



# LEPTON



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## INTRODUCTION

The company Oxygen S.p.A. would like to thank you for your confidence in its products and congratulate you on your purchase of the new electric LEPTON scooter.

This manual features all the main points you will need to know to look after your Lepton, get the best possible performance out of it and prolong its service life cost effectively.

The Lepton has been designed for city use on roads only.

**N.B.:** Being a moped, the Lepton is not designed to carry passengers. The Lepton has a top speed of 45 Km/h (28 mph), and can be registered as a MOPED in some states.

### **WARNING:**

- **any work carried out on the scooter during the warranty period by any person other than authorized OXYGEN S.P.A. personnel shall result in the warranty becoming void.**
- **don't forget your Lepton is very quiet when it runs, and bear this in mind when riding near other vehicles and pedestrians.**

Oxygen S.p.A. reserves the right to make any changes to its models at any time, though the essential features described and illustrated herein shall remain unaltered. and therefore declines liability for any errors encountered in the manual as a result of said changes.

## GENERAL FEATURES

### ELECTRIC MOTOR

Your Lepton scooter uses a three-phase brush-less permanent-magnet electric motor.

Apart from its high efficiency and low consumption this motor is also characterized by its compactness, lightness and silent running and the fact it does not require routine maintenance.

### DRIVE ELECTRONICS (FIG.1)

The heart of your Lepton scooter is its electronic drive and management system (EDM) known as "DRIVE".

The system can be divided into the following functional components:

1. Generation of auxiliary voltage, both internal and external (ancillary equipment). The system taps the external voltage originating from the traction battery unit and supplies the following output voltage:
  - the internal voltage required to run the hardware properly
  - the 12 V for the scooter's external ancillary equipment.

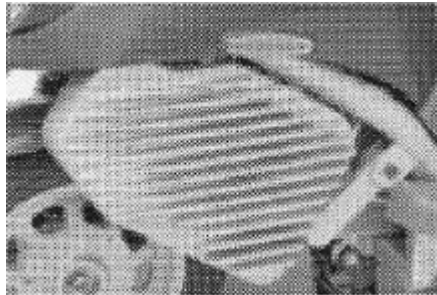


Fig. 1

2. Control of the brushless motor. The motor is controlled by means of the different physical value readings, i.e.:
  - o internal sensors checking the intensity of the current delivered to the motor;
  - o external sensors checking the temperature status and condition of rotary parts, located in the motor.

**In this regard, it is essential that there are no breaks in the signals-to-motor connection cable. Consequently, if the user notices any damage to this cable, the vehicle must be checked by a service centre immediately or the Warranty conditions shall become void.**

3. Management of auxiliary signals to and from the drive regarding:
  - o Anti-theft device
  - o Speed, operating status and diagnostics indicator device
  - o Monitoring of the battery charge status.

The advantages of the DRIVE lie in the high efficiency and low energy consumption, energy recovery during braking, rpm management at constant speed, battery management and battery charge status check as well as the management of the other auxiliary functions.

## **BATTERY CHARGER**

The battery charger is the intermediary element between the power mains and the electric scooter. It transforms the alternating voltage supplied by the mains into direct voltage.

**There is a high-frequency battery charger built into the DRIVE of your Lepton.**

It can be connected to any 220/240 Volt outlet.

The built-in battery charger is programmed for the automatic charging of the battery model used on Leptons only. The battery charger cannot be used to recharge other battery types.

## ELECTRIC BATTERY

There is a compartment under the footboard capable of housing four 38AH batteries connected in series.

## VEHICLE MARKINGS (FIG. 2)

### Frame number

The frame number is printed on a bracket welded in the central part of the frame, on the right-hand side. In accordance with the new international regulations, the scooter must feature the VIN marking consisting in 17 alphanumeric characters essential for the vehicle's univocal identification for 30 years.

The "type-approved plate" must be applied in the same position, on the left-hand side.

Frame n. ....

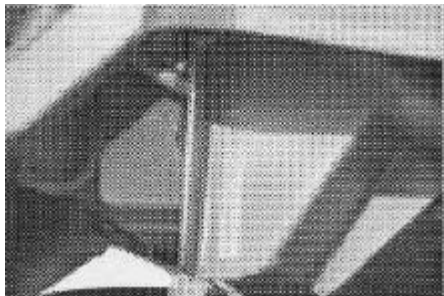





Fig. 2

## INSTRUMENTS AND CONTROLS ( FIG. 3 )

- 1) Rear brake lever.
- 2) Left rearview mirror.
- 3) Horn 
- 4) Mode control.
- 5) Indicator switch 
- 6) Light switch 
- 7) Standard drive and start mode control.
- 8) Sprint mode control.
- 9) Dashboard.
- 10) Right rearview mirror (optional extra).
- 11) Electronic throttle.
- 12) Front brake lever.
- 13) Ignition switch and steering lock.
- 14) Electronic security key.
- 15) Bag hook.

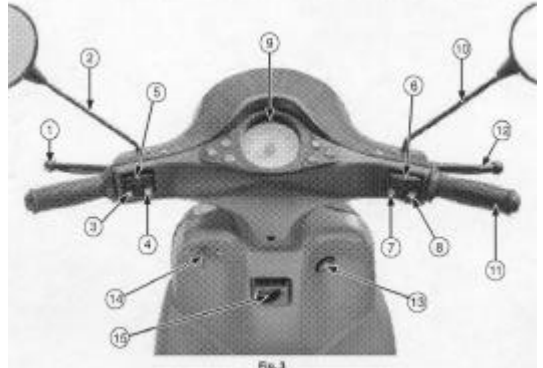


Fig. 3

Fig. 3

## DASHBOARD ( FIG.4 )

- 1) Indicator telltale.
- 2) Battery recharge warning light.
- 3) Low battery charge warning light.
- 4) Lights indicator light.
- 5) Standard drive mode indicator light.
- 6) Sprint mode indicator light.
- 7) Speedometer.
- 8) LCD strip. displays the programmed function and any faults.

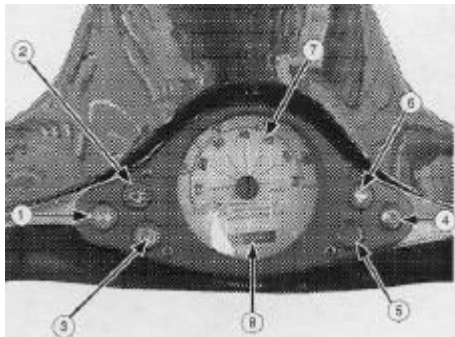


Fig. 4



## INDIVIDUAL CONTROLS

### CONTROLS ON THE LEFT HANDLEBAR (FIG. 5)

#### 1) Horn

The horn sounds when the button is pressed



#### 2) Indicator switch



Move the switch to the left " ← " to indicate you are turning left; move the switch to the right " → ", to indicate you are turning right.

Return the switch to the centre to turn off the indicator.

#### 3) Mode control.

This enables the programmed functions on the LCD strip of the dashboard to be chosen in the following order:

- Remaining runtime (aut.) expressed in kilometres and calculated based on the driving behaviour of the last 15 seconds.
- Total distance covered (t.) in kilometres.
- Partial distance covered km.

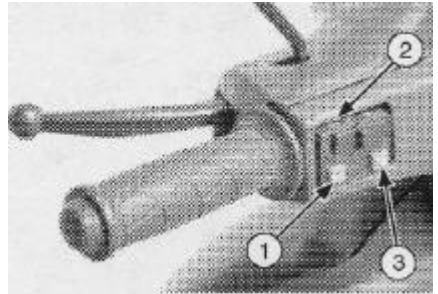



Fig. 5

- In order to zeroize the latter function. keep the button pressed for 5 sec.

## CONTROLS ON THE RIGHT HANDLEBAR (FIG. 6)

### 1) Light switch

The lights come on when the switch is set to "  " .

### 2) Standard drive mode control

This enables the scooter to be started ridden in normal mode at a maximum speed of 45 km/h. The relevant indicator light on the dashboard lights to advise that the control has been switched on.

### 3) Sprint mode control

This enables the rider to shift from standard drive to sprint mode when pressed for a few seconds.

This shift must be made whilst the scooter is powered and enabled, but at a very low speed or at a standstill.

The relevant indicator light on the dashboard lights to advise that the control has been switched on.

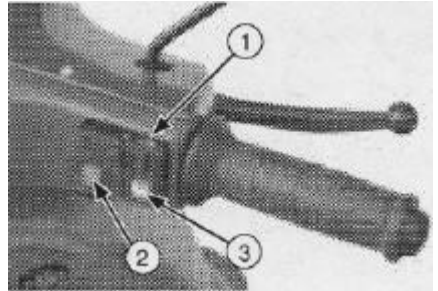





Fig. 6

**N.B.: the same conditions must be observed when returning to the standard drive mode.**

## IGNITION SWITCH (FIG. 7)

The ignition switch is located on the right-hand side near the steering head (1 ). Turn the key to  to start the scooter.

## STEERING LOCK (FIG. 8)

In order to lock the steering, turn the handlebar as far to the left as it will go with the key (1 ) turned to "  ", press the key, release it and then set it to "  ". Remove the key.

**N.B.:** The ignition key is used to enable the ignition switch/steering lock and the saddle lock. The scooter comes with two keys (one is a spare).

## ELECTRONIC SECURITY KEY (FIG. 9)

The electronic security key interface is located on the left-hand side of the legshield. When the electronic key is inserted, the means is enabled for starting and the immobilizer-type anti-theft device disabled.

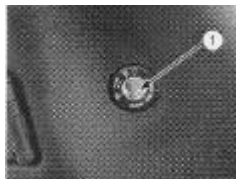


Fig. 7

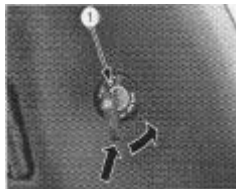


Fig. 8



Fig. 9

### LOCKING/UNLOCKING THE SADDLE (FIG.10)

The saddle lock (1) is located on the rear fairing. In order to unlock the saddle, insert the ignition key and turn it anticlockwise, then lift.

To lock the saddle, simply lower it and press down until it locks in place.

### CRASH HELMET COMPARTMENT (FIG. 11)

The crash helmet compartment is located under the saddle.

The maximum weight the compartment is designed to carry is approx. 2 to 3 kg.

**WARNING:** Before locking the saddle, make sure you have not left the keys in the crash helmet compartment by mistake.

### BAO HOOK (FIG. 12)

The bag hook (1) is located on the countershield.

The maximum weight the hook is designed to carry is approx. 1 to 2 kg.

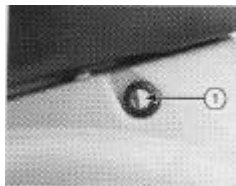



Fig. 10




Fig. 12

## OPERATING INSTRUCTION

### STARTING

1. Set the ignition switch to "  " (FIG. 7). The lights on the dashboard come on for a second as the test check is run. The message CODE appears on the LCD display.
2. Insert the electronic security key which enables the scooter to be started and disables the anti-theft device. The standard drive mode light starts to flash. The electronic key can now be removed and the scooter remains enabled.
3. Press the standard drive mode control (FIG. 6, pos. 2). The corresponding light (FIG. 4, pos. 5) stops blinking and remains steadily lit, indicating the engine is ready to be started.

### STOPPING AND PARKING

1. Release the electronic throttle, stop the scooter by pulling on the brakes, set the ignition switch to "  " (FIG. 7) and remove the electronic security key. This causes the power supply to be cut off and the scooter disabled, with the anti-theft device being re-enabled.

**N.B.:** The Lepton features a security function called "stand by" which is enabled when the standard drive mode control is pressed quickly twice in a row. When in this status, the vehicle is not enabled to start, even though all its functions are active. When pressed again, the standard drive control restores the initial situation.

## SETTING THE VEHICLE ON THE STAND (FIG. 13)

Hold the scooter by the handlebar and the rear cover, at the same time pressing down the lever to the left of the stand.



Fig. 13

## BRAKES (FIG. 14)

In order to ensure the brakes work perfectly, measure the distance the lever travels before the brake's braking action actually starts. The freeplay at the very end of the brake lever must be approx. 5/10 mm (FIG. 14). If this is not the case, contact an authorized Oxygen S.p.A. dealer for a checkup and possible adjustment.

**N.B.:** The Lepton scooter also features an effective engine brake which starts working automatically when the electronic accelerator control is released.

**WARNING:** Pay Attention when you use the engine brake because no brake light works.



Fig. 14

## BATTERY COMPARTMENT (FIG.15)

There is a compartment under the footboard capable of housing four 38AH batteries connected in series.

The batteries are reached by removing the cover of said compartment (FIG. 12) which is fastened at the front with a lock and at the back by a click-in system.

**Before entering the battery compartment, the ignition key must be removed.**

**Use the set of quick contacts supplied to fit the Fig.15 batteries, bearing in mind that each connection must be made between a negative pole (-) and a positive pole (+).**

Following the diagram featured on the battery fastening bar, connect the black cable, which ends in a quick-release coupling, to the negative pole of the **battery unit**; connect the terminal end of the white cable from the quick-release coupling kit to the terminal of the fuse carrier and the quick-release coupling end to the positive pole of the **battery unit**. Next, connect up the intermediate connections, carefully observing the colour coding to match the terminals and poles of the batteries.

When disassembling, open the battery compartment, disconnect the quick-release terminals (the positive one first, then the negative) followed by all the intermediate connections. Finally, remove one battery at a time.

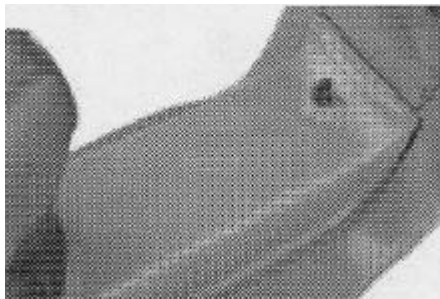


Fig. 15

**Under no circumstances should the batteries be kept completely discharged, even for short periods of time.**

## **BATTERY MANAGEMENT**

When the battery low warning light starts flashing, the amount of energy contained in the batteries is sufficient to cover a distance of less than 15 km.

The battery low warning light remains steadily lit when the energy reserve is sufficient to cover a distance of less than 10 km.

In order not to compromise battery performance, it is advisable to charge the batteries (or stop off at a service centre to have them changed) when the remaining runtime indicated in the LCD strip of the dashboard is equivalent to less than 5 km.

**N.B.: Below this threshold, the charge status detection system may not be able to determine the battery runtime in km with a sufficient degree of accuracy.**

## **BATTERY CHARGER**

In order to recharge the batteries with the Lepton DRIVE's built-in battery charger, first set the ignition switch to OFF, lift the saddle and connect the cable to the mains. Keep the saddle lifted whilst recharging is in progress.

The battery charger detects the presence of the voltage and switches on.

The plug warning light on the dashboard (FIG. 4, pos. 2) comes on and an additional disabling function makes it impossible for the scooter to be started whilst the battery charger is working.

The DRIVE goes into "stand by" mode and the message "stby" therefore appears on the speedometer LCD strip.

During the charging process, take extreme care as the DRIVE surface may become as hot as 60°C and, therefore, must not be touched.



During the charging process the plug warning light on the dashboard (FIG. 4, pos. 2) is flashing, once 80% of the charging is reached, light remain on, to switch off once the charging is complete.

The life of the batteries and their efficiency improve if recharging is performed frequently.

It is advisable to connect the scooter to the 220 V mains as soon as possible, even after covering rather short distances, so as to exploit all the power to the full.

Only charge the batteries with the DRIVE.s specific built-in charger.

Do not use battery chargers designed for other battery types with a different voltage and capacity.

### ***Safety instructions:***

**ATTENTION: To reduce the risk of electric shock, do not remove cover. Refer servicing to qualified service personnel.**

Battery charger has been designed to provide safety and reliable. It is necessary to observe the following precautions in order to avoid damage to persons and to the battery charger:

- Read the installation instructions contained in this Manual carefully.
- When you use the charger you have care that the fan work well. Don't cover the charger when it work.
- When use the charger the saddle must be open and the ignition key switch to OFF
- Ensure all ventilation ports are not obstructed, to avoid the overheating. Do not put the battery charger near heat sources. Make sure that free space around the battery charger is sufficient to provide adequate ventilation and an easy access to cables sockets.
- Verify that the available supply voltage corresponds to the voltage that of the battery charger. In case of doubt, consult a retailer or local Electric Supply Authority.
- For safety and electromagnetic compatibility, the battery charger has a 3-prong plug as a safety feature, and it will only fit into an earthed outlet. If you can not plug it in, chances are you have an older, non-earthed outlet; contact an electrician to have the outlet replaced. Do not use an adapter to defeat the

earthing.

- **To avoid damaging the power cord, do not put anything on it or place it where it will be walked on. If the cord becomes damaged or frayed, replace it immediately.**
- If you are using an extension cord or power strip, make sure that the total of the amperes required by all the equipment on the extension is less than the extension's rating.
- Do not try to service the battery charger yourself. Opening the cover may expose you to shocks or other hazards.
- If the battery charger does not work correctly or if it has been damaged, unplug it immediately from the supply socket and contact a retailer.
- Remember! When the charging operation is finish you have to disconnect the charger
- The battery charger can not be used to recharge other battery types.

## **WHEN YOU DON'T USE THE SCOOTER**

If you expect not to use the vehicle for a lengthy period, the procedure below must be followed:

1. recharge the batteries completely
2. do not leave the key in the ignition
3. recharge again after 1 month of disuse, and certainly after no more than 3.

## DESCRIPTION OF ALARMS AND POSSIBLE SERVICE REQUESTS

The LCD strip located on the dashboard (FIG. 4, pos. 8) also displays any faults, divided into two categories, "alarm" and "error".

**N.B.:** Failure to comply with the instruction given subsequent to alarm and error signals may compromise the safety of the vehicle and result in the warranty conditions becoming void.

### A) "ALARM" CATEGORY

The alarm category indicates temporary faults or malfunctions which, nonetheless, enable the scooter to continue running, albeit in less than optimal conditions. The message appears for 5 seconds every 20 seconds.

#### **"Ali" 4 (Alarm 4): Engine overtemperature**

Indicates that the temperature in the engine has reached 110°C. It is advisable to switch off the vehicle and only start up again when the .Ali 4. (Alarm 4) message disappears, otherwise, the "Error 5. message may appear, which causes the vehicle to stop.

### B) "ERROR" CATEGORY

The "error" category indicates permanent faults which might even entail the stopping of the vehicle and hence require the rider to contact a service centre. The message remains on the display until the fault has been remedied.

### **Error 1: Overvoltage**

The message "Err 1" indicates that the voltage has reached 70 Volts. An overvoltage may cause damage to the electronic power devices as well as to the batteries. The drive is disabled immediately and the scooter stops (despite still being powered). The user can try to resume riding by switching the scooter off and then switching it back on.

Even when the rider manages to make the "Err 1" message disappear with this procedure and hence resume riding, it is advisable to take the vehicle to a service centre as soon as possible and report the fault encountered. If, once the scooter has been switched on again (after a few seconds), the "Err 1" message reappears, the scooter must be switched off and taken to a service centre.

### **Error 2: Undervoltage**

The message "Err 2" indicates that the voltage has dropped below 20 Volts. An undervoltage may cause damage to the electronic devices. The drive is disabled immediately and the scooter stops (despite still being powered). The user can try to resume riding by switching the scooter off (by turning the mechanical key to OFF) and then switching it back on (by turning the mechanical key to ON). Even when the rider manages to make the "Err 2" message disappear with this procedure and hence resume riding, it is advisable to take the vehicle to a service centre as soon as possible and report the fault encountered.

If, once the scooter has been switched on again (after a few seconds), the "Err 2" message reappears, the scooter must be switched off and taken to a service centre.

### **Error 5: Engine overtemperature**

Indicates that the engine temperature has exceeded 140°C or is lower than -25°C.

An overtemperature may be the result of a mechanical problem (e.g. damaged bearings) or electric/electronic problems (deriving from an incorrect engine check, for example).

The overtemperature may cause damage to the engine (overheating/burnt winding/demagnetization of magnets etc.).

The drive is disabled immediately and the scooter stops (despite still being powered). The user can only try to resume riding, by switching the scooter off and then switching it back on, once the engine case has cooled down.

Should this procedure not make the "Err 5" message disappear and enable the user to resume riding, the scooter must be switched off and taken to a service centre.

#### **Error 7: Current alarm**

Indicates an anomaly in the current circuit. The drive is disabled immediately and the scooter stops (despite still being powered). The user can try to resume riding by switching the scooter off and then switching it back on.

Even when the rider manages to make the "Err 7" message disappear with this procedure and hence resume riding, it is advisable to take the vehicle to a service centre as soon as possible and report the fault encountered. If, once the scooter has been switched on again (after a few seconds), the "Err 7" message reappears, the scooter must be switched off and taken to a service centre.

#### **Error 10 : Battery charger alarm**

Indicates an anomaly in the current circuit. The drive disabled immediately and the scooter stops (despite still being powered). The user can try to resume riding by switching the scooter off and then switching it back on.

**Error 11 : Hall sensor alarm ( type 1)**

No signals from Hall Sensor. The drive is disabled immediately and the scooter stops (despite still being powered).

**Error 12 : Hall signal sequence alarm**

Wrong sequence of configuration of Hall Sensor. The drive is disabled immediately and the scooter stops (despite still being powered).

**Error 14 : Overtime of battery charger alarm**

Active when the recharge time exceeds the time limit.

**Error 15 : Overload alarm**

Alarm of the service circuit turns on when battery charger works.

**Error 16 : Over temperature of battery charger alarm**

Alarm of over temperature of battery charger.

## DESCRIPTION OF POSSIBLE CAUSES FOR ACTIVE ALARMS AND ERROR

ALARM TYPE	DESCRIPTION	ALARM CONDICTION	POSSIBLE CAUSES
ALL 4	Motor temperature first high level		Real values of temperature Break of temperature sensor Problems with electronic card of control
ERR 1	Over Voltage	Value of voltage over 70 V Time of intervention 60 ms	Hard use of the scooter on the way down Problems with electronic card of control
ERR 2	Under Voltage	Default value = 20 V Intervention Time 400 ms	Low level energy inside the battery Problems with electronic card of control
ERR 3	Temperature dissipator high and low level	Default high level value 75°C Time intervention 1 s	Dissipator over temperature (environmental causes, hard use) Problems with electronic card of control
ERR 5	Motor temperature second high and low level	Default high level value 140°C Default low level value -25°C Time intervention 1 s	Real values of temperature Break of wiring of temperature sensor on the motor Break of temperature sensor Problems with electronic card of control
ERR 7	Current Alarm	Too much elevated current on the motor	Break of Mosfet Wiring phases wrong motor Problems with electronic card of control

<b>ERR 10</b>	Current Alarm	<p>Current value over the set point of 1A for a time longer than 100 ms in phase 1 or</p> <p>Current value over 8,12A for a time longer than 100 ms in phase 2 or</p> <p>Current value over the set point of 1A for a time longer than 100 ms in phase 3</p> <p>Voltage value over 70V in buffer for a time longer than 1 s</p> <p>Current value over 2 A for a time longer than 2 s</p>	<p>Failure batteries</p> <p>Failure of battery charger</p> <p>Problems with electronic card of control</p>
<b>ERR 11</b>	Processor Error	No signal from Hall Sensor	<p>Wrong wiring of Hall Sensor on the motor or break of wiring</p> <p>Break of Hall Sensor</p> <p>Problems with electronic card of control</p>
<b>ERR 12</b>	Tuned of motor	Wrong sequence of configuration of Hall Sensor	<p>Wrong wiring of Hall Sensor on the motor or break of wiring</p> <p>Break of Hall Sensor</p> <p>Problems with electronic card of control</p>
<b>ERR 14</b>	Overtime of battery charger	Active when the recharge time exceeds the time limit	<p>Failure of the batteries</p> <p>Problems with electronic card of control</p>
<b>ERR 15</b>	Overload	<p>Alarm of the service circuit turns on when battery charger works</p> <p>Intervention time 3 s</p>	<p>Lighting service circuit (light,direction lights...)</p> <p>When battery charger works</p> <p>Problems with electronic card of control</p>
<b>ERR 16</b>	Over temperature of battery charger		<p>Excessive overheating of the battery charger (environmental condition, break of the batteries)</p> <p>Problems with electronic card of control</p>



### BATTERY (FIG. 16)

The technological content, manufacture and materials used for the lead-acid gas-recombination storage batteries means they require very little maintenance. They can be considered maintenance free provided both operating and environmental conditions are correct.

#### ***Main rules for use***

All the materials used in the lead-acid gas- recombination storage batteries are acid resistant.

Even more so since the batteries are sealed and no acid is able to leak out.

This means that the traditional greasing of the bare parts with Vaseline for technical use becomes redundant. Greasing the terminal poles has a negative effect as it increases the contact resistance between the battery and the connection. This, in turn, causes the drop in voltage to increase, especially with very high currents, and is therefore to be avoided. The lead-acid gas-recombination storage batteries use diluted sulphuric acid, as electrolyte, absorbed in glass microfibre felt. The amount contained in the battery is sufficient for its entire service life.

#### ***The battery does not require topping up.***

Under no circumstance must the battery be opened to check the electrolyte level and top up.

Since the lead-acid gas-recombination storage batteries do not smell, they can be charged in places frequented by people.

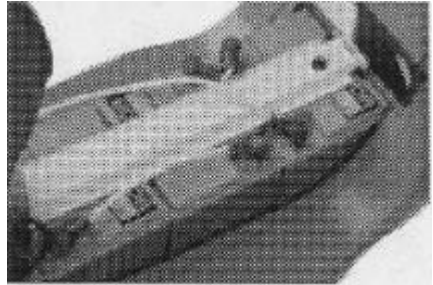


Fig. 16

### ***Maintenance measures: Looking after the battery***

A number of simple steps will ensure the batteries remain efficient and ready to work:

*Visual inspection of the terminals and battery case:* neither must be damaged or cracked. The terminals can be damaged.

If they are bent, deformed or feature any burnt parts, the battery must no longer be used.

### ***Keep the batteries clean***

The batteries must be cleaned with clean rags. Where necessary, use lukewarm water containing a small amount of detergent. It is prohibited to clean the batteries with abrasive agents or solvents.

Said materials may damage the plastic of the battery case. The battery terminals must be cleaned with a copper wire brush or tools specific for the task.

### ***Temperature effect***

The performance may be deteriorate when use at low temperatures

### ***New electric battery***

A new battery must undergo a number of complete charging/discharging cycles before the best performance can be achieved.

### ***For a long life to your battery***

1. Your Scooter is equipped with a low voltage cutout. This means that when your battery is discharged, the controller will shut off the motor. If this happens, you must recharge the scooter immediately to avoid damaging your battery permanently
2. Recharge the battery every time that is possible

3. Recharge completely the battery all time that is possible
4. Discharge the scooter completely only the times that it are essential
5. You have to recharge the scooter as soon as possible, even after covering rather short distances, so as to exploit all the power to the full.
6. Under no circumstances should the batteries be kept completely discharged, even for short periods of time

### **Operating precautions**

Work on the batteries must be performed by expert, suitably trained personnel only. For the sake of health and safety, it is forbidden to eat, drink and/or smoke near the batteries.

Even though the batteries do not feature free electrolyte, take care not to damage the batteries which could result in the acid getting onto the skin or clothes.

If, despite all these precautions, any acid gets onto the skin or clothes, wash immediately and abundantly with soap under cold running water.

When the water contained in the electrolyte decomposes, the result is a hydrogen/oxygen mixture which is to be found in the free spaces and inside the battery. If the mixture exceeds certain concentrations, it may detonate or explode and burn. In view of the above-mentioned hazard, it is strictly forbidden to let naked flames and incandescent bodies near the batteries. Never smoke near the batteries.

### **WARNING**

- The battery is a reservoir of energy. If the energy is tapped in an uncontrolled manner, for example owing to a short-circuit, this may result in serious damage to property and personal injury. Consequently:
- none of the conductive parts must be connected or disconnected whilst the battery is being charged or discharged.
- any work on the batteries must be done using insulated tools! -never set tools down on the batteries!

- never improvise or perform work using unreliable tools; use correct tools only!
- it is forbidden to wear rings, bracelets, or watches with metal straps or buckles when working on the batteries!
- make sure the connectors are fastened properly.
- The batteries must not be allowed to work in airtight rooms.

## CHECKING THE REAR REDUCTION GEAR OIL LEVEL (FIG.17)

Check the level of the rear reduction gear oil every 5,000 km or once a year. Proceed as follows:

1. Run the engine until it reaches the regular working temperature, then switch it off.
2. Set the scooter on the stand.
3. Place a graduated receptacle, with a capacity of 120cm<sup>3</sup> or over, under the drain plug (2).
4. Unscrew and remove the filler cap (1) and oil drain plug (2).
5. Let all the oil drain out of the oil sump, measure the quantity; if it is less than 40 cm<sup>3</sup>, top up with the missing quantity.
6. Tighten the drain plug (2) and proceed with filling.
7. Tighten the filler cap (1).

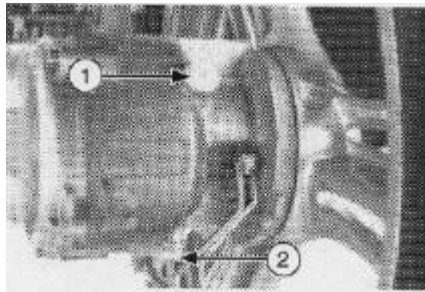


Fig. 17

## CHANGING THE REAR REDUCTION GEAR OIL (FIG. 17)

In order to assure the scooter's lengthy service life and efficient running, change the oil after the first 500 km, and then every 10,000 km or once every 2 years.

Perform the first four operations indicated in "CHECKING THE REAR REDUCTION GEAR OIL LEVEL" .

Let all the oil drain out of the oil sump.

Tighten the drain plug (2) and pour 40 cmq of oil into the filler neck (1).

Tighten the filler cap (1).

**WARNING: Check periodically for oil leaks around the seals of the sump's cover. If you detect any leakage, contact an authorized OXYGEN S.P.A. dealer.**

**Do not use the scooter when there is not enough lubricant or using incorrect lubricants as they help moving parts wear down quicker and may result in irreparable damage.**

## FRONTWHEEL (FIG.17-18)

### *Disassembly*

1. Set the scooter on the stand and use supports to prevent it falling.
2. Unscrew and remove the wheel pin nut (1 -FIG. 18).
3. Remove the wheel pin (2- FIG. 19), taking note of the positioning of the spacers and the device connecting to

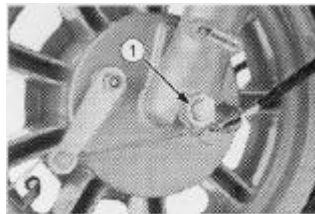


Fig. 18

### **Reassembly**

1. Refit the device connecting to the odometer, inserting its tab into the hole on the wheel hub along with the relevant spacers.
2. Once the wheel pin (2 -FIG. 19) has been inserted, compress the fork so as to align the tubes.
3. Tighten the wheel pin nut up firmly (1 .FIG. 18).

**N.B.:** Pull the brake lever repeatedly in order to make sure the braking system is working properly.

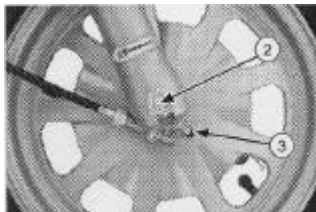


Fig. 19

## **REAR WHEEL**

### **Disassembly**

-Set the scooter on the stand.

1. Remove the nut cover.
2. Unscrew the wheel nut.
3. Slide out the wheel.

### **Reassembly**

-Follow the above procedure in the reverse order.

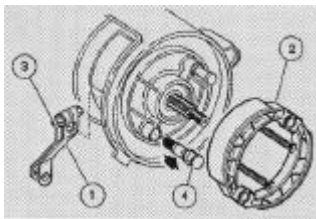


Fig. 20

## **GREASING THE REAR BRAKE OGIVE (FIG. 20)**

1. Every 4,000 km, grease the rear brake ogive as follows:

2. Disassemble the rear wheel.
3. Release the rear wheel cable from the arm by loosening the adjusting screw.
4. Disassemble the brake shoes (2 -FIG. 20)
5. Remove the brake lever (1 -FIG. 20) by loosening the nut (3 -FIG. 20).
6. Remove the pin (4- FIG. 20).
7. Only grease the area indicated by the arrow.
8. Reassemble by following the procedure in the reverse order.

**WARNING: Take extreme care not to grease the pin (4) in the cam area and not to dirty any parts or areas other than those indicated with the grease as this is likely to compromise braking efficiency.**

## CHECKING THE STEERING (FIG. 21)

Every now and again, check for slack steering.

1. Set the scooter on the stand.
2. Shake the fork in the direction of travel (FIG. 22).
3. If there is considerable slack, contact a service centre

## CHECKING THE ENGINE FULCRUM AXIS (FIG. 22)

The engine should be checked periodically for slack between the engine pin bushes and the actual engine pin.

1. Set the scooter on the stand.
2. Push and pull the rear wheel sideways (FIG. 22).
3. If there is considerable slack, contact a service centre.



Fig. 21

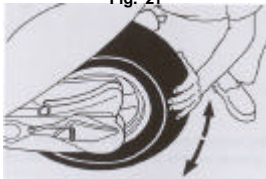


Fig. 22

## REMOVING THE HEADLIGHT FAIRING (FIG. 23)

In order to remove the fairing (FIG. 23), unscrew the fastening screws and then slide it out, taking extreme care not to snap the centring tabs.



Fig. 23

## ADJUSTING THE HEADLIGHT BEAM (FIG. 24)

The headlight beam can be adjusted by turning the relevant screw with a screwdriver (1 -FIG. 24).

Turn clockwise to raise the beam and anticlockwise to lower it.

The headlight beam must always be parallel to the ground.

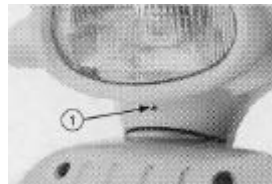


Fig. 24



## CHANGING BULBS

### A) HEADLIGHT (FIG. 25)

1. Set the scooter on the stand.
2. Open the headlight fairing.
3. Change the flat bulb (1 -FIG. 25).

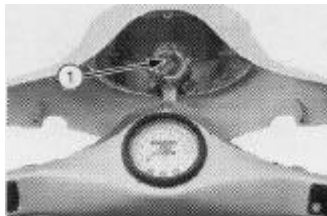


Fig. 25

### B) FRONT INDICATORS (FIG. 26)

1. Remove the screws (1 -FIG. 26).
2. Remove the glass shield (2 -FIG. 26) taking care not to snap the catch.
3. Press the bulb lightly and turn it anticlockwise. -Remove the bulb from the socket and install a new bulb correctly.

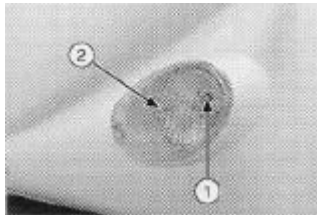


Fig. 26

### **C) REAR LIGHT AND REAR INDICATORS (FIG. 27)**

1. Remove the screws (1 -FIG. 27) for the rear light or the screws (3 -FIG. 27) for the rear indicators.
2. Remove the glass shields (2-4 -FIG. 27).
3. Press the bulb lightly and turn it anticlockwise.
4. Remove the bulb from the socket.
5. Install the new bulbs correctly following the procedure in the reverse order.

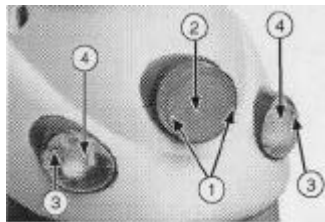


Fig. 27

### **LUGGAGE RACK (FIG. 28) -OPTIONAL EXTRA**

Proceed as follows to fit the rack:

1. Make holes in the rear fairing in the premarked point (2 -FIG. 28).
2. Use the screws supplied to fasten the rack to the rear fairing (1-2-FIG. 28).

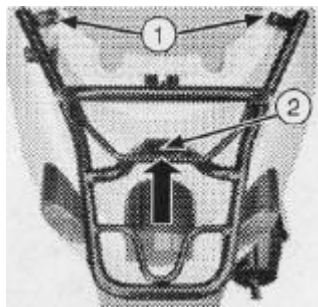


Fig. 28

## TECHNICAL DATA

### Dimensions

Wheelbase mm	1.240
Max. length mm	1.710
Max. width mm	680
Max. height mm	1.070
Running weight kg	133

### Engine

Model	vc Lafert Brushless with permanent magnets
Max. power	1.8 kW at 6.000 rpm
Working voltage	48V D.C. / 35V r.m.s.

### Drive

Technology	Digital
Power device	Mosfet
Current demand	70 / 120 ADC
Output current	60 / 100 A r.m.s.
Input voltage	48 VDC
Output voltage	35V r.m.s.

### Battery charger

Voltage	230/240 V (50/60 Hz)
Max. demand	360 W
Max. voltage	63.6 V
Max. current ( output )	6 A
Normal recharge time	5 hours

### Frame

Type	Tubular
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### Suspension

Front	telescopic mechanical
Rear	side oleopneumatic monoshock

### Brakes

Front	drum brake d. 104 mm
Rear	drum brake d. 120 mm

### Tyres

Front	100 / 80 - 10 53J
Rear	100 / 80 - 10 53J

