

To BOV or Not to BOV??



The reality of BOV verse DSV is one of personal opinion and nothing more. You make choices in life to drive a car or motorcycle, own a handgun or home security system, drink milk or vodka, gamble at casino or invest in securities.... it sounds silly but people can justify anything they set their mind to. Neither DSV or BOV is a perfect system and both are a choice you make that come with consequences. When I started ccr (Before Semi Closed) diving the Inspiration was my first ccr, then Meg, then KISS and twelve other models.... I had passed on the CisLunar MkVI as it was twice the price of an Inspo and Bill Stone had just canceled the production as the order quantities crashed when the Inspo was introduced to public. The CisLunar had a BOV, and today if you see the Poseidon CCR you realize that the platform includes a BOV and is PADI endorsed. Bill Stone designed the CisLunar which is still the most sophisticated CCR ever manufactured, and he engineered the Poseidon CCR which most people do not consider a serious CCR??? Both have BOV? The KISS rebreather was made by a tool maker in British Columbia named Gordon Smith. He was not a tech diver, he was a PNW scuba diver who had poor air consumption, but liked to tinker and build. He designed a rebreather (early in the history of ccr's) in his workshop that worked so well he went public. Gordons vision was that if a rebreather failed, the diver should just flip a lever and bail-out, no complicated skills to make the ccr limp along, just bail out and Keep It Simple S. The Prism Topaz was designed by a Britt Peter Ready who eventually sold it to Hollis/ AUP and it had a simple DSV. Leon was early in history with Meg and formerly taught divers on military rebreathers (BMR500/Mk 15) of which none of these used BOV's. So historically when I had my first KISS rebreather it used a BOV which if you plumbed it on Gordons vision with 20 cu. ft of diluent would "maybe" get you to the surface on a recreational dive? Martin Parker launched his BOV after many years of having a standard DSV. The Inspiration BOV was quite possibly the worst design ever? The "Muscle Memory" that Martin wanted to retain from the standard Inspo DSV was to twist the barrel of the mouthpiece to bailout. This was complicated and required two hands to firmly grip the loop and twist to bail out? There is no room for a diver to be in a panic, or compromised with High Po2 or god forgive Hypoxia to try and manipulate a complicated bailout before they die midstream?

Here is a summary of rebreathers with or without BOV

DSV Only

rEvo
Meg
Prism2
Titan
Optima
JJ
SF2

BOV

Poseidon
HH/X-CCR
KISS – Classic/Sport
Orabortion/ Trojon-Sentinal –no longer mfg

MFG Optional

Inspiration/Evolution
Prism2 / Hollis Exploder
KISS Spirit, Sidewinder

For me it was a personal decision of the complication of adding gas whips for a bailout mouthpiece that I would need to switch gasses on descent or ascent if I were to be diving a hypoxic trimix? Coupled with the amount of divers who I've met who have had leaky BOV's that caused a great amount of distress on deep dives, I was happy sticking with a simple DSV that if I needed I could shut and deploy 2nd stage regulator. Since I dive a lot and travel the world with rebreathers, I get to see things that people do not post or in many cases want to admit. On a trip to dive the Empress of Ireland I was with a former student who was looking to change ccr's . He has previously only dived units with standard DSV, but the "XYZ" rebreather sales rep was there and it was a perfect time to get a quality sales pitch. After the thorough run down on the unit, I nudged the diver and whispered "Why does this guy not use the XYZ BOV on his unit???" So my student asked. The reply was "Well there are cases where the BOV can leak, especially on deep dives". Ok not only have I had students on deep trimix dives have leaky BOV which caused panic and near fatal dives, but I've heard enough of imperfect BOV's that I don't bother to consider them "my choice" for this reason I choose a simple DSV.

The other negative for me is the bulk and size as compared with a slim DSV. There are BOV out there that rival a dinner plate in size and I simply do not want something that big attached to my loop where I have to move to look past my BOV?

If by some strange coincidence you were to find that you agreed to go the way of BOV, then you find that your dive buddies do not agree with the choice of gas whip plug in? There is absolutely NO standard for gas whip plug in, just as there is no standard for MAV gas addition nipple.

Now there is a newer technique which I frown on that was born in the stubborn cave community to use a necklace wrap of a long hose 2nd stage in very close proximity. This is "muscle memory" from the cave community that fought the introduction of rebreathers into cave diving and then agreed. Well yes they agreed to accept rebreathers into the cave community as long as divers wear them like Open Circuit? Well the long hose necklace wrap works, but see my article on "Octopus Wrestling" to learn more about better choices than wrapping a long hose around your neck on a ccr.

If you are selling rebreathers to a recreational crowd such as PADI and you want people to do only one easy maneuver which is bailout, then you have the platform for teaching rebreathers. If anything goes wrong, bail out. But I have also been on dives in Bonaire where we are deeper on a reef and along swims a couple of SeaHorses on Inspo CCR's with No Bailout? I guess they were only 60' ft depth at the time, but I can fathom a diver diving a rebreather without some form of bailout other than backgas?

There are instructors out there that are feverent about the use of BOV's, and I have spoken to some that think that they have resuscitated a student underwater by switch the lever and having the diver breather open circuit breaths? Well that is fine and good, but a simple push on a diluent valve to flush a loop accomplishes the same thing.

If the inevitable were to occur and you felt funny underwater, then the diver must breath fresh gas. The gas the diver breathes must be breathable at the depth without being hypoxic or excessively hyperoxic. In an emergency the diver does not have the luxury to check to see if they are plugged into the correct mixture. There are two distinct scenarios of great concern for CCR divers. When entering or exiting the water, the diver must ensure that they have a high po2 mixture as this transition from dry land to water or water to climbing a dive ladder is a zone of danger. The second scenario is if a diver were to be a deepest part of the dive profile and had neglected to watch the Po2 and was hyperoxic, or ready to tox. Now consider the two options for a diver to breath the correct mixture. If a BOV divers switches the lever at the surface they must be on the normoix bailout, and if they switch at depth then they must be on the deep bailout. A diver must be rigid in their method of diving to always switch gas to the appropriate gas mixture. A DSV diver will only need to have the muscle memory of a flush. At or near the surface, getting in or out of the water then the diver jams on the oxygen. If a diver is at depth, they hit the diluent. If the diver is using a gas block such as the Titan, also copied by rEvo, some KISS divers, then the single gas block has buttons that are very easy to feel. Muscle memory, just hit the button and flush the loop.

Leaking BOV are common, but another consideration is a flood if a diver were to get a caustic cocktail into the mouthpiece, then they must remove the BOV and flush it. Why not just bailout to a regulator that does not have caustic chemical?

Another small matter that I do not choose to do is use the offboard gas as drive gas for the rebreather? Sorry but it is just a nuisance for me to be filling my stages or off-board gasses. I can efficiently dive a set of 3 liter bottles for multiple days on a deep wreck dive, I do not want to be filling stages as well.

This article is not to convince divers to switch the model of mouthpiece DSV or BOV, but to consider that they are making a choice and both styles have consequences. Only a fool believes that there is a free lunch or never a drawback to choices you make.

If I were to choose a BOV, then it would have to be the Gonad Gear Golem Shrimp as them most reliable, and streamlined BOV on the market.

See pictures attached of some of the BOV that are on the market today.

I train divers with either DSV or BOV and have no argument as long as the diver accepts the responsibilities that either design entails. Both work.

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