

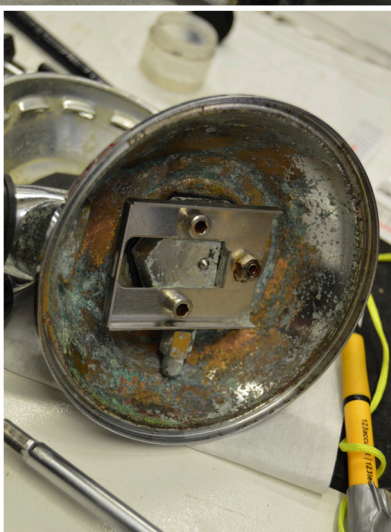
75 YEARS OF SPORT DIVING VINTAGE DIVING

FEATURE **PATRICK VAN HOESERLANDE** UNDERWATER PHOTOGRAPHY **JEF DRIESEN**

When Dirk Deraedt and I thought about the concept of this series on 75 years of sport diving, we both agreed that a chapter about diving with the Mistral single stage regulator should be a part of it. There had to be a piece about the practical experience. However, this required that we find a functioning Mistral whose owner would give us permission to dive with it. I considered this a simple assignment, but nothing was further from the truth.







In this article I will cover the theory explained in the previous issue. A long time ago, I dived with a single stage regulator; but then I did not possess the knowledge to observe the differences in its function. Yes, my field of vision was 'bubble free' and the regulator sounded different, but I no longer remember this dive in any great detail. It was a dive to enjoy, not one to test the regulator and write about it. To be able to compose the review below, I had to find a working specimen and test it underwater. The clock was ticking towards the deadline!

Before we begin with the third part of this series, I want to draw your attention to two important aspects. Firstly, the title does not really cover the load because this is not about diving with 'antique' equipment. This was and is not my intention. The title, "what is it like to dive with a single stage regulator?" would have been more explanatory, but sounded less attractive. Secondly, I would not send a fellow diver out with the regulator I tested, certainly not without additional repairs. Despite the precautions taken, the regulator was not completely safe. An important lesson from this is that it is not because you have an old regulator laying about that you can go diving with it. But you already know that.

THE QUEST

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diving, we both agreed that a chapter about diving with the Mistral single stage regulator should be a part of it. There had to be a piece about the practical experience. However, this required that we find a functioning Mistral whose owner would give us permission to dive with it. I considered this a simple assignment, but nothing was further from the truth. Many fellow divers had one and so I thought that I only had to ask to borrow one and test it out on a dive. After months of emailing and calling, I had to conclude that most people considered their Mistral a decorative piece or in some cases, a relic. Afraid that a return to the environment for which it was designed would destroy the decorative element of it, I could not lay a hand on a single specimen. Others were curious to see if their regulator would still work, but I had to refuse their offer because it was not a complete piece. When I finally found someone with a complete set, the necessary maintenance turned out to be too expensive. A month before the deadline, I still had no usable regulator in my possession.

At the last possible moment, I received a message from Loumar that I was allowed to test his single stage regulator during a real dive. His specimen had been a gift and he had dived with it for the last time without any problems... in 1995. After a visual inspection, I decided that the regulator looked to be in very good condition and that is was an

excellent candidate for the accomplishment of my goal. Of course I would not jump with it into the water solely based on an external inspection, the device had to be thoroughly checked before I even thought about diving with it. Unfortunately, I neither possess the knowledge, nor the equipment to service a regulator; so I went knocking on Ronny's door at the Scuba Service Store.

Ronny had no experience with maintaining this old type of regulator. Only because I relentlessly insisted that he should at least have a look at it and after promising that he could stop at any time, he agreed to give it a try. Also, I would not dive with the device if he thought it would be dangerous. As agreed, he began with great precision dismantling the regulator. As he did so, I took photos for the article which would also be useful for reassembling it. After removing the lid, I noticed the good condition of the regulator. The only part that we were a little worried about, was the 'becque de duc'. The rubber outlet valve looked brittle, so we decided to leave it as we were afraid of damaging it. We did not have spare parts available, which meant that a broken part would result in cancelling the dive and the article. What was even more striking, were the small parts inside the regulator. I counted 25. And that was it. This limited number of parts made the Mistral a rock-solid regulator and it was popular with so many divers.



After having thoroughly cleaned all the parts, Ronny neatly reinstalled everything. The placement of the large diaphragm was more difficult than expected, but ultimately we were successful in keeping the rubber seal in its place with two pairs of hands. A flow test showed that it worked, although breathing would be heavy. This was probably because the regulator was not optimally tuned, but without good instructions on how to do that, we decided that it would serve its purpose.

Happy, I left Ronny's shop with a fully functioning and serviced authentic Mistral. During my dive breathing would be difficult, but I expected that it would be easier underwater – a modern two-stage regulator breathes heavier above water than under – and the rigidity of the brittle outlet valve could cause problems. However, I did not know what kinds of problems they would be. Difficulty to exhale?

In the days between my visit to the workshop and the actual dive, while enjoying a BBQ, I was telling my friend Remi about my project. Spontaneously he took me to his cellar. I suspected that he would offer me a single stage regulator because for some bizarre reason I believed that once I had found a working Mistral, other people would suddenly tell me that they had one too. To my surprise he did not offer me a regulator, but an original Fenzy

and an analog decompression calculator; a prehistoric dive computer. With this equipment, along with an old mask I had found in one of my boxes, the picture was complete. I was ready for the dive.

DIVING WITH A MISTRAL

The maintenance check had convinced me that the regulator I was now mounting to my tank was indeed a single-stage. The first commercial derivatives of the regulator of Cousteau-Gagnan, the CG45, were after all two-stage versions. The later Mistral, however, was a thoroughbred single stage regulator. Because I had observed through pictures that the regulator's casing was directed backwards, I mounted mine the same way. The manner in which the two tubes were now positioned, confirmed my idea that it was assembled correctly.

At the dive site, although we deliberately avoided the busy parking lot, passersby and other divers looked at us with a look of admiration. Was it admiration for the equipment, or for the guinea pig who was going to dive with this collection of antiques? I left it in the middle and focused on my part of the job.

From the theoretical research, I knew that: the inspiratory pressure drop decreases as the pressure in the tank decreases. To test this,

I would almost completely empty my tank at the end of my dive. This would turn my environment into a jacuzzi.

The ambient pressure, as long as it is negligible in respect to the tank's high pressure, has no influence on the inspiratory pressure drop. This situation would not be valid at great depth with an almost empty tank, but because the 'Put van Ekeren' cannot be described as deep, and it would not be recommended for safety reasons to put myself in a potentially hazardous situation, testing this was not on my list.

The breathing comfort depends on the position of the diver. The greater the vertical distance between the mouthpiece and the regulator housing, the more breathing effort the diver must exercise. I would test this by diving in different positions.

Because it was not a normal dive, I took a few extra safety precautions: we would first test everything in very shallow water. Whatever would happen would give me the option to surface quickly in a controlled manner. My buddy and photographer was an experienced instructor and through a detailed briefing he knew exactly what to expect (and what was not normal). We had a clear signal in case something was to go wrong, and I had a second 'modern' regulator at hand.

During the first few minutes underwater, I was already experiencing the result of the stiff outlet valve: after exhalation, water easily poured into the exhalation hose and then into the mouthpiece. The valve probably did not close immediately after my exhalation due to its stiffness, causing water to enter. The exhalation valve on the mouthpiece apparently only controlled the air circulation and allowed water to enter into my mouth with every breath. I swallowed the first bit, but this was certainly not a permanent solution. Then I remembered the explanation of an older diver who had dived with a Mistral before. "If water gets into your mouthpiece, then hold the inlet hose up and the outlet down." Because drinking lake water was not a good alternative, I tried this manoeuvre out. And yes, the water disappeared. By frequently applying this solution, I could continue my test dive.

Diving felt strange as I did not see any bubbles and barely heard a sound. I doubted the operation of the regulator. Jef, my buddy, signalled that everything looked normal and I could breathe, so it had to be working, even without visual confirmation. I swam a few rounds to get used to the way of breathing and to give my photographer a chance to do his job. When I wanted to inhale, I had to use a lot of force for one breath of air. It was heavier than expected, but it was not too bad. It was now time for the real test.

As theoretically predicted, breathing in required a lot of effort, while exhaling went well. In an upright position, the difference in effort was smaller. I turned over onto my back and the mouthpiece provided me with an oversupply of air. I expected an easier inhalation, but this was too much. Upside-down breathing was better. There was, in contrast to the modern two-stage regulator, a clearly discernible difference in breathing comfortably depending on my position. This would vary less with depth, but I would not test that, nor the analog decompression calculator. That would have to wait.

I realised that I could reduce the inhalation effort by fitting the regulator backwards onto my tank, i.e. with the casing pointing towards the front. This strange set up would reduce the distance between my lungs and the regulator valve. The tanks Cousteau and his fellow divers used were unlike the thick 200 bar tank I was employing now, and so my distance would be bigger than theirs. Turning the housing the other side around would shorten that distance by only a few centimetres but it would result in easier breathing. I noticed that the tubes were really pulling at my mouthpieces so this convinced me that this was the way forward. I signaled that I would surface to modify my equipment configuration.

Back underwater I directly noticed the difference. Not only did I feel the mouthpiece – although upside down – it was better





without the traction and my breathing had clearly improved. I began to feel like, I guess, what a real Mistral diver must have felt underwater: The difference of breathing in the various positions had also decreased. It was still there, but not as pronounced as before. I was beginning to enjoy the absence of bubbles. I thought about replacing my modern regulator with this single-stage, but water in my mouth made me decide not to do this yet. Anyhow, after this dive I had to give the regulator back. After passing 30 dive minutes, I became a bit bolder: I decided to take the mouthpiece out to discover how to free it of water. I remembered that you had to do this by holding the mouthpiece high up, which causes the water to come out. I pulled the mouthpiece out and pushed it up. Almost immediately there was a local bubble curtain, and I put it back in my mouth. Yes, I could

directly breathe. The water was out.

After everything had been tested and photos had been taken, I could take the final test. I transformed my environment into a local bubble bath by depleting my tank through my modern second stage. I fantasized about what people on the surface would think. When I read 20 bar, I decided that it was good enough. As I inhaled the leftover air, I observed my breathing efforts. An improvement in comfort was noticeable. I now had to make tangibly less effort to get air. The theory was correct.

Fortunately, we did not have to fin far to dry ground. The test dive went well and confirmed the findings based on the previous technical analysis. Even after so many years of being stored away, the Mistral worked very well.

With a new outlet valve, the regulator would probably have worked flawlessly and provided a good adjustment. Based on a maintenance book, it would have worked like new.

My dive with the Mistral has been a few months ago now. I reluctantly returned the regulator and the other equipment to their rightful owners. I would have liked to dive with it a few times more, but circumstances decided otherwise. And yes, as predicted, others started offering their single stage regulators for me to test out. Meanwhile, I am now the proud owner of a Mistral. It is a more recent version of this regulator, with a high-pressure connection. I am determined to return this specimen back to its natural environment and it goes without saying, I will be accompanying it.