Telair

GENERATORS

ENERGY 8012 GAS

USE AND MAINTENANCE MANUAL AND

INSTRUCTIONS FOR INSTALLATION

GB

V. 001 - May 2008

INDEX

Via E. Majorana , 49 48022 Lugo (RA) ITALY

"CE" COMPLIANCE STATEMENT

Under Machine Directive 89/392/EEC, attachment II A

We hereby represent that the generator-set, the data concerning which appear below, has been designed and built to correspond to the essential safety and health requirements laid down by the European Directive on Machine Safety.

This statement shall not be valid any longer if any changes are made on the machine without our written approval.

Machine: GENERATOR-SET

Model: ENERGY 8012 GAS

Serial number: ……..

Directive of reference:

Machine Directive (89/392/EEC) in version 91/31/EEC

Low Voltage Directive (73/23/EEC)

Electro-magnetic Compatibility (89/336/EEC) in version 93/31/EEC

Harmonised standards applied, especially: EN 292-1; EN 292-2; EN 60204-1

DATE ..... 29/04/2008.....

THE PRESIDENT

1 FOREWORD

Refer carefully to this manual before performing any operation on the air conditioner.

1.1 Purpose and scope of this manual

This manual has been drawn up by the Manufacturer in order to provide basic information and instructions for performing every operation for servicing and using the generating set in a proper and safe manner.
It is an integral part of the equipment of the generating set, must be kept with care throughout the life of the same, and must be protected against any agent which could damage it.
It must follow the generating set if the latter is installed on a new vehicle, or if its ownership changes hands.
The information in this manual is addressed to the personnel which must install the generating set, and to all those involved in its maintenance and use.
This manual sets out the purpose the machine was designed for, and contains all the information required to guarantee that it is used in a safe and proper fashion.
Constant attention to the instructions laid down here will guarantee the safety of the user, economy and longer life of the machine.
To facilitate reference, this manual has been subdivided into chapters which specify the main notions; for quick consultation, refer to the table of contents.
The most important parts of the text are in bold letters and preceded by symbols described below.
It is strongly recommended that you read the contents of this manual and the reference documents carefully; doing so is essential to the correct long-term performance and reliability of the generator set and the prevention of injury and/or damage.

Note: *The information contained in this publication was correct at the time it went to print, but may be modified without advance notice.*

1.2 Symbols and Definitions

"Graphic safety symbols" have been employed in this booklet to identify different levels of danger or important information.

This means that you must pay attention to avoid serious consequences which might lead to serious accidents or damage the health of the operators.

This means a potentially hazardous situation which could lead to accidents or to damage to property.

This calls the user's attention to a potentially dangerous situation which could cause malfunction or damage to the machine.

The drawings are only provided by way of example.
Even though the machine you actually have may differ from the illustrations contained in this manual, safety and information about the same are guaranteed.
The manufacturer, as part of his policy of constant product development and updating, may effect changes without providing advance notice.

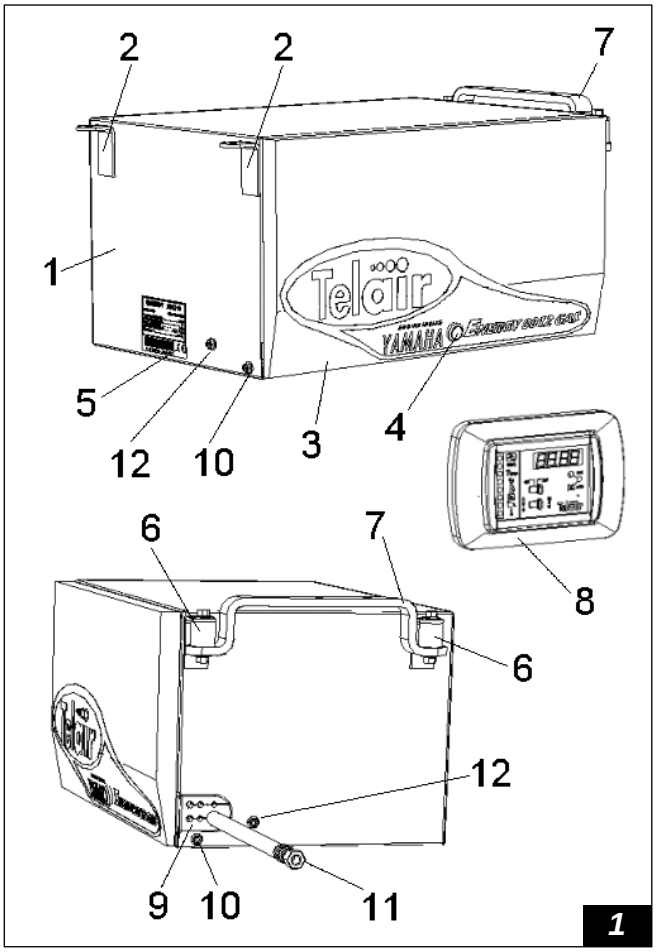
1.3 General Information

The ***ENERGY 8012 GAS*** generating set has been designed for installation on vehicles. It can supply power at a voltage of 13.5 Vdc.
The ***ENERGY 8012 GAS*** model must be fed with LPG.
In order to achieve a low noise level, the ***ENERGY*** series generating sets are provided with internally insulated sound-proofing boxes.
They can be accessed easily in order to perform maintenance work, and are provided with a remote control panel which can be installed inside the vehicle.

2 GENERATING SET IDENTIFICATION DATA

2.1 Components (Fig. 1)

1 Sound-proofing box
2 Supporting brackets
3 Access door
4 Access door closure
5 Technical features sticker
6 Anti-vibration support
7 Anchoring bracket
8 Electronic control panel
9 Cable holder and gas pipe
10 Frame locking screw
11 Supply gas arrival pipe
12 Frame all-out setscrew



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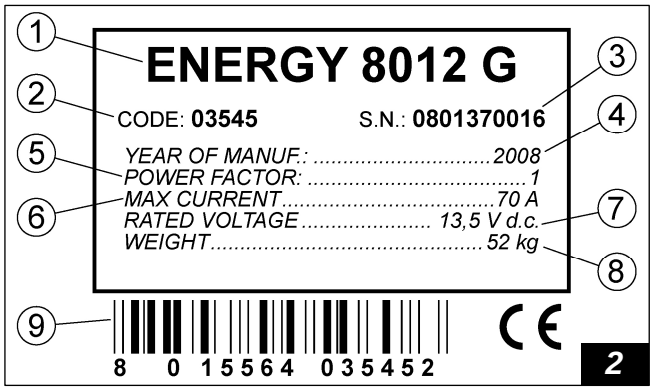
2.2 Identification plate (Fig. 2)

1 Generating set model
2 Model code number
3 Serial number
4 Date of manufacture
5 Power factor
6 Maximum current
7 Rated voltage
8 Weight
9 Barcode



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2.3 Dimensions

Figure 3 shows the dimensions of the generating sets.

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2.4 Fiche technique

		ENERGY
ENGINE		**8012 GAS**
Type		Single-cylinder, 4-stroke LPG, overhead-valve, air cooled
Engine		Yamaha MZ 175 GAS
Displacement	cm^3	171
Bore x Stroke	mm	66 x 50
Max Fuel Consumption		1.2 l/h
Fuel supply		LPG or Propane pure when it is cold
Ignition system		Electronic
Spark plug		BPR4ES
Oil sump capacity	litres	0.6
Speed governor		Automatic, centrifugal mass type
ALTERNATOR		**8012 GAS**
Type		Salient-pole rotor – Stator with brushes and built-in rectifier – Separate voltage regulator
Max power	Watt	945
Steady power	Watt	945
Voltage	Volt	13.5
Direct current output	Ampere	70
Rotor insulation class		H
Stator insulation class		F
Cooling		Centrifugal fan
GENERATOR		**8012 GAS**
Overall weight	kg	52
Overall dimensions (Length x Width x Height)	mm	555 x 385 x 295
Starting		Electric / Manual - Automatic
Supply device		Pressure reducer
Noise level		82 (56 dB_A 7 m)
Running hours	h	7

3 SHIPPING, HANDLING, STORAGE

3.1 Storage

The generating set is protected during shipping by suitable carton packaging and a wooden base. It must be stored horizontally, in a covered, dry and ventilated area.

INFORMATION **When using the generator in cold environments, please remember that the lower the temperature (down to a temperature limit of – 15°C), the higher the percentage of propane gas which is recommended**

INFORMATION ***Do not turn the package upside down. The right position is the one shown by the symbol printed on the package (↑).***

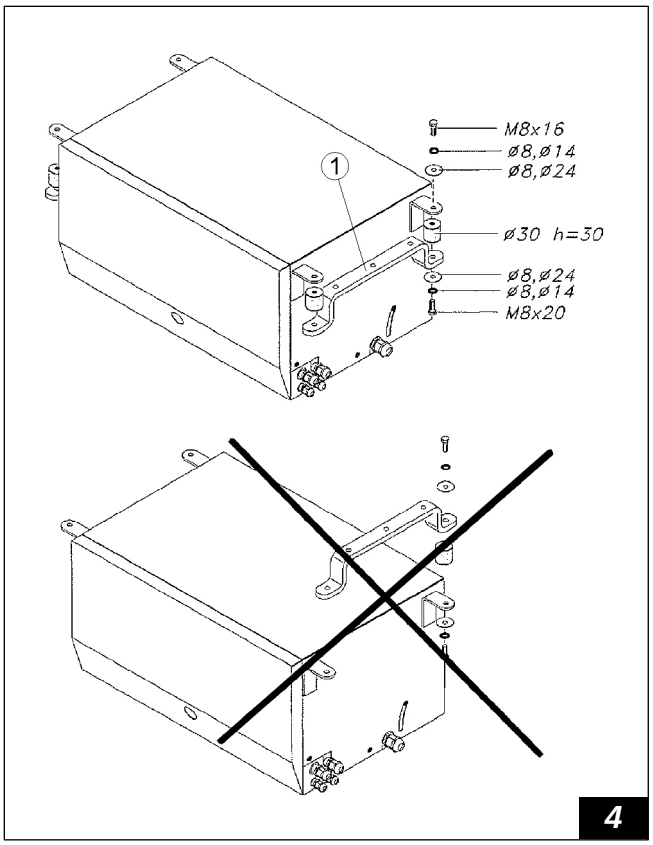
3.2 Weight

Total weight including packing:
ENERGY 8012 GAS: 52 kg

3.3 Handling

The generating sets, complete with their packaging, can be moved using common lifting and transport vehicles.
The boxes are provided with spacers in order to allow for the introduction of transpallet forks.

DANGER ***During lifting and transport, comply with accident prevention and safety regulations. Use lifting and transport equipment with a capacity greater than the load to be lifted.***



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4 INSTALLATION

4.1 PRELIMINARY NFORMATION

MANUAL ***Before installing the conditioner, it is absolutely necessary to read these instructions, in order not to make any mistakes during installation.***

WARNING ***The generator must be installed so as to prevent water seeping directly into the alternator through the inlet holes; it must therefore be protected.***

Improper installation of the generating sets can cause irreparable damage to the equipment and compromise the safety of the installation engineer.

Should the generating sets be installed in a manner which does not comply with the instructions in this manual, the Manufacturer shall be held harmless for malfunctions or for the safety of the generating set, under D.M. 89/392/EEC. Furthermore, he shall be held harmless for any damage or injury to people or things.

DANGER ***Installation must be performed by qualified and properly trained personnel only.***

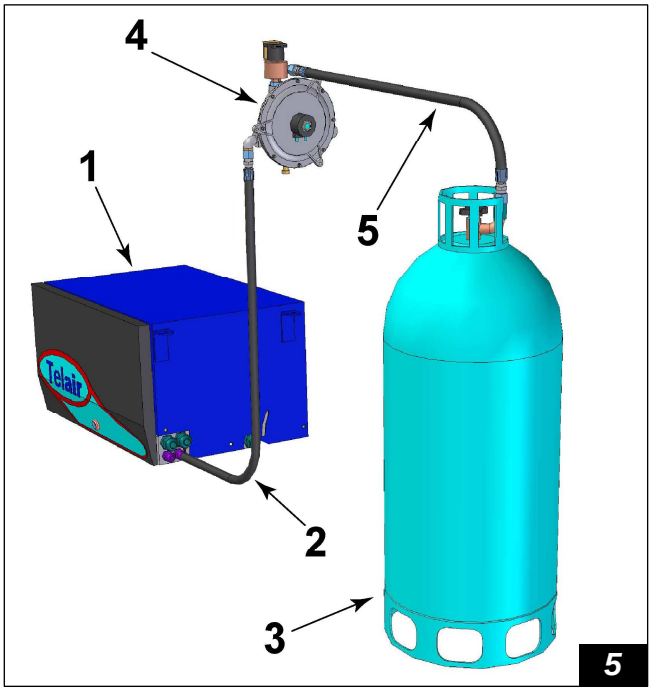
4.2 FASTENING the generating set

The ***ENERGY 8012 GAS*** generating sets are provided with anchoring brackets with extra vibration dampers (Fig. 4, Ref. 1). The brackets allow for hanging assembly.
This kind of assembly provides the following advantages: less room taken up, quick installation, easy access for routine and unscheduled maintenance.
Make sure that there is enough room around the hood of the generating set to allow cooling air to pass; leave at least 20 mm free room between the hood and the surrounding parts.
Should the generating set be behind a wheel of the vehicle, **care should be taken to prevent water from being sprayed into the generating set by the wheel when raining**.

WARNING **Make sure that the engine frame can be taken out when the door is open (Fig. 9).**

4.3 FASTENING the pressure reducer

The generating set comes standard with the suitable pressure reducer (Fig. 5 Ref. 4) already set, and 1 metre long gas hose (Fig. 5 Ref. 2) which is already connected to both the generating set (Fig. 5 Ref. 1) and the pressure reducer.
The reducer should be fastened using the suitable holes located on the 3 wings (Fig. 7 Ref.1).



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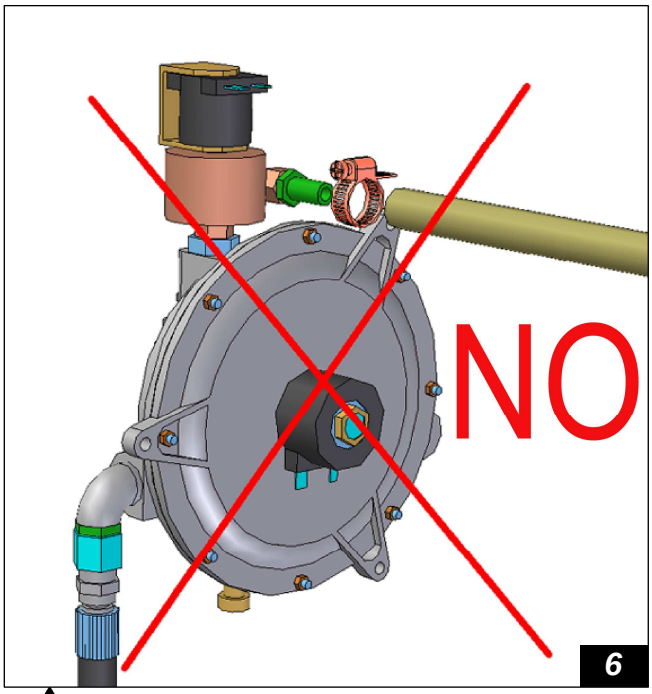

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DANGER **Remember that the pressure reducer must NOT be installed in the body interior. Moreover, it should be located in a well-ventilated area.**

No pressure reducing device should be placed between the Telair reducer (Fig. 5 Ref. 4) and the gas bottle.
The gas hose (Fig. 5 Ref. 5) which directly connects the pressure reducer and the gas bottle (Fig. 5 Ref. 6) is not supplied.
For this connection, the installer will use a suitable type-approved hose which is equipped with the suitable fittings.

DANGER **Connections as shown in Fig. 6 are FORBIDDEN on both the reducer and the gas bottle.**

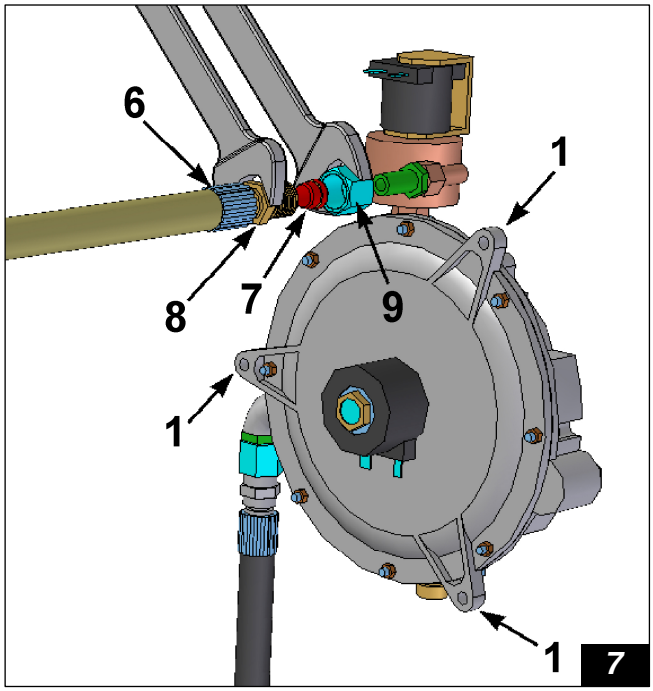

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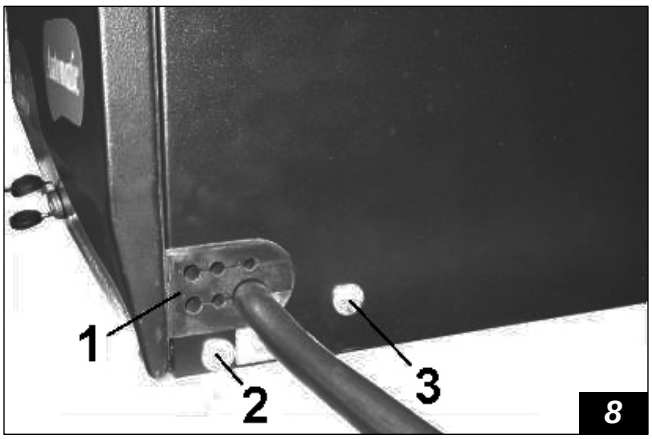
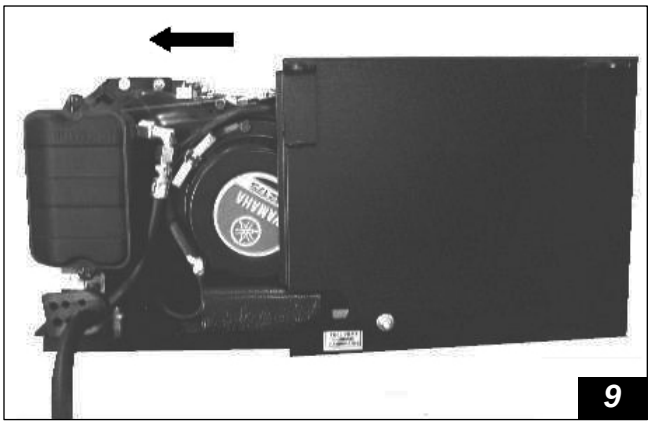
Fig. 7 shows proper connection, with a suitable hose on which the fitting (6) is tightened.
Fit the ogive (7), hold the fixed hexagon ring (8) by means of a wrench and tighten the ring nut (9).

INFORMATION **When using the generator in cold environments, please remember that the lower the temperature (down to a temperature limit of – 15°C), the higher the percentage of propane gas which is recommended**

4.4 Preparing the Wiring connection



Use the suitable key to open the lock and remove the front door.
Then remove the fastening screw (Fig. 8 Ref. 2) of the lower surface on both sides.



Take out the lower surface with the engine up to the retainer (Fig. 8 Ref. 3)
Should you wish to take out the engine holding surface in full, remove the setscrews (Fig. 8 Ref. 3) too.

DANGER ***The wiring connections to the generating set must be made by qualified personnel.***

4.5 Battery connection

To start up the generating set, you must connect to the vehicle battery using a sheathed cable (to determine its cross-section, see Table 1) in compliance with the regulations in force.
For this purpose, the generating set is provided with two terminals (Fig. 10 Ref. 1) used to connect the positive and the negative poles of the battery.

Connect the positive pole cable (red cable) to the terminal which is already provided with a red cable, and the cable of the negative pole to the terminal already provided with a black cable. The cable of the negative pole must be of the same cross-section as the positive cable and must be connected to both the negative pole of the battery and the chassis of the vehicle.
The contact must be good. If necessary, remove any paint or rust from the contact surface, and protect the connection with grease.
The start-up battery must have a capacity of at least **100 A/h**.
The soundproofing case is provided with a cable holder to let the battery connection cables go through (Fig. 8 Ref. 1).
The cable holder will prevent water from entering the generating set.

DANGER ***Check the proper position of the 12 Vdc current pick-up line carefully. A wrong connection could cause irreparable damage to the generating set or create dangerous short circuits.***

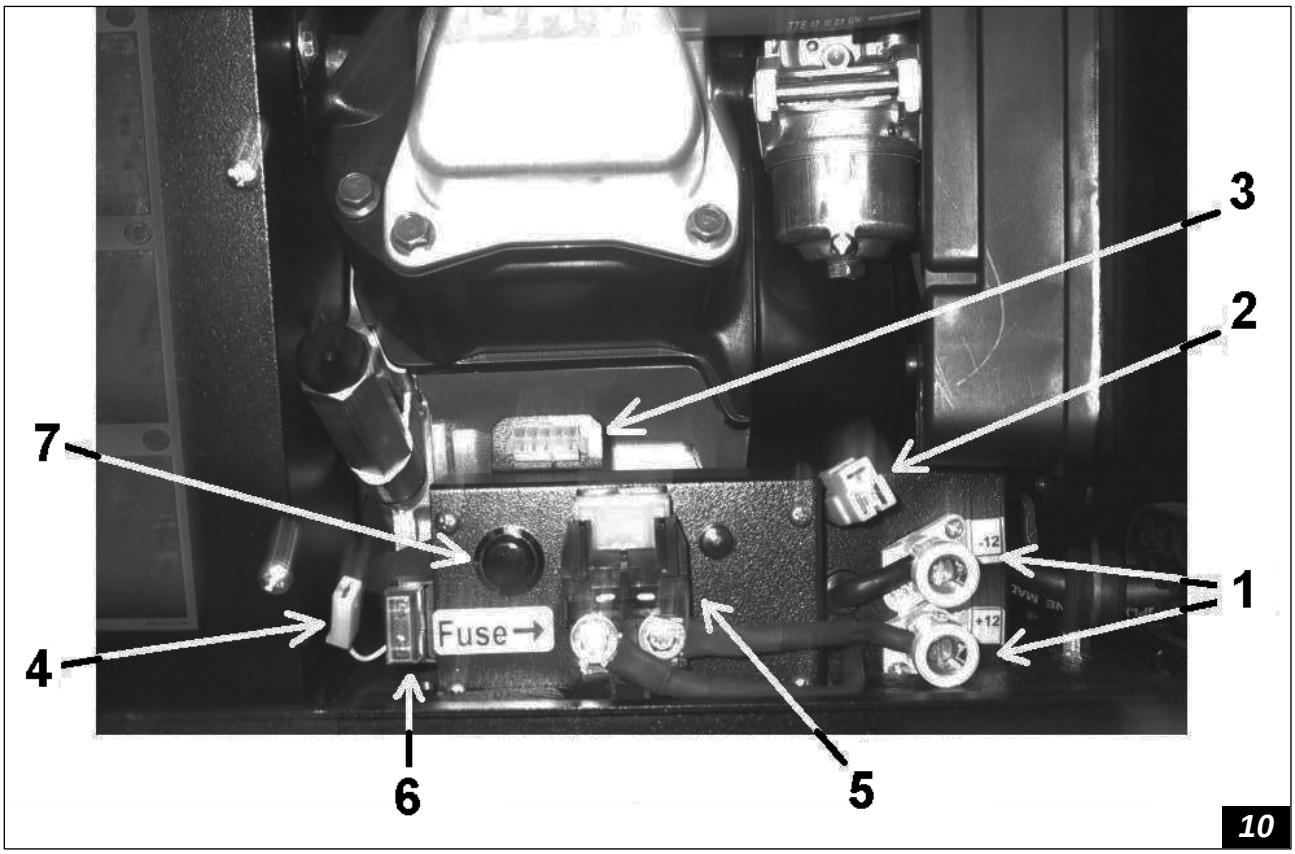
4.6 12 Volt connection

Any use of 12 Vdc is to be drawn from the generating set battery, via a cable of suitable size. The cable of the negative pole must be of the same cross-section as the positive cable.

INFORMATION ***Even if the generating set is provided with a power cutout fuse (Fig. 10 Ref. 5) in case of overload or short-circuit, a suitably calibrated thermal cutout should be installed inside the switchboard of the vehicle, which disconnects the power line to users whenever power input exceeds 70 Amp.***

TABLE 1

Battery Connection	**Cable length**	< 6 m	> 6 m
	Cross sect. mm²	25	35



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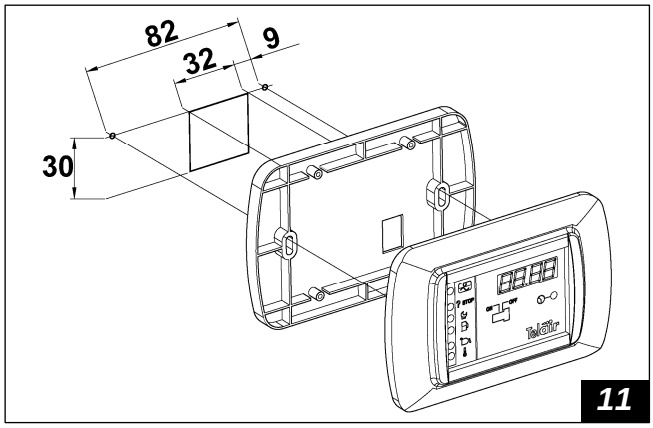
4.7 Connection of Auxiliary cables

2 auxiliary cables are to be connected, both are provided with a polarized connector.

- A 5 m long cable is delivered standard for connection from the generating set to the control panel. Make sure it is long enough for the selected path from the generating set to the control panel. Longer cables are available as an option. **See also paragraph 4.8.** Let the cable through the cable holder (Fig. 8 Ref. 1) and connect the white connector (observe proper fitting side) to the fixed connector (fig. 10 Ref. 3) which is located inside the generating set over the fuses.
- A cable is delivered standard together with the generating set for connection from the generating set to the pressure reducer. It is already connected to the pressure reducer. Let the cable through the cable holder (Fig. 8 Ref. 1) and connect the 3-pole white connector to the fixed connector (Fig. 10 Ref. 2) which is located inside the generating set near the 12 Vdc terminals.

4.8 Electronic control panel connection

Choose the position you want inside the vehicle and make a rectangular hole sized 30 x 32 mm. Let the connection cable coming from the generating set out of the hole (paragraph 4.7) and connect the black connector of the cable on the back of the electronic control panel. Fasten the electronic control panel (Fig. 11) using self-tapping screws sized 3 x 20 mm, and make sure that the rear part does not touch other surfaces; use slight pressure to fasten the plastic frame until you hear the click of the fastening tabs.



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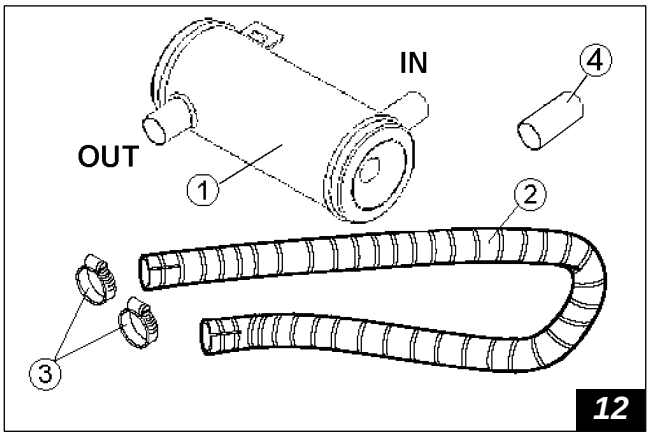
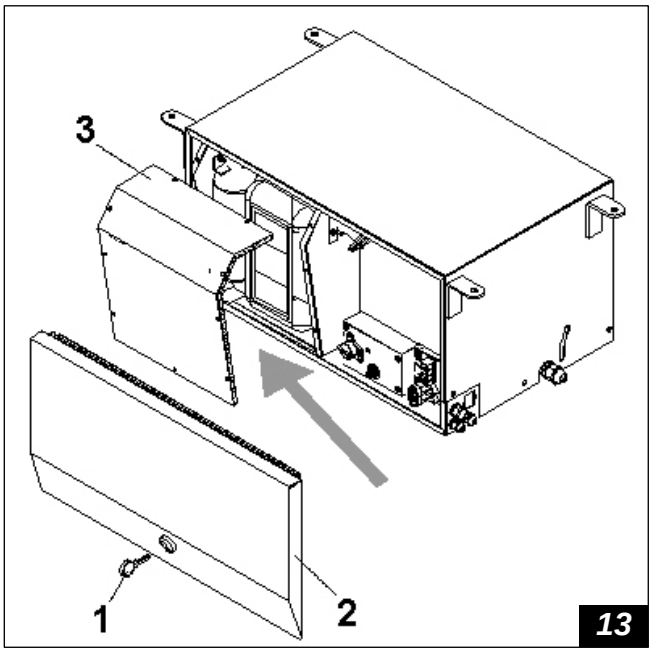
4.9 Additional muffler connection

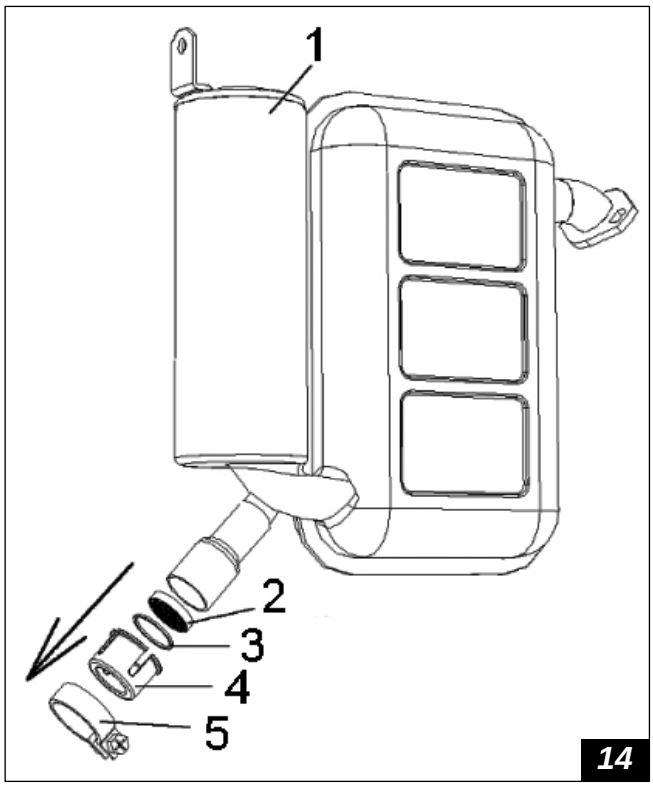
To further reduce the noise level released by the generating set, an additional (optional) muffler can be installed on the outside.
The additional muffler kit is coded 02482 and consists of the following:

- A muffler coded 02019 (Fig. 12 Ref. 1).
- A steel flexible hose, 1 m long, coded 00433 (Fig. 12 Ref. 2).
- Two fastening clamps coded 00543 (Fig. 12 Ref. 3).
- A pipe fitting for flexible hoses coded 03645 (Fig. 12 Ref. 4).

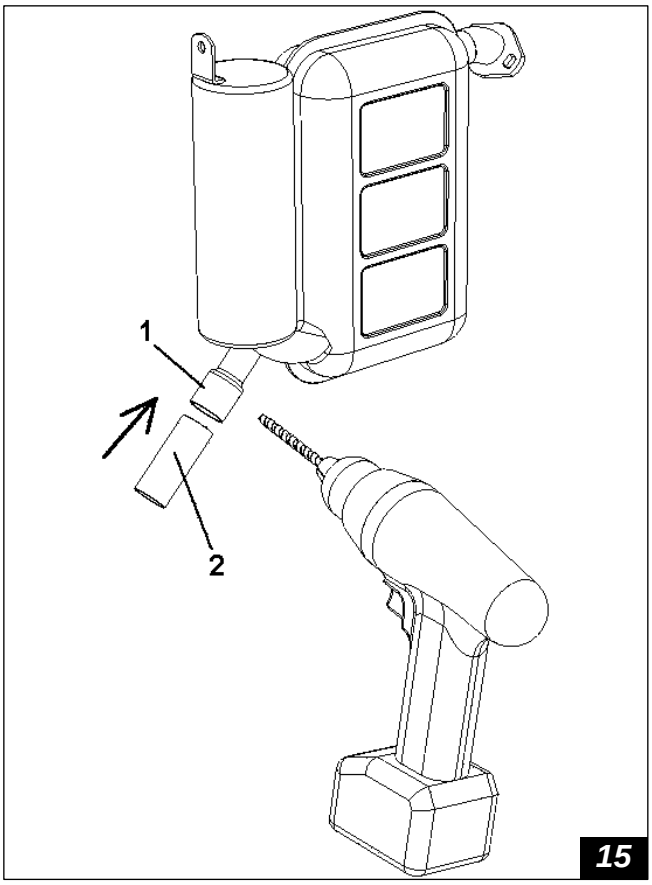


To connect the muffler to the generating set, remove first the door (Fig. 13 Ref. 2) by means of the suitable wrench (Fig. 13 Ref. 1) and then the muffler casing (Fig. 13 Ref. 3)



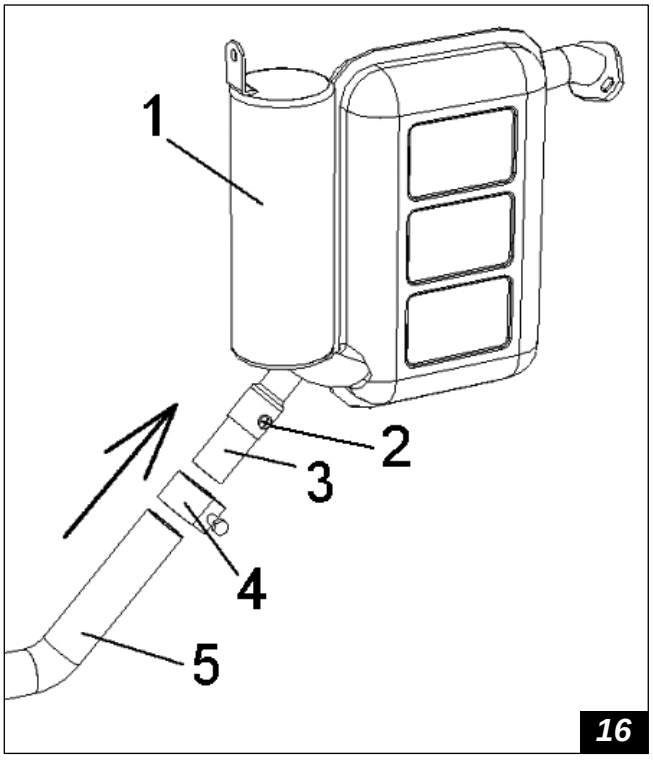


Remove all parts of the flame trap (Fig. 14 Ref. 2 – 3 – 4 – 5) from the muffler (Fig. 14 Ref. 1).



After inserting the fitting coded 03645 (Fig. 15

Ref. 2) in the tail part of the muffler (Fig. 15 Ref. 1), drill a little hole on the muffler tail part, so as to put a self-tapping screw to fasten the fitting on the muffler tail part (Fig. 16 Ref. 2)
Then insert the flexible hose coded 00433 (Fig. 16 Ref. 5) on the fitting (Fig. 16 Ref. 3)
Fasten the hose by means of the clamp coded 00543 (Fig. 16 Ref. 4).



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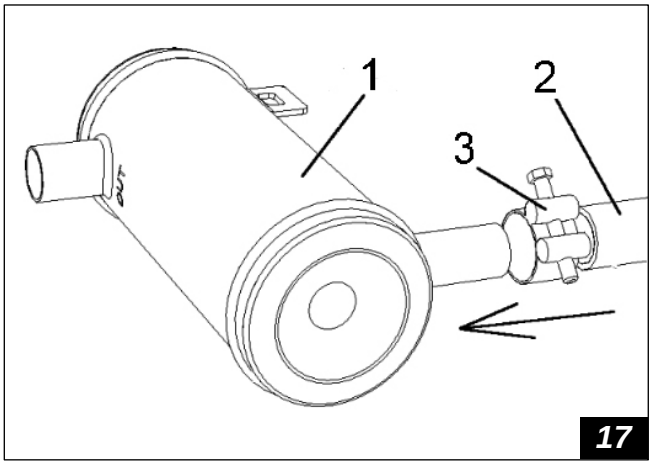
Fasten the flexible hose (Fig. 17 Ref. 2) to the tail part of the muffler on the inlet side (Fig. 17 Ref. 1) using the other specially-provided clamp (Fig. 17 Ref. 3).



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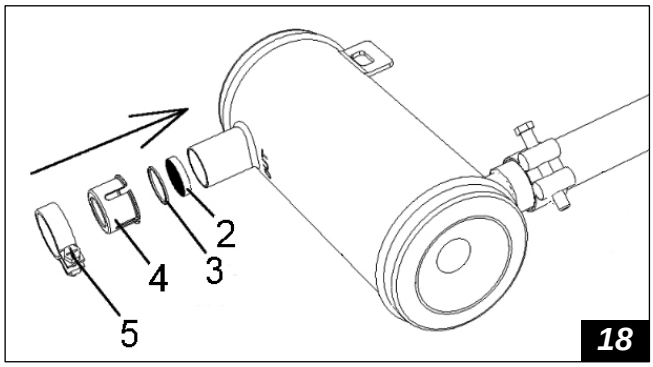

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Put the parts of the flame trap in place again (Fig. 18 Ref. 2 – 3 – 4 – 5) on the tail part of the muffler. Use the bracket welded on the muffler to fasten the latter in any spot where there are no electric cables or fuel pipes.

WARNING ***Use only mufflers supplied by Telair. Mufflers of unsuitable size could damage the engine.***

5 OPERATING INSTRUCTIONS

ATTENZIONE **The generating set is delivered without engine oil.**
Use detergent oil for multigrade 4-stroke petrol engines, having SAE viscosity suitable for the operating climate (see table and detailed indications on the user and maintenance manual of the engine).

The Energy 8012-G generating set consists of an endothermic engine connected to an alternator able to produce direct electric current. It is assembled inside a steel plate casing, insulated and sound-proofed using special sound absorbing materials.
The gas is fed to the endothermic engine by a pressure reducer which is pre-calibrated and assembled standard on the generating set.
This generating set can work up to an altitude of 1000 m above sea level.

5.1 Machine safety

The generating sets come with perfectly sealed casings, so there is no danger of contact with any mobile parts, with high temperatures or with live cables.
The doors open with a lock and key. The keys must not be left within the reach of children or inexpert people.

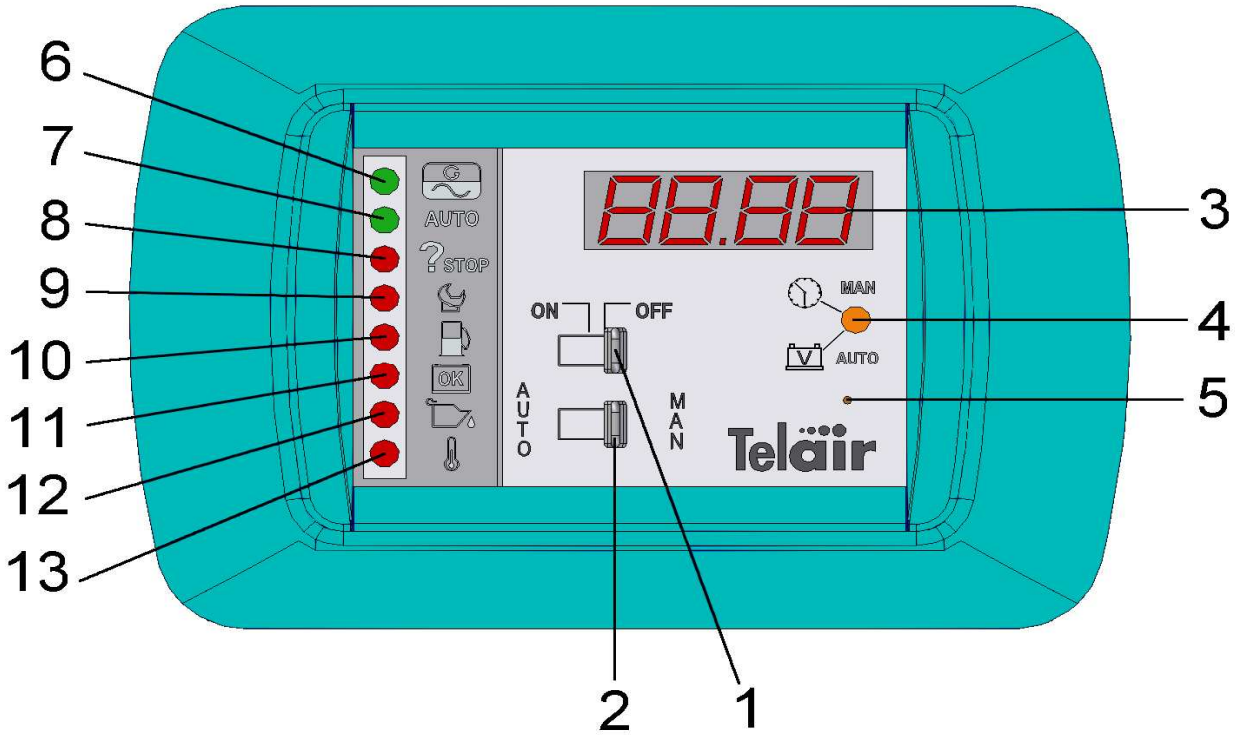
DANGER ***The generating sets must be used only and exclusively with their doors shut.***
Remove any flammable substance from near the generating set, for example: petrol, paints, solvents, etc.
The hot parts of the generating sets must never be in touch with easily flammable materials.
Never touch the generating sets or the wiring connections with wet hands.
Never replace the fuses or the thermal switches using others having a higher amperage.
Should you have to check any electrical part, this must be done only with the engine turned off and by skilled personnel.

I gruppi elettrogeni sono stati realizzati in accordo alle norme di sicurezza indicate nella dichiarazione di conformità CEE.

6 USING THE GENERATING SET

6.1 Control panel description

The Energy 8012 generating sets are provided with an automatic electronic remote control panel which allows you to perform starting up / turning off and automatic / manual operations as well as to check their running conditions.



The elements making them up are:
1 ON/OFF switch for the start-up and switch-off function
2 AUTO/MAN switch for the automatic or manual function
3 Display
4 Hour or voltmetric switch button
5 Reset
6 Generator running indicator (flashing)
7 Automatic function indicator
8 Startup failed indicator
9 Maintenance request indicator
10 Fuel reserve indicator
11 Battery charged indicator
12 Minimum oil level indicator
13 High temperature indicator

6.2 MANUAL operation

Position the AUTO/MAN **(2)** switch on the MAN position and set the startup switch **(1**) to ON position. The word ***WAIT*** will appear on the display **(3)** for 8 seconds. When these have run out, the electronic control panel will start the first automatic procedure for starting up the generating set. If the engine starts up at the end of this phase, then the generator running indicator **(6)** will start to flash.
Should the engine not start up, this automatic procedure will be repeated up to 4 times. If the engine has not started up yet at the end of this complete cycle, the startup failed indicator **(8)** will light up. If only the startup failed indicator **(8)** stays lit, you can repeat the startup procedure several times.
If the generating set has not started up at all even after many attempts, you will have to get in touch with the after-sales service.
During the operation in manual mode, the display **(3)** will show the total running hours of the generating set.
Press the hour or voltmetric switch button to display the running hours after the last maintenance.

6.3 AUTOMATIC operation

Position the AUTO/MAN **(2)** switch on the AUTO position and set the startup switch **(1**) to ON position.
The automatic function indicator **(7)** will light up. If the battery which supplies the generating set has a voltage of more than 11.5 Volts, the battery charged indicator **(11)** will light up.
When the voltage at the ends of the 12Vdc terminals of the generating set is lower than 11.5 Volts, the battery charged light indicator **(11)** will go off and the generating set will begin the startup procedure (similar to that of the manual operation).
During the operation in automatic mode, the display **(3)** will show the total running hours of the generating set. Press the hour or voltmetric switch button to display the voltage at the ends of the 12Vdc terminals, or at the ends of the battery.
When the battery is charged, the battery charged indicator **(11**) will light up and the electronic control panel will turn off the generating set.

6.4 Control and Alarm Functions

3 *DISPLAY*: when the generating set has started up, the total running hours will be displayed. Press the hour or voltmetric switch button during the manual operation to display the running hours after the last maintenance. Press the hour or voltmetric switch button during the automatic operation to display the voltage at the ends of the 12Vdc terminals, or at the ends of the battery.

4 *HOUR and VOLTMETRIC SWITCH BUTTON*: when in MAN **(2)** function, press this button to display the running hours elapsed after the last change of the engine oil. When in AUTO **(2)** function, press this button to display the voltage at the ends of the 12Vdc terminals.

5 *RESET*: when the display shows any characters without logic, the panel is to be reinitialised. Press the Reset key and, holding it down, switch on the panel. When 4 zeroes (0000) are shown on the display, the panel is reinitialised.

6 *GENERATOR RUNNING INDICATOR*: this indicator flashes during proper operation of the generating set.

7 *AUTOMATIC FUNCTION INDICATOR*: this pilot lamp is illuminated as long as the AUTO **(2)** function is selected.

8 *STARTUP FAILED INDICATOR*: this pilot lamp will light up to indicate that the generating set has not started up, after all four attempts at starting up have failed.

9 *MAINTENANCE REQUEST INDICATOR*: this pilot lamp flashes after 50 running hours have elapsed and the engine oil level is to be checked. When the lamp illuminates steady, this means that 100 running hours have elapsed and the engine oil is to be changed. Upon every engine oil

change the After-sales service must reset the Timer to make it restart from zero. To reset the flashing light, press the switch button **(4)** and, holding it down, switch on the electronic panel by means of the switch **(1)**.

10 *GAS RESERVE INDICATOR*: if a reserve detector is provided in the gas tank, it is possible to connect the suitable cable located inside the generating set (Fig. 10 Ref. 4). This way the pilot lamp will light up when the gas level has gone below its reserve level.

11 *BATTERY CHARGED INDICATOR*: this pilot light is illuminated as long as the voltage at the ends of the 12Vdc terminals, located inside the generating set, is more than 11.5 Volts.

12 *MINIMUM ENGINE OIL LEVEL INDICATOR*: this pilot lamp will light up to indicate that the level of oil in the engine has gone below the minimum level. A safety system turns off the engine automatically in order to avoid damages.

13 *HIGH TEMPERATURE INDICATOR*: this pilot lamp will light up when the temperature of the generating set goes over its safety value; the engine will stop at the same time.

6.5 Notice

The warning light located inside the generating set (Fig. 10 Ref. 7) lights up only during the startup phase and serves to give the alternator the startup excitation.

Remember that the battery connected to the 12Vdc terminals of the generating set performs two functions: starting up the engine and storing the energy supplied by the generating set; it must therefore have a minimum value of **100 Ampere**.
The Energy 8012 generating set, when in automatic mode, will turn on not only when the battery is down, but also when you connect a load such as to make the battery voltage drop below **11.5 Volts**.

WARNING ***Applying any load higher than the energy just then available in the battery will prevent the generating set from turning on due to insufficient voltage***.

INFORMATION ***If you do not use the vehicle for long periods, we recommend you to start up the generating set periodically to ensure a properly charged battery*.**

Remember that the time which is taken by the generating set in automatic mode to recharge the battery may vary according to the battery status, the amount of connected batteries and the season temperature.
Generally, the lower the temperature the less the time required to charge the battery.

6.6 Turning the generating set off

To stop the generating set, place the switch **(1)** in its "**OFF**" position.

DANGER ***The generating set is provided with an internal combustion engine; therefore the fuel used is highly flammable.***
The exhaust gases are conveyed under the hood; their temperature, inevitably, is quite high, even though they are mixed with cooling air.
Do not touch the hood areas near the exhaust, and do not put your hands or other objects inside the hood.

INFORMATION **When using the generator in cold environments, please remember that the lower the temperature (down to a temperature limit of – 15°C), the higher the percentage of propane gas which is recommended**

6.7 Information on forbidden use

DANGER ***The generating set must be installed and used only by personnel qualified and authorised according to the manufacturer's instructions. The generating set must be used only and exclusively to produce electrical power on vehicles provided with an electrical system made according to standards and depending on the quantity of power delivered.***

6.8 Useful tips

During the running-in period, do not subject the new engine to a load higher than 70% of the rated load, at least for the first 50 running hours.

7 MAINTENANCE INSTRUCTIONS

INFORMATION ***Use only original spare parts. The use of spare parts of non-equivalent quality may damage the generating set. Periodical control and adjustments are of the essence in preserving a high level of performance. Routine maintenance also ensures long generating set life.***

DANGER ***Before performing any check or maintenance operation on the generating set, turn the ON/OFF switch of the control panel to the OFF position and the AUTO/MAN switch of the control panel to the MAN position.***

Then disconnect the red 12 Vdc cable from the terminal (Fig. 10 Ref. 1)
This way you can operate under safe conditions as the generating set cannot start up.

7.1 Maintenance schedule

See the table at the bottom of the page.

7.2 Maintenance not requiring skilled personnel

To perform this kind of check, it will be necessary to open the door of the generating set. The following precautions must therefore be taken:

1 The generating set must not be running, and all its parts must be cold.
1 Let the generating set cool off.

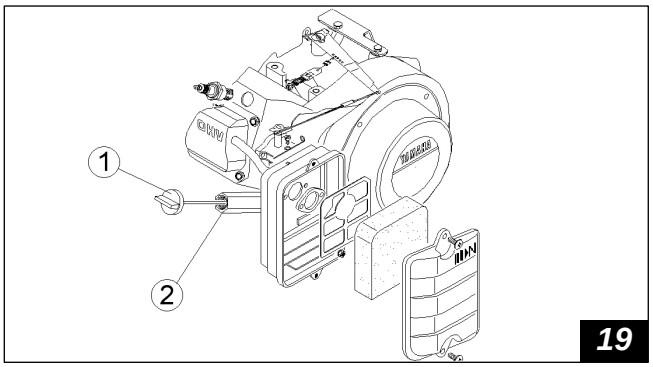
ROUTINE MAINTENANCE SCHEDULE To be performed after the period of time or the number of running hours listed here, whichever the earlier may be.		Every use	Every month or 20 h	Every 6 month or 100 h	Every year or 300 h
Engine oil	Inspection	●			
	Change		● (2)	● (2)	
Air filter	Cleaning		(1) ● (2)		
Spark plug	Inspection-cleaning			● (2)	
Valve adjustment	Check-adjust				● (2)
Tank and fuel filter.	Cleaning				● (2)
Engine r.p.m.'s or frequency	Adjust		● (2)		
Vibration damper suspension points	Check				● (2)
Fuel pipes	Check (replace if necessary)	Every two years			

NOTES: (1) Clean more frequently if you use it in a very dusty environment.
(2) These operations must be performed by specialised personnel only

7.3 Checking the engine oil level

Unscrew the engine oil level reference cap and clean the dipstick (Fig. 19 ref. 1).

- Put the dipstick back in without screwing.
- Take the dipstick out again, and make sure that the engine oil level is between the two notches (min and max). Should the oil level be below the minimum notch, restore the level of the oil with the kind of motor oil advised (refer to the engine user and maintenance manual).
- Put the dipstick cap back on and screw tightly.



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WARNING ***Do not exceed the maximum level, since this could cause malfunction of the generating set.***

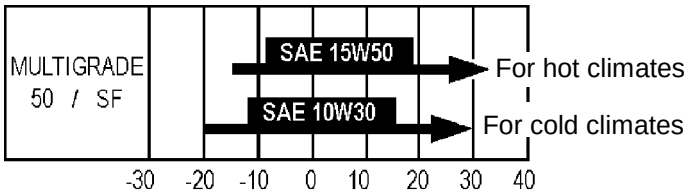
INFORMATION ***Every engine oil level checking operation must be performed with the generating set in a perfectly horizontal position.***

7.4 Maintenance operations calling for qualified personnel

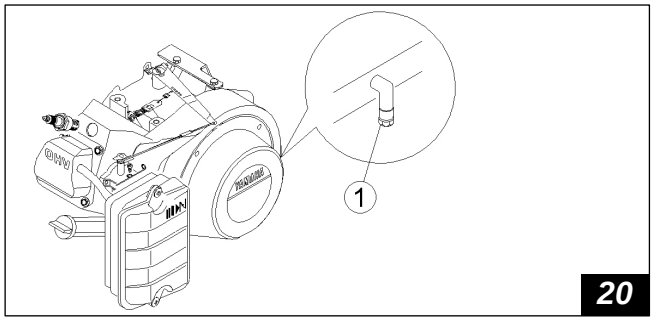
With certain maintenance operations, it is possible to take out the engine-alternator unit, removing the locking screw (Fig. 8 Ref. 2) of the lower surface on both sides.
This will make it easier to access all the inside parts of the generating set for unscheduled maintenance or repair operations.

7.4.1 Engine oil replacement

Use multigrade detergent oil for four-stroke petrol engines having a SAE viscosity suited to the climate the generating set is working in (see table and detailed instructions shown on the engine use and maintenance manual).



To make it easier to take the engine oil out, it is best to heat the engine for 3 - 5 minutes; this way, the oil will be more fluid and emptying will be quicker and more complete.



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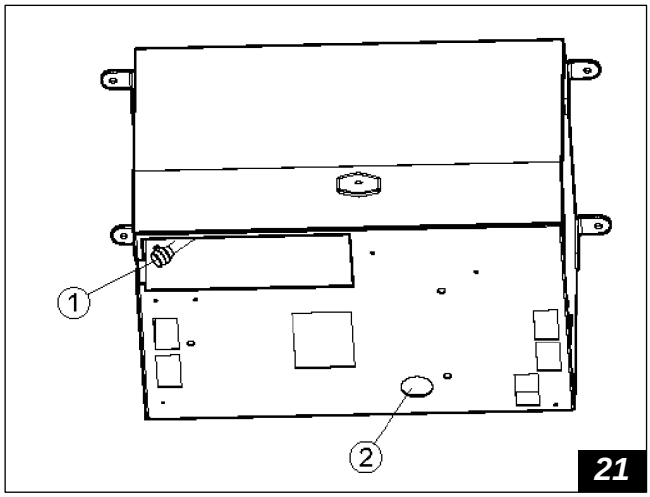
Loosen the special cap on the oil pan(Fig. 20 ref. 1) by a few turns, and let all the oil inside run out into a collection container (Fig. 21 ref. 2).



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When this has been done, screw the cap back on again and restore the oil level inside the engine pan, using the filler hole (Fig. 19 Ref. 2).

For the quantity of oil to be fed into the pan, see the following table (Table 2).

MOD.	Quantity of oil (litres)
Energy 8012 GAS	0,6

Tab. 2

DANGER

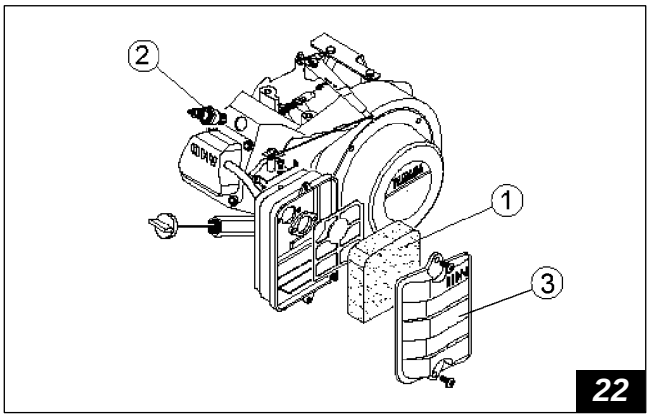
- ***Hot oil can scald.***
- ***Running the engine when the oil level is too low can damage it seriously***
- ***Check the oil level when the engine has been turned off.***

INFORMATION ***Used oil must not be disposed of in the open, but handed over to companies specialising in disposal and/or recycling according to the laws current in the country where such operations are performed.***

7.4.2 Air filter maintenance

INFORMATION ***A dirty air filter will reduce the air flow to the carburettor. To prevent carburettor malfunction, check the air filter regularly. If the engine is used in an especially dusty environment, we suggest you check it every time before starting up.***

DANGER ***Never use Diesel fuel or solvents with a low evaporation point for cleaning the air filter cartridge.***



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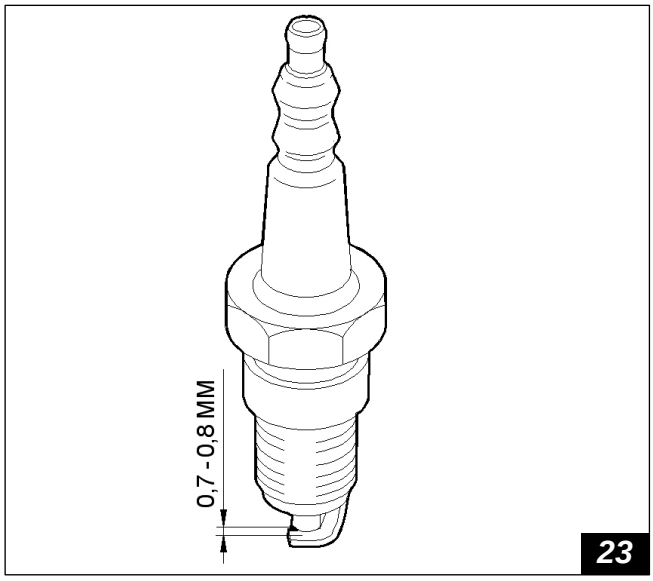
Never run the engine without the air filter; the engine would wear down quickly due to dust in the air.
To access the filter cartridge, remove the air filter closing lid (Fig. 24 ref. 3) after having unscrewed both screws which keep it attached to the air filter box.
Take out the cartridge (Fig. 26 ref. 1) and wash it using a neutral detergent solution and rinse carefully. Let the filter cartridge dry out completely, then dip it in clean motor oil. Squeeze out carefully in order to remove excess oil.
Replace the cartridge only if it should be visibly no longer whole.

7.4.3 Spark plug maintenance

For both models of generating sets, use spark plugs mod. BP6ES, BPR6ES (NGK), W20EP-U, W20EPR-U (ND) or else spark plugs made by other manufacturers but compatible with the above.
Never use spark plugs with a different temperature degree from those listed above.

- Take the cap off the spark plug (Fig. 26 Ref. 2) and using the special wrench take out the plug.
- Perform a sight check. Replace in case of obvious war or if the insulator is broken or cracked.
- Use a steel brush to clean the spark plug, if it can be used again.



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- Use a thickness gauge to measure the distance between the electrodes. The right distance should be between 0.7 and 0.8 mm (Fig. 23).
- Correct the distance if necessary, folding the side electrode.
- Make sure that the spark plug washer is in good condition and then screw back on by

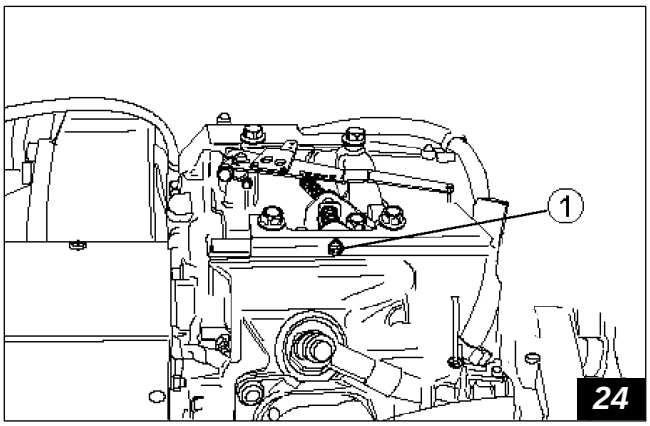
hand so as to be sure it is put back in place properly. Finally, tighten using the special wrench at the right torque (see instructions on the engine user and maintenance manual).

INFORMATION ***When assembling a new spark plug, tighten by 1/2 turn after the spark plug has compressed the sealing washer.***
If you put back the old plug after having removed it, tighten it by 1/4 turn after it has compressed the sealing washer.

WARNING ***The spark plug must be tightened firmly. A badly positioned spark plug may become very hot and damage the engine.***

7.4.4 Voltage adjustment

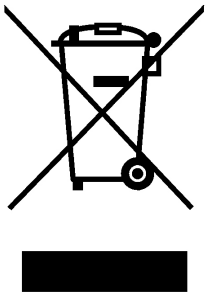
At the time of testing, the generating set has been set on 2800 rpm so that the right voltage can be obtained at the output terminals.
Any setting adjustment must be authorized by us and anyway performed by skilled personnel.
Adjust the voltage when the engine is hot, no load is present and the generating set is running (Fig. 24 Ref. 1).



Turn the screw clockwise to increase the engine revs and hence the voltage.
Turn the screw counter-clockwise to diminish the engine revs and hence the voltage.

8 DISMANTLING

Should you have to dismantle the generating set, refer to specialised shops.



9 FIRE-PREVENTION

In case of fire, never open the hood of the generating set and use only approved type fire extinguishers.

DANGER ***Never use water to put out flames in the generating unit.***

GENERAL WARRANTY TERMS

TELAIR guarantees its products against any material and/or manufacturing faults and defects.

The entitlement to warranty cover for new engines is valid for a period of 24 months from the time of handing over to the end user, or for a maximum of 2000 operating hours, whichever of these limits is reached first. In all cases the warranty period shall lapse no later than 26 months (28 months if delivered outside Europe) after delivery ex factory.

For electric and hydraulic components, pipes, belts, sealing elements, injection nozzles, clutches, gear boxes, the warranty term is 12 months from the time of handing over to the end user, or for a maximum of 2000 operating hours, whichever of these limits is reached first. In all cases the warranty period shall lapse no later than 14 months (16 months if delivered outside Europe) after delivery ex factory.

In any case, the costs of lubricants and consumables shall be charged.
Any transport expenses shall be intended as to be covered by the purchaser; the same applies to any expenses connected with inspections requested by the customer and accepted by ***TELAIR***.

In any case, the costs of lubricants and consumables shall be charged.

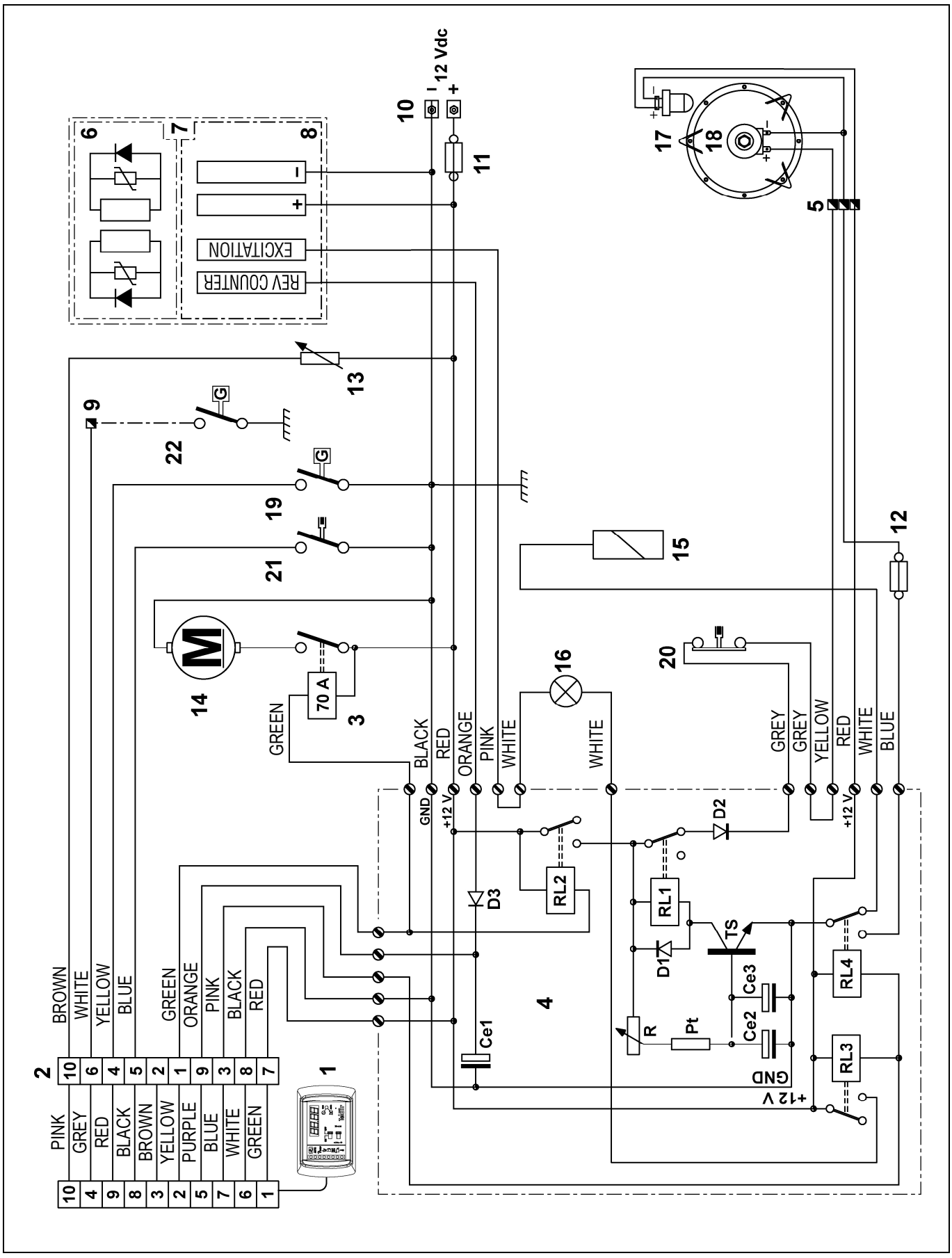
The manufacturer's warranty shall only be valid if:

- the customer has carried out any routine maintenance according to the recommended schedule and has promptly visited the nearest after-sale centre if required.
- the customer can produce a document showing the date of sale (invoice or receipt).
  Such document will have to be kept with care and be intact when produced to the ***TELAIR*** After-Sales centre on requesting service.

In any case, the purchaser shall not be entitled to:

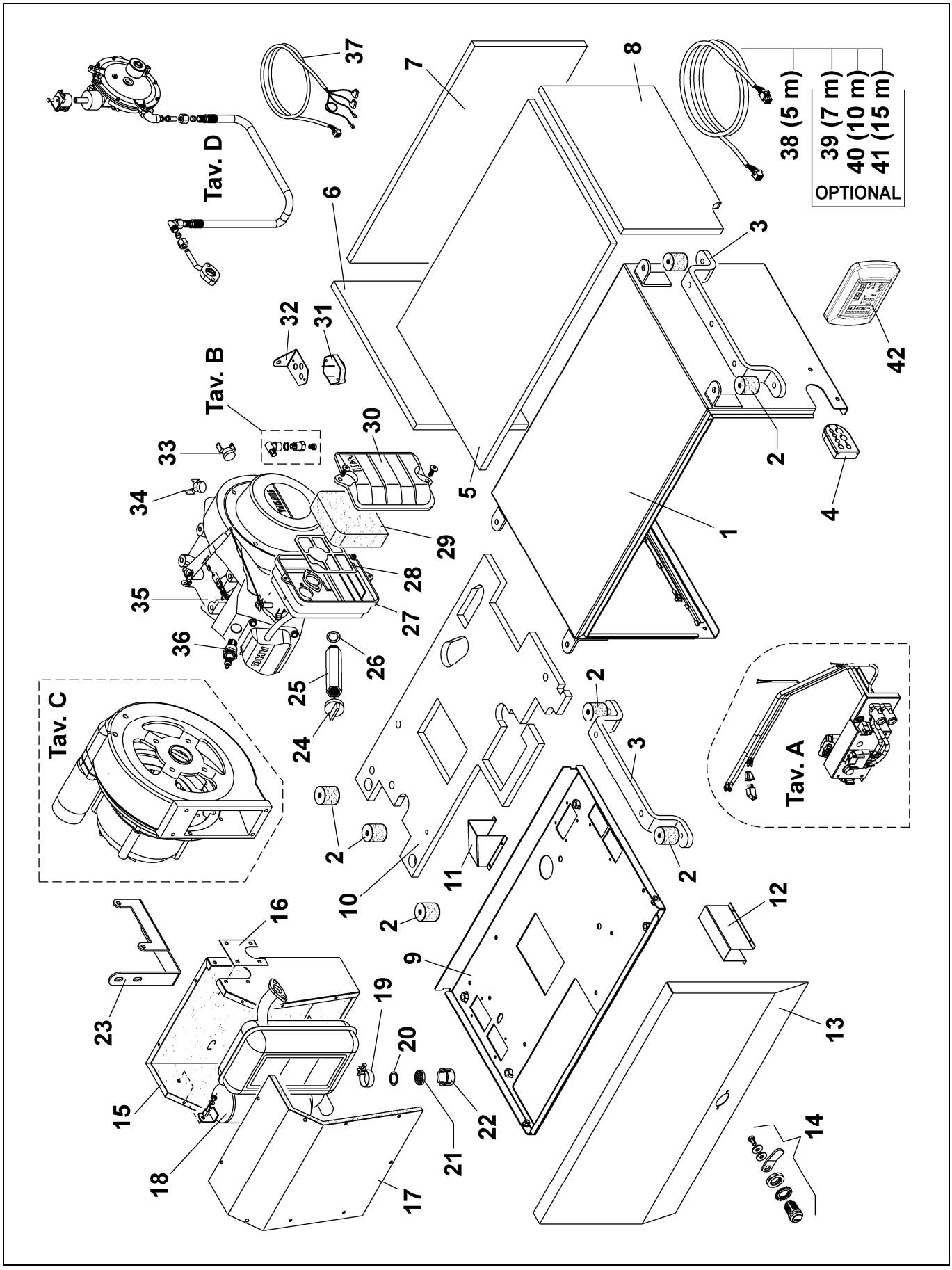
- terminate the contract;
- claim damages to persons or property;
- ask that the warranty be extended in the event of product defects or malfunctioning.

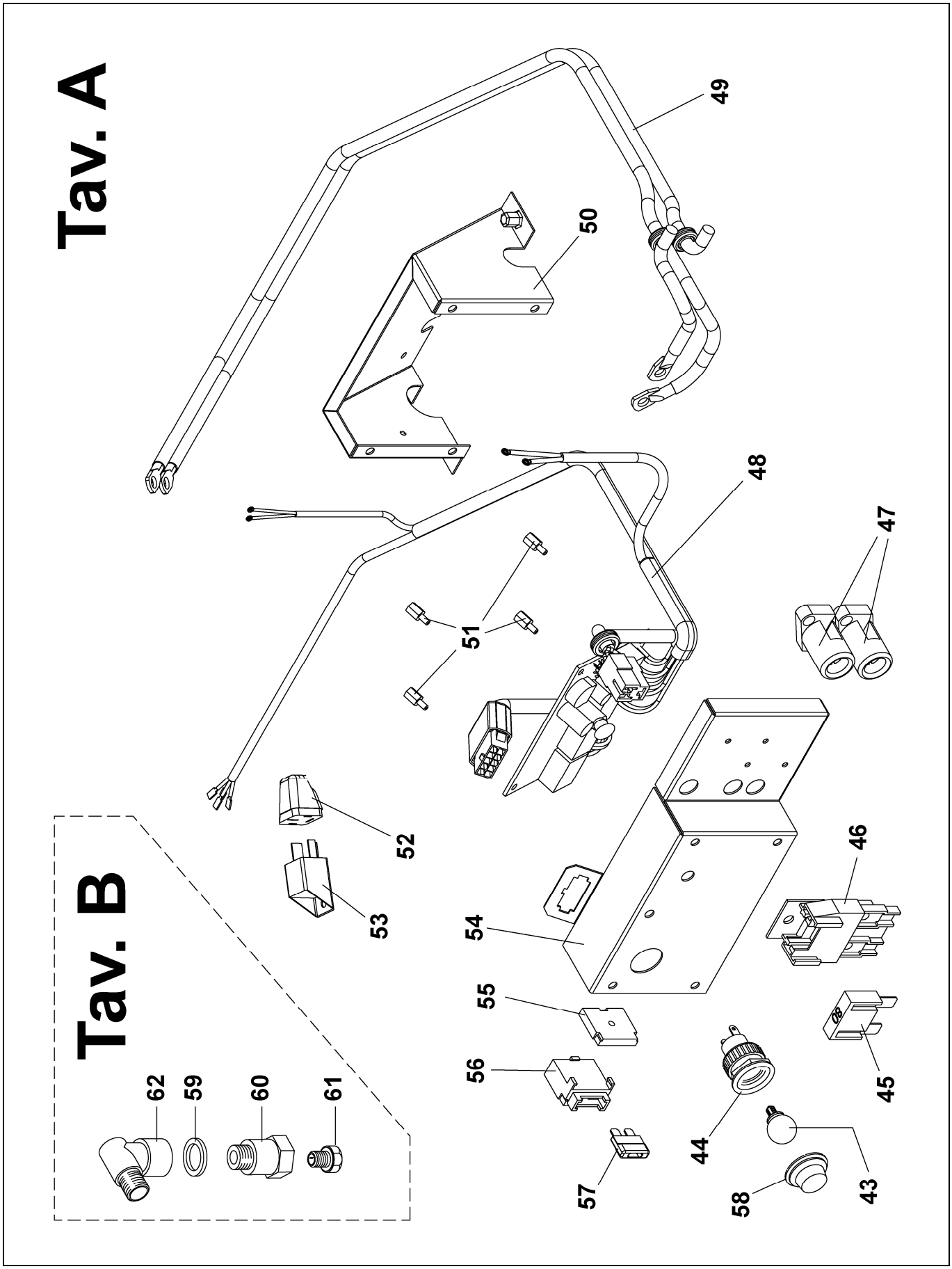
WIRING DIAGRAM ENERGY 8012 GAS



Pos.	Description	Pos.	Description
1	Electronic control panel	12	4 A fuse
2	Control panel connector	13	Summer/winter charge NTC probe
3	Start-up relay	14	Starter
4	Electronic card	15	Ignition coil
5	Pressure reducer connector	16	Excitation lamp
6	Rotor	17	GAS solenoid valve
7	Alternator	18	Pressure reducer
8	Stator	19	Engine oil float
9	Fuel reserve connector	20	Choke thermocouple probe
10	Power terminal board	21	Engine thermocouple probe
11	80 A fuse	22	Fuel reserve float

DRAWING FOR SPARE PARTS LIST ENERGY 8012 GAS




Tav. A
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Tav. B
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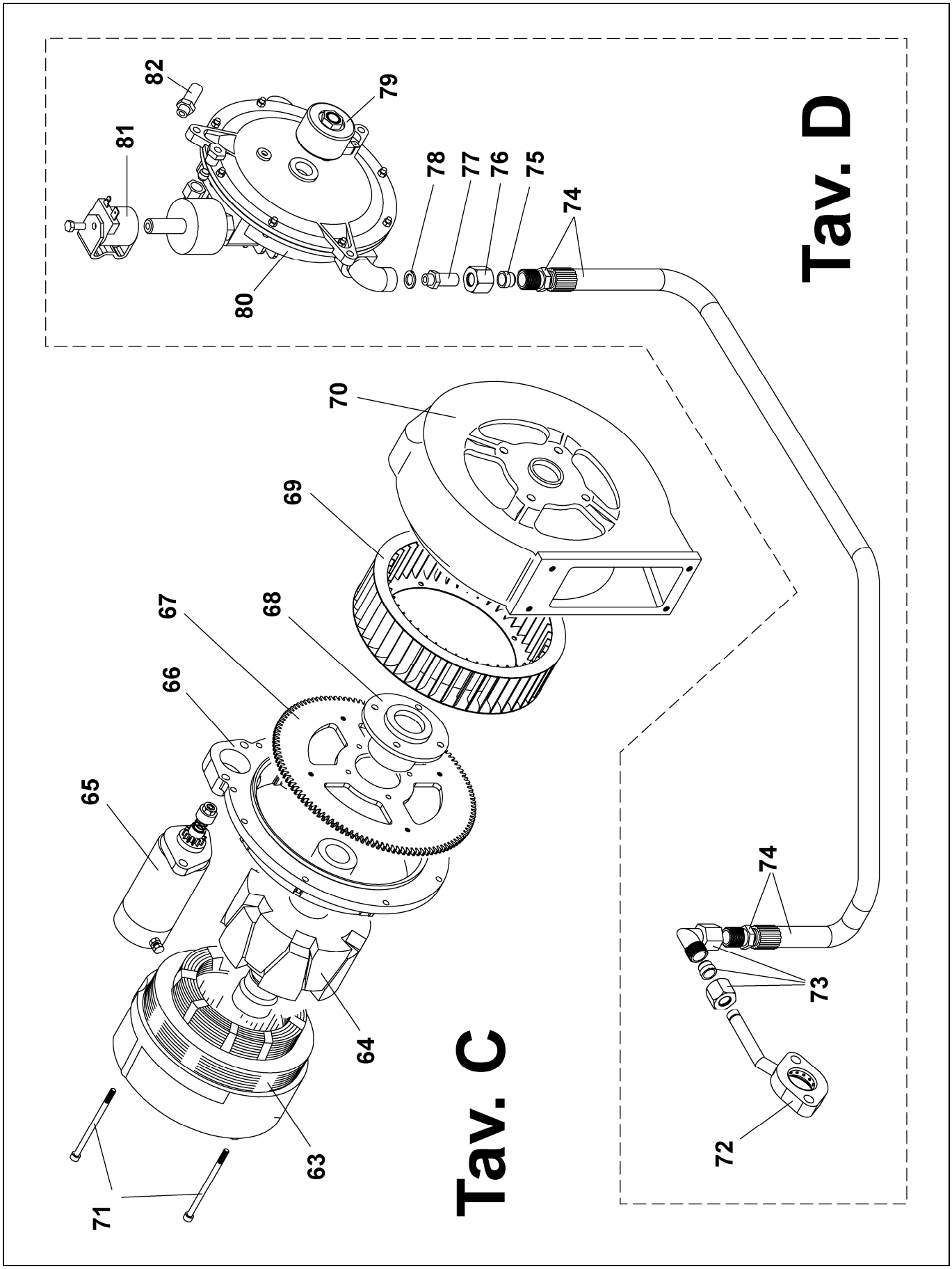
Tav. D
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Tav. C
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Pos.	Code	Q.tà	Descrizione Description	Dèsignation Bezeichnung	Denomination Descripcion
1	03895	N. 1	Cofano superiore Upper hood	Capot supérieur Obere Haube	Bovenste kap Capo superior
2	00632	N. 7	Antivibrante Vibration damper	Antivibratoire Schwingungsdämpfendes Element	Trillingsdemper Anti-vibrador
3	01671	N. 2	Staffa ancoraggio Anchor clamp	Bride de fixation Befestigungsbügel	Verankeringsbeugel Estribo de anclaje
4	03805	N. 1	Tassello Portacavi Gas Gas cable holder	Serre-câbles Gaz Aufnahme Kabel/Gassch.	Steunprofiel voor snoeren/gasslang Pasador Porta-cables Gas
5	03904	N. 1	Isolante Superiore Cofano Upper hood insulation	Isolation supérieure coffre Isolierung für obere Haube	Isolatie boven voor kap Aislante Superior Capó
6	03906	N. 1	Isolante Sinistro Cofano Left hood insulation	Isolation Gauche Coffre Isolierung links für Haube	Isolatie links voor kap Aislante Izquierdo Capó
7	03907	N. 1	Isolante Posteriore Cofano Rear hood insulation	Isolation Arrière Coffre Isolierung hinten für Haube	Isolatie achter voor kap Aislante Trasero Capó
8	03905	N. 1	Isolante Destro Cofano Right hood insulation	Isolation Droite Coffre Isolierung rechts für Haube	Isolatie rechts voor kap Aislante Derecho Capó
9	03894	N. 1	Basamento cassa Case base	Base de la caisse Kasten-Grundrahmen	Onderstel kast Base caja
10	03903	N. 1	Isolante Basamento Base insulation	Isolation Base Isolierung für Grundrahmen	Isolatie voor onderstel Aislante Base
11	03809	N. 1	Barriera Antirumore Posteriore Rear antinoise barrier	Barrière anti-bruit Arrière Lärmbarriere hinten	Geluidsbarrière achter Barrrera Anti-ruido Trasero
12	03807	N. 1	Barriera Antirumore Destra Right antinoise barrier	Barrière Antibruit Droite Lärmbarriere rechts	Geluidsbarrière rechts Barrrera Anti-ruido Derecha
13	01829	N. 1	Lamiera di chiusura sportello Door closing plate	Tôle de fermeture de porte Türblech	Afdekplaat deurtje Chapa cierre puerta
14	01224	N. 1	Serratura Lock	Serrure Schloss	Slot Cerradura
15	01830	N. 1	Convogliatore marmitta Muffler conveyor	Convoyeur pot d'échappement Auspufftopf-Leitblech	Geleider knaldemper Transportador silenciador escape
16	01833	N. 1	Piastrina di scarico Exhaust plate	Plaquette d'échappement Auslassplatte	Uitlaatplaatje Chapa de descarga
17	01827	N. 1	Chiusura convogliamento marmitta Muffler conveyance closure	Fermeture du convoyeur pot d'échappement Verschluss des Auspufftopf-Leitblechs	Afdekking geleider knaldemper Cierre transportador silenciador escape
18	01061	N. 1	Marmitta Muffler	Pot d'échappement Auspufftopf	Knaldemper Silenciador de escape
19	01178	N. 1	Fascetta Clamp	Collier Schelle	Bandje Abrazadera
20	02058	N. 2	Rondella piana Plain washer	Rondelle plate Flachscheibe	Platte onderlegring Arandela plana
21	02057	N. 1	Rete metallica Wire netting	Grille métallique Metallgitter	Metalen rooster Red de alambre
22	01177	N. 1	Terminale di scarico Muffler end pipe	Partie terminale pot d'échapp. Auspuff-Endrohr	Uiteinde uitlaat Tubo de descarga
23	03742	N. 1	Staffa Supporto Alternatore Alternator support bracket	Bride Support Alternateur Tragbügel für Lichtmaschine	Steunbeugel voor dynamo Estribo Soporte Alternador
24	01432	N. 1	Tappo olio Oil plug	Bouchon de l'huile Ölschraube	Oliedop Tapon aceite

Pos.	Code	Q.tà	Descrizione Description	Dèsignation Bezeichnung	Denomination Descripcion
25	00980	N. 1	Raccordo olio motore YAMAHA YAMAHA motor oil fitting	Raccord huile moteur YAMAHA Ölanschluss für YAMAHA-Motor	Oliekoppeling YAMAHA motor Empalme aceite mot. YAMAHA
26	02115	N. 1	Guarniz 14X20X1.5 ALLUMINIO Gasket 14X20X1.5 ALUMINUM	Joint 14X20X1.5 ALUMINIUM Dichtung 14X20X1.5 ALUMINIUM	Afdichting 14X20X1.5 ALUMINIUM Junta 14X20X1.5 ALUMINIO
27	01409	N. 1	Scatola filtro aria Air filter box	Boîtier du filtre à air Luftfiltergehause	Behuizing luchtfilter Cajà filtro aire
28	02812	N. 1	Rete porta filtro Filter holding net	Filet porte-filtre Filtertragnetz	Filterhoudernet Red porta-filtro
29	02060	N. 1	Filtro aria Air cleaner	Filtre à air Luftfilter	Luchtfilter Filtro aire
30	02271	N. 1	Coperchio filtro aria Air filter lid	Couvercle du filtre à air Luftfilterdeckel	Kap luchfilter Tapa filtro aire
31	04030	N. 1	Regolatore dell'Alternatore Alternator regulator	Régulateur de l'Alternateur Regler der Lichtmaschine	Regelaar dynamo Regulador del Alternador
32	03928	N. 1	Staffa Sostegno Regolatore Regulator bearing bracket	Bride de Support du Régulateur Tragbügel für Regler	Steunbeugel voor regelaar Estribo Soporte Regulador
33	02314	N. 1	Termostato 45° Thermostat 45°	Thermostat 45° Thermostat 45°	Thermostaat 45° Termostato 45°
34	01128	N. 1	Termostato 90° Thermostat 90°	Thermostat 90° Thermostat 90°	Thermostaat 90° Termostato 90°
35	01176	N. 1	Motore YAMAHA YAMAHA motor	Moteur YAMAHA Motor YAMAHA	YAMAHA motor Motor YAMAHA
36	02743	N. 1	Candela Plug	Bougie Zündkerze	Bougie Bujia
37	04031	N. 1	Cavo raccordo GAS-8012 GAS-8012 fitting cable	Câble raccord GAS-8012 Verbindungskabel GAS-8012	Verbindingskabel GAS-8012 Cable de empalme GAS-8012
38	03796	N. 1	Cavo 5 m da generatore a Pannello di controllo 5 m cable from generating set to control panel	Câble 5 m du Générateur au Panneau de Contrôle 5 m Kabel von Generator zu Bedienpanel	5 m kabel van generator naar bedieningspaneel Cable 5 m de generador a panel de control
39	03797	N. 1	Cavo 7 m da generatore a Pannello di controllo 7 m cable from generating set to control panel	Câble 7 m du Générateur au Panneau de Contrôle 7 m Kabel von Generator zu Bedienpanel	7 m kabel van generator naar bedieningspaneel Cable 7 m de generador a panel de control
40	03798	N. 1	Cavo 10 m da generatore a Pannello di controllo 10 m cable from generating set to control panel	Câble 10 m du Générateur au Panneau de Contrôle 10 m Kabel von Generator zu Bedienpanel	10 m kabel van generator naar bedieningspaneel Cable 10 m de generador a panel de control
41	03799	N. 1	Cavo 15 m da generatore a Pannello di controllo 15 m cable from generating set to control panel	Câble 15 m du Générateur au Panneau de Contrôle 15 m Kabel von Generator zu Bedienpanel	15 m kabel van generator naar bedieningspaneel Cable 15 m de generador a panel de control
42	03790	N. 1	Pannello di controllo ENERGY 8012 G ENERGY 8012 G control panel	Tableau/contrôle ENERGY 8012 G Bedienpanel ENERGY 8012 G	Schakelpaneel ENERGY 8012 G Panel de control ENERGY 8012 G
43	03763	N. 1	Lampada 12 V / 3 W 12 V / 3 W lamp	Lampe 12 V / 3 W Lampe 12 V / 3 W	Lamp 12 V / 3 W Bombilla 12 V / 3 W

Pos.	Code	Q.tà	Descrizione Description	Dèsignation Bezeichnung	Denomination Descripcion
44	03765	N. 1	Portalampade Lamp holder	Douilles Lampenhalterung	Lamphouder Portabombilla
45	02884	N. 1	Fusibile 80 A 80 A fuse	Fusible 80 A 80 A Sicherung	Zekering 80 A Fisible 80 A
46	02883	N. 1	Potafusibile 80 A 80 A fuse carrier	Tableau des fusibles 80 A 80 A Sicherungshalter	Zekeringhouder 80 A Portafusible 80 A
47	01405	N. 2	Morsetto LEGRAND 2x35 LEGRAND 2x35 terminal	Borne LEGRAND 2x35 Klemme LEGRAND 2x35	Aansluitklem LEGRAND 2x35 Borne LEGRAND 2x35
48	04032	N. 1	Cablaggio + Circuito stampato Wiring + Printed circuit	Câblage + Circuit imprimé Verkabelung + Gedruckte Schaltung	Bedrading + Gedrukte schakeling Cableado + Circuito Impreso
49	04033	N. 1	Cablaggio di potenza Power wiring	Câblage de puissance Leistungskabel	Vermogensbedrading Cableado de potencia
50	03823	N. 1	Fondo Scatola di Comando Control box bottom	Base Boîtier de Commande Boden der Steuerbox	Bodem besturingskast Fondo escala de Mando
51	03440	N. 4	Distanziale Esagonale M3x8 Hexagonal M3x8 spacer	Entretoise Hexagonale M3x8 Distanzstück Sechskant M3x8	Zeskantafstandshouder M3x8 Separador Hexagonal M3x8
52	00235	N. 1	Zoccolo per Relè 12 V/70 A Base for 12 V/70 A relay	Culot pour Relais 12 V/70 A Sockel für Relais 12 V/70 A	Sokkel voor relais 12 V/70 A Zócalo para Relé 12 V/70 A
53	00093	N. 1	Relè 12 V/70 A 12 V/70 A Relay	Relais 12 V/70 A Relais 12 V/70 A	Relais 12 V/70A Rele 12 V/70 A
54	03822	N. 1	Scatola di Comando Control box	Boîtier de Commande Steuerbox	Besturingskast Caja de Mando
55	01603	N. 1	Piastra fissaggio Potafusibile 4 A Fastening plate for 4 A fuse carrier	Plaque de fixation tableau des fusibles 4 A Befestigungsplatte 4 A Sicherungshalter	Bevestigingsplaat Zekeringhouder 4 A Placa fijación Portafusible 4 A
56	01605	N. 1	Potafusibile 4 A 4 A fuse carrier	Tableau des fusibles 4 A 4 A Sicherungshalter	Zekeringhouder 4 A Portafusible 4 A
57	02688	N. 1	Fusibile 4 A 4 A fuse	Fusible 4 A 4 A Sicherung	Zekering 4 A Fisible 4 A
58	03764	N. 1	Spia verde Green warning light	Voyant vert Grüne Kontrollleuchte	Groen controlelampje Piloto verde
59	00931	N. 2	Rondella in alluminio Aluminium washer	Rondelle en aluminium Alu-Scheibe	Onderlegring van aluminium Arandela aluminio
60	01936	N. 1	Prolunga Extension	Rallonge Verlängerung	Verlengstuk Prolonga
61	00810	N. 1	Tappo Cap	Bouchon Kappe	Dop Tapon
62	00478	N. 1	Raccordo 90°1/8 MF 1/8 MF union elbow	Raccord 90°1/8 MF Anschlussstuck 90°1/8 MF	Koppeling 90°1/8 MF Empalme 90°1/8 MF
63	04034	N. 1	Statore alternatore Alternator stator	Stator de l'alternateur Stator der Lichtmaschine	Stator dynamo Estator alternador
64	04035	N. 1	Rotore alternatore Alternator rotor	Rotor de l'alternateur Rotor der Lichtmaschine	Rotor dynamo Rotor alternador
65	00299	N. 1	Motore EL. 12 V 0,30 kW El. Motor 12 V 0.30 kW	Moteur él. 12 V 0,30 kW Elektromotor 12 V 0,30 kW	El. motor 12 V 0,30 kW Motor el. 12 V 0,30 kW
66	03739	N. 1	Flangia attacco Alternatore Alternator connecting flange	Bride de fixation de l'Alternateur Befestigungsflansch für Lichtmaschine	Bevestigingsflens dynamo Brida conexión Alternador

Pos.	Code	Q.tà	Descrizione Description	Dèsignation Bezeichnung	Denomination Descripcion
67	03727	N. 1	Corona Dentata Ring gear	Couronne dentée Zahnkranz	Tandkrans Corona Dentada
68	03773	N. 1	Mozzo Flangiato Flanged hub	Moyeu à bride Flanschnabe	Flensnaaf Cubo Embridado
69	01023	N. 1	Ventola Fan	Ventilateur Lüfterrad	Ventilator Ventilador
70	01431	N. 1	Fusione ATR 2503/C1 ATR 2503/C1 Casting	Moulage ATR 2503/C1 Gussteil ATR 2503/C1	Gietwerk ATR 2503/C1 Fundicion ATR 2503/C1
71	05522	N. 4	Vite M 6x100 M 6x100 Screw	Vis M 6x100 Schraube M 6x100	Schroef M6x100 Tornillo M 6x100
72	01351	N. 1	Miscelatore Gigleur 2,7 Gicleur 2.7 mixer	Mélangeur Gigleur 2,7 Mischer Gigleur 2,7	Menger Gigleur 2,7 Mezclador Gigleur 2,7
73	03834	N. 1	Raccordo GAS a 90° GAS union elbow	Raccord GAZ à 90° GAS Anschluss 90°	GAS aansluiting 90° Conexión GAS a 90º
74	03855	N. 1	Tubo raccordo GAS GAS union pipe	Tuyau de raccord GAZ GAS Anschlussleitung	GAS aansluitpijp Tubo conexión GAS
75	03422	N. 1	Anello di serraggio Locking ring	Bague de serrage Arretierring	Klemring Anillo de apretado
76	03423	N. 1	Ghiera di serraggio Locking ring nut	Douille de serrage Befestigungsschraube	Klemmoer Virola de apretado
77	04042	N. 1	Raccordo uscita GAS GAS output fitting	Raccord sortie GAZ Anschluss Ausgang GAS	GAS uitlaatkoppeling Conexión salida GAS
78	00931	N. 1	Rondella in alluminio Aluminium washer	Rondelle en aluminium Alu-Scheibe	Onderlegring van alumi-nium Arandela aluminio
79	02292	N. 1	Bobina Choke 12 V / 18 W Choke 12 V / 18 W coil	Bobine étrangleur 12 V / 18 W Spule Choke 12V/18V	Chokespoel 12 V / 18 W Capuchón Choke 12 V / 18 W
80	01349	N. 1	Riduttore Pressione GAS GAS pressure reducer	Manodétendeur GAZ GAS Druckreduzierer	GAS drukregelaar Reductor Presión GAS
81	01344	N. 1	Bobina GAS 12 V GAS 12 V coil	Bobine GAZ 12 V Spule GAS 12 V	Gasspoel 12 V Capuchón GAS 12 V
82	05570	N. 1	Raccordo ingresso GAS GAS input fitting	Raccord d'admission GAZ Anschlusss Eingang GAS	GAS inlaatkoppeling Conexión entrada GAS

Notes

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