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T-11147

HYDROSTATIC TEST OF CENTAVO EXPLOSIVE ASSEMBLY (U)

Introduction

The purpose of this test was to determine the adequacy of the assembly seals, and if the assembly will explosively function when submerged in salt water.

This test was requested by S. Thunborg, 5613, on May 26, 1965. R. A. Mikkelsen, 7331, was the Test Project Engineer and R. D. Jones, 7332, was the Test Engineer. The test item was received July 29, 1965, and the test was completed July 30, 1965.

Procedure and Results

This test was performed in Building 864 and used the ST-5 Pressure Vessel for the immersion of the test specimen. This vessel is 40.25 inches ID and 113 inches long and is capable of maintaining 1400 psi hydrostatic pressure on a test specimen. A Type-907 Visicorder was employed to monitor separation time, and a T-128 DC Power Supply supplied the firing current.

The test specimen contained three Horex 2504 explosive bolts which, when detonated, allowed one structure to fall off, and a Horex 2802 Guillotine which cut an aluminum bolt allowing the drag plate to separate and drop off.

In the performance of this test, the test specimen was suspended, with the drag plate down, in the pressure vessel. A 150-pound weight was added to the drag plate to simulate a drag force. The vessel was completely filled with water and a pressure of 1000 psi applied and maintained for approximately 23 hours. At the end of this period, the pressure was released and the unit removed and inspected for leaks. A very small amount of water was found in the cavity between the drag plate and the cone. No other leaks were found.

At this time, 150 pounds of salt was added to the water in the pressure vessel to approximate the concentration of sea water. The test specimen was reassembled with all explosive components in place and immersed in the vessel. One-thousand psi was applied and the Guillotine detonated. No indication of separation was observed. The test specimen was removed from the vessel where it was found that the aluminum bolt had been cut and partially released the drag plate. It was found that when the bolt was cut the shearing action of the cutter deformed the bolt and held it in place. It is believed the hydrostatic pressure of 1000 psi contributed to the bolt deformation.

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The test specimen was again immersed in the vessel and the pressure raised to about 7 psi. The three Halex bolts were fired and again no indication of separation was noted. Upon inspection it was found that the bolts had expanded into the bolt holes and held the cone in place by friction.

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