NEW MEXICO SCUBA CENTER

November 2011

As a full service dive center we measure our success through your continued safe and enjoyable diving. We provide professional instruction , quality equipment, and world wide dive adventures

Stacey and Si

As this newsletter goes out, Stacey and a cohort of intrepid adventurers are in route to the Philippines. Stacey promises to grace the newsletter with an account of the group's exploits and photos.

For those contemplating a winter or spring dive trip, the next few months offer an excellent opportunity to brush up on skills, acquire new ones, or for some to gain needed certifications. It is also a great time to service your gear if you haven't already.

A quick note regarding Scuba Pro. They have changed their lifetime policy of free parts for life on in-warranty regulators. You will have 12 months from your previous service or purchase to get your Scuba Pro equipment Scuba Pro will grandfather earlier equipment and retain the free parts for life provided the equipment has had annual service. Regulators exceeding one year from service will be dropped from the free parts for life (there is a 30 day grace period). If you have any questions please let us know.

Inside this issue:

DIVE PIRATE OF THE YEAR

ADAPTIVE SCUBA DIVING

Senior Airman Michael Malarsie, USAF—be the recipient for next years Dive Pirate trip from Albuquerque

Michael is still active duty in the air force . While on foot patrol in Iraq an IED blasted him off a bridge and into the water. Michael lost his sight and suffered some shrapnel injuries. In honor of those in his patrol that died that day from the blast, Michael is pursuing everything he's ever wanted to do, and scuba diving was definitely on his bucket list.

Yes Davey Jones Locker challenge will be held in February 2012. And of course Michael will be here to join us. Teams are forming now.

Alphabet Soup for Scuba Divers

Stacey Minton

As in any sport or occupations we come across a different language. It is not one that we can always figure out but it would be real close to looking at a bowl of alphabet soup and try to decipher what those letters mean. It is a soup of certification agencies, certifications, and equipment just to mention a few. As an example we have heard B.C. or B.C.D also called a Buoyancy Compensator / or Buoyancy Compensator Device. Which one is correct or incorrect?

All the certification agencies have their own style – so is there one certification agency better than the other? Each agency will tell you that theirs is the best. Is Agency ABC better than LMN or is XYZ . What most people do not realize is that all the major certifying agencies all started at the same time back in the 1970's. As you can imagine they all could not agree on the same things, so they dispersed and took their philosophies and goals of what a scuba certification agency should and should not be. This is why we have different certification agencies. Forty years later we still have these certification agencies that have grown and unfortunately some that have gone by the wayside.

Most major agencies subscribe to dive industry standards and recognize each other's certifications. There are Instructors / Dive Stores / Representatives that have what we refer to in the industry as drinking the cool aid, and only will recognize their agency and not accept any certifications that others have done from other agencies. Those who do that are doing an injustice to themselves and of course divers as well. Most agencies cooperate and recognize each other's credentials.

There are many decisions that go into what agency a dive center selects for its accreditation. We, the New Mexico Scuba Center (NMSC), have been affiliated with all of them at one time or another. At the present time we are affiliated with Scuba Schools International (SSI) and Scuba Diving International (SDI). We chose to affiliate with them because they subscribe to industry standards, adhere to strong accreditation principles, and manage effectively.

For the confident diver, a lifetime of fun awaits

Classroom or back of truck? Some certification agencies require that the instructors be involved with a store where there are more checks and balances. Others allow them to teach on their own out of their garage, a rented office space or back of a truck, where the checks and balances are left up to the instructor only.

Educational materials and Instructors are a very important part of this as well. You can have a great instructor that cares, is very knowledgeable, and

The major certification agencies have world wide recognition and acceptance in the dive industry.

takes the time – but their instructional materials are not very good. While the quality of instruction is excellent, valuable content may be lacking or overlooked. Alternatively, sole reliance upon course materials without sufficient hands-on instruction and evaluation is a non starter. Poor instructors rarely teach someone to become a competent, confident diver. The person receiving that certification may go diving, but never become a self reliant diver

A question one must ask is how long will instruction take and one's willingness to invest in the time? Effective training is a process of demonstration and repetition. The quick weekend class (about 12 hours) comprises 12 hours (Friday & Saturday classroom, Saturday & Sunday pool, and next weekend certification dives). Attractive in time commitment, the quick course does not allow needed repetition to learn, master, and retain essential skills. By contrast, a comprehensive course (24 hours) with four to six class room & pool sessions and subsequent weekend certification, allows needed repetition. *It is a critical difference between merely completing as opposed to achieving competence and confidence.* The Scuba industry did their research and found most divers who certified through a condensed / weekend course remain with the sport for an average of eight months because they are not comfortable. Those who do the extended course and gain the confidence it provides stayed with the sport for eight or more years.

When selecting, consider how long has the dive center and its instructional staff been teaching, and the real cost of certifications. As an example, at NMSC our instructional staff goes through a rigorous development period of professional courses, demonstration, and hands-on experience before instructor certification. We consider the Open Water Diver (OWD) certification as the collection of essential skills to dive in New Mexico. These include the OWD course of instruction as well as Altitude Diving and Dive

Michael and Charlotte join the ranks of SSI Master Diver

Computer operation. For those who wish to explore before "diving in," the *Try Scuba* provides potential divers a low cost means to evaluate their interests and make an informed judgment. By contrast, some dive centers may charge the diver for three individual certifications plus *Try Scuba*, when in fact it should be included as the OWD package.

How much is this going to cost? Is the least expensive or the most expensive the way to go? The question centers on one's time commitment, expectations, and objectives. A resort or cruise ship's *Try Scuba* might be the ticket for the once in a life time experience but cost nearly as much or more than an OWD certification. By investing *both* money and time, the serious diver will gain a lifetime of diving.

Do your homework. In choosing, consider the whole of instructional content and quality. Recommendations are useful, but in the end one should examine the agency and instructional staff by meeting with the dive center. The shortest, least expensive or most expensive may not be the best. And, of course, make sure that there are no hidden fees.

Now hopefully that bowl of alphabet soup makes more sense.

"The Scuba Industry has done some research and found that most divers that have gone through a condensed / weekend course only to stick with the sport for an average of 8 months because they are not comfortable. Those who do the extended course will stay with the sport for 8 + years."

Kelp in Catalina, California

SPEARFISHING IN NEW MEXICO: NAVAJO LAKE

Kirk Loy and Ernie Garcia

Interested? Go to the NMDGG web-site at www.wildlife.sate.nm.us for details

The photographs capture Kirk and Ernie on their August 29th spear fishing trip. During this trip they encountered Bluegill, Smallmouth Bass, Catfish, Carp, and others.

The water temperature is a balmy 72° F at the surface, but drops quickly upon descent. Visibility was around 20 feet. Most of the fish dwelled around 30 feet.

Kirk and Ernie filleted and cooked the Smallmouth Bass...delicious!

"What a superb dinner with just a little olive oil and seasoning. Next time we plan to eat a Carp...currently researching Carp recipes."

Kirk Loy is a segment producer for the New Mexico Wildlife TV and weekly series about New Mexico outdoor activities. The NM Department of Game and Fish (NMDGF) and the Federal Wildlife Conservation Fund sponsors the series. The program airs on Fox TV (channel 2 in Albuquerque) at 6:30 AM each Saturday.

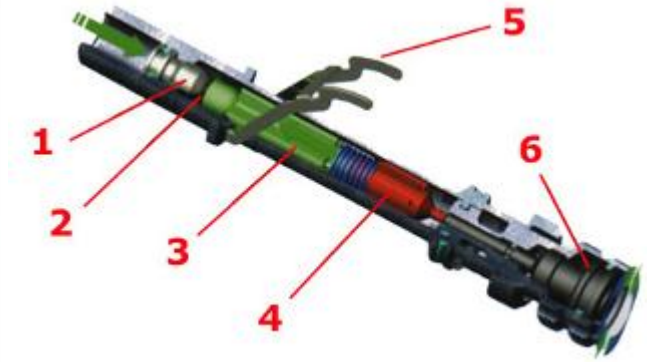
Surface Interval

David Olson

The Second Stage

Scuba pro S600

1. LP inlet hose
2. Dive/Pre Dive knob
3. Faceplate and purge
4. Micro adjust



Apeks Second Stage Housing

1. Orifice seat
2. Rubber seating for poppet
3. Poppet valve stem
4. Counter balance cylinder
5. Lever
6. Cracking resistance control (micro adjust)

The second stage (primary/alternate) regulator is a critical and highly reliable component of our air delivery system. When well maintained and cared for the second stage will consistently perform safely throughout the range of dives most make.

The second stage regulator has these functional elements:

Low pressure inlet hose: Threaded to the external portion of the valve housing, it inlets low pressure (LP) air (145psi) from the first stage to the second stage.

Orifice: Located within the housing connected to the LP hose it provides a metered, precise point for the poppet valve seat.

Poppet valve: Located within the valve housing inside the regulator, it seats against the orifice. A tensioned spring on the poppet valve stem balances against the inlet pressure to close the valve.

Diaphragm Lever: A mechanical arm attached to the poppet valve housing, which rests against the inside of a diaphragm located at the front of the regulator body. The lever acts upon the poppet valve stem in response to diaphragm movement.

Diaphragm: A flexible material such as silicone. The diaphragm skirt seals against the regulator body preventing ambient air or water from entering the interior volume, while allowing easy distortion due to imbalanced pressure.

Purge button: Located on the face of the regulator, depressing it manually forces the diaphragm inward resulting in the diaphragm lever opening the poppet valve.

Normal breathing cycle. The diver creates a negative internal pressure by demanding air (inhalation) distending diaphragm inwardly and depressing the diaphragm. The depressed lever acts on the poppet valve stem overcoming the valve spring force, which opens the poppet valve and LP air enters. Once the diver's air demand is met, air continues to flow into the regulator volume increasing the pressure until the internal pressure balances against the ambient. Moving with the diaphragm, the lever's repositioning allows the spring force to reseat the poppet valve against the orifice.

Exhalation causes an imbalance by creating a positive internal pressure. Air escapes from the interior volume along the diaphragm skirt of the exhalation valve

until the internal and ambient pressure are equal (exhalation will remove water and debris as well). The diaphragm skirt reseals, and the regulator is ready for the next cycle.

Two off normal conditions can cause uncommanded air flow. Intermittent bubbles, hissing, or popping usually indicate a valve that is either improperly seated or inlet air exceeding the valve spring's force. A second, "free flow," indicates a poppet valve that is open.

Improperly seated poppet valve: During maintenance the technician will adjust the orifice so that it rests firmly upon the poppet valve seat. If air continues to flow, the technician will examine both the orifice and the valve seat for irregularities or damage and take appropriate action. In the field, it is possible some debris or residue might form on the valve seat. Avoid debris or residue by NOT opening the poppet valve through pressing the purge button on an unpressurized second stage, such as during fresh water rinse post-dive. If in salt water, crystals might later form on the seat preventing full closure. Another failure might occur if the valve spring fails (unlikely) or loses tension (more on this later). If this condition persists, a qualified technician should inspect and service as needed.

A properly adjusted primary second stage will allow relatively effortless inhalation. During maintenance, the technician uses an instrument to measure the breathing effort (cracking resistance) to opening the poppet valve. The technician achieves through tensioning of the valve spring. Some regulators allow the diver to later increase or decrease the tensioning and change the cracking resistance.

Free flow is common and occurs when the valve does not return to its fully seated (closed position) following initiation such as during a purge check. When the diver inhales, air flows through the regulator creates a venturi effect or negative pressure inside the regulator (Bernoulli discovered as a fluid moves through an orifice, the pressure decreases). Regulators use the venturi effect in the mouth piece design to ease breathing resistance. However, if the breathing effort (cracking resistance) to open the poppet valve is low the venturi effect may induce a sufficiently low pressure to keep the poppet valve open even when the diver releases the purge valve.

Some regulators have a micro adjust, which allows divers to adjust breathing effort. All divers should try the "micro adjust" to determine what is an "acceptable" effort. Some regulators will allow the micro adjust to overly decrease the poppet valve spring tension, which increases free flow occurrences. Again, tighten the spring to increase resistance and decrease free flows.

Uninitiated free flow occurs when sufficient negative pressure in the regulator causes the diaphragm to distend spontaneously (inward), which opens the poppet valve. This can occur when the diaphragm is below the mouth piece in a fully or partially submerged regulator. Free flow may also occur when sufficient water flow passes over the mouth piece of a regulator with a low cracking resis-

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"Avoid debris or residue by NOT opening the poppet valve through pressing the purge button on an unpressurized second stage, such as during fresh water rinse post-dive.."

New Certified Divers

Congratulations and Happy Diving!

Open Water Divers: Vanessa Price, Johnny Fisher, Bryan Shiloff, Geffrey Trapp, Cameron Trapp, Micah Melnikoff, Jaclyn Melnikoff, Eric Floyd, Elena Heiss, Maria Garcia

Master Divers: Michael Nasr & Richard Wachowsk, Michael Mar Michael Martinez,,CharlottePerry

Stress & Rescue Divers: Robin Reynolds, Carolyn Reynolds, Michael Martinez, Charlotte

"SSI offers a very broad selection of continuing education courses such as NITROX, Advanced Open Water, Stress & Rescue, and Dive Leader

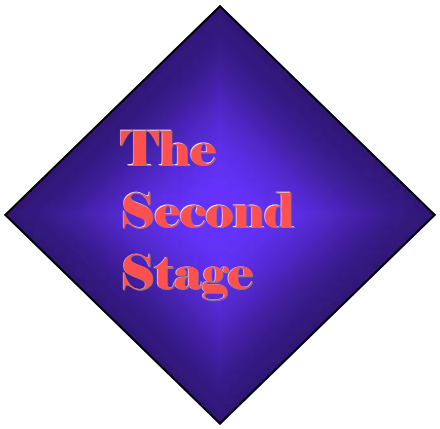
Continuing Education this month

Open Water	**Adaptive Scuba Training**
Stress and Rescue:	**Atlanta GA—January 2012**
Nitrox:	**Albuquerque—January 2012**
First Aid /CPR / 02 provider	**Albuquerque—April 2012**
	Houston Texas—May 2012

Equipment

DEMA

The big Industry wide Trade show is the beginning of this month. This is when all of the manufacture's show all of their new toys. We cannot wait to see what is new. Stay tuned next month to see what there is .



tance, the induced negative pressure may be enough to cause free flow.

Stopping a free flow usually requires no more than placing a hand over the mouth piece and/ or turning the regulator around so the mouth piece is below the diaphragm (regulator cover facing up).

Some regulators have a "dive-predive knob" that reduces flow through the mouth piece and minimizes the venturi effect in the mouth piece. Failing to return the knob to the "dive" position during the dive may result in nothing more than slightly higher breathing effort.

Adiabatic free flow. In near or at freezing conditions, purging or consistent heavy breathing could result in an *adiabatic* induced free flow. Adiabatic refers to the condition of rapid gas expansion (reduced pressure) and subsequent cooling. An example is an aerosol can cooling as gas escapes. At temperatures approaching freezing, the moisture in the compressed air from the tank will first condense then freeze on the poppet valve seat preventing closure. It is essential cold water divers understand and heed the manufacturer's instruction on use and environmental limitations. Some regulators have design features to prevent this condition.

"At or near freezing, an adiabatic free flow may occur resulting in an uncontrollable loss of air."

The alternate second stage should always have a relatively higher cracking resistance. Why? Water passing over the regulator mouth piece or position of the mouth piece above the diaphragm could be sufficient to induce a free flow. For this reason, technicians should always set a higher cracking resistance. During pre dive checks, most divers will notice the increased breathing effort.

Uncontrollable free flow. The diver must respond immediately to any free flow. If placing a hand over the mouthpiece fails then the diver must stop air flow to the second stage. For alternates such as the combined inflator-second stage (e.g. scuba pro Air 2), disconnecting the quick disconnect is a quick, safe solution (remember, there is no power inflation!). A second solution is to double bend the air hose (like we would with a garden hose) to stop the air flow. If neither works, look for your buddy (air sharing) and/or ascend immediately--a free flowing regulator can rapidly drain a tank.

Before one dives, these checks assure proper operation:

Shake. Properly adjusted, there should be no rattling noise. A rattling noise may indicate the lever is improperly adjusted (bounces against the diaphragm).

Exhalation. With no inlet air (for example, connected to an unpressurized first stage), exhale in the regulator. Air should escape only from the exhalation valve. If not, check the exhalation valve (diaphragm) for damage, blockage, or skirt adhesion.

Negative pressure. Again with no inlet air, inhale. No air should enter the regulator volume (either the inhalation or exhalation diaphragm). Entering air indicates an improperly seated or torn diaphragm. Check both diaphragms for damage or debris. Note: Checking /replacing a diaphragm is within most divers capability but should be demonstrated such as during the Advance Open Water course.

Pressurization. No air should flow from the regulator. Non demanded airflow can occur from valve seat-to-orifice damage or debris, improper assembly/set up following maintenance, or excessive inlet air pressure (indicating first stage issues). Inspection and possible service are the best solution. Note: Free flows may occur on regulators with micro adjust too loose.

Inhalation. Once pressurized, inhale. Air flow should follow diver's demand and with *acceptable* effort . High effort may indicate need for regulator adjustment. Note: On regulators with micro adjust, the diver should try loosening.

Purge. Press the purge button on the regulator face. Air should flow from the regulator. A free flow might occur. There should be no air flowing from the regulator before or lingering after the purge (hissing, popping noise, or felt). Note: On some regulators with the "dive/pre dive" mouth piece feature, turning it to pre dive may eliminate free flow following purge check.

In closing, I emphasize one should treat their second stage like their life depended on it...it does! Don't throw it around or allow debris to enter the regulator. Keep water out of the LP hose. Service it at prescribed intervals per the manufacturer's recommendation or when circumstances dictate. Have a plan if the regulator malfunctions during the dive. And finally, servicing should be left to a qualified technician with proper equipment.

Diver's must respond promptly to any free flow. Unchecked, a free flowing regulator can rapidly drain a tank.

Diver emerges from swim through in Cozumel

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Not just an adventure of a lifetime, but a lifetime of adventure

Photos courtesy of Stacey Minton , Kirk Loy, and Mike &Charlotte

nmscuba.com

We are looking for contributors and encourage you to share stories, travel notes, and/or photos.

Upcoming Dives

Barbados: Feb 4-11, 2012

Curacao: April 2012

Florida Wreck Week: July 2012

Kona Hawaii: September 21 –28, 2012

BVI: November 3—11, 2012

Moray in Bonaire

Call us for details!