



**IS2500**

**IS3501**

**IS5501**

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**DEALER SERVICE  
MANUAL**

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## 1.1) PRODUCT SPECIFICATIONS

### IS2500 -

#### Engine

Model:	<b>Yanmar L48AE</b>
Type:	Diesel / 4-stroke
Cylinders:	1
Cylinder block material:	Aluminium
Bore:	2.75"
Stroke:	2.16"
Displacement :	211cc
Power @ 3600rpm:	4.7hp
RPM:	3600
Compression ratio:	20.5:1
Combustion system:	Direct injection
Engine head material:	Aluminium
Speed governor:	Centrifugal mechanical
Lubrication system:	Forced
Oil sump capacity with filter:	0.85qt.
Engine stop system:	Fuel solenoid
Fuel pump:	Electric
Fuel pump discharge:	2.3'
Fuel consump. @ full load:	.211 gal/hr
Air combustion requirement:	12cfm
Starting battery:	45Ah - 12V
Starter:	0.8kW - 12V
Max. inclination:	30°
Water pump flow:	4.4gal/min

#### Generator Ratings (@77° F)

Type:	Synchronous, 2-poles, self-excited
Cooling:	Air/water (Intercooler)
Voltage:	120 - 240V
Nominal current:	18.3 - 9.16A
Frequency :	60Hz
Max. power :	2.2kW
Continuous power:	1.9kW
Battery charging output:	10A - 12V
Power factor (cos $\phi$ ):	1
Insulating class:	H
Voltage stability:	$\pm 10\%$
Frequency stability:	$\pm 5\%$

**IS3501 -****Engine**

Model:	<b>Yanmar L70AE</b>
Type:	Diesel / 4-stroke
Cylinders:	1
Cylinder block material:	Aluminium
Bore:	3.07"
Stroke:	2.44"
Displacement :	296cc
Power @ 3600rpm:	6.7hp
RPM:	3600
Compression ratio:	20:1
Combustion system:	Direct injection
Engine head material:	Aluminium
Speed governor:	Centrifugal mech.
Lubrication system:	Forced
Oil sump capacity with filter:	1.2qt.
Engine stop system:	Fuel solenoid
Fuel pump:	Electric
Fuel pump discharge:	2.3'
Fuel consump. @ full load:	.396gal/hr
Air combustion requirement:	16.9cfm
Starting battery:	45Ah - 12V
Starter:	0.8kW - 12V
Max. inclination:	30°
Water pump flow:	4.4gal/min

**Generator Ratings (@77° F)**

Type:	Synch., 2-poles, self-ext.
Cooling:	Air/water (Intercooler)
Voltage:	120 - 240V
Nominal current:	26.6 - 13.3A
Frequency:	60Hz
Max. power:	3.2kW
Continuous power:	2.9kW
Battery charging output:	10A - 12V
Power factor (cos $\phi$ ):	1
Insulating class:	H
Voltage stability:	$\pm 10\%$
Frequency stability:	$\pm 5\%$

**IS5501 -****Engine**

Model:	<b>Yanmar L100AE</b>
Type:	Diesel / 4-stroke
Cylinders:	1
Cylinder block material:	Aluminium
Bore:	3.38"
Stroke:	2.75"
Displacement :	406cc
Power @ 3600rpm:	10.0hp
RPM:	3600
Compression ratio:	20:1
Combustion system:	Direct injection
Engine head material:	Aluminium
Speed governor:	Centrifugal mechanical
Lubrication system:	Forced
Oil sump capacity with filter:	1.7qt.
Engine stop system:	Fuel solenoid
Fuel pump:	Electric
Fuel pump discharge:	2.3'
Fuel consump. @ full load:	.660gal/hr
Air combustion requirement:	23cfm
Starting battery:	45Ah - 12V
Starter:	0.8kW - 12V
Max. inclination:	30°
Water pump flow:	4.4gal/min

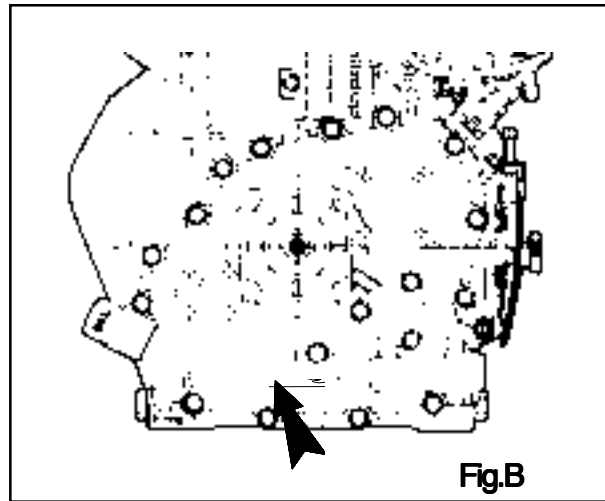
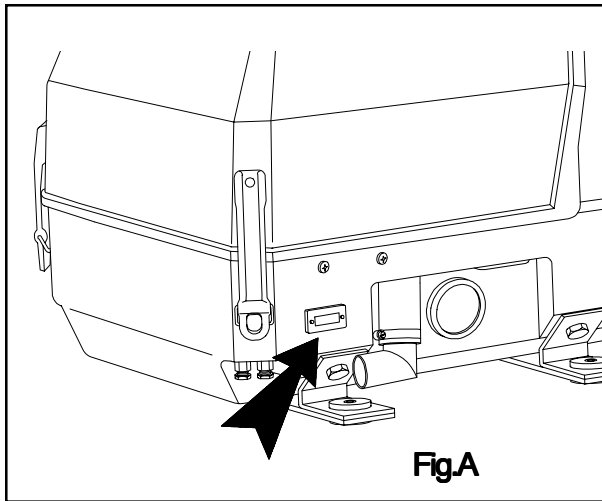
**Generator Ratings (@77° F)**

Type:	Synchronous, 2-poles, self-excited
Cooling:	Air/water (Intercooler water/air)
Voltage:	120 - 240V
Nominal current:	47.5 - 23.7A
Frequency:	60Hz
Max. power:	5.7kW
Continuous power:	4.8kW
Battery charging output:	10A - 12V
Power factor (cos $\phi$ ):	1
Insulating class:	H
Voltage stability:	$\pm 10\%$
Frequency stability:	$\pm 5\%$

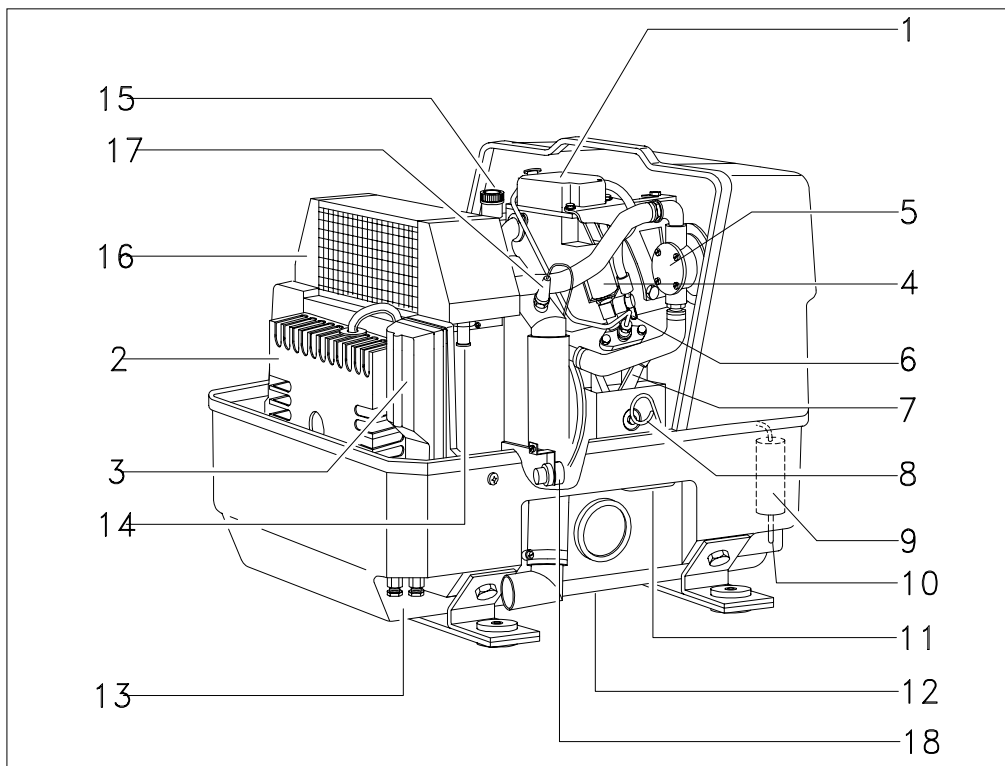
### 1.2) IDENTIFICATION OF GENSET

Each generator has an identification number impressed on a small metallic plate and rivetted to the lower front side of the sound shield (Fig.A).

In case identifying by this number becomes impossible, please note the engine number, die stamped on the crankcase (Fig.B)



### 1.3) IDENTIFICATION OF COMPONENTS



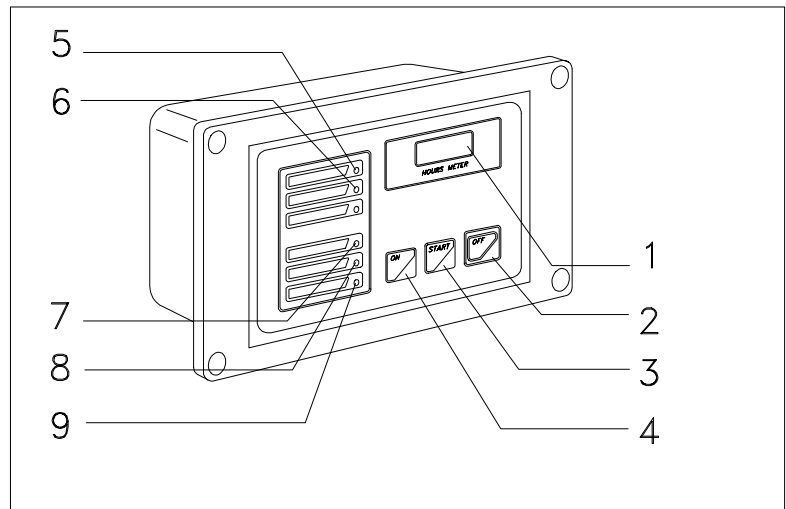
## Generator components (Fig.5)

- 1) ENGINE
- 2) ALTERNATOR
- 3) ALTERNATOR CONTROL PANEL
- 4) FUEL SOLENOID
- 5) WATER PUMP
- 6) FUEL RETURN
- 7) STOP LEVEL
- 8) OIL DIPSTICK
- 9) FUEL PUMP
- 10) FUEL FEED
- 11) INPUT WATER CONNECTIONS
- 12) AIR INLET
- 13) INLET ELECTRIC CONNECTIONS
- 14) INLET WATER
- 15) OIL FILLING WP
- 16) HEAT EXCHANGER
- 17) WATER TEMPERATURE SWITCH
- 18) OIL PRESSURE SWITCH

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### 1.4) CONTROL PANEL

- 1) HOUR METER
- 2) OFF BUTTON
- 3) START BUTTON
- 4) ON BUTTON
- 5) PANEL ON LED (GREEN)
- 6) GENERATOR OUTPUT LED (GREEN)
- 7) OIL PRESSURE LED (RED)
- 8) ENGINE TEMPERATURE LED (RED)
- 9) GENERATOR TEMPERATURE LED (RED)



## 2) MAINTENANCE

For the longevity and peak performance of the generator, it is necessary to inspect and maintain the genset according to the following table.

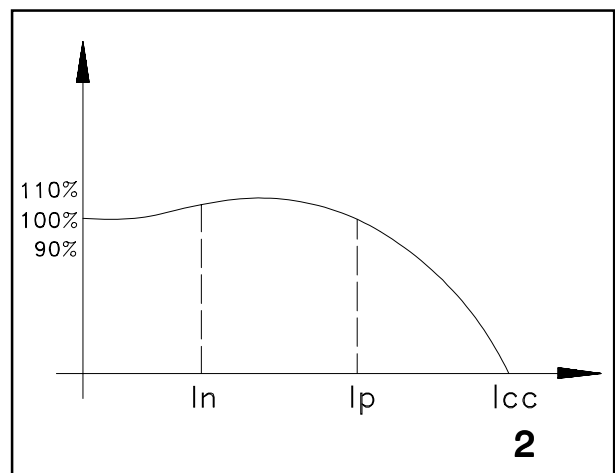
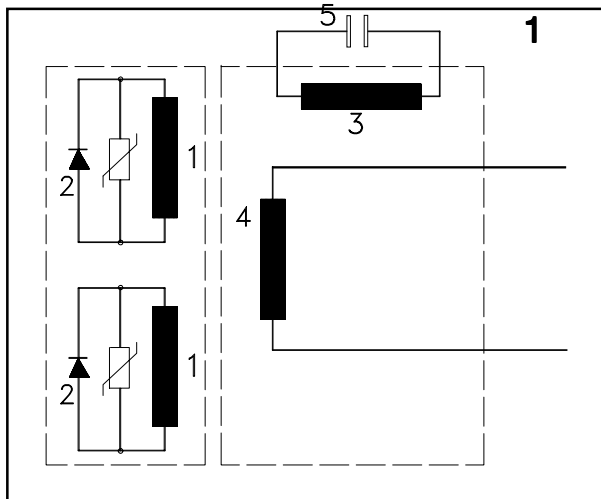
Regarding the engine, the maintenance operations are described in the use and maintenance manual and shop manual issued by Yanmar, the engine manufacturer.

Important note: while involved in normal maintenance work of the generator (dismounting/mounting) certain guidelines must be followed:

- respect the torque specifications.
- use appropriate oil, grease and bonding agents.
- do not clean windings or electrical parts with acid or other corroding substances.
- spray deoxidizer on the electrical contact points
- respect the numerical order of wires. If necessary, note their numeration and position.

	MANUTENZIONE - MAINTENANCE - ENTRETIEN WARTUNG - MANUTENCIÓN		PERIODICITÀ ORE - HOURS HELPER STANDEN - HORAS						
	10	25	50	100	200	300	500	1000	
NETTOIL - INJECTORS - INJECTORS ENGRAISSAGE - NETTOILES								●	
FILTRU OILU INTRINCO - FILTERU OILU FILTER - FETRE MALE INTRINCOU - FETRE OILU INTRINCOU - FETRE MALE INTRINCOU								●	
PULIZIA DEL GENERATORE - GENERATOR CLEANING - NETTOYAGE DU GENERATEUR - REINIGUNG DES GENERATORS - LIMPIEZA DEL GENERADOR								●	
PULIZIA CIRCUITO NOVA - INVERT CIRCUIT CLEANING - NETTOYAGE DU CIRCUIT INVERSEUR/RECHARGEUR LIMPIEZA CIRCUITO ACU								●	
LEVEL OIL MOTOR - TOP/REAR OIL LEVEL - NIVELU SOPRIN MOTO - ÖLSTAND MOTOR - NIVELU ACQUA ACQUA	●								
LEVEL LIQUID BATTERY - BATTERY WATER LEVEL - NIVELU LIQUIDU DE BATERIE - SÄURESTAND DER BATERIE - NIVELU LIQUIDU BATERIE				●					
RECOIL MOTOR - MOTOR REPAIRING - DURATA MOTOR - LÄUFERREPARATUR - ANWENDE MOTOR								●	
CONTROLLED CIRCUIT ACQUA - INVERT CIRCUIT CONTROL - CONTROL CIRCUIT OIL - INVERSEUR/RECHARGEUR CONTROL CONTROL CIRCUITO ACU								●	
WASH 2 BENCH - 2ND ANCHOR - FASTENERS OF ONE ANCHOR - FASTENERS OF ANCHOR								●	
TENSION CIRCUIT BELT TENSION TENSION CIRCUITS - DEHNSCHNURANSPANNUNG - TRACINU CORREA								●	
SECC HANDLE - ROCKER HANDLE SLIDANCE - SECC SOUPLAS IT CALIBR - KONTAKTSPREIS - KONTAKTSPREIS								●	
SEPARATE PROTECTIVE MOUNTING COMB - TIGHER PLUS DELU KOPF ANKER - SPERRSCHALTER KOPF ANKER - DRUCKDRUCKPOMPE SCHLUSS - MOMENTU TORSON JUNTURA BINGU COMBUSTIBLE								●	
SOLO CARTER - CHANGE OF CARTER PALE MOTOR OIL - ANZUG CARTER								●	
FILTRU OILU - OIL FILTER - FETRE MALE - OIL FILTER - FETRE MALE								●	
FILTRU COMBUSTIBILE - FUEL FILTER - FETRE COMB - KRAFTSTOFFFILTER/TEMPERONE - FILTRU COMBUSTIBILE								●	
CARINA BELT COURNOU - DEBILITAZIONE COMB Fp - Adm - F - Rp - Rp - Rp - Rp								●	
SMERIGLIATURA PAVOLE - LIP PAULES - PULSAGE SOUFA PEL - LINDSCHLEIFEN DER PAVOLE - LINDSCHLEIFEN AL PAULAS								●	
SOFT FUSION ELASTIC PISTONE - REPLACEMENT OF PISTONE ELASTIC BATTERIES - SUBSTITUTION BATTERY DE PISTON - ERSETZUNG DER SPANNUNGSNUTZBATTERIE - SUBSTITUCION BATERIA ELASTIC PISTON								●	

## 3) PRINCIPLE OF POWER GENERATION



IS 2500 generators are equipped with two pole synchronous brushless alternators. These alternators are also self-regulating and self-exciting with a capacitor (Fig. 1 Ref. 5) connected to the auxiliary winding of the stator (Fig. 1 Ref. 3).

The alternator generates an alternating voltage at the terminals of the main winding (Fig. 1 Ref. 4) having a frequency of 50 or 60 Hz. (Depending on whether the engine runs at 3000 or 3600 R.P.M.). The generation of current is in accordance with the principle described here below:

When starting the unit, the magnetic force of the rotor (residual magnetism of the nucleus) induces a voltage in the auxiliary winding of excitation (Fig. 1 Ref. 3). This voltage is fed to the capacitor (Fig. 1 Ref. 5) which creates a capacitive current circulating in the closed circuit constituted of the capacitor and the auxiliary winding.

This capacitive current, creates a magnetic field reinforcing the magnetism of the rotor, thus creating in it a voltage which rectified by the diodes (Fig. 1 Ref. 2) makes a D.C. current circulate in the induction windings (Fig. 1 Ref. 1). As a result of which a rotating magnetic field is created which generates the rated output in the principal winding (Fig. 1 Ref. 4) and which can be tapped at the terminals.

The voltage and current values (denoted in percentage terms of rated values) are as shown in the diagram (Fig. 2).

As you will note, it is possible to get energy up to the nominal value. With voltage practically constant (+/- 5%). Moreover, the alternator at a voltage not inferior to 70-75% of the rated voltage, is able to furnish, as initial power rush, up to 3 times the rated amperage.

As we know, this initial rush, typical of this alternator is extremely important to start asynchronous motors.

<b>IS 2500</b>	<b>60 Hz 3.80 Ohm</b>
<b>IS 3501</b>	<b>60 Hz 1.86 Ohm</b>
<b>IS 5501</b>	<b>60 Hz 0.75 Ohm</b>

#### 4) SERVICE

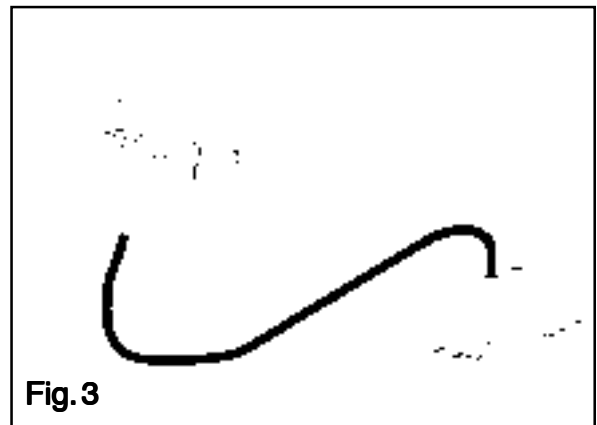
All the resistances must be measured when the alternator is cold, ambient temperature between 10 - 30 °C and with an instrument that allows reading of given values.

The tolerance against the reported values is around  $\pm 10\%$ .

Readings taken with simpler instruments can only indicate the continuity of the winding but cannot indicate the presence of short circuits.

*Note:  
Apart from the possibilities suggested here, one or more windings could also be grounded causing a failure.  
We suggest with a tester that has no continuity between the extremities of the windings and ground.*

##### 4.1) Excitation winding



##### Testing method:

-Disconnect from the capacitor the two wires (color: BLUE) coming from the stator (Fig. 3).

-Verify the resistance values between these two wire terminals are within the limits as reported in the table.

**REMEDY:** Replace the stator.

## 4.2) Power excitation

### Characteristic:

IS 2500	60 Hz	0.90 Ohm	
IS 3501	60 Hz	0.44 Ohm	
IS 5501	60 Hz	0.18 Ohm	
IS 2500	60 Hz	0.10 Ohm	13 V
IS 3501	60 Hz	0.10 Ohm	13 V
IS 5501	60 Hz	0.10 Ohm	13 V

## 4.2) Power winding

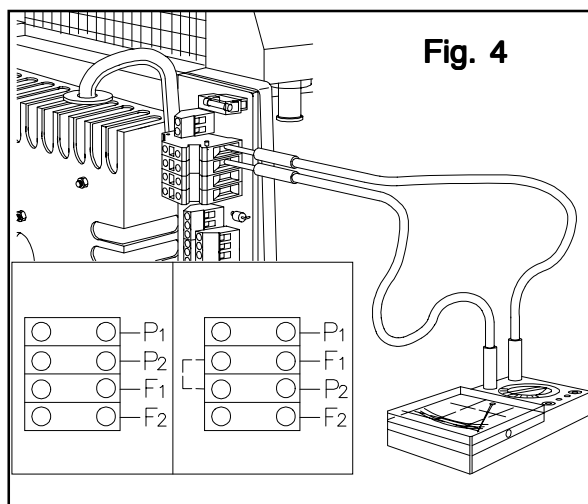


Fig. 4

### Testing method:

- Disconnect from the terminal board, the wires coming from the stator, marked by the letters  $P_1 F_1$   $P_2 F_2$  (Fig. 4).
- Verify that the resistance values between the two pairs of wire terminals  $P_1 F_1$  and  $P_2 F_2$  are within the limits as reported in the table above.

**Note.** The total resistance value for power winding (220 V 240 V) is measured connecting  $F_1$  and  $P_2$ . the resistance value measured between  $P_1$  and  $F_2$  is double of that indicated in the table above.

**REMEDY:** Replace the stator.

## 4.3) Battery charger winding (stator)

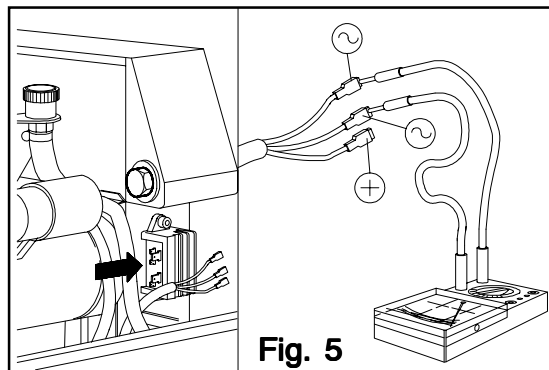


Fig. 5

### Testing method:

Disconnect the wires coming from the regulator (Fig. 5) and verify that the resistance values between the green wires are within the limits indicated in the table above.

### AS AN ALTERNATIVE:

- Verify that the voltage between the GREEN wires is as reported.

IS 2500	60 Hz	20 Amp
IS 3501	60 Hz	30 Amp
IS 5501	60 Hz	30 Amp

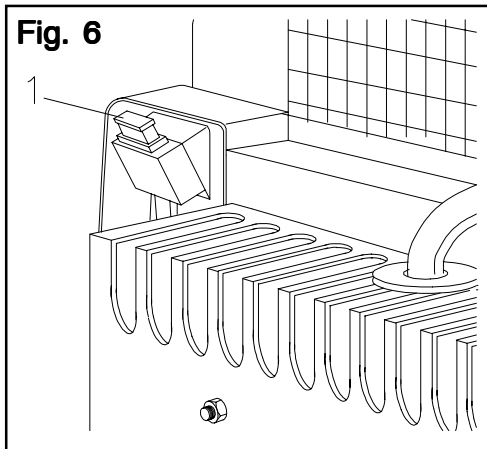
**Note:** The above measurements must be done within few minutes of starting, without any load applied to the generator and with the starting battery connected.

**REMEDY:** Replace the stator.

### **WARNING**

*The battery charger circuit, equipped with an electronic charger regulator, has a max. output of 15 A at 12 V. If the defect on the battery charger circuit results do not depend on the fuse or on the stator windings, it is advisable to replace the regulator*

#### 4.4) Battery charger fuse



#### Testing method:

-Verify the continuity at its terminals (Fig. 6 Ref.1).

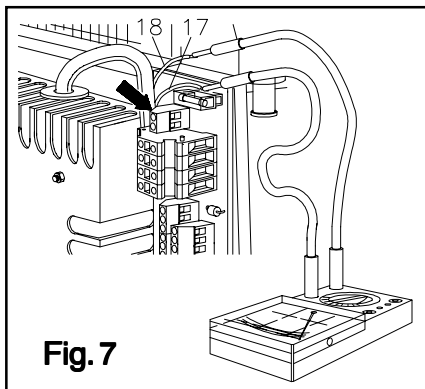
**REMEDY:** Replace the fuse.

#### 4.5) Thermal switch (stator)

#### Characteristics:

Normally closed. Trips at a temperature of 185°F

IS 2500	60 Hz 0.50 Ohm
IS 3501	60 Hz 0.57 Ohm
IS 5501	60 Hz 0.74 Ohm



#### Testing method:

-Disconnect from the terminal board, the two wires (colour: Black), connecting terminals No. 17 and 18 (Fig. 7) to the stator.

-Check that there is continuity between the two ends of the two wires.

**REMEDY:** Replace the stator.

**Note:** The thermal switch can trip because of overload or overheat. Therefore, it is important to verify the loads connected and the running temperature of the generator considering the installation to verify if it may have contributed to the problem.

#### 4.6) Rotorwinding (no. 2)

#### Testing method:

-Disconnect the wires of the rotor winding.

-Verify the resistance value between the wire terminals is as reported in the table above (Fig. 8).

**REMEDY:** Replace the rotor.

#### **WARNING**

*If there is still no power, it is a rare possibility the residual magnetism of the rotor may have dissipated. To solve the problem it is advisable to connect a 12 V battery to the capacitor terminals or to the power terminals, for a few moments, while the generator is running. The rotor become magnetized immediately.*

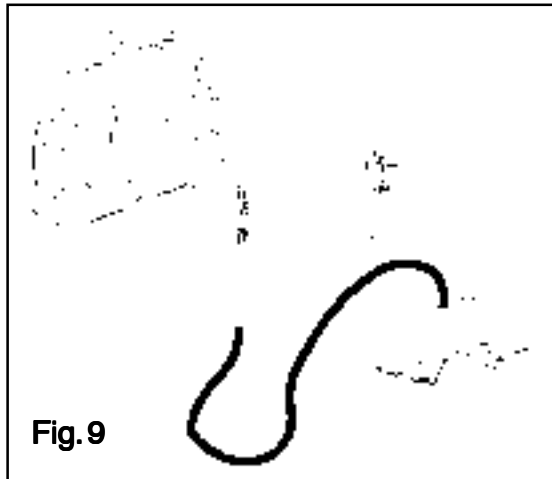


IS 2500	12.5 microfarad	500 V
IS 3501	20 microfarad	500 V
IS 5501	35 microfarad	500 V

#### 4.7) Rotor diodes

**Characteristics:** 21 A 800 V

**Normal direction**    0.66 Ohm  
**Reverse direction**    No continuity.



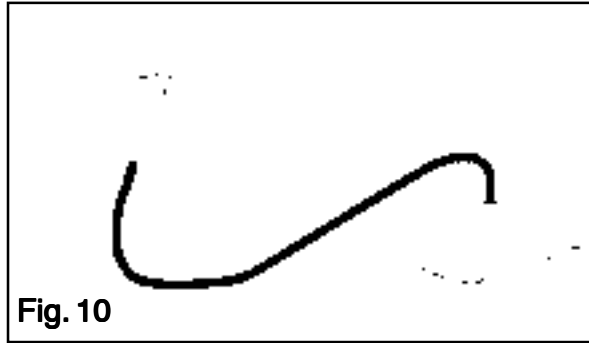
#### Testing method:

- Disconnect the wire from the diode.
- Verify that the resistance value between (+) and ground is as reported in the table above. (Fig. 9).
- Invert the tester terminals and verify that there is no continuity in the reverse direction.

**REMEDY:** Replace the diode.

**Note:** If the diode is defective, it is necessary to replace the varistor too, (Fig. 9 Ref. 1), even if it appears intact.

#### 4.8) Capacitor



#### Testing method:

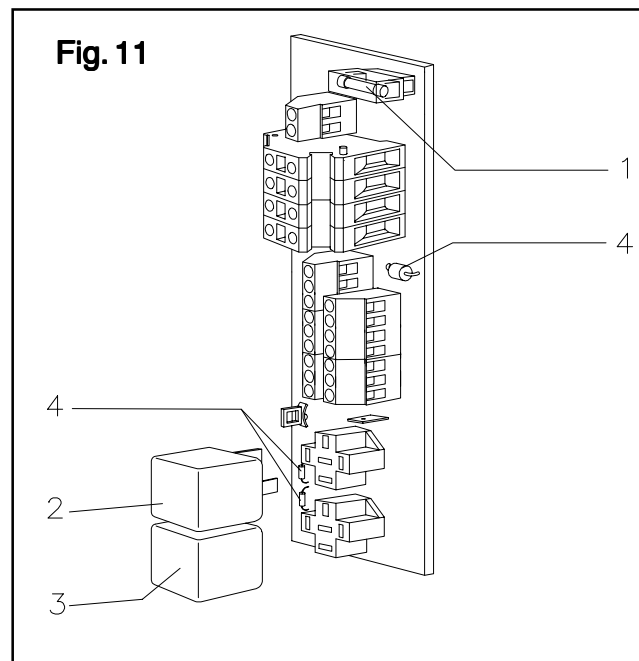
-Disconnect the wires (color: BLUE) of the capacitor.

-With the tester set to (x1000) connect it with the capacitor terminals. The needle must swing sharply away and back the moment the tester probs touch the capacitor terminals (Fig. 10).

**Note:** With this test, the capacitor is checked for short circuits/interruptions. However, if the capacity is diminished, resulting in a voltage drop under no load condition, this test cannot diagnose the problem. In this case we suggest the capacitor be replaced after having checked for other possible faults.

**REMEDY:** Replace the capacitor.

#### 4.9) Relay p.c. board



#### 4.9.1) Fuse

**Characteristics:** 1A

#### Testing method:

-Verify the continuity at its terminals (Fig. 12 Ref.1).

**REMEDY:** Replace the fuse

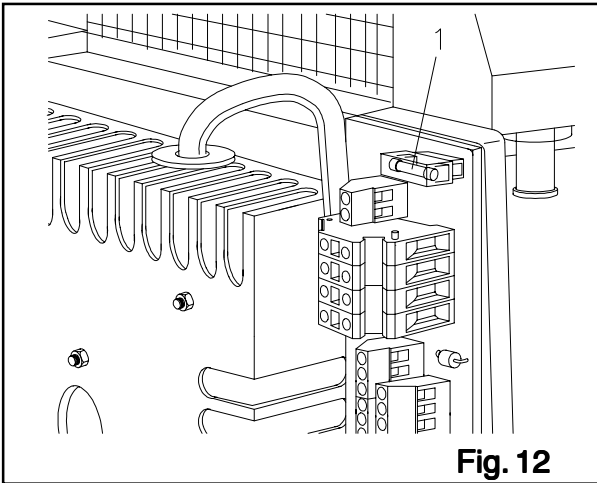


Fig. 12

#### 4.9.2) Relay

**Characteristics:** 12V, 30A

30 - 87 Contact normally OPEN

30 - 87b Contact normally CLOSED

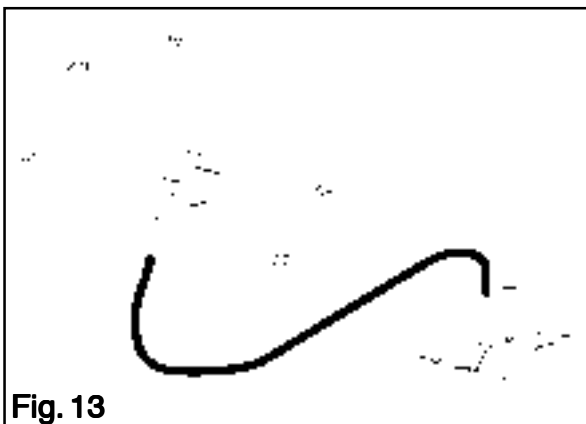


Fig. 13

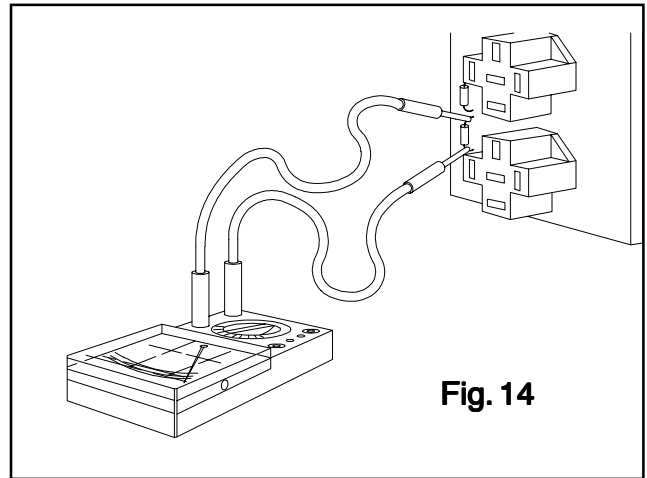


Fig. 14

#### Testing method:

- Remove the relay.
- Verify that there is continuity between 85 and 86 (Fig. 13).
- Verify that exciting the coil (apply 12 V to terminals 85 and 86) makes terminals 30 and 87 CLOSE and terminal 30 and 87b OPEN.

**REMEDY:** Replace the relay.

#### 4.9.3) Diodes

**Characteristics:** 1 A 1000 V

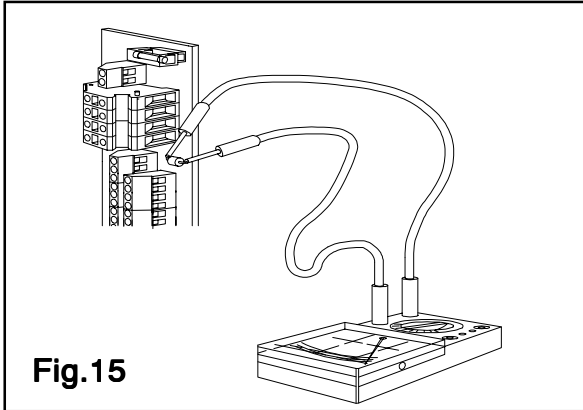
Normal direction 0.850 Ohm

Reverse direction No continuity

#### Testing method:

- Remove the relays
- Disconnect the wires from the terminal board.
- Verify that the resistance value between the diode's terminal is as reported above.
- Invert the tester probs and verify that there is no continuity in.

**REMEDY:** Replace the diode.



**Fig.15**

**4.9.4) Diodes**

<b>Normal direction</b>	<b>0.75 Ohm</b>
<b>Reverse direction</b>	<b>No continuity</b>

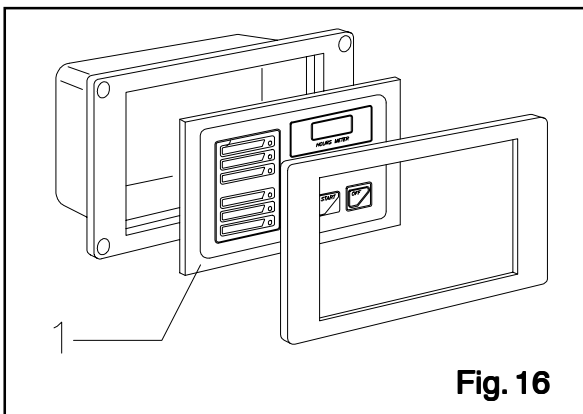
**Characteristics: 6A 600V**

**Testing method:**

-Verify the resistance value between the terminals is as reported above(Fig.15)

-Invert the tester terminals and verify there is no continuity in the reverse

**REMEDY:**Replace the diode



**Fig. 16**

**4.9.5) Printed circuit**

**Testing method:**

-Verify all generator's functions (start, stop, safety devices).

-Verify all possible causes of improper running (battery,starter, oil pressure switch, water temperature switch, alternator thermostat, relay board fuse)

**REMEDY:** Replace the printed circuit .(Fig.16 Ref.1)

*Note: When the unit stops because of an alarm intervention, the operating time indication disappears from the control panel display and a code appears to indicate the cause of the generator fault.*

*The error code meanings are as follows:*

<b>TABLE OF ALARM CODES</b>	
<b>CODE</b>	<b>REASON FOR ALARM</b>
<b>E - 80</b>	No power to genset
<b>E - 81</b>	Oil pressure low
<b>E - 82</b>	Motor temperature high
<b>E - 83</b>	Alternator temperature high
<b>E - 85</b>	Generator set overloaded
<b>E - 87</b>	After 30 sec. from start-up, the genset has not reached 80% of rated voltage
<b>batt</b>	Battery voltage low

**Code E-80** This code indicates the genset has stopped due to a total lack of voltage = 0 V. This code means:

- the control panel is not able to read the voltage in the alternator due to a break in an electrical connection;
- the alternator is damaged.

**Code E-81** This code indicates the genset stopped because the pressure in the motor lubrication system is insufficient.

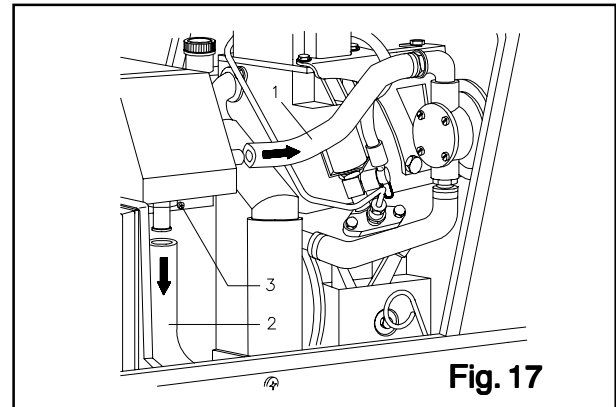
**Code E-82** This code indicates the genset stopped because the motor is too hot.

**Code E-83** This code indicates the genset stopped because the alternator is too hot.

**Code E-85** This code indicates the genset stopped because the voltage has dropped to under 70% of the rated value for over 15 seconds.

**Code E-87** This code indicates the genset stopped because, 30 seconds after start-up, the voltage in the generator group has not reached 80% of the rated voltage. This may be because the engine revs. are too low or because the alternator is broken.

**Code batt.** This code indicates the battery voltage is too low. When this code appears the generator is not stopped.



#### 4.9.6) Heat exchanger (air / water)

**Characteristics:** Fouling free

#### Testing method:

- Disconnect the water hoses (Fig. 12 Ref. 1/2).
- Remove the screws (fig. 17 Ref. 3) and the heat exchanger.
- Verify visually.

**REMEDY:** Wash exchanger in water (90%) and hydrochloric acid (10%) solution at 150°F temperature.

Replace component if necessary.

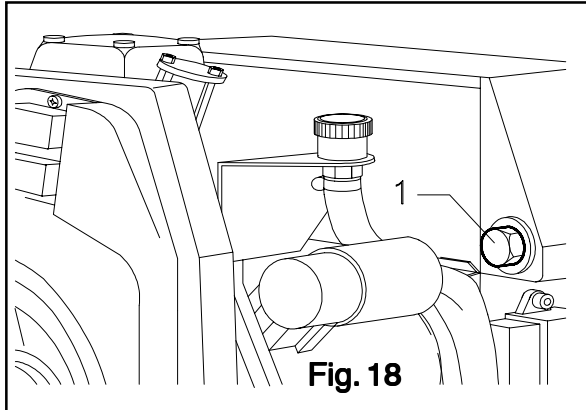
#### 4.9.7) Zinc anode

**Characteristics:** Regular consumption

**Testing method:**

- Check visually.
- Unscrew and remove the complete plugs (fig.18, Ref.1).

**REMEDY:** Replace the Zinc.



**Fig. 18**

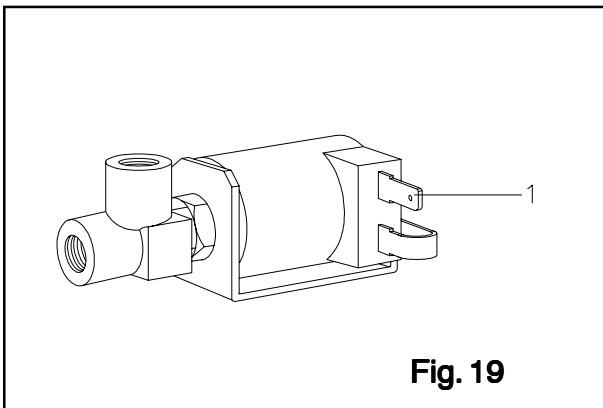
#### 4.9.8) Stop solenoid

**Characteristics:** 12V, normally closed, coil resistance 18.3 ohm

**Testing method:**

- Disconnect the terminal (Fig.19 Ref.1).
- Verify the resistance value between the terminal and ground is as reported above.

**REMEDY:** Replace the fuel solenoid



**Fig. 19**

#### 4.9.9) Diesel pump

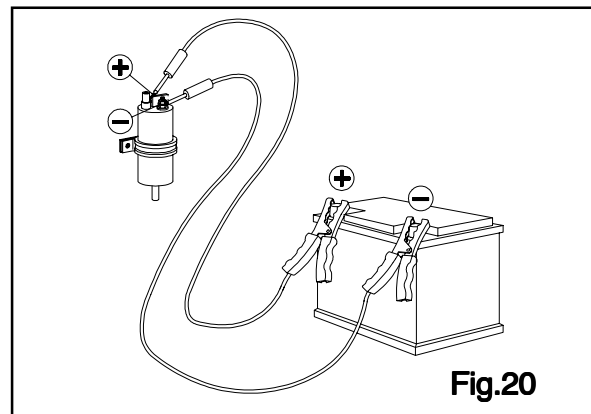
**Characteristics:** 12V

**Testing method:**

- Disconnect the wires
- Connect a 12V battery (+) pole to the(+) of the pump and (-) pole to the (-) of the pump and verify if it is running well (Fig.20)

**ATTENTION:**

*The pump is cooled directly by the passage of DIESEL fuel. Make sure the pump does not run in dry condition (without fuel).*



**Fig.20**

**REMEDY:** Replace the pump

Note: The diesel circuit has a filter cartridge type before the pump. For correct functioning of the pump itself, replace the cartridge every 300 hours.

#### 4.9.10) Water temperature switch

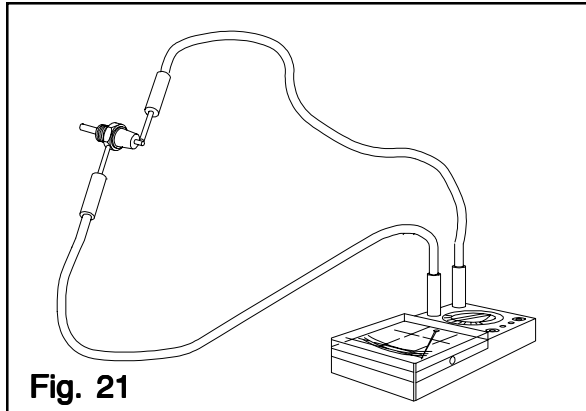


Fig. 21

##### Characteristics:

The contact is normally open.

The contact is closed at  $T > 185^{\circ}\text{F} \pm 8^{\circ}\text{F}$

##### Testing method:

-Verify there is no continuity between (+) and ground(Fig.21).

-Put the thermostat in water at  $185^{\circ}\text{F}$  and check if the contact closes.

**REMEDY:** Replace the thermostat

#### 4.9.11) Oil pressure switch

##### Characteristics:

Contact normally CLOSED

Contact OPEN  $P=1\text{ATM}$

##### Testing method:

-Check if there is continuity between (+) and ground when the engine is not running (Fig.22).

-Check if there is no continuity between (+) and ground when the engine is running and the oil is at the right level.

**REMEDY:** Replace the pressure switch

##### WARNING:

*The pressure switch does not provide exact indication of oil level. A periodically check (8hours) the oil level to prevent the engine from seizing.*

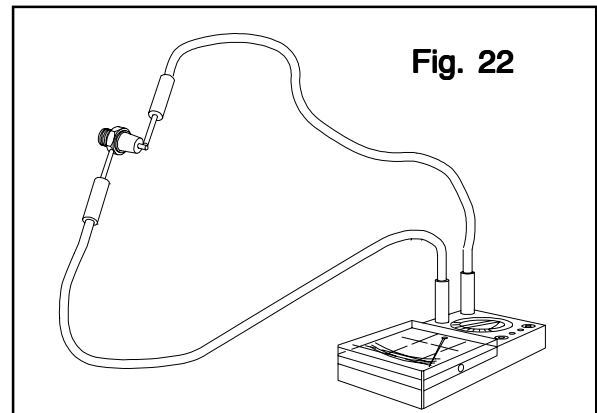


Fig. 22

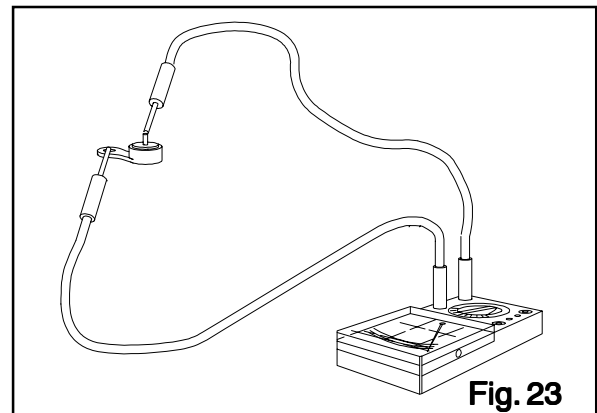


Fig. 23

#### 4.9.12) E.H.T. Device (Engine high temperature)

##### Characteristics:

The contact is normally open

The contact is closed at  $265^{\circ}\text{F} \pm 8^{\circ}\text{F}$

##### Testing method:

-Verify there is no continuity between (+) and ground (Fig.23).

**REMEDY:** Replace the thermostat

#### 4.9.13) Starter

**Characteristics:** 12V 0,8 KW

##### Testing method:

-Disconnect the wires.

-Connect a 12V battery (+) pole with the screw clamp and (-) pole to the body of the starter (Fig.24).

-Connect the screw clamp and the adjacent fast-on and verify if the starter is running well (Fig.24 Ref.1).

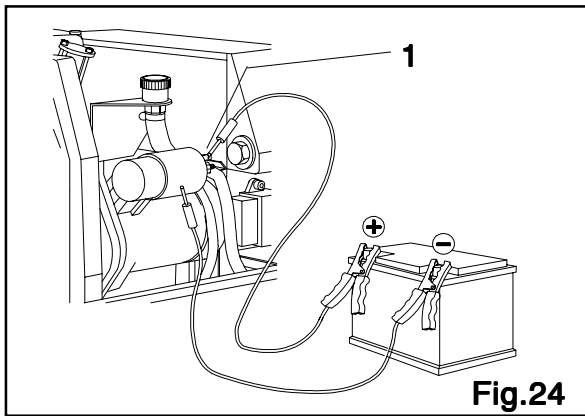


Fig.24

IS 2500 60 Hz Z22 - 10x560  
 IS 3501 60 Hz Z24 - 10x610  
 IS 5501 60 Hz Z25 - 10x635

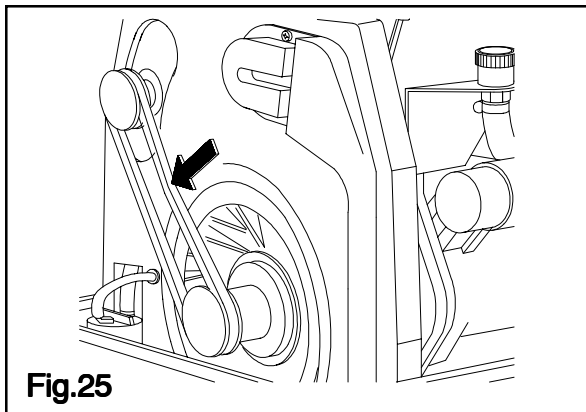


Fig.25

#### 4.9.14) Water pump belt

##### Testing method:

-Press the belt with approx. 10Kg of pressure and to be sure that bending is not more than 0,5 cm (Fig.25).

**REMEDY:** Stretch the belt. Loosen the fixing bolts of the water pump (Fig.26 Ref.1). Adjust the screw (Fig.26 Ref.2) and tighten the fixing bolts(Fig.26 Ref. 1).

**Note:** For correct functioning of the water pump repete these operations every 200 hours.

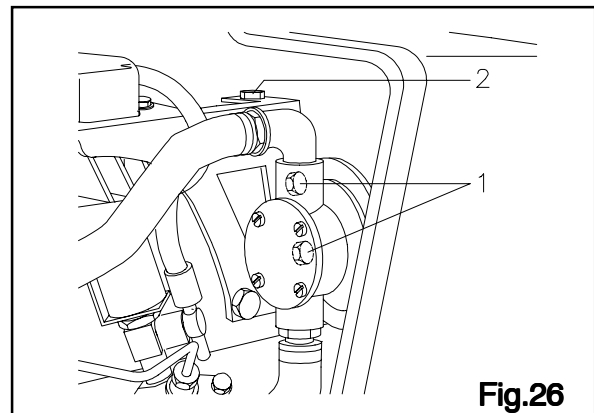


Fig.26

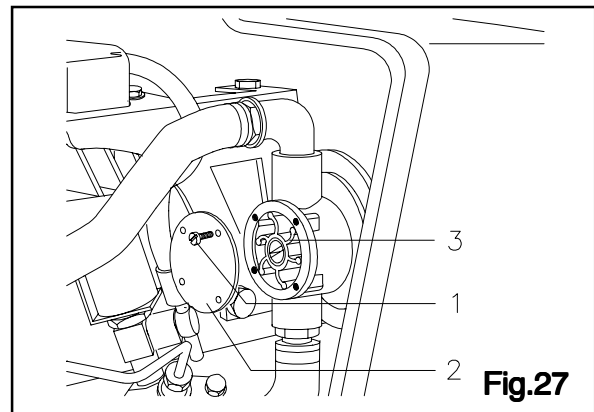


Fig.27

#### 4.9.15) Water pump

**Characteristics:** diameter 40mm

height 20mm

type Johnson (F35 B/8)

##### Testing method:

-Visual

-Remove the screws (Fig.27 Ref.1) and pump cover (Fig.27 Ref.2).

-Remove the impeller (Fig.27 Ref.3).

**REMEDY:** Remove the impeller

**Note:** For correct functioning of the generator repete these operations every 300 hours or after one calendar year, whichever is less.

## 60Hz

no load 62/62.5Hz 245/250V-120/125V

full load 60/56Hz 235/240V-115/120V

### 4.9.16) Engine speed adjustment

#### Characteristics:

Since the alternator is a two pole type, 1Hz->60 R.P.M. (3000 R.P.M. ->50Hz, 3600 RPM. -> 60Hz).

#### Testing method:

-Verify the frequency at power terminals using a suitable instrument (vibrating-reed or digital frequency-meter).

*Correct readings of voltage and amperage are obtained only by employing instruments with true effective value*

**REMEDY:** Slack the screw (Fig.28 Ref. 1/2).

-Rotate the levers up to reach RPM then lock the screws.

**Note.** Since voltage is proportional to frequency, if and when there are voltage anomalies, check the RPM.

#### IMPORTANT:

*Since RPM is adjusted and blocked during the testing phase, it is advisable not to modify. The above instruction should be followed by a check-up of the engine. When looking for causes leading to low efficiency, it is advisable to verify air filter, fuel filter choking, and defective holed injection.*

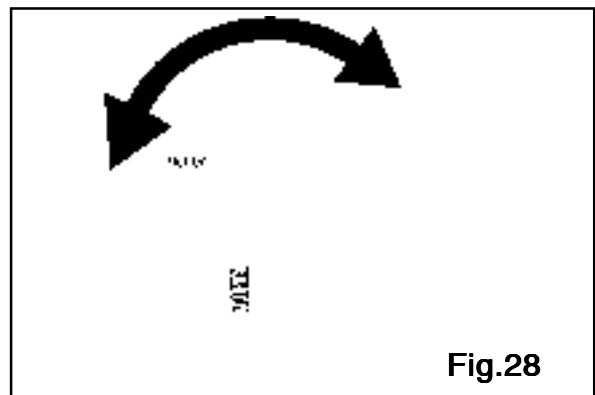


Fig.28

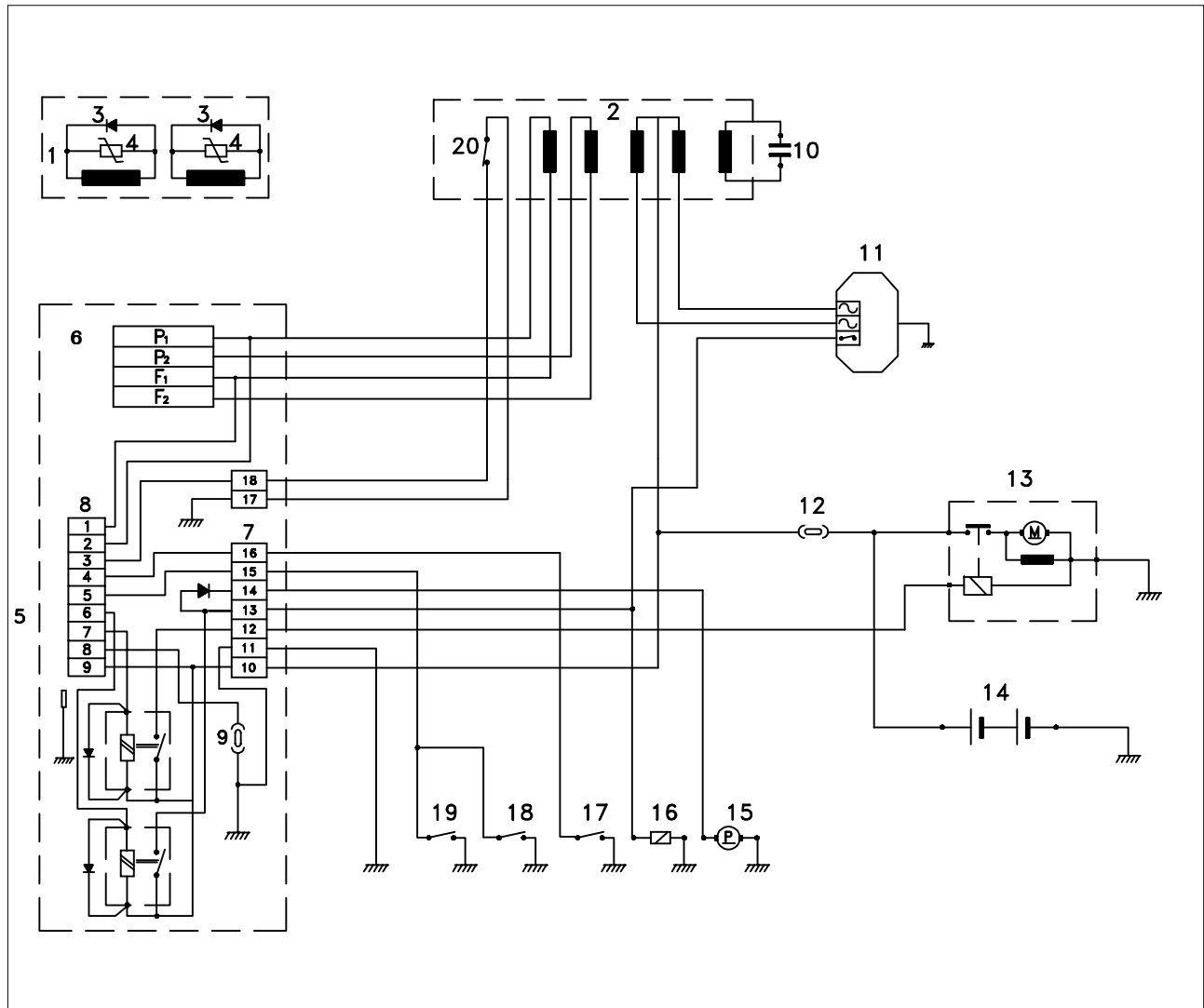
## 5) TROUBLE SHOOTING/MAINTENENCE

COMPLAINT	DOES NOT START	START AND STOP	UNSTABLE RUNNING	WHITE SMOCKE	BLACK SMOCKE
PROBABLE REASON					
Defective starting buttons	●				
Defective fuel solenoid	●	●			
Defective battery cable section	Battery ●				
Defective starting motor	●				
Piping fuel filter choked	●	●			
12V circuit fuse	●				
Avv./Ev.relay	●				
Too much oil in crankcase			●	●	
Safety device intervention	●	●			
Overload					●
Defective governor linkage			●		
Worm valve guides				●	
Blocked valves	●				
Worm cylinder and position rings				●	
Defective injector	●				●
Defective injector pump	●	●	●		●
Defective feeding pump	●	●			

MAINTENANCE		HOURS							
		10	20	50	100	200	300	500	1000
CLEANNING	INJECTORS							●	
	INTERNAL OIL FILTER							●	
	GENERATOR CLEANING						●		
CHECK	KRANKCASE OIL LEVEL		●						
	BATTERY WATER LEVEL			●					
	ROTOR BUSHING								●
	ROCKER AARMS CLEARANCE			*				●	
	TIGHTEN FUEL DELIVERY UNION						●		
REPLACEMENT	CRANKCASE OIL			*		●			
	OIL FILTER							●	
	FUEL FILTER						●		
OVERHAUL	LAP.VALVES								●
	REPLACEMENT OF PISTON'S ELASTIC BANDAGES								●

\* FIRST REPLACEMENT

## 6) WIRING DIAGRAM



## DESCRIPTION

- 1 ROTOR
- 2 STATOR
- 3 DIODE 3A
- 4 VARISTOR
- 5 PRINTED CIRCUIT RELAY
- 6 POWER TERMINAL BOARD
- 7 RELAY CIRCUIT TERMINAL BOARD
- 8 CONTROL PANEL TERMINAL BOARD
- 9 FUSE 1A
- 10 CAPACITOR
- 11 BATTERY CHARGER REGULATOR
- 12 FUSE
- 13 STARTER
- 14 BATTERY
- 15 FUEL PUMP
- 16 FUEL SOLENOID
- 17 OIL PRESSURE SWITCH
- 18 OVERHEAD ENGINE THERMOSTAT
- 19 WATER THERMOSTAT
- 20 ALTERNATOR THERMOSTAT