DESCO Corporation
US Navy Mark V Non-Return Valve(s)

Note: These instructions are an excerpt from the 1970 USN Diving Manual. The text and valve graphics are reproduced verbatim. The design change occurred in the early 1960's.

Safety Air Nonreturn Valve

(6) The safety air nonreturn valve is one of the most important safety devices supplied the diver. Its purpose is to prevent the diver from being injured by "squeeze" if his air hose bursts, or the air-supply system becomes so seriously damaged as to fail to maintain an air pressure sufficient to counteract the external water pressure. Under either of these conditions, the air pressure in the hose would fall suddenly. If the compressed air in the helmet and dress should escape through the air hose, the pressure within the helmet and dress would become less than the external water pressure. Because the helmet is rigid and the dress is flexible, the greater external pressure would squeeze the diver's body into his helmet in the same manner that a cork is forced into an empty bottle when lowered into deep water.

(7) It is essential that the safety air nonreturn valve function properly at all times. It must be carefully tested before a diver is permitted to descend. It should be examined frequently, disassembled, and cleaned. The leather valve-seat washer of the spring and stem type valve and the cartridge and O-ring of the cartridge-type valve should be inspected for wear and tear, cleaned, and given a coating of neat'sfoot oil. The valve spring, valve stem, or valve cartridge, whichever one applies, should also be given a light coat of neat's-foot oil. To test the valve after assembly, screw it in the reverse manner to the end of a length of air hose, attach the hose to the air supply, and apply pressure.

(8) There are two types of diver's air nonreturn valve: the spring and stem type and the cartridge O-ring type shown in figures 2-7(a)

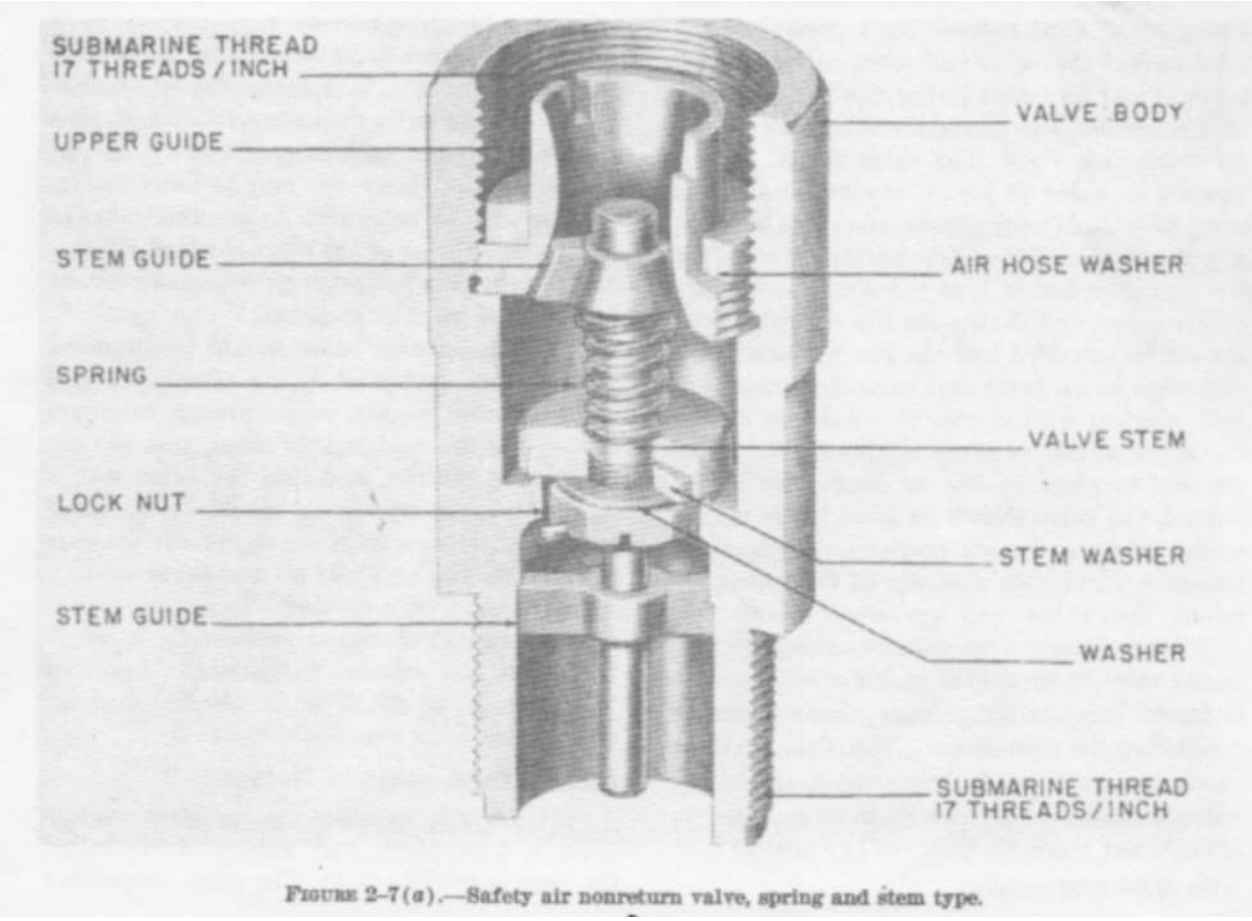

FIGURE 2-7(a).—Safety air nonreturn valve, spring and stem type.

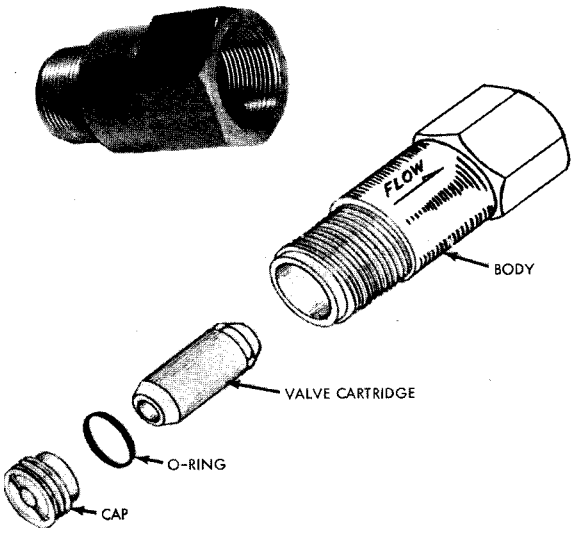

Figure 2-70(b).-Safety air nonreturn valves, cartridge and O-ring type.

and 2-7(b). Careful attention should be given to testing the valve for positive closure at lowpressure differentials in the range one-half to three-fourths psi. The lower pressures are more likely to be vital because high pressures will tend to seat the valve and assist in making an airtight seal. In actual diving, the internal pressure is not likely to exceed the external pressure by more than 1 psi. The valve should be immersed in water to see if any bubbles of air come from it. If none appear, the valve is tight; if not, a new leather washer, spring, or both, for the spring and stem type valve and a new cartridge insert and O-ring for the cartridge type should be installed and the test repeated. The cartridge valve body and cartridge insert are both marked with arrows that indicate the direction of airflow to assist in installation. When screwed in place on the air connection of the helmet, the valve should be tried to see that it works freely and seats properly on release of pressure. The inside diameter of the gasket between the valve and gooseneck should be checked because it is possible, by setting up tight on the valve, to spread the gasket so that its edge is forced into the air passage, thereby greatly restricting the flow of air to the diver. If these precautions are carefully observed, the safety valve is absolutely dependable in an emergency; if neglected, the valve may fail at a critical time with disastrous results.