



HDV T 16

Diving vehicle

INSTRUCTION MANUAL and WARNINGS FOR USE

03/2010

Welcome to the world of HALCYON

Halcyon congratulates and thanks you for your trust in purchasing our vehicle. Every “underwater scooter” is the result of extensive experience and prolonged prototype testing. A capable and creative staff, assisted by highly courageous diving experts with proven professional and recreational abilities, have created this and other underwater vehicles to assist and extend your underwater dives.

However, never overestimate your abilities and always take specific underwater diving courses to be able to use your underwater vehicle in total safety.

Always remember that fun should NEVER put your life at risk.

The HALCYON staff

WARNING!

PLEASE READ THE FOLLOWING

THIS MANUAL CONTAINS IMPORTANT PRECAUTIONS, WARNINGS AND INFORMATION. IT IS IMPORTANT THAT IT IS CAREFULLY AND FULLY READ BEFORE USING THE UNDERWATER SCOOTER!

Observance of the instructions contained in this manual will allow you to carry out use, transport and maintenance operations safely, while guaranteeing optimal vehicle operation and reduced running costs. The company Halcyon is not liable for damage resulting from negligence on behalf of the user or from failure to observe these instructions.

The Distributor, Halcyon, declares that:

- the *Halcyon diving vehicle* (henceforth called "**HDV**") shall be delivered to the buyer in perfect working condition, complete with its use and maintenance manual;
- any person attempting to use the *diving vehicle* shall be deemed to have undergone specific training in the use of similar diving vehicles and to have obtained the necessary certification issued by a qualified agency;
- any person attempting to use the *diving vehicle* shall be deemed to have read the use and maintenance manual provided, and hence the instructions contained within, in particular:
 - how to use the *diving vehicle*, with details regarding the diver's correct equipment configuration, the diver's posture during use, the position that must be maintained by the *diving vehicle* during the dive, and that the *vehicle* must not be bound with systems hard to release to its user in any way whatsoever.
 - the environmental conditions where use of the diving vehicle is especially dangerous, such as deep-water dives, obstructed environments, muddy or suspension-filled environments; the special precautions to be adopted when dives are effected in such environments and the need of having undergone suitable training held by qualified agencies;
 - dangerous behaviour that is to be avoided such as, for example, use of the diving vehicle to accelerate the descent or ascent rate;
- it is therefore assumed that the user has been fully informed on how to use and maintain the product as well as of its technical characteristics, and that he shall scrupulously abide by these rules.
- It hence follows that any damage to persons or objects, deriving from incorrect maintenance of the diving vehicle or from its use other than as stipulated by this manual or without the precautions described within, cannot be attributed to defects of the product.

The company Halcyon is not liable for losses or damages suffered by third persons consequent to the use of this *diving vehicle*.

The HDV **is not a toy, nor a suitable rescue means**. It's exclusive function is to **help** expert divers in immersions to cover greater distances than could be normally covered with fins only. The HDV and its components, specifically the battery and battery charger, are intended for adult and expert use after carefully reading these instructions.

In order to prevent any harm to things or individuals, the user of the battery and battery charger supplied with our diving vehicles must first read the use and maintenance manual and strictly observe the indications on correct use and product features, **preventing inexperienced personnel or minors from handling, even inadvertently, the HDV and supplied instruments.**

Our HDV are equipped with a “cut off” device that protects internal components, impeding operations when voltage is too low. **When this device is triggered, it inevitably, shuts off.**

This feature must always be kept in mind to avoid any hazards for the diver who, when planning a dive, will leave sufficient time to **surface even without HDV power** should the battery, due to the amount of time under water, die.

Halcyon is not liable for any damages to persons and/or property caused by use other than that described in this manual and in neglect of the precautions described herein.

Due to constant technological developments, Halcyon diving vehicles may be modified at any time without prior notice.

This manual is not a substitute manual for an adequate course held by certified agencies on the correct use of HDV on dives.

Use of the HDV under the influence of alcohol and drugs and in any situation in which psycho-physical conditions are not suited for diving is prohibited.

ADDITIONAL NOTE!

This HDV model comes with the following accessories:

**N-Handle
Prop lock propeller
BY PASS device**



In addition to normal HDV use, these accessories make it extremely important that you are fully aware of their use and operations and the potential hazards that may be associated with their use if not adequately informed on their use. (see specific paragraphs)



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1 General safety and accident prevention regulations

Pay special attention to the hazard signs in this manual. There are 3 levels of hazard signs:



This sign is a warning that failure of the user to adhere to the described operations will expose him to health hazards that may lead to serious or permanent harm.



This sign is a warning that failure of the user to adhere to the described operations will expose him to possible health hazards that shall not, however, lead to serious or permanent harm.



This sign is a warning that failure of the user to adhere to the described operations may lead to damage of the vehicle.

Please read the instructions in this manual carefully, before using the vehicle. Copyrights for this manual belong exclusively to the company Halcyon. Reproduction of this document, in part or in whole, is forbidden unless prior consent is obtained in writing.

IMPORTANT NOTE!

Although diving with the HDV is great fun and relieves you of substantial effort, do not ever forget that it is a machine and ...

IT CAN BREAK!

Never consider the HDV to be an aid in dangerous situations.

IT IS NOT A LIFE-SAVING DEVICE!

Always remember that you can ONLY COUNT ON YOUR OWN STRENGTH.

2 Description and operating principle

The HDV consists of a perfectly watertight, streamlined, hollow body, see figure 1, inside which the electric motor, rechargeable batteries and speed-reduction gear are housed. On the outside, two manoeuvring handles (1) are found at the rear, one of which has an integrated trigger (2) to control propeller rotation by means of a proximity switch (3). At the front, a handle (4) is used for gripping and carrying the vehicle. The propeller (10) is located at the rear end and is protected by a surrounding circular strip which constitutes the flow conveyor (5). The main switch (6) for turning the power on and off and the speed regulator knob (7) are also found at the rear.

In front is situated the head cap (8). By opening it we can access to the battery compartment, the locking wheel (9) is inserted in the shell.

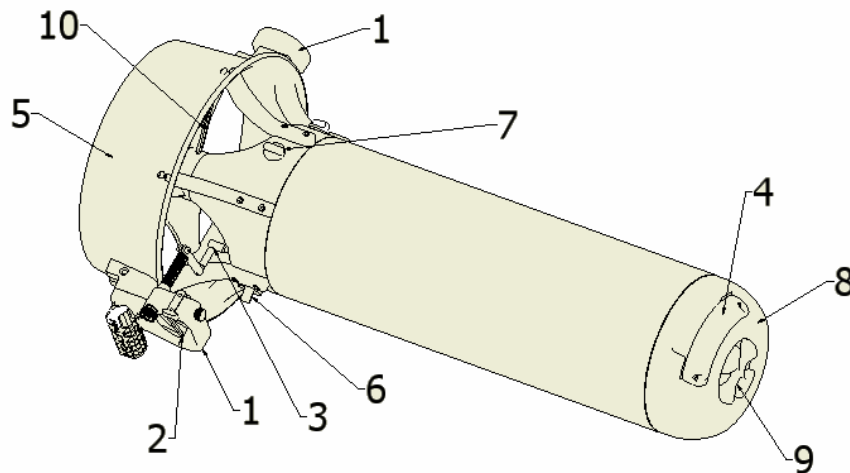


Figure 1

3 Using the vehicle

The *diving vehicle* distributed by Halcyon is a vehicle that has been designed and constructed for dive transportation purposes. Customers and third parties are forbidden from carrying out any alterations that may substantially modify its intended purpose.



The vehicle has been designed, sized and constructed for the sole purpose described above. Any other use or operation that does not comply or agree with the instructions contained in this manual, may result in damage to the vehicle. This would prevent the conditions for which it has been designed and built from being achieved, and may compromise its technical and safety characteristics. The manufacturer shall not be liable for damage to persons and/or objects deriving from inappropriate use of the vehicle.

4 Preliminary operations

Make sure the following parts are in the box:

A HDV T 16 model

A battery

A battery charger

A salt water ballast

This instruction manual

4.1 Opening the battery compartment

Stand the HDV upright on a flat surface resting it on the flow conveyor (5).

Turn the front hand wheel (9) counter-clockwise. Rotating the hand wheel, the shell (8) (see fig. 1) start to lift. Continue rotating until the shell detaches from the engine body. Remove the shell.

4.2 Extracting the battery

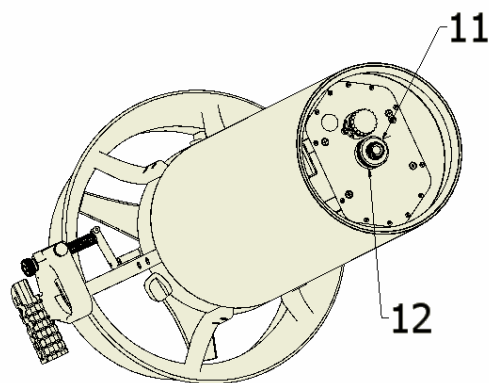


Figure 2

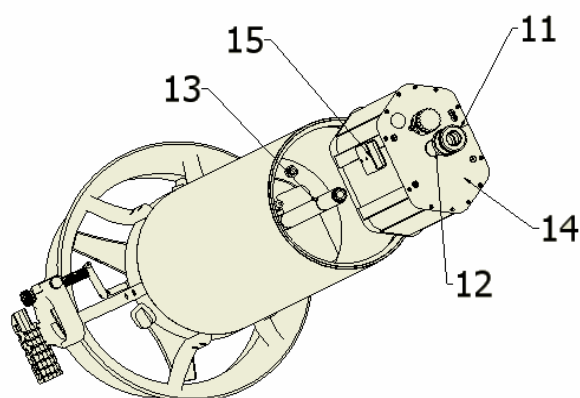


Figure 3

After removing the shell, stand the HDV vertically, detach the red connector (15) (do not pull the wires), unscrew the ring nut (11), remove the red ring (12) (see fig. 2) and extract the battery (14) pulling it upwards off the rod (13). (see fig. 2 and 3)

4.3 Recharging the battery

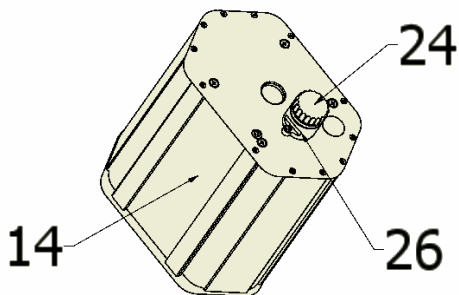


Figure 4

To recharge the battery, extract the battery (14) from the HDV (see fig. 4), put it in a safe place away from people and flammable objects. Unscrew the charger connector cap (24) and connect the charge connector (26) to the battery charger (see battery charger instructions). Next connect the battery charger power cord to the mains. When charged, disconnect the battery charge and close the connector (26) cap (24) and insert the battery in the HDV.

4.4 Inserting the battery

With the HDV in vertical position, repeat the battery extraction procedure in reverse order, being careful to insert the anti-rotation pin (16) in the battery hole. (see fig. 5)

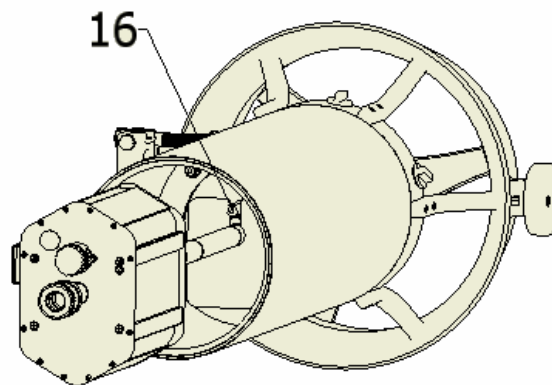


Figure 5

4.5 Closing the battery compartment

Stand the propeller protection on a level surface. Carefully check that the lock O-ring (19), (see fig. 6) is properly seated and that it is clean and suitably greased with silicone oil (the one commonly used for underwater gear). Check that the rim of the body (20), is clean, and if necessary pass a clean cloth to remove any dust or sand. Insert the front shell (8) matching the screw (18) up with the hole (17). Turn the wheel (9) clockwise until it closes completely and tighten using only two fingers.

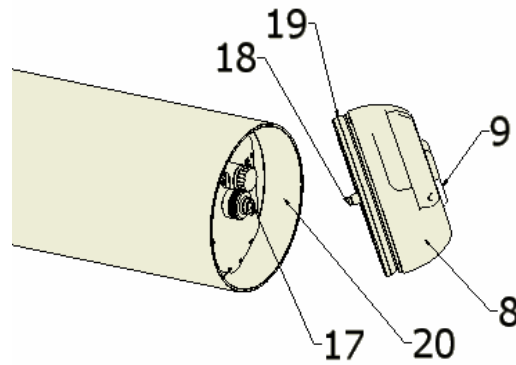


Figure 6

5 Correct use

Check the preliminary operations. Proceed as follows to start the HDV:

Always make sure the switch (6) is in the off position, submerge the HDV under water and make sure nothing is caught between the propeller blades. If something is found between the propeller blades, remove the HDV from the water and free the propeller blades of the foreign object. **Be extremely carefully since using hands or other parts of the body between the propeller blades is potentially hazardous, even if a safety clutch is installed between the propeller and engine. For this reason, avoid introducing your hands in the propeller area and, if necessary for cleaning purposes or to remove foreign objects, use or stick or other suitable tool.**

Turn the switch (6) (see fig. 1) fully clockwise without forcing it.

Grasp the two HDV handles (1) (fig. 1) or, if using the tow cord, hook the carabineer to the tow sling.

Press the trigger (2) until the engine starts.

To stop the engine, let go of the trigger (2).

To change propeller rpm, use the knob (7), rotate it clockwise to drive the HDV slowly, rotate it counter-clockwise to drive the HDV faster. This latter operation can be conducted at any time, even underwater.

When finished use, turn the switch (6) counter-clockwise to turn off the HDV.

IF YOU DO NOT USE THE TOW CORD, DO NOT DRIVE THE HDV SINGLE-HANDED. YOU MAY RISK LOSING CONTROL.

WARNING: when you press the trigger, the propeller starts to rotate and the HDV starts to move.

6 Battery depleted alarm siren device

The HDV is equipped with an alarm siren system (continuous siren), easy to hear in both immersion and emersion, which automatically sounds when a set voltage, considered the minimum for HDV use, is reached, without further or inappropriately using the battery.

This alarm is always triggered, whether the HDV is in use or accidentally left "ON".

When the siren sounds, the HDV may continue to run for several minutes. This amount of time varies and depends on several factors such as the power used and battery wear conditions. After this period, the battery cut-off will trigger, turning off the HDV. (see CUT OFF paragraph)

Note: the sole purpose of the battery depleted signal is warn the diver that the battery is low. Halcyon is not liable for the failed operation or erroneous evaluation of residual battery charge which led to the incorrect assessment of HDV autonomy. The system is based on battery voltage readings that cannot fully guarantee residual battery charge calculations. The indication highly depends on battery wear.

7 HDV diving settings

The HDV should have **NEUTRAL** buoyancy **and be practically horizontal** meaning it should not sink but remain stable at the desired depth. The vehicle is supplied neutrally buoyant or slightly float in fresh water. Additional weights (23), are provided to compensate for differences between use in fresh or salt water (see fig. 7) consisting in a stainless steel plate that should be included or removed according to whether the HDV is used in fresh water (NOT USED) or seawater (USED).

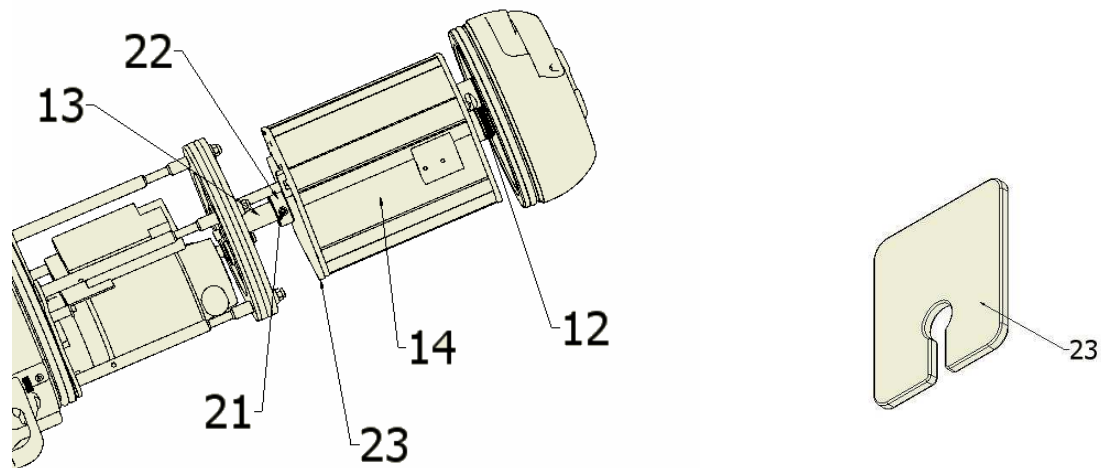


Figure 7 (view of the HDV without the external case)

7.1 Inserting the ballast

Proceed as follows to insert the ballast (23): (see fig. 7)

Open the scooter and extract the battery (see previous chapters).
 Insert the ballast on the rod (13) also inserting the anti-rotation pin (16) (Fig. 5).
 Insert the battery and close the scooter as described in previous chapter, being careful to connect the red connector only if you have to immediately use the HDV.

IMPORTANT NOTE: Figure 7 illustrates the HDV in salt water settings, meaning the red ring (12) fig. 2 is positioned above the battery and the ballast (23) is positioned under the battery; when using the HDV in fresh water, the ballast (23) should be removed from the HDV and the red ring (12) is positioned under the battery in the place of the salt water ballast (23).

This makes the HDV lighter and re-establishes the correct centre of gravity for the HDV to assume the right position underwater.

7.2 Settings and trim adjustments

According to salinity or water temperature, you may need to adjust the float or trim settings (trim is the HDV longitudinal axis inclination).

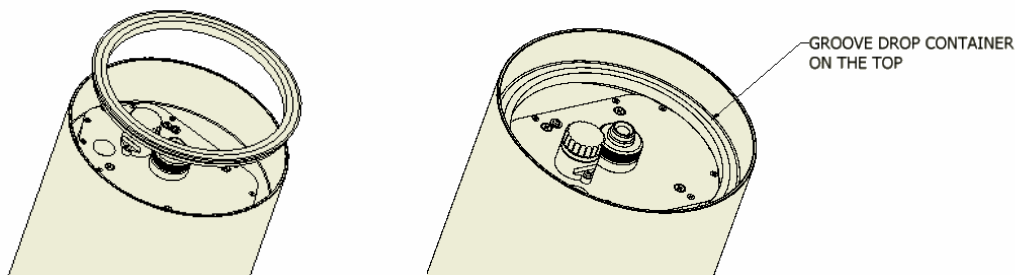
As for floating, the HDV is produced to slightly float in both fresh water (without using the ballast 23) and salt water (using the ballast 23).

As for trim, you can change factory settings by moving the battery along the pin (13) (see fig.7). Remove the battery, loosen the nut (21) with a 4 mm Allen key, unscrew or screw in the ring nut (22); screwing it in, the HDV tends to position itself with the rear sinking, unscrewing it causes the opposite. Screw in the nut (21) without perforating, replace the battery and try the HDV in the water until the desired settings are reached.

7.3 Drop-trap

The drop-trap is positioned inside the HDV. It has to be slid inside the body and set on top of the battery pack.

It avoid a water drops entering the battery compartment during the opening operation.



If the drops-trap is not inserted the HDV would be slightly positive on the prow.

8 Safety instructions

8.1 Indicator label

The following indicator label is found on the vehicle. It should not be removed, tampered with or destroyed. The user of the vehicle shall be responsible for replacing any worn out or illegible label with a new one, it must be requested to our after-sales service. Halcyon will not be liable for damages and accidents happened in consequence of behaviors in contradiction to the indications in it reported.

IMPORTANTE! NOTICE!

LEGGERE IL MANUALE DI ISTRUZIONI – READ THE INSTRUCTIONS MANUAL — ATTENZIONE ALL'ELICA – PAY ATTENTION TO THE PROPELLER
 NON USARE LO SCOOTER PER AUMENTARE LA VELOCITA' DI RISALITA - DO NOT USE THE SCOOTER TO INCREASE THE ASCENT SPEED
 RUOTARE L'INTERRUTTORE IN POSIZIONE OFF QUANDO LO SCOOTER NON E' UTILIZZATO - TURN THE SWITCH OFF WHEN THE SCOOTER IS NOT IN USE
 RIMUOVERE LE BATTERIE DOPO L'USO - REMOVE THE BATTERIES AFTER THE USE
 NON FUMARE O USARE FIAMME LIBERE DURANTE L'APERTURA - DO NOT SMOKE AND DO NOT USE OPEN FLAMES DURING THE OPENING PROCEDURE
 PRIMA DI OGNI IMMERSIONE CONTROLLARE CHE I CONNETTORI ELETTRICI SIANO INSERITI, CONTROLLARE LE GUARNIZIONI DI TENUTA E ASSICURASI
 CHE LO SCOOTER SIA CHIUSO A FONDO
 BEFORE EVERY DIVE CHECK THAT THE ELECTRICAL CONNECTORS ARE INSERTED PROPERLY, CHECK THE GASKETS ENSURE THAT THE SCOOTER IS
 CLOSED COMPLETELY.
 LE BATTERIE VANNO RICARICATE IN LOCALI AERATI, NON DEVONO ESSERE RICARICATE ALL'INTERNO DI CONTENITORI ERMETICI, NON DEVONO ESSERE
 RICARICATE IN PARALLELO, SE PRESENTANO PERDITE DI LIQUIDO O RIGONFIAMENTI NON POSSONO ESSERE PIU' UTILIZZATE
 BATTERIES MUST BE CHARGED IN WEL-VENTILATED ROOMS AND MUST NOT BE CHARGED INSIDE AIRTIGHT CONTAINERS. THEY MUST NOT BE
 CHARGED IN PARALLEL. DISPOSE OF LEAKY OR SWELLED BATTERIES
 NON BAGNARE I CONTATTI ELETTRICI - DO NOT WET ELECTRICAL CONTACTS — NON USARE LO SCOOTER SE NON PERFETTAMENTE FUNZIONANTE - DO
 NOT USE THE SCOOTER IF IT IS NOT PERFECTLY OPERATIONAL
 NON RIMUOVERE QUESTA ETICHETTA - DO NOT REMOVE THIS LABEL — USARE SOLO IMMERSO – OPERATE IMMERSED ONLY

Use by children prohibited round sticker.

Rectangular sticker indicating the need to read the instruction manual.



8.2 Training

The HDV may be used by any diver but it is assumed that whoever is effecting the dive has obtained the necessary certification issued by qualified certification agencies. At any rate, **use of the HDV implies that the user has undergone specific training** that permits him to use the vehicle safely and to fully appreciate its potential. Do not forget that the greatest danger is constituted by the underwater environment being explored.

8.3 Equipment configuration and riding position

Halcyon diving vehicles are TOW BEHIND type (as opposed to a “ride-on-top” which must be straddled) and *ideally* the diver should be towed behind the HDV.

READ CAREFULLY! The HDV should not be improperly bound to the diver. The user should be able to abandon the HDV at all times and with extreme ease. The HDV must be connected to the diver by a cord and quick-release carabineer. The diver should always carry a sharp knife on dives to manage emergency situations including that of cutting the cord and abandoning the vehicle.

Proper ways to connect the HDV to the diver.

The tow cord should be suitable dimensioned. Use of a 4 – 6 mm cord made of non-decaying synthetic material, in good working order and with at least 100 kg (220 lbf) haulage capacity is considered correct.

The carabineer must be made of rustproof material in good working conditions and equipped with an easy to grasp opening device. It must also be usable with gloves. The carabineer should be connected to the harness or “D” ring on technical balancing jackets.



Examples of the harness and carabineer to be used

Improper ways to connect the HDV to the diver.

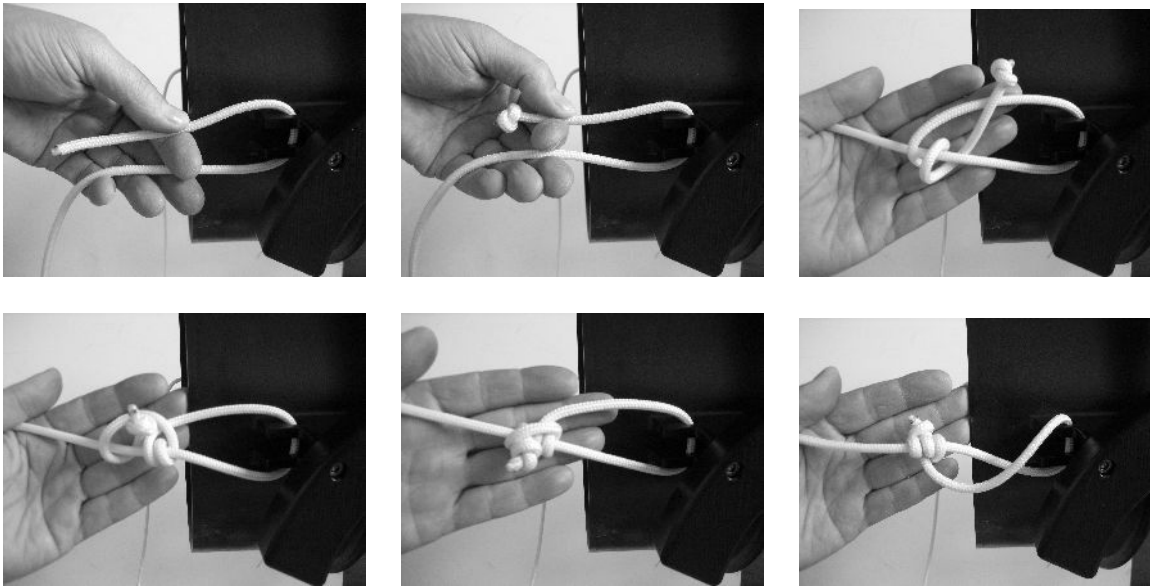
These include cords with knots, chains and elastic cords, to name a few, that do not allow the vehicle to be immediately abandoned in the event of emergency!

Correct way to connect the tow cord to the scooter.

The tow cord should be connected to the HDV through the two holes near the handle on the propeller conveyor. See the following illustrations.



Cord attachment to the left handle



Attachment to the right handle, knot that allows for tow cord length adjustments.

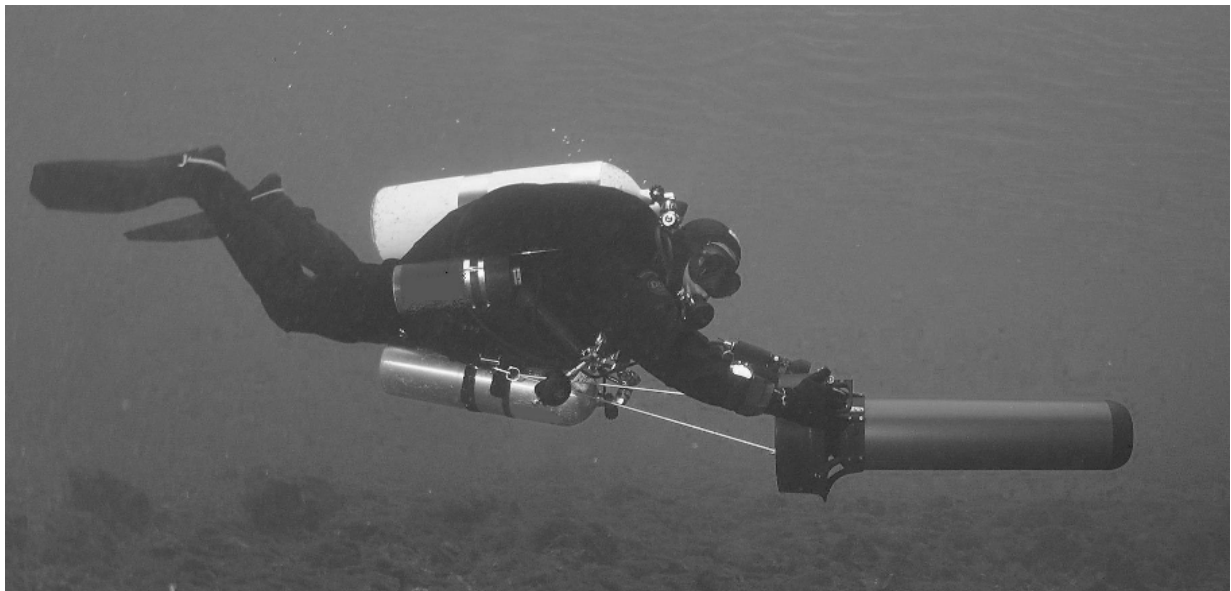


Figure 8

Diver position Fig. 8 illustrates a driver in technical configuration with the HDV correctly positioned. Other positions are admitted but considerably reduce drive efficiency. Tow cord length is extremely important for good towing efficiency. The right arm should remain slightly bent, drive the vehicle by pointing it in the direction to be followed but never hold the HDV which exerts all drive force on the tow cord.



If you prefer not to use the tow cord, both handles must be used. This type of use does not permit high speeds since resistance is higher with consequent arm fatigue.

The diver's position during the dive must be more or less horizontal (posture and buoyancy always derive from correct equipment configuration and adequate training). This ensures safety, longer running times, speed and riding comfort. Be especially careful when setting out your equipment especially as

regards: hoses, regulators, pony bottles, pressure gauges, audible alarms, flashlights and pertinent cables, reels, etc., making sure they do not dangle and that they cannot come into contact with the propeller or entangle themselves on the bottom or on your buddy, creating possibly serious hazard situations.

Correct equipment configuration is a crucial factor for safe diving in general and becomes vital when diving with the HDV. As a rule, the type and position of the diving equipment should guarantee perfect streamlining and no elements should protrude or be left dangling.

9 Using the HDV *diving vehicle*

Underwater diving is a potentially dangerous activity and incorrect use of the HDV further increases the hazards of the dive itself.

Before use, make sure the battery is charged, that connectors are connected and that no electrical parts are rusted. Check that the head cap is closed properly, check its condition, especially following accidental bumps, or accidental scratches, and make sure that the trigger and main switch are functioning correctly. At this point the HDV is ready for use. After entering the water, the main switch must be switched on by rotating it.



The main switch must be turned to running mode only when the HDV is in water. Rotating the propeller out of the water may be dangerous and damage the seal of the motor shaft.

Once in the water, the propeller is activated by pulling the trigger incorporated on the right manoeuvring handle towards you. Releasing the trigger will stop propeller rotation.

Speed can be regulated slow or fast, see the previous paragraph fig. 7.

10 Entering the water with the HDV



Entering the water is one of the most delicate moments in the dive. Various factors like the change in temperature, use of a respirator, the weight of the equipment and other difficulties make the addition of the HDV an inevitable added burden.

Before turning on or using the HDV, make sure that all the equipment you use for the dive is correctly positioned and in good working order. Only use the HDV after completing these checks. Incorrect dive preparation is highly dangerous and, in some situations, the HDV may represent an additional hazard.

Pay particular attention when entering choppy water since waves could lift and launch the HDV against you with even fatal consequences.

11 Exiting the water with the HDV



Exiting the water is another delicate moment in the dive and, here too, the addition of the HDV could be an extra burden.

According to where you started the dive, always make sure the HDV is the last piece of equipment to recovery. Always put your safety first.

Pay particular attention when exiting choppy water since waves could lift and launch the HDV against you with even fatal consequences.

12 “Parking” the HDV underwater



When diving you may need to “park” the HDV to continue the dive with fins only, recovering the HDV later. We strongly recommend you leave the HDV far from areas with currents that could cause the HDV to collide with rock walls, the sea bottom or boats. Violent collisions could compromise the HDV’s hermetic seal and irreparably damage it.

During decompression stops, be careful the HDV does not cause uncontrolled depth variations, turning it off and leaving it at your side.

DO NOT USE THE HDV TO MAINTAIN THE DECOMPRESSION QUOTA!

13 Descent rate

The HDV allows you to accomplish a fast descent rate. **AVOID** using it to accelerate your descent since problems related to equalising and psychological/physical adjustment are increased.

14 Ascent rate



The HDV **MUST NEVER BE USED FOR VERTICAL ASCENTS**. In fact, using it in such a manner may result in an **excessively rapid ascent WHICH IS POTENTIALLY DANGEROUS**. Hence it is better to **DEACTIVATE IT BY TURNING THE MAIN SWITCH TO THE OFF POSITION**, position it out of the way, and ascend normally.

15 Using the HDV in apnea



Diving in apnea is highly dangerous in itself. The use of the HDV in apnea could cause serious accidents. Always be certain and aware of your capabilities. Adequate training courses are essential for your safety.

16 Depth and operating environments

DO NOT EXCEED THE MAXIMUM OPERATING DEPTH!!!

The dive is already **VERY DANGEROUS** at that depth. **INCORRECT USE OF THE HDV IN SUCH ENVIRONMENTS INCREASES DIVING HAZARDS.**

It is important to remember that maximum diving vehicle operating depth refers to the HDV in prime conditions. Collisions, scratches or deformations significantly reduce this limit.

16.1 Obstructed environments

Dives in such environments are already **VERY DANGEROUS.**

INCORRECT USE OF THE HDV IN SUCH ENVIRONMENTS INCREASES THE DIVING HAZARDS. For example: if the control valves are hit accidentally whilst travelling at high speeds, these may break, with obvious consequences. **DIVING IN SUCH ENVIRONMENTS REQUIRES ADEQUATE TRAINING BY QUALIFIED AGENCIES.** It is hereby emphasized that the running time of both the HDV and the breathing gas must be planned in such a manner that every team member has **TWICE** the necessary resources available. It is also obligatory to carry another extra HDV.

16.2 Muddy or suspension-filled environments

These include those environments, obstructed or otherwise, in which visibility may suddenly fall to zero due to the suspension that is created by moving the bed sediment. Dives in these environments are already **VERY DANGEROUS. INCORRECT USE OF THE HDV IN SUCH ENVIRONMENTS INCREASES THE DIVING HAZARDS. DIVING IN SUCH ENVIRONMENTS REQUIRES ADEQUATE TRAINING BY QUALIFIED AGENCIES.**

For example: the rotating propeller that faces downwards can lift a considerable amount of suspension.

Accidental activation of an emergency HDV in tow may create highly critical situations.

17 Positions and behaviours to be avoided when diving



The diver's head or other body parts should never be beyond the propeller conveyor (5) (see fig. 1) where flow is suctioned.

Do not direct the flow from the conveyor at you. This thwarts the propulsion drive and could move your equipment away from you. Do not ride the HDV.

Do not attach the HDV to your tanks or their supports in any way.

Do not attach the HDV to your body, legs, arms or other parts in any way.

Do not use more than one HDV simultaneously.

Do not start the HDV with body parts other than your right hand.

When using the HDV, always keep your left hand far from the propeller, better is resting against your body, on your side, or on your right hand to more comfortably control the HDV.

Do not direct propeller flow at the sea bottom to avoid raising sand or mud.

18 Hazardous area and residual risks

The propeller is protected by an external radial circular band. Therefore it is exposed on both the suction and expulsion sides. Additional protections were not installed in these areas **since they would significantly reduce fluid passage in the conduit**, drastically reducing propulsion system performance **and thus vehicle autonomy**. A protection grill on the flow suction side can be easily clogged when near aquatic plants or algae normally suspended in the water, forcing the diver to frequently stop to clean the grill which is not always possible in safety conditions underwater. A grill placed on the flow output side would prevent any cords or lines caught in the propeller to be removed, inhibiting HDV operations. This would frequently distract the diver and cause him to forget that the greater hazard is represented by the surrounding environment and diverting his main focus away from the dive. For the above reasons and, considering that the propeller is protected by a safety clutch, we believe that the natural behaviour of being careful not to place hands or other body parts between propeller blades is safer for the diver (who in correct use, is always behind the propeller) than being distracted by cleaning and untangling any objects from the grills around the propeller.

Entanglement and cut hazards



Do not insert any object or body part inside the flow duct, that could obstruct the rotating propeller blades. When in use, besides the hand on the trigger, a safety distance of at least 40 cm must be maintained between the diver's body and the propeller assembly.

A CAP OR OTHER HAIR RESTRICTION DEVICE MUST BE WORN BY DIVERS WITH LONG HAIR. LONG HAIR MAY BECOME ENTANGLED IN THE PROPELLER IN THE EVENT OF IMPROPER USE.

ALSO BE CAREFUL OF ANY OBJECTS SUCH AS FISHING LINES, DIVING EQUIPMENT, FLOATING TOYS OR ANYTHING ELSE THAT MAY COME NEAR THE PROPELLER.

PROTECTIVE GLOVES MUST ALWAYS BE WORN



Crushing risk

Be careful not to place fingers between the two parts when closing the maid body or head cap.



NEVER LEAVE THE HDV UNATTENDED ESPECIALLY NEAR CHILDREN OR AMATEURS. ALWAYS TURN IT OFF BEFORE EXITING THE WATER AND DISCONNECT THE BATTERY AS SOON AS POSSIBLE (see previous chapters).

18.1 Safety device

A torque-limiting device is installed between the motor and the propeller. When the resistance felt by the propeller exceeds a certain torque, this device intervenes, preventing the propeller from rotating.



The device will generate a rhythmic sound signalling its insertion. If this situation occurs, release the trigger immediately, switch off the power by means of the main switch and free the propeller of the foreign body.

Do not leave the torque-limiting device inserted for more than 10 seconds. It has been conceived for emergency purposes and may be

damaged by prolonged use.

If conditions allow you to remove the foreign body safely during the dive, then do so. Otherwise let go of the HDV. Do not lubricate the safety device.

19 Electrical and mechanical safety systems applied to the HDV HDV T 16

In order to insure maximum diver safety when using the ADC, various solutions were implemented to eliminate possible fault risks or potential injury.

19.1 Electronic engine control

The electronic engine control board includes:

A short circuit emergency fuse (on replaceable at authorized service centres)

Temperature sensor (slows propeller rotation to a stop. The system automatically restarts when the engine is cool)

Maximum absorbed current sensor (maximum current that can be absorbed by the electrical engine, fully automatic, to protect electronic parts)

Engine ignition sensor without mechanical contacts (the sensor is not a reed or mechanical type but inductive)

19.2 Electronic battery control

The battery includes:

An emergency thermostat (if a battery charger fault occurs that overload the battery when charging, the thermostat prevents battery overheating by cutting off the charge)

Cut off (in the event of depletion, it eliminates electric absorption cutting off the power supply. It is restored when the battery is charged)

19.3 Switch

This HDV comes with a switch that cuts off the battery from the electronic engine control. Using the switch limits accidental ignition which may not occur in any case if the switch is in the OFF position.

19.4 Mechanical clutch on the propeller

See chapter 18.1

19.5 Trigger guard

The trigger is isolated by a guard that forces the diver to insert a finger in the ignition area to press the trigger and start the HDV.

20 Running time

Running time data is indicative and is nevertheless referred to use:

- with a vehicle in perfect running order
- in moderate environments
- in the absence of currents
- with an average load (diver with a double tank 12+12 liters)
- in perfect buoyancy conditions

As a rule, the running time should be calculated to cover the descent and ascent. An **EMERGENCY** running time, which will vary according to the type of dive, must also be established.

In any case, when planning a dive you MUST consider the event of returning to the exit point without the HDV.

21 Speed

Speed depends on the same factors as running time. The speed chosen should be compatible with the type of dive and be adjusted to match that of your buddies.

22 Precautions for use

- **Do not expose the HDV to solar radiations, closed into the car under the sun, or exposed to excessive heat (max 50°C (122°F)). Over heating and successive deformation may occur, to the prejudice of the water tightness of mating surfaces.**
- Avoid bumps during the dive
- Do not direct the HDV toward other divers.
- Do not use it as a stool
- Do not stand up on it
- Do not have it used by children or untrained people.
- Do not transport it dismantled or open.
- Do not attempt to stop the propeller with your hands.
- Do not block the starter trigger when the switch is turned to on.
- Do not throw it off a boat or the shore.
- Do not tow it with motor boats.
- Do not dismantle it.
- Do not run it dry above water.
- Do not wet electrical contacts.
- Do not short-circuit the battery
- Do not charge the batteries with a battery charger other than the one supplied.
- Do not start the HDV when holding the propeller or with objects between the blades.
- Do not remove wires from the connector or invert polarity.
- Do not get internal HDV parts and batteries wet.

23 Troubleshooting

PROBLEM	POSSIBLE CAUSE - TREATMENT
The HDV does not run. When the trigger is activated the propeller does not turn.	Open the HDV, check that the batteries are charged and that the connectors are inserted and undamaged, then try again.
Although the battery pack has been charged and the connectors are inserted the HDV does not run.	The control system may be damaged - must be checked.* The motor may be damaged - must be replaced.* The battery pack may be damaged - must be replaced.
The speed regulator doesn't work.	The control system may be damaged - must be replaced.*
The HDV's running time is visibly diminished.	The batteries need to be replaced. The battery charger is broken or does not work well - must be replaced.
When the main switch is on, the HDV runs continuously with no chance of stopping it.	The control card is damaged - must be replaced.*
The motor is noisy.	The HDV needs to be serviced.*
Vibrations are felt when the propeller rotates.	The propeller is damaged - must be replaced. The drive system is damaged - needs to be serviced.*
The HDV floods very slowly.	Replace all the O-rings and carefully check that the seating surfaces are not damaged.
The control trigger sticks and the HDV remains running.	Shut off the HDV, try to slide the starting piston, driven by the trigger, to get out any foreign bodies, try to start again. If the HDV continues to work, the starting system must be verified, probably it was damaged by a shock.
There are oil stains on the conic end of the case near the propeller or it is visibly greasy.	The external propeller shaft seal is damaged and requires maintenance. The second internal seal prevents flooding but you should suspend HDV use and replace the gaskets.

*operations to be carried out by HALCYON authorised service centres.

24 HDV flooding, sinking



This could occur especially due to improper use, a collision, incorrect closing or inefficient maintenance.

In the event of flooding, the scooter will start to tilt downward and thus sink.

In the event of **total** flooding, the situation could become **POTENTIALLY HAZARDOUS since the HDV will start to SINK, DRAGGING YOU DOWN** and therefore the vehicle **MUST BE IMMEDIATELY ABANDONED**.

25 Cleaning and storage

After use, the HDV must be rinsed thoroughly with fresh water. A neutral detergent may be used for more stubborn dirt. Before opening the HDV, it is important to remove all traces of salt. In particular, the magnetic reed connected to the trigger must be cleaned thoroughly and all grit and sand particles removed.



Do not use any solvents or petroleum-based products.

The HDV must be stored in a cool, clean, and ventilated place, in an upright position with the nose facing upwards. The battery must be removed, charged and stored away from frosty conditions or excessive heat. Make sure that the connectors do not come into contact with metal objects inside the HDV or the battery will be shorted. The wheel for opening the head cap must be loosened such that the gasket is in view.

Important note: always remove the battery after the use.

26 Maintenance

Lubrication of head cap O-ring case

Open the HDV, gently remove the lock O-ring (19) (see fig. 6) being careful not to scratch the O-ring support surfaces, and clean the seating thoroughly (only by means of a clean brush or soft cloth). Do not use any type of solvent or alcohol. Apply silicone oil to the O-ring and return it to its place. Do not use any other type of oil!!! We recommend the aerosol spray type which is usually used for diving equipment. Occasionally, lubricate the lock knob screw with normal mineral grease. Never lubricate trigger or magnetic piston movement. They would fill of sand and dirt. Do not lubricate electrical contacts!

Closing knob gasket maintenance

Whenever the closing knob (9) (see fig. 1) comes into contact with sand, rinse with running water before rotating it. About every 50 uses, remove it, using pliers, clean the gaskets and lubricate with marine grease, If you are not familiar with this operation, contact an authorized service centre.

Aluminium body maintenance

The aluminium body was protection with a special hard anodized so that it is immune to normal saline corrosion. When collisions or incorrect use ruin this protection, the body material, aluminium, comes into contact with water and this could be a source of corrosion, especially in salt water. If the protection is damaged, be careful to rinse the HDV, leaving it in fresh water for at least 15 minutes.

NOTE: leaving the HDV exposed to the sun for long periods of time could damage the black body protect colour creating lighter or grey areas. This situation does not compromise the rust protection since it is only an aesthetic effect. Please remember that surface deterioration is considered normal wear and is not covered by the warranty.

Supplementary maintenance

Every hundred hours of use or at least every two years, we recommend you overhaul the HDV checking hydraulic seals and electrical circuits.

Halcyon fully overhauls your HDV with shipping throughout the world.



NOTE: using spray lubricants, it is important to air the inside of the HDV. In this way the propelling gas go away, for the most part are inflammable!

27 Disposal and scrapping

This apparatus is partly constructed with recyclable materials.

When the HDV can no longer be used safely or when the service centre deems it no longer suitable for use, the HDV must be scrapped.

The HDV must be disassembled and divided into distinct parts. Plastic parts must be deposited in the relative plastic waste containers and metal parts must be taken to a collection centre for metal waste.



Special care must be taken when disposing of battery packs, which are highly polluting to the environment. Batteries must be taken to a collection centre for spent batteries.



PLEASE SAFEGUARD YOUR SURROUNDINGS!! ALL VEHICLE PARTS AND THE BATTERY PACKS IN PARTICULAR SHOULD BE DISPOSED OF ACCORDING TO LOCAL DISPOSAL REGULATIONS!

28 Handling

WARNING! The HDV T 16 weight is 21 Kg – 46,3 lb

In every transport condition, the HDV must be always closed.

The vehicle has been conceived for use in water environments. When transporting it or loading it onto a car, some precautions need to be taken due to its shape and weight.

Lift it holding a flow conduit support and front handle.

Whilst transporting it by car or by boat, make sure it is blocked in a secure position. If not blocked it could easy roll and cause damages to property and personal injury.

The use of the support cod. _____ is advised (see Halcyon accessories).

Do not position the HDV at the front of boats or dinghies or in positions where it would be subjected to harsh jolting the inner parts may be damaged. When the HDV is laid on the ground, always do so gently, and when it is placed in the upright position, rest it on the propeller guard. Always make sure that the surface is flat and that nothing comes into contact with the propeller.

If you prefer to grip the HDV from the maneuvering handles, do so, but do not overstress them - they were not designed to bear excessive loads. Do not carry the entire weight of the HDV on only one handle.

BEFORE EMBARKING THE HDV ON AIRPLANES OR PUBLIC TRANSPORTATION VEHICLES, PLEASE READ THE REGULATIONS ON BATTERY TRANSPORT!

29 Storage

If you do not plan to use the HDV for long periods of time (over two months) please follow the instructions below for correct storage.

- Carefully rinse the HDV with fresh water and wash with a neutral detergent if necessary
- Fully dry the HDV
- Open the HDV and remove the battery
- Remove the body gasket OR
- Accurately clean the OR and its housing
- Insert the OR in the body (to avoid losing it)
- Close the HDV without tightening the knob
- Place the HDV in a dry, dark place away from children
- Place the battery in a dry place at a temperature between 10°C (50°F) and 30°C (86°F)
- Charge the battery at least every 2 months

When you resume HDV use, follow the instruction in chapter “Preliminary operations”

Note: remember to replace the body OR adequately lubricated with silicon oil before use.

30 Technical specifications

Size: Length x breadth x height	Mm - in	839x420x338 – 35,2x16,5x13,3
Weight:	Kg - lb	21 – 46,3
Speed:	m/min - kn	from 20 to 60* - from 0,66 to 2*
Running time	min.	From 60 to 100
Voltage	V.DC	26,4
Max. charging time	h	8
Max. depth	M - ft	180 - 590
Static traction + - 10%	daN - lbf	22 - 49

Data is only exemplary since constant product developments could cause variations without prior notice.

31 Spare parts

The following table lists the main spare parts and accessories. Any other part is available upon request. Contact your local Halcyon dealer or visit www.halcyon.net for availability and pricing:

4 blade prop lock removable propeller
 Balanced support for instruments
 Instrument support
 Accessories insert
 HDV support
 Automatic burn tester.
 Tow harness
 Safety clip
 Shaft seal or kit
 HDV-T 16 complete gasket kit

Complete shaft seal kit
 HDV-T 16 battery pack
 CB 2500/22 NiMH battery charger
 HDV-T 16 ballast
 Battery lock ring nut
 Red battery spacer

32 Product identification

The machine has been marked with a hot-pressed serial number generally located in the body, on the battery and engine body. This number is to be quoted whenever technical assistance or spare parts are required.

Check plate data and EC marking completeness on the HDV.



33 Battery charge (general rules)

- **CAREFULLY READ THE BATTERY CHARGER INSTRUCTIONS MANUAL.**
- The battery should only be charged with the specifically supplied battery charger.
- Charge the battery in a well-ventilated, covered area, away from flammable objects or liquids, away from crowded rooms and in no way in the home.
- The battery must be connected to the charger using the specific connector.
- **REMOVE THE BATTERY** from the HDV and wait at least two hours from the last use before charging.
- Do not connect any device to the battery when charging.
- The battery should be kept off the HDV and only inserted and connected to the engine immediately before use: it should be disconnected and removed immediately after use

34 How to correctly charge the battery

- Remove the battery from the HDV.
- Place it in a protected, well-ventilated area away from people and flammable materials.
- **FIRST** connect the battery charger to the battery charge connector (varies according to the model) on the battery.
- **NEXT** connect the battery charger to the mains.
- Wait until fully charged (see battery charger instructions)
- Wait until the battery cools. In any case, replace the battery in the HDV before use.



DO NOT ATTEMPT TO CHARGE DAMAGED, LEAKING, RUSTED OR OTHERWISE DAMAGED BATTERIES.
Halcyon IS AVAILABLE FOR ANY NECESSARY TECHNICAL ASSISTANCE.

35 NiMH battery information

The NiMH battery is made up of 22 1.2 volt cells, connected in sequence, assembled on a plastic support and wired with two connectors, one for the charger (24) (see fig. 4), and a red one for connection to the HDV engine.

If a perceptible drop in distributed power is noticed during HDV use, immediately stop use and turn off using the switch.

NEVER leave the battery connected to the HDV when not in use.

Charge the battery at least once a month.

Charge the battery before each use, letting the battery cool before inserting it in the HDV; during this phase the battery could release hydrogen which would inevitably accumulate inside the HDV which is air tight.

Hydrogen accumulation (in special conditions) could cause accidents, with consequent damages to people and property.

A new battery will only work at full regime after four or five complete charge cycles.

The battery may be charged hundreds of times, but deteriorates in time. When autonomy is significantly lower than normal, it is time to replace it.

Only use Halcyon srl approved batteries, exclusively charging them with their approved battery chargers. When the battery charger is not in use, disconnect it from the power socket.

Even when not in use, a fully charged battery slowly dies due to the self-discharge phenomenon; charging the batteries within 24 hours of use is recommended.

Extreme temperatures may affect battery charge capacity.

Leaving the battery in hot or cold climates such as, for example, a closed car in mid-summer or mid-winter, reduces battery capacity and life. Always try to keep batteries at a temperature between 15°C (59°F) and 25°C (77°F). Battery performance is significantly reduced at temperatures lower than 0°C.



DO NOT THROW BATTERIES IN FIRES, THEY EXPLODE!

Do not use the battery for purposes other than those prescribed.

Never use damaged battery chargers or batteries.

Accumulators must be kept outside the HDV, in dry locations, (relative humidity 65% +- 5%) and at a temperature between 15°C (59°F) and 25°C (77°F), with the electric connectors away from metallic objects that can short circuit the two battery poles, with

serious fire hazard, damages to people and property.

Do not wet electrical contacts or the battery.

Dispose of batteries observing local regulations such as, for example, recycling them. Do not dispose of batteries with domestic waste.



Nickel Metal Hydride (NiMH)

36 Ideal battery charging conditions

Admitted room temperature from 10°C (50°F) to 35°C (95°F)(ideal 20°C (68°F))

Battery temperature at charge start 20°C (68°F).

Conditions other than those described above may influence charging as well as the number of possible charges with acceptable yield.

37 Ideal battery depletion conditions

We recommend using discharging batteries at a temperature between 5°C (41°F) and 35°C(95°F).

To avoid short-term deterioration and potential cell polarity inversion, the battery **should never, in any case, fully deplete**. A cut off device was installed in the battery for this reason (see specific paragraph).

During HDV use, it is best not to constantly drive at maximum speed suspending frequent starts, making brief pauses, to give the battery time to better conduct the chemical reaction required to generate power, avoiding abrupt cell heating.

37.1 Important note on battery depletion!

After HDV use, always remember to cut off motor power using the switch.

This is because the HDV electronic control, even if the motor is not running, consumes a small amount of energy which, in the long term, depletes the battery. The cut off device prevents the battery from overheating, but if, for any reason, it malfunctions, the battery would die and the polarity of some cells may invert.

38 “CUT OFF” battery protection system, operating principle and instructions for use

The electronic battery protection system from total accidental depletion is located inside the battery and connected in sequence between the battery and HDV engine.

Its purpose is to prevent excessive cell depletion that could lead to the polarity inversion of one or more cells, with consequent potential battery destruction and possible damages, even serious, to property and/or people.

When accumulators deplete, voltage lowers until it reaches a limit value. When this value is reached, cut off prevents the battery from further depleting by interrupting power distribution.

When the cut off is triggered, the battery no longer outputs voltage to the connector.

To continue battery use, it must only be charged with the specific battery charger (see battery charger instruction manual) and restore the circuit.

The cut off device should only trigger in exceptional cases and this event should not occur during normal battery use since correct use does not include excessive depletion.

In case of short circuit of the battery the cut off system will be completely damaged with subsequently high risk of fire.

38.1 Procedure to follow in the event the cut off device is triggered

In the event the cut off system triggers, IT IS IMPORTANT you proceed as follows:

1. Follow the HDV opening procedure.
2. Disconnect the engine battery power connector.
3. Remove the battery from the HDV.
4. Let the battery rest for at least 2 hours. This is the minimum time required, in this case, for the battery to cool and return to awaiting charge conditions.
5. Connect the battery charge connector to the battery charger.
6. Charge following the instructions in the battery charger manual.



IMPORTANT NOTE!

Also remember that the HDV inevitably stops running when the cut off device is triggered. This event is not hazardous to the diver in any way since the dive was planned taking into account that HDV use is not considered a safety device or rescue means.

Halcyon is not liable after the cut off system triggers, in any situation, in hazardous situations or immersions where the driver (at his full risk) confided on surfacing by using our manufactured under water vehicle.

Please remember that the HDV must be considered as an immersion aid and not as a rescue vehicle.

39 NiMH battery, frequently asked questions:

I often use the HDV, twice a week or every day, but I never fully deplete the battery since I make short dives. Should I remove the battery after every use and charge it?

The battery should be disconnected and removed after every use, if possible, charge when the charge level is almost depleted, otherwise, charge after every use.

The battery should be kept off the HDV and inserted and connected to the engine only immediately prior to use. It should be disconnected and removed immediately after use.

Can I leave the battery connected to the battery charger for a long period of time?

After charging, our battery chargers enter idle mode and can be left attached to the battery as long as you like. They only charge if necessary. However, it is always best to disconnect them as soon as charging is finished.

I dropped the battery. One of the cells is dented. Can I still use it?

NiMh cells are extremely delicate. NEVER use a battery that has fallen on the ground since some connections could be damaged. Send the battery to customer service who will check damages and repair the battery if necessary.

Is battery heating normal when charging?

Given that a battery should always be charged at room temperature between 15°C (59°F) and 25°C (77°F), the battery's temperature may rise during charge.

Is battery heating normal when outputting?

As with charging, battery output slightly raises battery temperature, therefore, the same conditions apply as above.

How long does good NiMh battery efficiency last if not used?

This depends on many factors, especially on the battery's "life". Usually a battery charged at least once a month and never fully depleted can last up to five years.

When the battery is dead, what should I do with it?

The battery should be disposed of in a specific depleted battery recycling center. There are specific collection centers in every city.

I left the battery on the boat and sea elements rusted the silver-plated connector contacts. What should I do?

All electrical contacts inside the HDV battery case should never generate electrical shocks or sparks due to the presence of hydrogen.

The connector should be immediately replaced (see Halcyon customer service).

I pulled the battery wires by mistake and damaged the insulation. Do I have to replace them or can I insulate them with tape?

A wiring short circuit could even make the battery explode creating serious hazards to people and property (see Halcyon customer service).

When I have to charge the battery, can I leave the red connector attached to the HDV engine?

No! Although turning off the HDV using the circuit breaker knob (see instruction manual) prevents engine power absorption, the battery must be detached and charged off the scooter in all cases.

I noticed the battery leaks liquid, can I still use the battery?

No! Do not use the battery. It is hazardous to people and property!

I noticed some bumps on the battery, can I still use it?

No! Do not use the battery. It is hazardous to people and property!

How can I tell what the battery efficiency is? If I have to plan a dive, how can I be sure that the battery charge provides a certain autonomy?

For this reason, there is a tool that simulates electrical scooter absorption during operations and depletes the battery to a 20 volt residual voltage. When finished, the length of output in minutes is displayed. This data gives you an idea on battery "health" letting you plan correct use. (see "burn tester" accessories).

40 PROP LOCK PROPELLER

40.1 Description

The easy to replace prop-lock propeller can be removed from the underwater scooter without the use of tools in any situation such as in the event the propeller is wound by foreign objects like fishing lines or hooks or if the diver wants to replace the propeller with one shaped differently or with a different number of blades, both underwater and on land, still maintaining the safety friction built within.

40.2 How to remove the prop lock propeller.

Turn off the HDV and make sure it is off!

Do not grasp the propeller by a blade (30) but unscrew the white knob (31) (COUNTER-CLOCKWISE) until the propeller detaches. (see fig. 9)



DO NOT UNSCREW OR SCREW IN THE SAFETY CLUTCH TORQUE ADJUSTMENT SCREW (32) WHICH WAS FACTORY CALIBRATED. MODIFY TORQUE COULD CAUSE POTENTIAL HAZARDS SINCE IT COMPROMISES THE SAFETY SYSTEM.

PROTECTIVE GLOVES MUST ALWAYS BE WORN

Be extremely carefully since using hands or other parts of the body between the propeller blades is potentially hazardous, even if a safety clutch is installed between the propeller and engine. When replacing or removing the prop lock propeller, always make sure the HDV is off. The propeller should not rotate when the trigger is pressed!

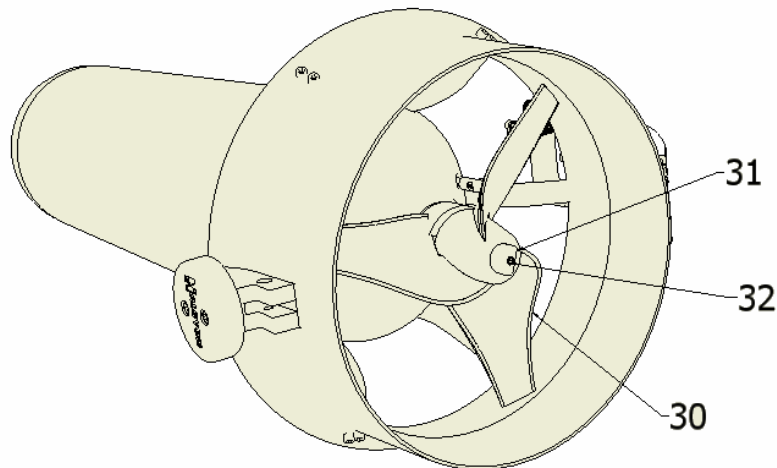


Figure 9

40.3 How to insert the prop lock propeller.

Turn off the HDV and make sure it is off!

Insert the propeller hole (36) on the HDV engine shaft (35). Turn the propeller (CLOCKWISE) until the plug (33) matches the propeller housing (34). A click will be heard and the propeller stops turning. Continue rotating the white knob (CLOCKWISE).

Tighten the knob **WITH YOUR FINGERS ONLY, WITHOUT FORCING.**



THE PLUG (33) MUST BE ALIGNED WITH THE HOUSING (34) FOR CORRECT PROP LOCK PROPELLER POSITIONING AND OPERATIONS. (see fig. 10)

PROTECTIVE GLOVES MUST ALWAYS BE WORN

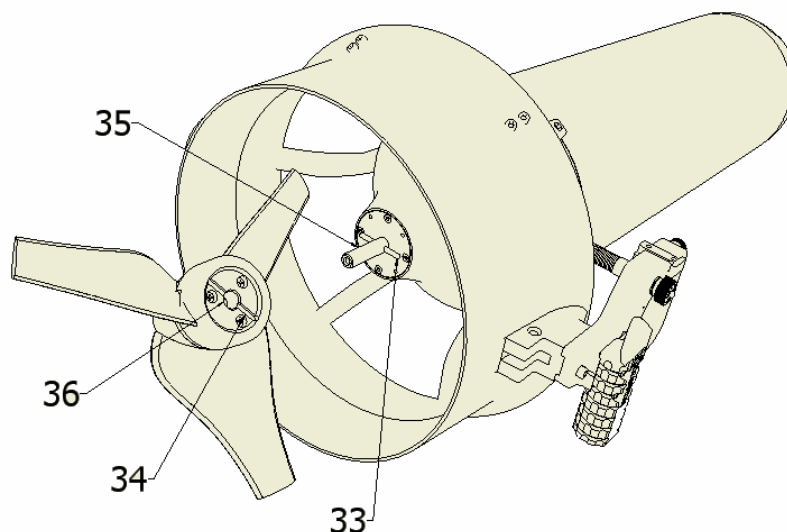


Figure 10

40.4 Prop lock propeller maintenance.

The prop lock propeller does not require maintenance. However, make sure that everything is clean and free of foreign objects before inserting it on the HDV shaft.

IMPORTANT NOTE:

THE PROP LOCK PROPELLER SINKS WHEN SUBMERGED IN WATER!

WHEN REMOVING AND REPLACING THE PROPELLER UNDERWATER, BE CAREFUL SINCE YOU COULD RISK LOSING IT AND, CONSEQUENTLY, LOSE USE OF YOUR UNDERWATER SCOOTER.

WHEN THE SAFETY CLUTCH TRIGGERS, MAKE SURE THE PROP LOCK PROPELLER DOES NOT UNSCREW BY ROTATING THE KNOB (31) CLOCKWISE. WHENEVER OBJECTS HIT THE PROPELLER BLADES, MAKE SURE THE PROP LOCK PROPELLER IS PERFECTLY SCREWED IN.

40.5 Prop lock propeller troubleshooting.

PROBLEM	CAUSE - SOLUTION
Rotating the white knob requires excessive strain	The knob was damaged and should be replaced*
Even if the shaft pin is in the correct position in the propeller housing, the friction jerks and the scooter does not move forward.	The traction pin was damaged (bent) and should be replaced. The propeller hub was damaged and should be replaced*
The white knob turns freely and does not stop the propeller.	Too much force was used to tighten the knob and it was damaged. It should be replaced.*
The screw on the knob turns freely	The knob was damaged and should be replaced*

*operations to be conducted at a authorized HALCYON service centre.

Note:



The prop lock propeller is larger than a standard propeller (the white knob protrudes further).

This means that the use must pay closer attention when standing the l'HDV on the flow conveyor in the vertical position. Any collisions with the propeller (larger) could damage both the prop

lock propeller and HDV.

41 N-HANDLE CONTROL.

41.1 Description.

The N-Handle control device (see fig. 11) was created for better HDV manageability in certain conditions.

The corrugated handle (40) can be installed in three different positions according to hand span. The trigger guard (41) prevents accidental ignition. The trigger (42) is easier to

press. The cruise control knob (43) lets you “lock” the trigger in the desired position. The accessory lock knob (44) lets you lock the accessory case (46) in its housing (47).

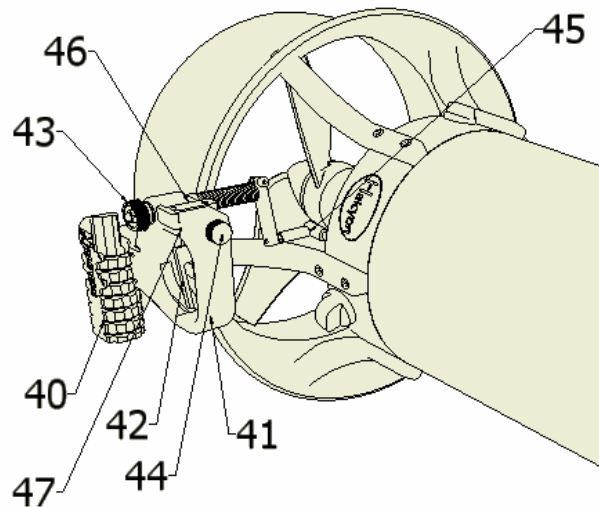


Figure 11

SAFETY NOTE:



The knob cruise control (43)(see fig.11), must only be used under the diver's maximum control. **The knob, trigger or HDV ignition switch must be usable at all times to avoid any type of collision or driver dragging risks in hazardous areas.**

The knob must only be used to lock speed, adjusted to 50% of available power at best. Locking HDV ignition at maximum power is potentially hazardous.

During normal HDV use the knob must be fully rotated counter-clockwise and locked in place so that it does not stop normal trigger return in any way.

Only use the knob with fingers.

IN ANY CASE, PAY THE UTMOST ATTENTION DURING CRUISE CONTROL KNOB USE SINCE THIS OPERATION COULD BE POTENTIALLY HAZARDOUS

41.2 N-HANDLE device use.

- Perform the preliminary operations
- Submerge the scooter.
- Make sure nothing is between the propeller blades
- Turn on the scooter using the main switch (6) (see fig.1).
- Grasp the device (40) (see fig.11).
- Insert one or two fingers around the trigger.
- Press the trigger (42) the scooter will run.
- Release the trigger at any time to stop the scooter.

41.3 Adjusting the grasp position.

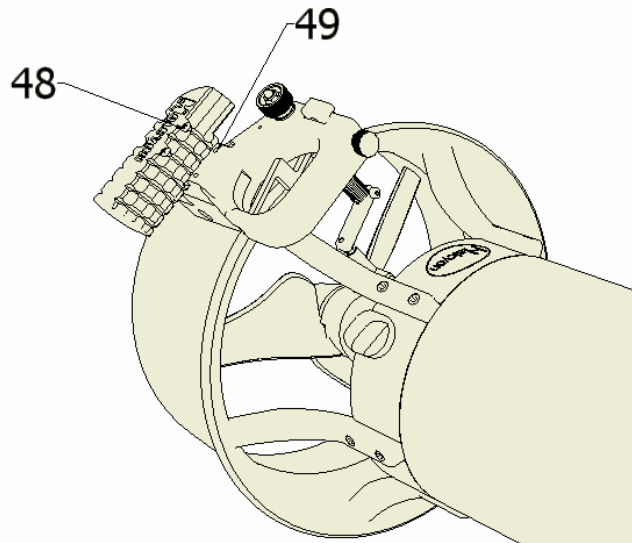


Figure 12

To adjust the grasp position (40) (see fig. 11), unscrew the 4 screws (48) (see fig. 12) remove the grasp (40) and reposition it screwing the screws into the selected holes (49). There are three possible positions.

Accessory support

The purpose of the accessory support (46)(see fig 11), is to be able to attach the specific accessories that may be useful during dives on the handle. For this reason, HALCYON has created some supports to be used with normal wrist or console tools.

Support use.

Loosen the lock screw (44) (see fig.11) and insert the support.

Tighten the lock screw only using two fingers.

Always make sure the screw is fully screwed in when the support is not used.

41.4 N-HANDLE device Maintenance.

The N-HANDLE does not require special maintenance. Follow the HDV's general maintenance instructions.

41.5 N-HANDLE device troubleshooting.

PROBLEM	CAUSE - SOLUTION
The cruise knob is blocked and will not turn.	Lubricate the knob screw and try again.
The scooter does not operate or jerks when the trigger is pulled fully back.	Adjust the magnetic piston to the correct position.*
The lock screw turns freely	The thread was damaged and requires replacement.*

* operations to be conducted at a authorized HALCYON service centre.

42 BY PASS DEVICE.

The BY PASS device is recognizable as a white knob (50) (see fig.13) located on the left side of the motor unit, exactly opposite the main switch, creates a direct electrical connection between the battery and electrical motor, by passing any other component usually used for electrical HDV use: trigger, speed regulator, electronic control.



This device was designed to ensure HDV use in the SOLE event of electronic control or control sensor fault. Use of this device is potentially hazardous since once activated, it starts the motor continuously and the only control we have is to turn the HDV off using the min switch or by pass knob.



Please remember that a specific training course is essential to safe HDV use.



NEVER ROTATE THE BY PASS KNOB (50) (see fig. 13) UNLESS ABSOLUTELY CERTAIN THAT YOU HAVE COMPLETE AND ABSOLUTE CONTROL OF THE HDV. ROTATING THE KNOB WITH THE SWITCH IN THE ON POSITION IMMEDIATELY STARTS THE HDV.

ALSO REMEMBER THAT YOU MUST BE ABLE TO ABANDON THE HDV AT ANY TIME. DO NOT USE TOW SYSTEMS THAT ARE DIFFICULT TO RELEASE.

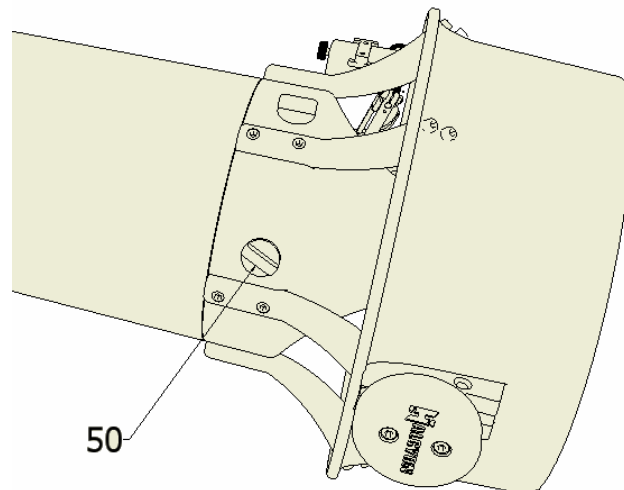


Figure 13

42.1 Operations



THIS DEVICE SHOULD ONLY BE USED WHEN DIVING AND ONLY IF ONE OF THE TWO FAULTS OCCUR:

1. Despite the switch rotated to the ON position, the HDV does not start when the trigger is pressed (with the battery charged).
2. Following a collision when diving, the trigger was damaged and can no longer be used.

IF YOU ARE ABSOLUTELY SURE TO BE IN THE ENVIRONMENTAL AND PSYCHOLOGICAL CONDITIONS TO MANAGE A SITUATION SUCH AS A MALFUNCTIONING HDV, PROCEED AS FOLLOWS OR ABANDON THE HDV.

- Rotate the main switch (6) (see fig.1) counter-clockwise and make sure the HDV does not start. (TURNING OFF THE HDV)
- Fully rotate the By Pass knob (50) (see fig. 13) clockwise without forcing.
- Rotate the main switch (6) clockwise. The HDV starts in continuous mode. If it does not start, the HDV is broken. Abandon or recover it.
- Rotate the main switch (6) counter-clockwise to stop the HDV.

Turn the HDV on and off using the main switch without forcing.

In normal operating conditions, the By Pass device knob should be **ALWAYS FULLY** rotated counter-clockwise.

THE BY PASS DEVICE SHOULD ONLY BE USED IF AN ELECTRONIC FAULT OCCURS AND ONLY DURING A DIVE. DO NOT USE THIS DEVICE AS A NORMAL STARTING PROCEDURE.

42.2 Correct diving behaviour using the BY PASS device

When diving with buddies, immediately warn them that your HDV is having troubles and that you are about to use the BY PASS. Your buddies should stay at a safe distance of at least 6 meters. If visibility does not safely permit this distance, **DO NOT USE THE BY PASS**. Tow the HDV by swimming or abandon it.

When towed by an HDV that is using the BY PASS system, you must be absolutely sure that all your equipment, gas, respirators and anything else required for your underwater safety is in good working order.

MANAGING SEVERAL MALFUNCTIONING DEVICES IS PROHIBITED. THIS WOULD CREATE A HAZARDOUS AND EVEN FATAL SITUATION.



When using the BY PASS during a dive, your right hand should always be ready to rotate the switch knob counter-clockwise **TO IMMEDIATELY STOP THE HDV.**

When using the BY PASS during a dive, you should always be ready to leave the HDV at any time, even cutting the tow cord. **ALWAYS REMEMBER TO KEEP THE CARABINEER MAINTAINED AND TO CARRY A SHARP KNIFE OR OTHER TOOL WITH YOU TO CUT THE CORD.**



If you leave the HDV free without any restriction with the BY PASS on (the same applies for cruise control, see the previous chapter) it will independently start and there will be no way to stop it until the battery dies. You are fully responsible for leaving an HDV free to hit anything or anyone at high speed with **HIGH IMPACT FORCE**. Halcyon is not liable

for any damages to property or people caused by either improper BY PASS or CRUISE CONTROL use or an abandoned HDV free to run without any restriction to the diver.

We also remind you that the BY PASS device should only be used in the event of absolute emergency. Remember that, as repeatedly mentioned in this manual, **THAT THE HDV IS NOT A RESCUE DEVICE!**

ONCE THE BY PASS DEVICE IS USED, THE HDV MUST BE SENT TO AN AUTHORIZED SERVICE CENTER FOR THE NECESSARY CHECKS AND TESTS.

42.3 BY PASS knob protection.

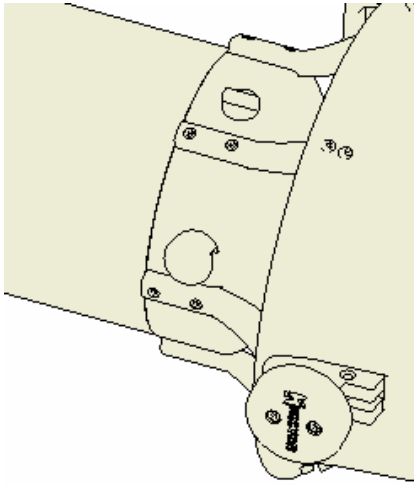
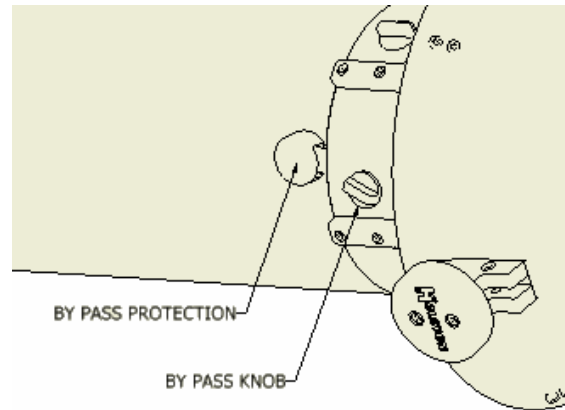


Figura 14



igura 15



The by pass knob must be always protected with ist special protection click-cap. The special protection click-cap has to be removed only when it is necessary to activate the BY PASS SYSTEM.

Never remove the special protection click-cap for other reasons. It has always to be in pace in order to protect the by pass knob against any accidental activation.

43 Warranty

Each HDV is factory tested underwater and only marketed when all necessary tests are passed, including waterproof tests.

In the event of flooding (meaning the liquid in which the HDV was submerged enters the watertight case) warranty validity is at the discretion of Halcyon

Transport and packaging fees to or from the Halcyon offices from non EU countries shall be born by the purchaser.

The product (excluding the battery) is covered against all manufacturing defects for a period of two years from the date of purchase proven by a sales document, excluding:

- non-conform use or use other than that foreseen or illustrated in this manual
- negligence, attempts to repair or modify the HDV by personnel not expressly authorized by Halcyon that jeopardize correct operations or prevent adequate checks and tests to meet repair needs under the warranty
- temporarily rented products
- Scratches or damages to any surface, due to normal product use by the consumer.
- normal wear or deterioration
- damages due to transport, falls or accidents

The batteries supplied with our ADC are guaranteed for a period of 3 months excluding:

- Defects due to damages, incorrect use, accident, tampering, negligence or neglect and in the event of modifications or repairs made by unauthorized personnel that jeopardize correct operations or prevent adequate checks and tests to meet repair needs under the warranty
- Defects or damages due to product use in conditions other than those described in this manual
- Defects or damages due to incorrect controls, operations, maintenance, installation, adjustments, unauthorized applications or any other alteration or modification of any form.
- Broken or damaged wires or connections unless directly due to material or factory defects.
- Defects or damages due to humidity, liquids or foreign objects introduced within the battery pack or that have rusted any part of the battery.

44 RoHS and WEEE conformity

With reference to regulation RoHS (Restriction of Hazardous Substances) Halcyon declares that all products introduced on the European market meet the following European regulations, assimilated in Italy by legislative decree nr. 151 dated 25/07/2005:

1) European Directive 2002/95/ED dated January 27, 2003, on the restriction to use the following hazardous substances in electric and electronic equipment, and thus the items do not contain concentrations that exceed the acceptable limits for the following substances:

- Lead
- Hexavalent Chromium (Cr+6)
- Mercury (Hg)
- Polybrominated biphenyl (PBB)
- Cadmium (Cd)
- Polybrominated diphenyl ethers (PBDE)

2) European Directive 2002/96/EC dated January 27, 2003, or WEEE (Waste electrical and electronic equipment) that sets specific criteria for the collection, handling and recycling of electrical and electronic waste. All products that meet this regulation are marked with the following logo:



45 Noise levels

Continuous A-weighted equivalent noise pressure levels do not exceed 70 dB (A).
C-weighted peak noise pressure values do not exceed 63 Pa (130 dB regarding 20 microPa).

46 Vibration levels

The average weighted square root of acceleration transmitted to the hand-arm system does not exceed 2,5 m/s².

47 After-sales service

The company's after-sales service is at your disposal at all times. Any requests may be addressed to:

HALCYON Manufacturing
1110 S. Main St.
High Springs, FL 32463
United States
US/International Phone: 386.454.0811
US Phone: 800.HALCYON
FAX: 386.454.0815

Contact Email: info@halcyon.net

www.halcyon.net

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48 CE conformity



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www.halcyon.net

DECLARATION OF CONFORMITY

HALCYON Manufacturing
1110 S. Main St. High Springs, FL 32463 - United States

Declare, under our sole responsibility as
 Distributor, that the product :

Underwater scooter **HDV T 16**

Complies with regulations :

Machinery Directive 2006/95/CE
 Electromagnetic Compatibility EMC 2004/108/CE

and declares that the following rules are applied :

UNI EN ISO 14151-1:2007
 UNI EN ISO 12100-1:2009
 UNI EN ISO 61000-6-4
 UNI EN ISO 61000-6-1
 CEI EN 60034-1
 CEI EN 60335-1

High Springs, May 2nd, 2010

Sole Director

Name and Surname