

SCUBA WORKSHOP

EDUCATION THROUGH PRESERVATION

Dedicated to the preservation and restoration of our scuba equipment heritage.
by Kent Rockwell

Scott Hydro-Pak full face mask scuba (Part Two)

In part one we looked briefly into the Scott's history and then concentrated on the mask and second stage regulator.

The Hydro-Pak's first stage is a spring and diaphragm actuated upstream valve regulator set to the intermediate stage pressure of 100 P.S.I.

Scott features three basic first stages. The first was a single tank unit, with reserve, that bolted directly to the tank valve with a nipple adapter. The second was a dual tank unit, identical to the single, with two opposing nipple adapters that connect it between the tank valves. Finally, the Navy units, short versions of the Hydro-Pak units minus the reserve system that featured a yoke and wing bolt assembly to fit standard Scuba post valves.

You will need a 1 1/2" open end wrench to remove the spring case, spring and diaphragm from the regulator body making sure to protect its finish with either aluminum or plastic soft jaws when using a vice. The up-stream valve and screw body are next and unscrew with a 1/2" socket wrench. Do not disassemble the valve assembly. Below the valve is the reserve spring and if an early model (or prototype) a solid rectangular reserve poppet will drop free. The late style hollow poppet requires removing the reserve stem and then pushing the poppet out with a thin dowel against the drag of its two "O" rings. This drag on the poppet was designed to prevent flutter and has no sealing function.

To remove the reserve stem, first remove the flat metal detent spring and loosen the two set screws in the reserve knob with a 1/16" Allen wrench. On the early models the knob will slip off, but on production models the stem has a retaining groove so the set screws have to be turned most of the way out to remove the knob.

To remove the regulator-to-valve nipple couplings, tighten the regulator onto a tank valve and then rotate the regulator counter clockwise. These couplings are not on tapered threads but instead seal with "O" rings on their ends. The over-pressure relief valve, the 90 degree hose elbow, and on the twin tank as-

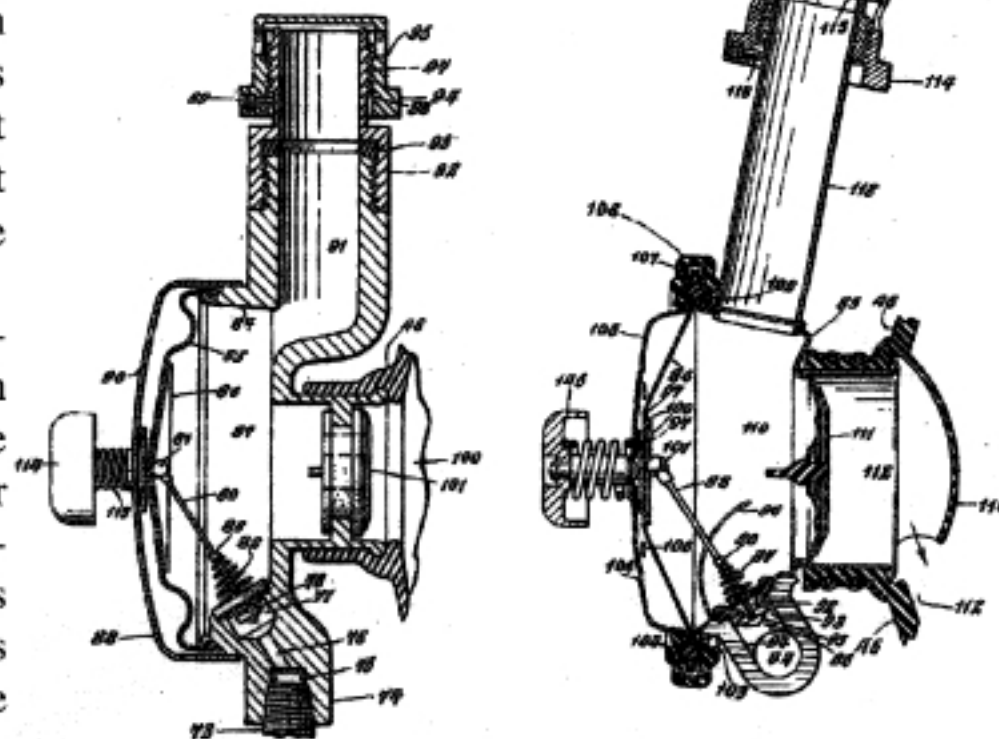
semblies the filler plug have tapered pipe threads. These fittings will require sealing tape on assembly.

We found only three areas that needed attention from wear and aging. Item one, the rubber diaphragm, needed close inspection but was found to have taken only a minor set and no cracks. The second item, the upstream valve assembly, was set with a locking compound so we only compressed the unit in our fingers to inspect the valve taper and its seat. We did find our reserve poppet's neoprene seat and "O" rings had self-destructed so we punched a tiny donut, from a 1/16" sheet of neoprene, and cemented it in place of the original. In operation the system pressure lifts the poppet on demand until the pressure drops to about 400 P.S.I. and then restricts the airflow thus giving the diver his reserve warning.

We cleaned our metal pieces in our mild vinegar soak and freshwater rinse and then carefully inspected all of our parts with a magnifying lens. We blew the parts dry with clean compressed air. Surprisingly, our twin tank regulator body had poor chrome and three minutes in vinegar (we forgot to dilute it) removed a lot of chrome requiring re-plating (ugh).

Assembly appeared straightforward following the manual. Place two, lubricated, -007 (AN6227-2) "O" rings on the poppet valve and with a 1/4" dowel push the poppet into its bore with its sealing seat facing toward the reserve stem (you did clean, and inspect the bore?) (Note: use only scuba approved silicone grease on "O" rings and fitting threads). Drop in the reserve spring and then the valve assembly and its screw and snug down with the 1/2" socket (do not over tighten this part and this goes for most fittings on your lung). Follow with the diaphragm and its components, lightly snugging the spring case down.

The assembly appeared straight forward until we came to the reserve knob installation. With the three stop pins in place it is impossible to install these components as the book suggests (note: we do not recommend removing these



Cast prototype and stamped production second stage regulators from the patent drawings