

NAVSEA
STANDARD ITEM

FY-21

ITEM NO: 009-25
DATE: 01 OCT 2019
CATEGORY: II

1. SCOPE:

1.1 Title: Structural Boundary Test; accomplish

2. REFERENCES:

2.1 S9AA0-AB-GOS-010, General Specifications for Overhaul of Surface Ships (GSO), Chapter 192

2.2 *S9086-RJ-STM-010/CH-504, Pressure, Temperature, and other Mechanical and Electromechanical Measuring Instruments*

3. REQUIREMENTS:

(I) (G) “COMPLETION AIR TEST”

3.1 Accomplish a completion air test of spaces in accordance with Section 192 of 2.1 and the following:

3.1.1 *Install two independent pressure gauges. Each test gauge must conform to gauge range and graduation shown on 504-3.5.1 and 504-6.1.5 of 2.2.*

3.1.2 Install 2 relief valves set at a maximum of 10 percent above test pressure.

3.1.3 Install one vent valve.

3.1.4 The air source must not exceed 25 PSIG and must have a supply capability less than the exhaust capability of either relief valve.

3.1.5 Pressurize the tank/void/space to be tested to the pressure specified in the invoking Work Item.

3.1.5.1 Isolate the pressure source and hold pressure for 15 minutes for temperature stabilization prior to commencing the pressure drop test.

3.1.5.2 Measure the pressure drop of the tested space for 10 minutes. Allowable pressure drop must be as specified in the invoking Work Item.

(I) “UNOBSTRUCTED FLOW”

3.1.6 Accomplish unobstructed airflow test of air escape and overflow piping.

3.1.6.1 Use compressed air at a pressure not to exceed max tank test pressure and hold a minimum of five minutes to demonstrate that air escapes and overflows are clear.

(V) "VISUAL INSPECTION"

3.1.7 Accomplish a visual inspection of disturbed mechanical joints for leakage upon completion of filling each tank. Allowable leakage: None.

(I)(G) "RUNNING AIR TEST"

3.2 Accomplish a running air test of spaces in accordance with Section 192 of 2.1, and the following:

3.2.1 Install two independent pressure gauges. Each test gauge must conform to gauge range and graduation shown on 504-3.5.1 and 504-6.1.5 of 2.2.

3.2.2 Install 2 relief valves set at a maximum of 10 percent above test pressure.

3.2.3 Install one vent valve.

3.2.4 The air source must not exceed 25 PSIG and must have a supply capability less than the exhaust capability of either relief valve.

3.2.5 Apply a soapy solution to the opposite side of the structure, associated tank piping, overflow and air escape piping, and inspect for leaks.

3.2.6 Inspect for leakage by observing for formation of bubbles. Allowable leakage: None.

(I) "UNOBSTRUCTED FLOW"

3.2.7 Accomplish unobstructed airflow test of air escape and overflow piping.

3.2.7.1 Use compressed air at a pressure not to exceed max tank test pressure and held a minimum of five minutes to demonstrate that air escapes and overflows are clear.

(V) "VISUAL INSPECTION"

3.2.8 Accomplish a visual inspection of disturbed mechanical joints for leakage upon completion of filling each tank. Allowable leakage: None.

(I)(G) "AIR HOSE TEST"

3.3 Accomplish a local air hose test in accordance with Section 192 of 2.1 and the following:

3.3.1 Air hose nozzle must be placed at less than 3 inches, but greater than zero inches, from the area to be tested and pressure directed at the structure under test in a manner most likely to disclose leaks.

3.3.1.1 The minimum nozzle diameter must be 3/8 inch and the nozzle pressure must be 90 plus or minus 5 PSIG as monitored at the nozzle.

3.3.2 Apply a soapy solution to the opposite side of the structure and inspect for leaks.

3.3.3 Inspect joint or fitting for leakage by observing for formation of bubbles.
Allowable leakage: None.

(I)(G) "WATER HOSE TEST"

3.4 Accomplish a water hose test in accordance with Section 192 of 2.1 and the following:

3.4.1 Use a one and one-half inch hose with a minimum nozzle diameter of one-half inch. Pressure at the nozzle must be 50 to 55 PSIG at a maximum distance of 10 feet from the surface being tested.

3.4.2 The stream of water must be directed against the structure in a manner most likely to disclose leaks. The opposite side of the structure must be inspected to detect and locate leaks. Allowable leakage: None.

(I)(G) "VACUUM BOX TEST"

3.5 Accomplish a local vacuum box test in accordance with Section 192 of 2.1 and the following:

3.5.1 Apply a soapy solution to the structure being tested.

3.5.2 Install a vacuum box with a clear cover over each joint or each fitting being tested.

3.5.2.1 Install the vacuum box so that the pressure differential is in the direction of an air test.

3.5.3 Draw a vacuum of at least 10.2 inches of mercury and inspect for leaks.

3.5.3.1 Inspect the joint or fitting for leakage by observing through the clear cover for no formation of bubbles.

3.5.3.2 When the joint length exceeds the available vacuum box size, a minimum of 10 percent of the previous inspection area must be overlapped with the new inspection area when moved to adjacent inspection area.

(I)(G) "COFFERDAM TEST METHOD"

3.6 Accomplish a cofferdam test in accordance with Section 192 of 2.1 and the following:

3.6.1 Install the cofferdam over the joint or fitting to be tested so that the pressure differential will be in the same direction of an air test.

3.6.2 Pressurize the air space inside the cofferdam to the test pressure specified for the air test.

3.6.3 Apply a soapy solution to the opposite side of the structure being tested.

3.6.4 Inspect the joint or fitting for leakage by observing for formation of bubbles.
Allowable leakage: None.

3.6.5 If the opposite side of the structure is inaccessible, an alternate method of proving tightness is to measure the drop in pressure within the cofferdam over a 10 minute period. The gasket and fittings in the cofferdam should be checked for leakage using a soapy solution. Allowable drop in pressure: None.

(I)(G) "CHALK TEST" (SEE 4.2)

3.7 Accomplish a chalk test of each knife edge and gasket on watertight doors, hatches, and scuttles.

3.7.1 Apply chalk to the bearing surface of the knife edge and close the door, hatch or scuttle by normal procedure.

3.7.2 When the door, hatch or scuttle is opened, the chalk from the knife must have been transferred to the gasket.

3.7.3 The chalk imprint must be in the center three-fifths of the width of the gasket with 100 percent continuous contact of knife edge to gasket.

3.8 Repaired areas requiring a structural boundary test must remain uninsulated and unpainted until completion of successful inspection and test.

4. NOTES:

4.1 Associated tank piping is defined as, "An assembly of pipe, tubing, valves, fittings, and related components forming a whole or a part of a system which starts or terminates in subject area, thus being common to and associated with same."

4.2 When a chalk test is required it must be accomplished prior to other structural boundary test on watertight doors, hatches, and scuttles.