

**GENERAL CARE AND MAINTENANCE
OF
SPORT DIVING EQUIPMENT.**

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General Care and Maintenance of Sport Diving Equipment.

The following article was written from a series of lecture notes I had made for a presentation on the subject to a group of interested divers.

My own credentials? At the time I was a full time diving equipment technician employed in a South Coast dive shop. In an average (if there is such a thing) week I would deal with over twenty five regulators, several computers/timers and around six buoyancy devices of different types. Within the same company wet and dry suits were made and repaired. In the test house literally hundreds of cylinders per week were visually inspected, hydraulically and ultrasonically tested, some cleaned up to pure oxygen standard plus, of course, shot blasted, zinc sprayed or painted as required. Additionally I am a former Royal Navy diver, diving supervisor and equipment maintainer. Civilian experience includes BSAC Club Instructor, a period as expedition's officer, another as equipment officer and a number of years as a Diving Officer. So I think I can claim to know a bit about diving and its equipment.

THE AIM.

The aim is to enable you to keep the cost of servicing down, maintain a high level of efficiency, thus a high level of safety and comfort for you, the diver.

STORAGE.

The ideal store should be dry, cool, dark and airy. As we all know this is beyond the means of most of us. The best domestic option is a wardrobe in the spare room or some similar cupboard, but **not** the airing cupboard! The cupboard under the stairs has much to recommend it unless it must be shared with vacuum cleaners, ironing boards and such that have to be hauled out at regular intervals. Dust must be avoided as well as vermin; this may have eight, six, four or two legs. From six down they can cause damage or malfunction. U K native spiders are just annoying and not very tasty if you suck one in, tropical varieties can be dangerous.

Damp is probably the most damaging for your kit, closely followed by wide temperature swings. Thus garages, garden sheds and attics are about the worst stores. Where do most of us have to keep our kit? If you are forced to use one of these, do try to reduce the bad bits as much as possible but don't wrap kit in plastic to protect it, that will make things even worse.

Where do you keep yours?

The following sub-headings break your kit into the various groups but are some way short of 'complete'. For instance most hoods are 'wet' so their care comes in with wet suits and so on.

WET SUITS.

Rinse thoroughly after use, inside and out, with fresh water. Use a hose, shower or in the bath. While washing examine the suit for damage, loose stitching, broken zip teeth etc. Allow to drip dry, out of direct sunlight if

possible. Once the suit is fully dry, and I mean dry, as the glue will not work in the wet, make or have made any repairs.

Occasionally wash with a little detergent to remove oils and dirt, rinse several times with fresh water. Add a little Dettol or a similar product to the last rinse to reduce fungal growth and smells. Do remember that you will be wearing it next to your skin, so choose carefully what you use. There are commercial cleaners available for the job, one is called "sink the stink", check what is on sale in your dive shop.

Lubricate the zips with bee's wax or one of the commercial zip lubricants. If you are caught without a suitable lubricant, use a bar of soap to prevent zip damage.

Once dry, stow the suit on a well-padded hanger in your store.

The so-called semi-dry suit is cared for in much the same way but with extra care being taken over the soft sealing faces at wrists, ankles, and zips. Dust seals with French chalk when dry.

DRY SUITS.

Care for these, both neoprene and membrane, as for wet suits but as a rule less interior washing is needed. Pay particular attention to seams and tape in stress areas, boots, crutch, underarms etc. Neck and wrist seals must be examined carefully and replaced as soon as damage or serious degradation is noticed. Inspect the zip every time you use the suit and keep it lubricated to prevent damage, bee's wax is possibly best as it is less liable to attract sand. Clean old wax out with a nylon bristled brush before applying new wax to prevent a build-up that will cause jamming. Do not subject the zip to sharp bends or twisting, take great care of dry suit zips, it will cost well over £100 to replace one. Seals should be dusted with French chalk both for storage and to ease dressing. Use a well-padded hanger and do the zip up to keep the suit in shape.

Inflation and dump valves should be serviced, at least annually, by a suitably qualified technician and you must check their action before dressing for a dive. This is to prevent the embarrassment of having one or both fail and the subsequent risk to your life. Inflators can "stick" open or resist efforts to admit gas into the suit. The former resulting in an uncontrolled ascent and the latter in, at best, painful "squeeze" or a rapid descent. A stuck dump valve, be it an auto type or a plain mushroom "cuff dump", will almost certainly lead to an inability to control ascent rate to a safe speed.

UNDERSUITS.

It is best to wear something underneath to prevent soiling, Helly-Hansen 'LIFA' is a good example, easy to wash, quick drying and designed as part of a 'layered' clothing system. Do remember to wash them after use. Wash the undersuit itself before it smells like old socks or gets crusty with salt, as the insulation value will be shot. You may also have difficulty finding someone willing to unzip you!! Follow the manufacturers instructions if they supply them, otherwise a gentle (wool) wash, a light spin and a cool tumble. In between washes air it well and, if possible, never pack it wet. Store in the same way as a suit.

BASIC KIT.

Mask, fins, snorkel and knives. Rinse well with fresh water after use and allow to dry fully, out of direct sun of course. Keep it all together in your dive box or bag but not squashed or bent as it may well take on a permanent set. It is best to keep your mask in a 'mask box' to prevent damage and/or colour leaching from other kit. Don't forget to examine it all as you pack it away, straps, clips, lanyards and so on for any damage or defects. Correct any found straight away then it's ready to go without delay. Sharpen your knife if necessary, not to a razor edge but leave it a little rough, as this will cut wet rope better. Lightly grease it afterwards. Check the blades in the net knife as well.

CYLINDERS.

Wash well with the reg' in place, using a hose is best but not with a powerful jet. Work the valve through the full range to ensure the handwheel and spindle are free of salt and debris. Rinse the protective mesh thoroughly. Occasionally remove the mesh, boot and any other fittings, rinse well and examine the cylinder all over for corrosion or other damage. Touch up the paintwork if required after removing any corrosion, but don't try to cover damage, have it checked out by your local test house. If it needs a lot of attention to the paint consider having it re-painted properly, it may well be due a test and it could all be done at the same time. Try not to obscure the information stamped around the shoulder, in particular, the last test date and working pressure, you may be refused a fill if they cannot be read. For long-term storage (3 to 4 months) leave 5 to 10 bar in the cylinder. Do not allow pressure to fall to zero or leave the valve open. This will prevent moisture entering and causing corrosion. Make a note in your diary of the next test date so you don't get caught out just before a good weekends diving. It is preferable to keep cylinders under the same conditions as the rest of your kit. Do not keep them next to heat sources such as radiators as this may cause the pressure of filled cylinders to increase beyond test limits! By the way, don't "jam" off the valve as this will cut and damage the soft seat causing leaks thus negating "jamming" off in the first place.

REGULATORS.

More problems are caused by incorrect storage and cleaning of reg's than anything else!

Rinse with running fresh water **WITH THE AIR PRESSURE ON** as soon as possible after use in the sea, pool or dirty quarry. Allow to dry thoroughly before shutting off the air and removing from the cylinder. If this is not practical, at least ensure that no water enters the first stage while the reg dries. If your conscience demands that you soak your reg, keep the air pressure on. This is the only way to keep water out of the 'air side'. While rinsing, purge the second stage(s) both to check the operation and to make sure there is no water in the system. Be careful to flush all parts exposed to seawater (Piston chambers on first stages in particular) to remove mud, sand, weed, hermit crabs or any other debris. Don't forget gauge consoles and other whips. Note, and have fixed straight away, any faults or damage. A minor fault could be the precursor of a major failure or even an incident that figures in an

accident report, thus becoming a statistic. If it's not yours TELL the owner or whoever is responsible for it. Remember a reg that fails underwater can kill! Finally, once dry, store loosely coiled in a bag or box with the other kit. Reg's can also be hung up in a loose coil provided no hoses are kinked or stressed

STAB' JACKETS or B.C.s.

This applies to whatever buoyancy device you use.

Rinse as for suits, with the device inflated, but be particular about regularly cleaning the inside (the air bladder) with an anti-bacterial cleaner. If you use warm water this will also dissolve any salt deposits in there. Commercial products are available but failing this use "Hibitane" or "T.C.P." as these taste least foul and, as far as I know, are not injurious to your health. After washing, rinse well with fresh water, inflate using all the methods available and check the operation of overpressure devices, dump valves and vents for both sealing and venting. This is important as it will prevent any rapid ascent or descent caused by a failure in these valves. It will also ensure that it stays inflated on the surface while you await pickup by the dive boat. Ensure no water remains inside and allow to dry, inflated, out of direct sunlight.

Power inflators should be treated as, and with, reg's especially Auto Air, Air 2 and Octo+ types. Emergency cylinders should be treated in the same way as the main cylinder. Remember that the test frequency for these is **two** years and not two and a half. Avoid emptying them completely as this may allow water in with the inevitable corrosion problems following on. Those of you with the CO2 cartridge system must take care to examine the cartridge before and after every dive and check the operation of the firing mechanism. Lubricate frequently to prevent it seizing up and replace the cartridge as soon as it shows signs of corrosion. Fire the old one prior to disposal to prevent accidents. Be sure to carry spares, as many U.K. dive shops do not stock them. You will also need a supply of the little plastic "safety pins". Store all buoyancy devices partially inflated, jackets on a padded hanger, "horse collars" on a padded hook or a loop of wide webbing.

OTHER KIT.

For the most part, a thorough rinsing with running fresh water and allowing to dry, out of direct sunlight, will be sufficient but the following points should be observed.

COMPUTERS. Follow the manufacturer's instructions to the letter. If it says soak, do it. If it says do not blow dry, don't. Have the batteries changed and the calibration checked at the recommended interval, as this is a lot less embarrassing than having it "go down" in the middle of a dive.

OTHER INSTRUMENTS. Pretty much as for computers. Depth gauges can, and will, go out by a frightening degree so have regular calibration checks done.

COMPASS. You can check your own quite easily by the use of a chart or map. If you don't know how, ask someone who can, then go back over your navigation lecture notes. If you still can't, why do you have one?

Carefully remove instruments from the console from time to time and clean out the gunge that gets behind them. The housing may need to be soaked in hot water to soften it enough to remove instruments.

REELS. Most, if not all, come to pieces so during the worst weather do an overhaul. Remove old grease and other disgusting stuff from inside, clean it up and sparingly apply the correct grease, where required, then reassemble. Several times a year run out all the line and examine it carefully for damage, knots and thinning bits. If it's bad, replace it. This is a good way to fill in the time between dives on a sunny day as there is likely to be enough room and some help around. An activity much cheaper and less stressful than a search for a lost diver!

TORCHES. Don't store with the batteries in. Check after each dive that it is not leaking. In the event of a leak throw away the batteries if they are not rechargeable, thoroughly rinse with fresh water and blow dry with air. Spray the switchgear with a little WD40 or similar lubricant/water dispersant. Allow to dry out in a warm place before trying it again. Examine all 'O' rings and sealing faces for nicks or scratches prior to re-assembly (a magnifying glass will help). Lubricate with enough silicone to give a shine but no more. A little is good, a lot will bring grief. Do this in a clean area, not on the beach where it will pick up sand and leak again. High-tech torches may not respond to this 'first aid' treatment. In any case take it in to your local diving technician as soon as possible, he may be able to offer further help.

AND FINALLY!

If you have any problems with your kit during a dive, get it seen to straight away! If happened once it can happen again, and probably worse, frightening for a beginner, embarrassing for the experienced and unforgivable for an instructor. Get to know your technician and listen to his or her advice. This, of course, assumes that your tech' is not one of those who wears a big hat and spurs. Due account must also be given to the personal preferences of those giving advice and to the type of diving that they themselves undertake. Above all remember that diving equipment is a bit like a car. Any car provides a means of transport, but not all cars will travel on any road conditions or carry the same number of passengers at the same speed or level of comfort. There is always someone who believes that theirs is better than anyone else's!