached the charge regulator and are not loose or broken (ref. wiring diagram).

- Disconnect the white 4-way plug from the charge regulator. Turn the key switch to the RUN position and measure the DC voltage between wire No.11 at the plug and the engine body. This should measure between 12 to 13V DC.

- Check continuity of cable No.11 at the white 4-way plug to the key switch.

- Turn the key switch to the RUN position and measure the DC voltage at wire No.11 on the key switch, this should be 12 to 13v DC also. If not replace the key switch.

- Check for any loose connections on the key switch and the white multi-pin plug and socket between the engine loom and the control panel loom inside the generator canopy.

If all the above seem to be ok then this could possibly indicate that the charge regulator has failed and would need replacing.

Battery Charge Fault - DSE 3110 Type

Reference will be made using the *DSE 3110* DC wiring diagram contained within this handbook.

Dynamo Test
Check the stator coil of the dynamo, this can be found under the starter motor - two green/white wires from the engine.

- Disconnect the white wires from the main engine loom labelled No.26 & 27 from the green/white stator wires. Check continuity between the two green/white wires, if no continuity is detected replace the stator coil on the engine.

- If continuity is present, start and run the generator/engine and measure the AC voltage between the green/white wires. This should be around 38V AC if the engine is running at the correct no-load speed (52.5Hz). If no AC voltage is detected replace the starter coil on the engine.

- Reconnect the wires No.26 & 27 back onto the green/white stator coil wires.

Charge Regulator Wiring
- Remove white wires No.26 & 27 from the charge regulator and again start and run the generator/engine and measure the AC voltage at these wires, not at the regulator. You should have the same reading as the last test, around 38V AC. Reconnect wires No.26 & 27 to the charge regulator.

- Check the 20Amp fuse in the white fuse holder near the charge regulator. A spare fuse can be found inside the fuse holder.

- Check wires No.7 & 24 are still connected in the white 4-way plug and socket attached the charge regulator and are not loose or broken (ref. wiring diagram).

- Disconnect the white 4-way plug from the charge regulator. Press and hold the *Fuel Pump Prime* button and measure the DC voltage between wire No.24 at the plug and the engine body. This should measure between 12 to 13V DC.

- Check continuity of cable No.24 at the white 4-way plug to the fuel relay (R2).

- Start and run the generator, while the generator is running measure the DC voltage between wire No.7 at the 4-way plug and the engine body. This should measure between 10 to 13V DC. If not this could indicate that the DSE 3110 may have an issue.

- Check for any loose connections on the DSE 3110 and the white multi-pin plug and socket between the engine loom and the control panel loom inside the generator canopy.

If all the above seem to be ok then this could possibly indicate that the charge regulator has failed and would need replacing.

Fuel System Bleeding Procedure

The fuel system shouldn't need bleeding unless maintenance has been carried out (e.g. fuel filter).

Should the need to bleed the fuel system occur ensure the fuel tank has at least 10L of diesel.

Be aware of the generator model type below as there are different methods to bleed the fuel system.

SSD6000 - SSD6000S - SSD6000/3PH
These generator model types have an easy bleed fuel system with the aid of a low pressure 12V fuel pump.

Key Switch
To self-bleed the fuel system that uses a key switch requires to operate the 12V fuel lift pump and fuel solenoid on the generator without cranking the engine. Follow this simple procedure:

- Turn the key to the **RUN** position, do not start the generator. The **BATTERY** and **LOW OIL PRESSURE** lamps should be illuminated - Ref. **Fig.11**

- Slowly begin to turn the key to the **START** position until the **BATTERY** lamp goes out. You should also hear the 12V fuel lift pump operate. Hold the key at this position for approximately 1 minute, this should be enough time to allow the fuel to completely fill the system. Turn the key back to the **STOP** position.

DSE 3110
Press and hold the "FUEL PUMP PRIME" button located on the control panel for 1 minute.

The bleeding of the fuel system is now complete.

SE6000D4
The SE6000D4 has no 12V low pressure fuel pump and solely relies on gravity to feed fuel to the injection pump. This requires a manual approach to bleed the fuel system.

Fig.16 below shows the fuel injection pump.

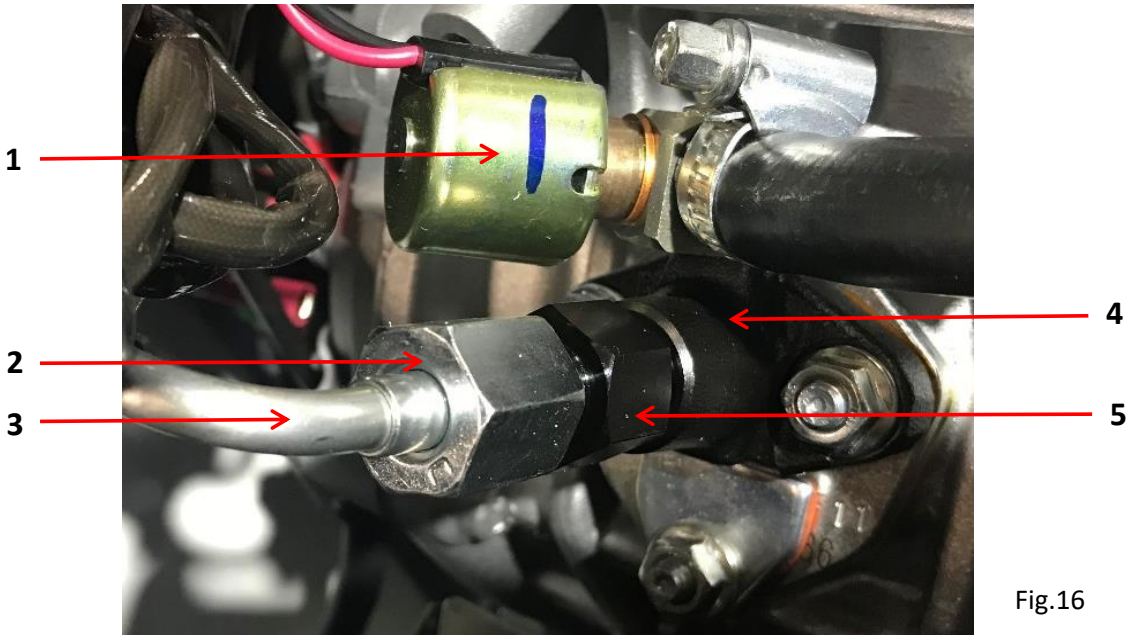


Fig.16

No.	Description
1	Fuel Solenoid
2	Fuel Injection Line Nut
3	Fuel Injection Line

No.	Description
4	Body
5	Fuel Delivery Valve

SE6000D4 - Bleed Procedure - Key Switch

• Using a 17mm spanner, loosen the Fuel Injection Line Nut **(2)** completely and move the Fuel Injection Line **(3)** to one side.

• **CAUTION** - Do not remove! Again using a 17mm spanner, loosen the Fuel Delivery Valve **(5)** - only turn out by two complete turns.

• Turn the starter key to the **ON** position, do not attempt to start the generator. On the control panel the **BATTERY** and **LOW OIL PRESSURE** lamps should be illuminated.

• Slowly turn the key towards the **RUN** position until the **BATTERY** lamp goes out. You should hear the Fuel Solenoid **(1)** click to indicate it is open. Hold the key in this position, you should see air escaping from the Fuel Delivery Valve **(5)** and eventually fuel will start to trickle out. Return the key back to the **STOP** position.

• Re-tighten the Fuel Delivery Valve **(5)** onto the Body **(4)**.

• Re-tighten the Fuel Injection Line Nut **(2)** onto the Fuel Delivery Valve **(5)**.

• Start the generator, if it still fails to start repeat the above steps to check if there is more air in the fuel system.

Service and Maintenance

Pre-service

Warning - Do not attempt to carry out any service or maintenance work on the generator whilst the engine is running. Always disconnect the battery prior to working on the engine or alternator.

Engine Service

Keeping to the maintenance schedule recommended by the engine manufacture will ensure your generator engine will perform at its optimum efficiency. The benefits of regular servicing will lower the risk of unexpected breakdown considerably and ensure your generator will continue to perform for many years.

Service the engine strictly in accordance with the instructions given in the relevant engine operator manual / handbook. It is recommended that an approved specialist must carry out any maintenance. Any spare parts required should be of genuine manufacturer's origin.

Note: Failure to adhere to manufacturer's recommended service schedules may invalidate the warranty. Please consult engine operator's manual for full service intervals

You can find the basic service intervals at www.stephill-generators.co.uk
or inside the engine handbook that was supplied with the generator for an in-depth overall service.

Alternator Service

Brushless alternators employed on Stephill Generators are maintenance free.
Brushed alternators, like the 3 Phase model, will require maintenance. The alternator handbook supplied with the generator will contain a maintenance chart. Any service must be carried out by competent qualified personnel strictly in accordance with the instructions given in the handbook. Any spare parts required should be of genuine manufacturer's origin.

IMPORTANT WARNING

After any service on the generator, ensure that all piping and electrical cables are correctly routed and secured away from hot parts. Failure to observe this warning may result in damage to the piping and cables which could result in a fire. Do not service or work on generator whilst the engine is running. Always disconnect battery prior to working on engine or alternator.

STEPHILL GENERATORS LTD STRESS THAT THE ULTIMATE RESPONSIBILTY FOR THE SAFE USE OF THE GENERATOR RESTS WITH THE USER.

Spares

Engine Consumable Service Spares

Basic Yanmar engine service kits are available form Stephill Generators, below are the individual parts complete with part numbers.

Description	Part No.
Oil Filter	029-0032
Air Filter	029-0007
Fuel Filter (In-line) - **SSD6000(S/3PH)**	048-0004
Fuel Filter Inline 90^{o} - **SE6000D4**	048-0013
Engine Yanmar L100V	029-0017

Alternator Spares

Description	Part No.	Description	Part No.
Alternator NSM M100 SG (Standard)	028-0036	Fan Adaptor	022-0596
Capacitor - 35µF	037-0019	Fan Cowl	022-0614
Diode - NSM	028-0026	Fan	022-1035
Alternator NSM Z100 SB (3Ph)	028-0036	Fan Locking Ring	022-1036

Control Panel - AC Components - Standard

Description	Part No.	Description	Part No.
20A 2 Pole MCB	036-0009	Voltage Selector Switch	043-0021
40A Double Pole 30mA RCD	036-0028	Hours Run Meter (115V)	055-0006
115V Socket 16A	044-0001	115V Socket 32A	044-0003
230V Socket 16A	044-0002	230V Socket 32A	044-0004
Reset Button 16A	036-0049	Reset Button 30A	036-0052
Dust Cover IP23 Reset Button	036-0056	MCB Cover (4 module)	036-0039

Control Panel - DC Components - Standard Key Start

Description	Part No.	Description	Part No.
Key Switch (Lucas)	045-0001	Relay-5pin 12V DC	056-0001
Reset Button 20A	036-0050	LED Warning Lamps 16mm - Red	022-1100
IP23 Cover -Resets	036-0056		

Previous Version 12V Lamps

Battery Warning Lamp	045-0012	Low Oil Pressure Warning Lamp	045-0016
High Engine Temperature Warning Lamp	045-0014	Low Fuel Warning Lamp	045-0013
12V Bulb	045-0017		

Control Panel - DC Components - Standard DSE 3110

Description	Part No.	Description	Part No.
DSE 3110 Control Module	045-0061	Fuel Pump Prime Push Button	045-0006
DSE 3110 Rubber Gasket	045-0062	Emergency Stop c/w with RED N/C Switch	045-0018
Relay 4-Pin 30-40A 12V	056-0002	RED N/C Switch (only) to Fit E-Stop	045-0032
2A Reset Button	036-0055	1A Reset Button	036-0043
Dust Cover (1 -2A Reset)	036-0077		

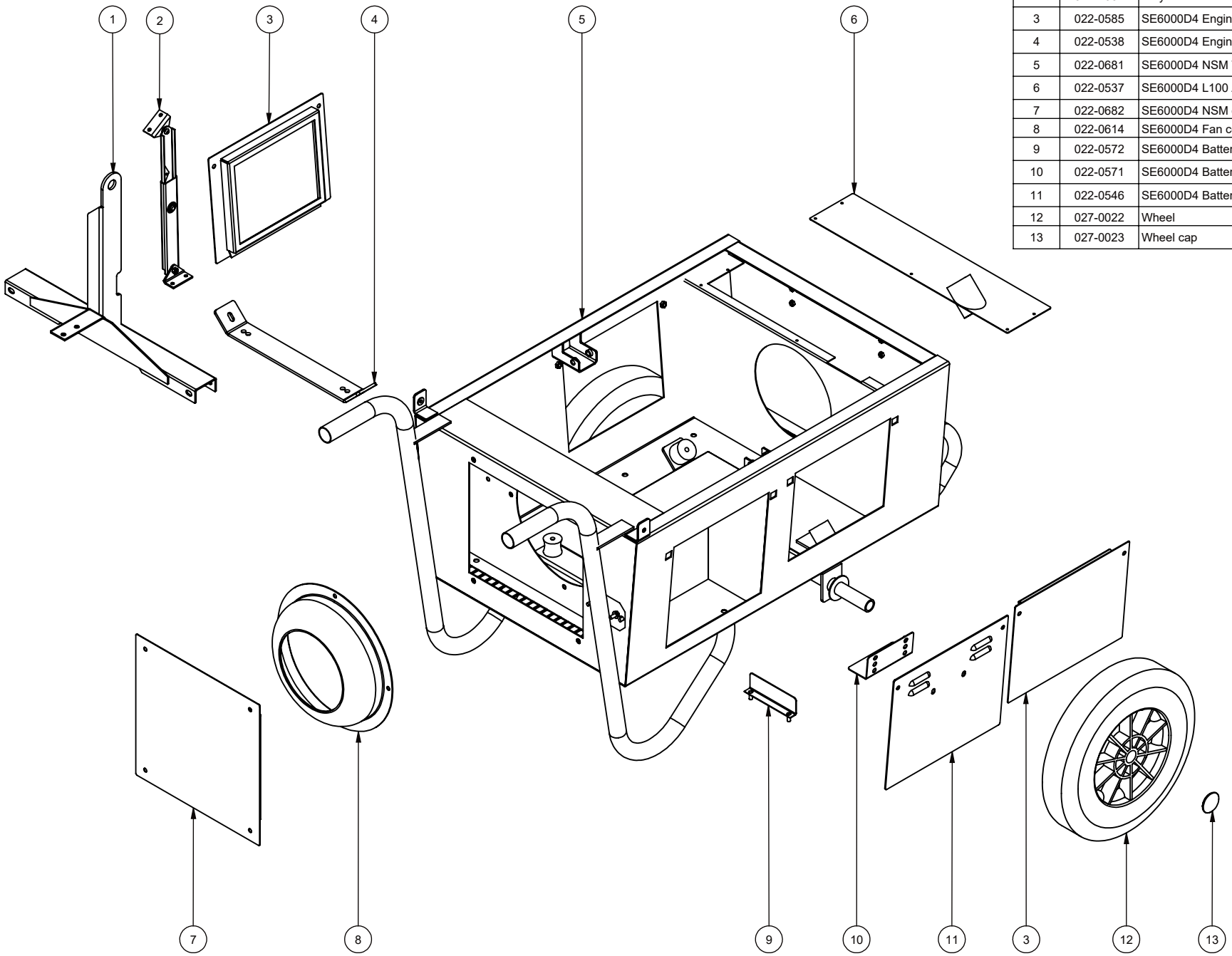
General Spares

Description	Part No.	Description	Part No.
Fuel Tank Cap	022-1012	Wheel	027-0022
Fuel Tank - **SSD6000(S/3PH)**	022-0579	Wheel Cap	027-0023
Fuel Tank - **SE6000D4**	022-0562	Flush Pull Handle (Roof) - **SSD6000(S/3PH)**	022-1033
50mm Fuel Tank Gasket	022-1003	Flush Pull Handle (Roof) - **SE6000D4**	014-1004
Low Fuel Switch	022-1015	Handle/Foot - Tubular - **SSD6000(S/3PH)**	022-0704
Alternator Mounts - **SSD6000(S/3PH)**	027-0014	Temperature Switch	022-1004
Engine Mounts - **SSD6000(S/3PH)**	027-0013	Temperature Switch Plate	020-0128
Alternator Mounts - **SE6000D4**	027-0014	Engine Wiring Loom	039-0015
Engine Mounts - **SE6000D4**	027-0013	Charge Regulator - Yanmar L100	029-0041
Toggle Latch Strike	022-1017	Gas Strut	022-1055
Toggle Latch	022-1018	Facet 12V Fuel Lift Pump	022-1037
Neoprene Roof Seal	022-1001	50mm Air Hose	022-1021

Exhaust System Spares

Silencer - **SSD6000(S/3PH)**	022-0566	Silencer - **SE6000D4**	022-0563
Tail Pipe - **SSD6000(3PH)**	022-0567	Tail Pipe - **SE6000D4**	022-0501
Manifold Pipe - **SSD6000(S/3PH)**	022-0565	Tail Pipe Bracket - **SE6000D4**	022-0536
Down Pipe - **SSD6000(S/3PH)**	022-0569	U-Clamp 35mm	027-0058
U-Clamp 42mm	027-0060	L100 Exhaust gasket	029-0049
Secondary Silencer - **SSD6000S**	022-0580		

Item	Part Number	Description	Qty
1	022-0687	SE6000D4 NSM Lifting beam	1
2	022-1002	Stay	1
3	022-0585	SE6000D4 Engine door	2
4	022-0538	SE6000D4 Engine mounting bracket	1
5	022-0681	SE6000D4 NSM Trolley base	1
6	022-0537	SE6000D4 L100 Air inlet tube plate	1
7	022-0682	SE6000D4 NSM door	1
8	022-0614	SE6000D4 Fan cowl	1
9	022-0572	SE6000D4 Battery clamp bottom	1
10	022-0571	SE6000D4 Battery clamp top	1
11	022-0546	SE6000D4 Battery door	1
12	027-0022	Wheel	2
13	027-0023	Wheel cap	2



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Drawing Number	Description
22-696	SE6000D4 NSM Exploded view

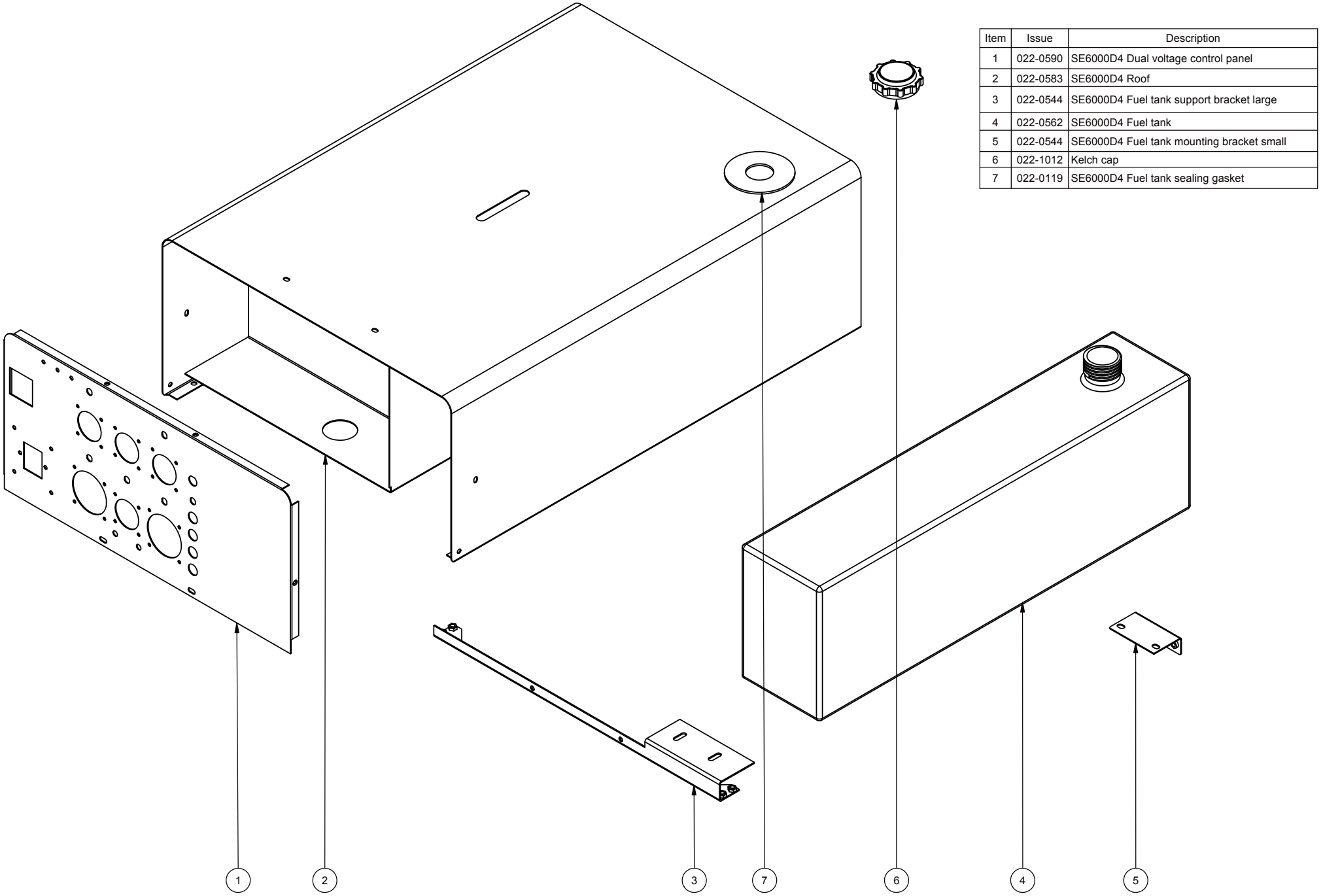
Drawn: R Golding

Issue	Date	Revision
A	04/02/13	New drawing
B	17/06/15	Descriptions changed.
C	11/06/18	Stay added.

Colour: N/A

Material: Mild steel

THIRD ANGLE PROJECTION



Item	Issue	Description
1	022-0590	SE6000D4 Dual voltage control panel
2	022-0583	SE6000D4 Roof
3	022-0544	SE6000D4 Fuel tank support bracket large
4	022-0562	SE6000D4 Fuel tank
5	022-0544	SE6000D4 Fuel tank mounting bracket small
6	022-1012	Kelch cap
7	022-0119	SE6000D4 Fuel tank sealing gasket

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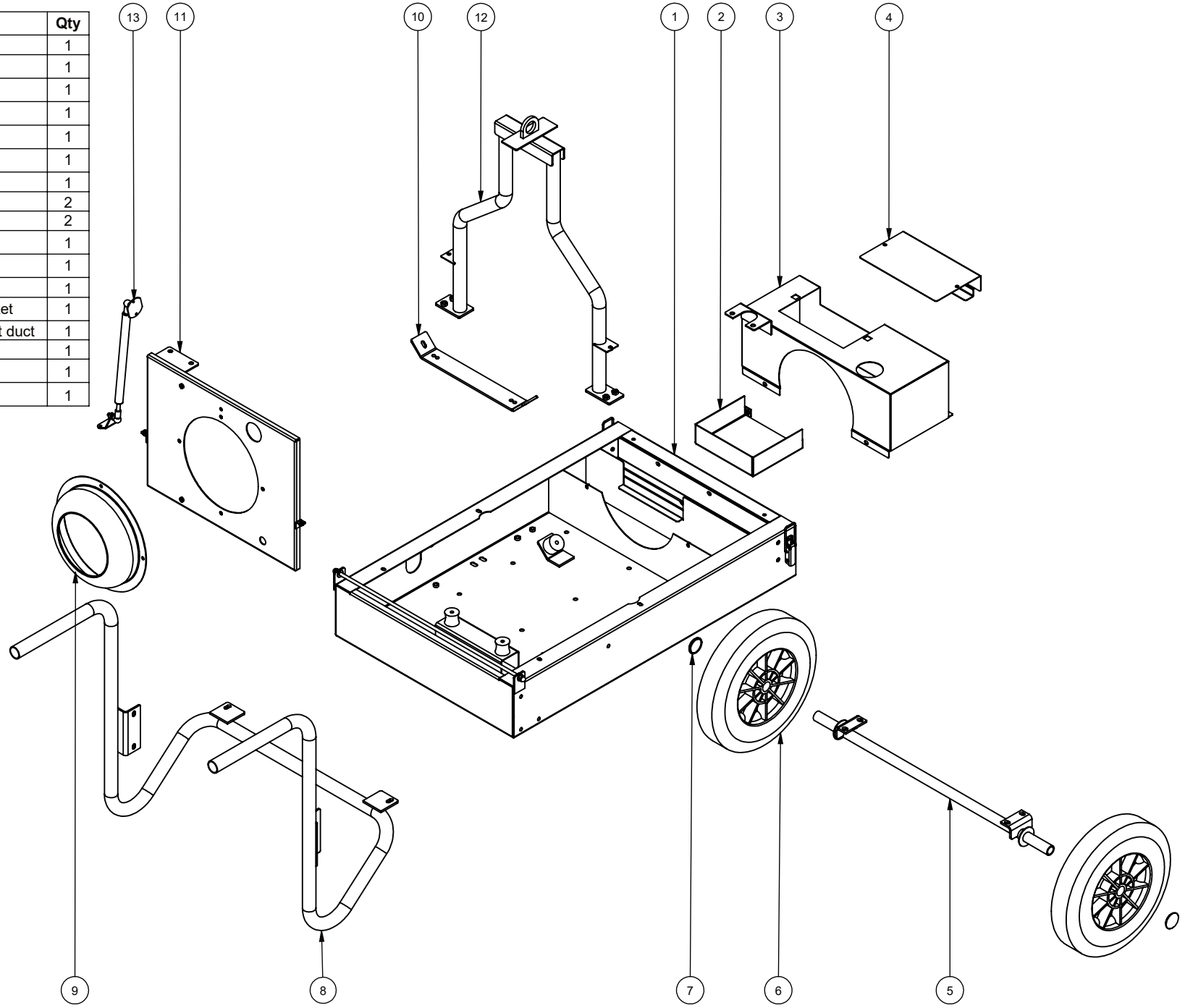
Drawing Number	Description
22-590	SE6000D4 Roof exploded view
Drawn: R Golding	

Issue	Date	Revision
A	08/11/04	New drawing
B	26/05/06	New part numbers added.
C	17/06/15	Descriptions changed.

THIRD ANGLE PROJECTION

	Part No	Description	Qty
1	022-0627	SSD6000 Base	1
1	022-0675	SSD6000S Base	1
2	022-0607	SSD6000 Battery tray	1
2	022-0673	SSD6000S Battery tray	1
3	022-0576	SSD6000 Engine air inlet duct	1
4	022-0575	SSD6000 Battery door	1
5	022-0598	SSD6000 Axle	1
6	027-0022	Wheel	2
7	027-0023	Wheel cap	2
8	022-0704	SSD6000 Handle	1
8	022-0724	SSD6000 Handle Lighting tower	1
9	022-0614	SSD6000 Fan cowl	1
10	022-0538	SSD6000 Engine mounting bracket	1
11	022-0660	SSD6000 NSM Alternator air inlet duct	1
12	022-0609	SSD6000 Lift beam	1
12	022-0677	SSD6000S Lift beam	1
13	022-1055	Gas strut	1



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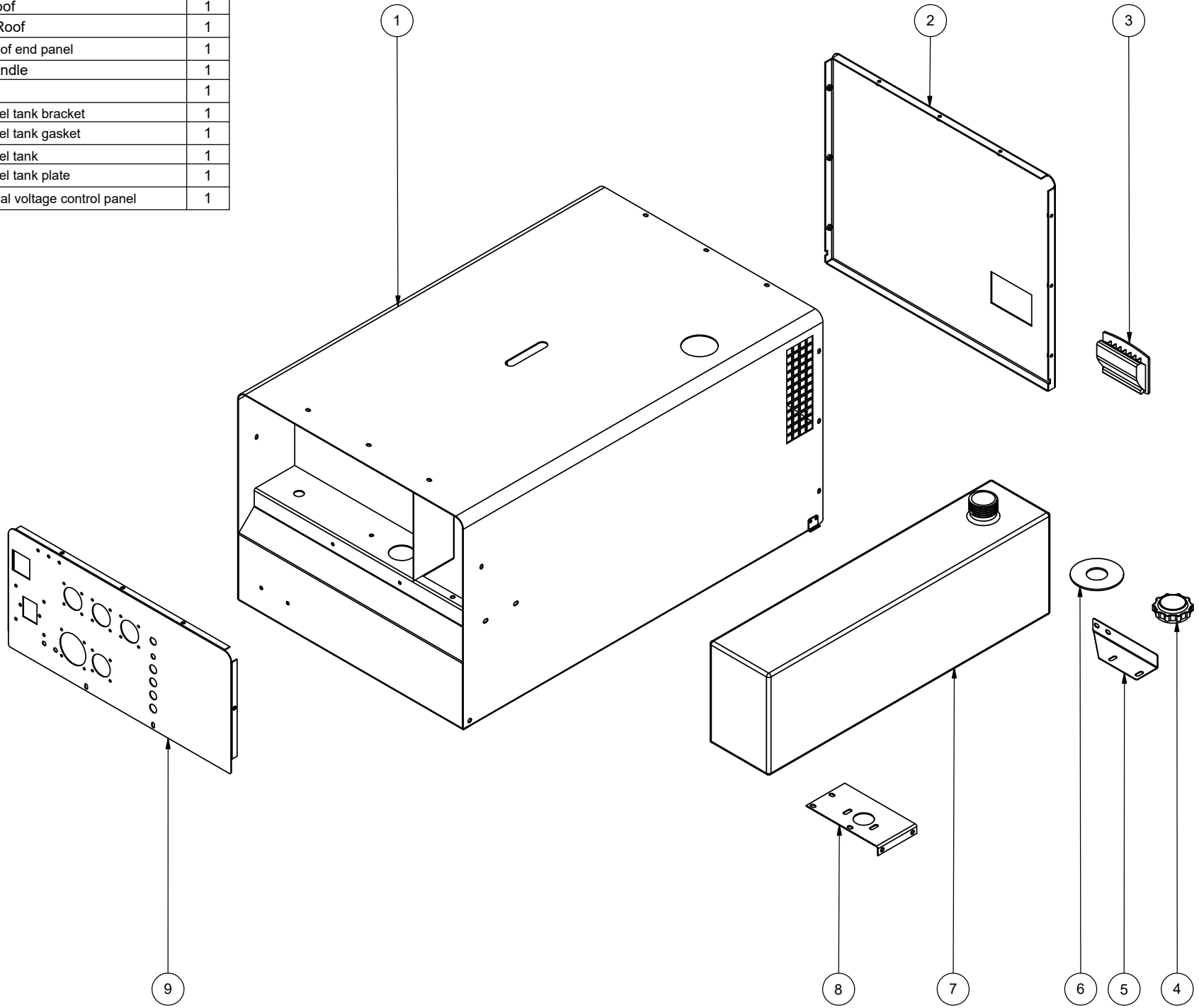
Drawing Number	Description
22-697	SSD6000 & SSD6000S Base exploded view
Drawn: R Golding	

Issue	Date	Revision
A	04/02/13	New drawing
B	16/06/15	Descriptions updated.
C	07/06/18	Handle changed & Gas strut added.

Colour: N/A
Material: Mild steel

THIRD ANGLE PROJECTION

	Part No	Description	Qty
1	022-0593	SSD6000 Roof	1
1	022-0676	SSD6000S Roof	1
2	022-0605	SSD6000 Roof end panel	1
3	022-1033	Flush pull handle	1
4	022-1012	Kelch cap	1
5	022-0594	SSD6000 Fuel tank bracket	1
6	022-0119	SSD6000 Fuel tank gasket	1
7	022-0579	SSD6000 Fuel tank	1
8	022-0633	SSD6000 Fuel tank plate	1
9	022-0606	SSD6000 Dual voltage control panel	1



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Drawing Number 22-665

Drawn R Golding

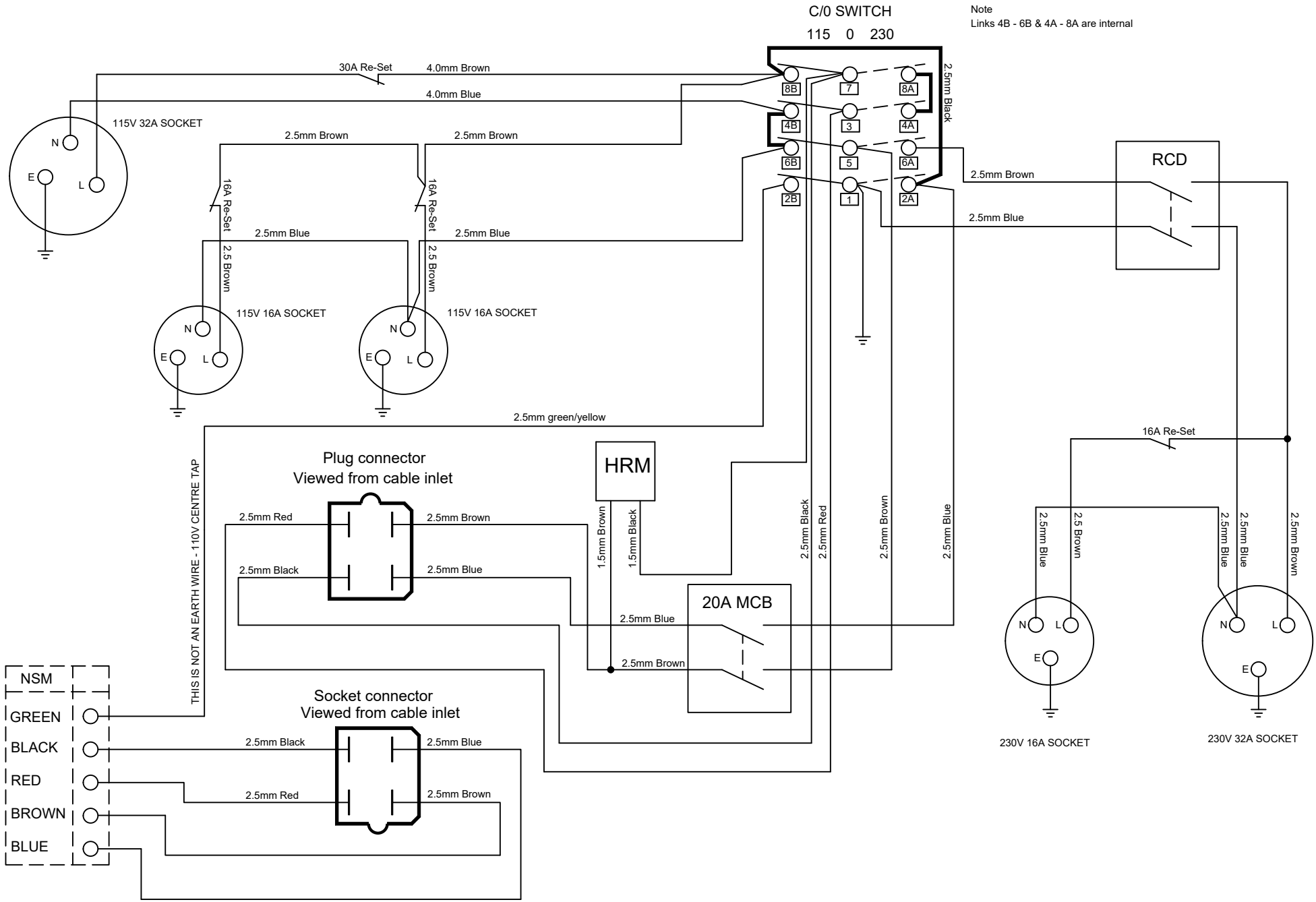
Description SSD6000 & SSD6000S Roof exploded view

Issue	Date	Revision
A	15/04/08	New drawing
B	17/06/15	Descriptions updated.
C	11/06/18	Fuel tank & fuel tank plate part number changed.

Colour N/A

Material Mild steel

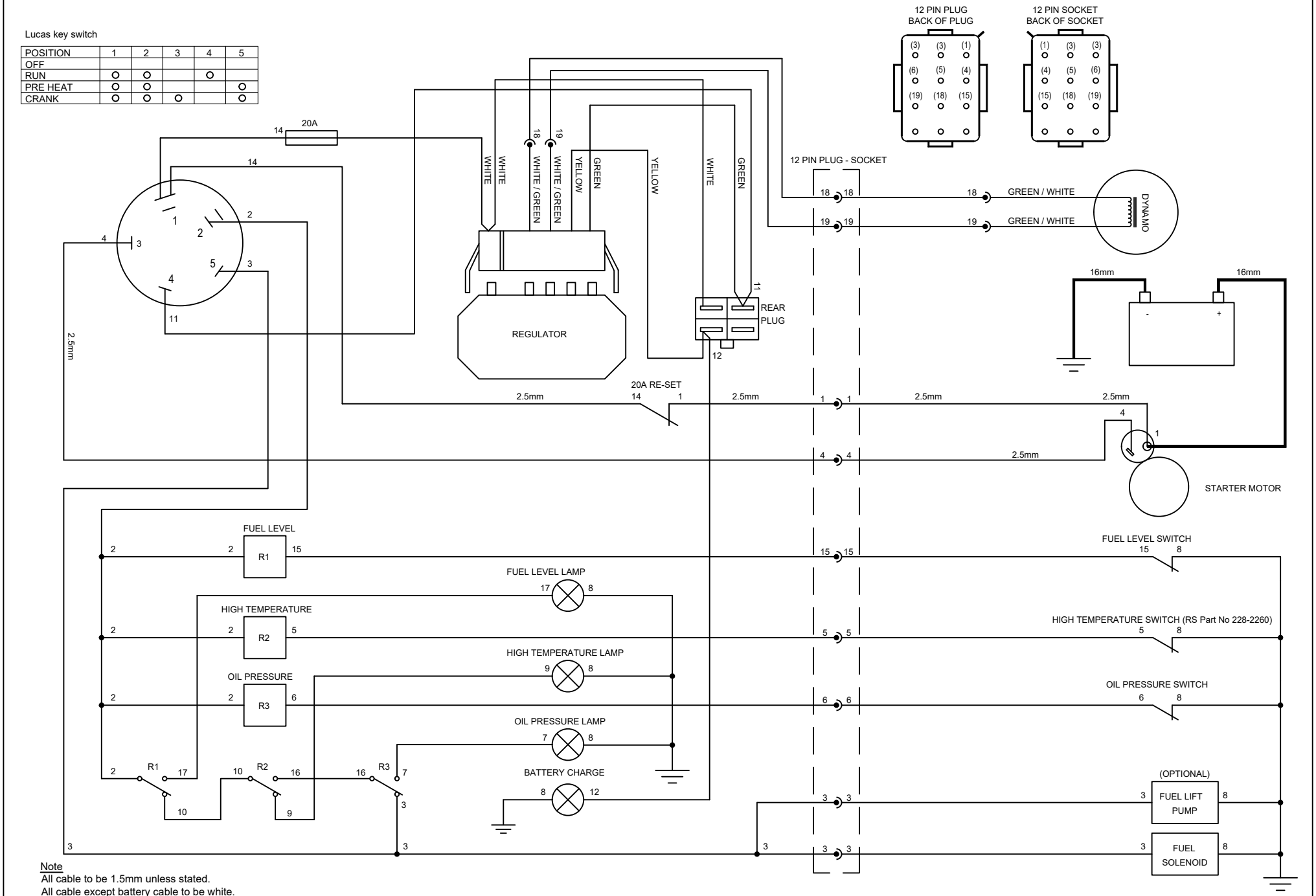
THIRD ANGLE PROJECTION



STEPHILL GENERATORS Phone 01933 677911 Fax 01933 677916	Drawing Number SW 12072 Drawn R Golding	Description SE6000D NSM D/V 115V CTE / 230V Neutral bonded & 230V RCD	Last Number Used N/A	Issue	Date	Revision
				A	28/01/13	New drawing.
				B	20/12/19	230V RCD added.

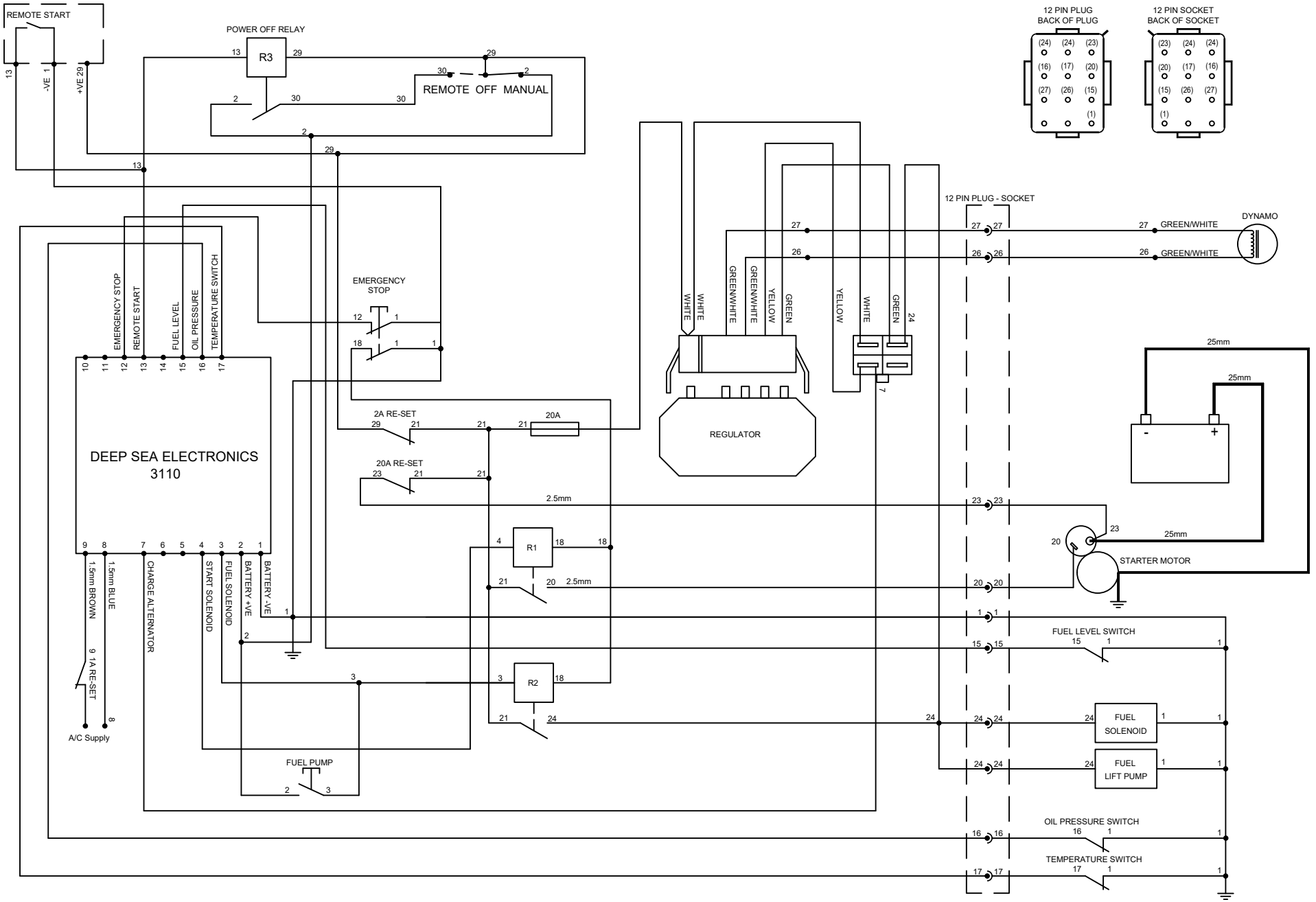
Lucas key switch

POSITION	1	2	3	4	5
OFF					
RUN	O	O		O	
PRE HEAT	O	O			O
CRANK	O	O	O		O



Note
All cable to be 1.5mm unless stated.
All cable except battery cable to be white.

STEPHILL GENERATORS Phone 01933 677911 Fax 01933 677916	Drawing Number SW11016 Drawn R GOLDING	Description L100 WIRING ELECTRIC START LOP/HET/CHARGE FAIL 15A FLYWHEEL CHARGER	Last Number Used 19	Issue	Date	Revision
				E	03/11/21	Updated to 12-way plug and socket - JD
				D	21/11/11	Wiring updated to show plug and socket & dynamo.
				C	24/09/08	Wiring changed numbers 11 & 14.



NOTE
ALL CABLE TO BE 1.5MM UNLESS STATED
ALL CABLE EXCEPT BATTERY CABLE TO BE WHITE

STEPHILL GENERATORS Phone 01933 677911 Fax 01933 677916	Drawing Number SW11066 Drawn R GOLDING	Description SSD6000 L100 Deep Sea 3110 Wiring with power off relay	Last Number Used 30	Issue	Date	Revision
				A	20/10/17	New drawing
				B	08/04/21	Wire 29 added to remote start terminals.
				C	12/01/22	Updated to show 12-way plug and socket - JD.

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