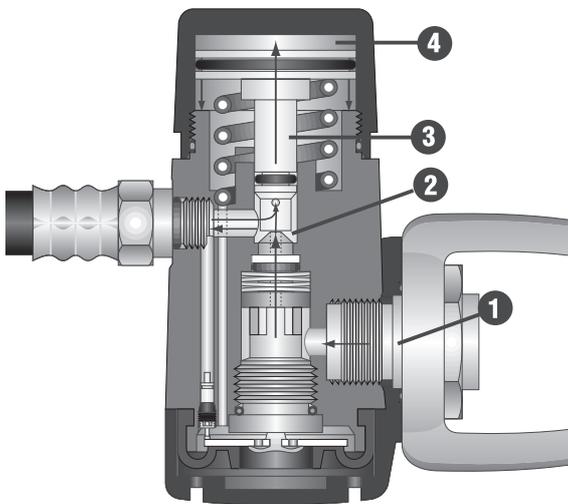


## FUNCTION &amp; DESIGN

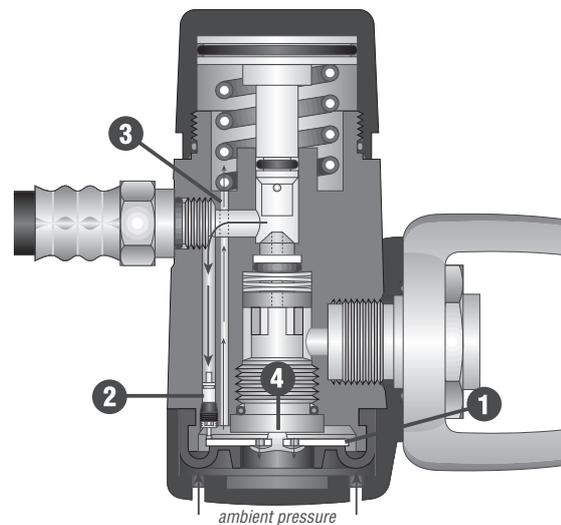
## INTRODUCTION

**The D.A.D. (Dry Air Demand) is a balanced piston first stage with a patented feature that seals out the environment with no messy oils or grease. Here's how it works:**



### Pressurization & Lockup

- ▼ High pressure air enters through the inlet (1), and travels through the orifice retainer and orifice (2).
- ▼ While the piston is unseated off the orifice, air travels through the low pressure ports, where it meets the closed valves of the second stages and BC inflator, and quickly travels backward.
- ▼ At the same time, air enters the small openings in the shaft of the piston (3), just above the HP seat, and flows out through the piston head.
- ▼ The air pressure (4) above the piston head is now slightly greater than the combined pressure of the spring and the ambient pressure inside the chamber (5) below the piston head. This causes the piston to move downward, until the HP seat is sealed against the orifice.
- ▼ Airflow is actuated when a second stage valve opens, causing the intermediate pressure to momentarily drop. This reduces the pressure above the piston head, allowing the spring and ambient pressure to lift the piston off the orifice.



### Dry Air Demand (D.A.D.) Feature

- ▼ As ambient pressure increases with depth, the ambient sensing diaphragm (1) flexes inward, against the ambient pressure (Schrader) valve (2).
- ▼ As the ambient pressure valve opens, intermediate pressure air is allowed to travel through the valve, and back into the spring chamber surrounding the piston through a separate channel (3). Sea water does not enter the spring chamber.
- ▼ When pressure inside the spring chamber becomes equal to ambient pressure, the diaphragm flexes away from the ambient pressure valve, causing the valve to shut.
- ▼ As ambient pressure decreases upon ascent, air inside the spring chamber expands. Excess air escapes through a one-way vent valve (4) built into the ambient sensing diaphragm, until the air inside the spring chamber is equal to ambient once again.

*These actions occur instantaneously in response to the slightest changes in ambient pressure.*