

NAVSEA
STANDARD ITEM

FY-05

ITEM NO: 009-53
DATE: 29 AUG 2003
CATEGORY: II

1. SCOPE:

1.1 Title: Bolted Bonnet Steam Valve; repair (shop)

2. REFERENCES:

2.1 T9074-AS-GIB-010/271, Requirements for Nondestructive Testing Methods

2.2 MIL-STD-2035, Nondestructive Testing Acceptance Criteria

2.3 S9253-AD-MMM-010, Volume 1, Maintenance Manual for Valves, Traps, and Orifices (Non-Nuclear), User's Guide and General Information

3. REQUIREMENTS:

3.1 Matchmark valve parts.

(V) "INSPECT PARTS FOR DEFECTS"

3.2 Disassemble, clean internal and external surfaces free of foreign matter (including paint), and inspect parts for defects.

(I) "LIQUID PENETRANT INSPECT"

3.2.1 Accomplish liquid penetrant inspection of seats (including back seat), discs, or gate in accordance with 2.1.

3.2.1.1 Acceptance criteria shall be in accordance with Section 7 of 2.2, except hairline cracks in hard-faced areas of seats and discs or gate are acceptable provided the valve does not show evidence of leakage.

3.3 Repair valve as follows:

3.3.1 Straighten stem to within 0.002 inch total indicator reading. Polish stem to a 32 Root-Mean-Square finish in way of packing surface and remove raised edges and foreign matter.

3.3.2 Chase and tap exposed threaded areas.

3.3.3 Dress and true gasket mating surfaces.

3.3.4 Machine, grind, or lap and spot-in gate or discs to seats (including back seat) to obtain a 360-degree continuous contact.

(V) "INSPECT CONTACT"

3.3.4.1 Inspect contact using blueing method.

3.3.4.2 Transfer line for gate valve shall not exceed 3/16 inch in width and shall appear within the lower 75 percent of the gate seating surface.

3.3.4.3 Transfer line for globe valve shall not exceed 1/16 inch in width.

(I)(G) "VERIFY LEVEL I PARTS" (See 4.3)

3.4 Assemble valve, installing new gaskets in accordance with the manufacturer's specifications, and new fasteners in accordance with Table One.

3.4.1 Install new valve stem packing conforming to MIL-P-24503/24583 combination in accordance with Chapter 6 of 2.3.

3.5 Hydrostatically test valve as follows:

3.5.1 Hydrostatic test equipment shall have the following capabilities:

3.5.1.1 Manual overpressure protection release valve.

3.5.1.2 Self-actuated and resetting relief valve with a set point no greater than 100 PSIG above the test pressure or 10 percent above the test pressure, whichever is less.

3.5.1.3 Master and backup test gages with gage range and graduation shown on Table 2.

3.5.1.4 Protection equipment shall be accessible and test gages shall be located where clearly visible and readable to pump operator and inspector.

(V)(G) or (I)(G) "SEAT TIGHTNESS" (See 4.4)

3.5.2 Test gate valve alternately on each side of gate with opposite side open for inspection.

(V)(G) or (I)(G) "SEAT TIGHTNESS" (See 4.4)

3.5.3 Test globe valve in the direction tending to open valve.

3.5.4 Do not exceed the handwheel closing force specified in Table 3.

3.5.5 Test shall be continued for a minimum of three minutes if there is no evidence of leakage, or in the event of visible leakage, until accurate determination of leakage can be made. Maximum allowable leakage: 10 cubic centimeters (cc) per hour, per inch of nominal pipe size. Valve sizes one inch or less may be 10 cc maximum per hour.

(V)(G) or (I)(G) "BACK PRESSURE TEST" (See 4.4)

3.5.6 Back pressure test globe stop check valve with stem in the open position. Allowable leakage as follows:

<u>VALVE SIZE (NOM)</u>	<u>LEAKAGE RATE</u>
Up to 2 inches inclusive	25 cc/hr./in.dia.
2-1/2 inches - 10 inches inclusive	50 cc/hr./in.dia.
Over 10 inches	100 cc/hr./in.dia.

The back pressure applied shall be in accordance with the following:

<u>VALVE PRESSURE RATING</u>	<u>TEST BACK PRESSURE</u>
100 PSIG and Below	50 PSIG
Over 150 PSIG	100 PSIG

4. NOTES:

4.1 The test pressures of 3.5.2 and 3.5.3 will be specified in Work Item.

4.2 Repair of valve operating gear will be specified in Work Item.

4.3 The paragraph referencing this note is considered an (I)(G) if the valve is Level I.

4.4 The paragraph referencing this note is considered an (I)(G) if the valve is Level I. If the valve is not Level I, the paragraph is considered a (V)(G).

TABLE ONE

VALVE BODY MATERIAL

	<u>1/</u> Alloy Steel	Carbon Steel	<u>2/</u> Nonferrous
<u>3/</u> Studs and Bolts to MIL-DTL-1222	Grade B-16	Grade B-16	Phosphor Bronze - Any Grade Silicon Bronze - Any Grade Nickel Copper - Class A <u>4/</u>
Nuts to MIL-DTL-1222	Grade 4 or 7	Grade 4 or 7	Phosphor Bronze - Any Grade Silicon Bronze - Any Grade Nickel Copper - Class A or Class B <u>5/</u>
Socket Head Cap Screws	FF-S-86	FF-S-86	

1/ Alloy steel is of Composition A - 2-1/4 percent Chromium, one percent Molybdenum, Composition B - 1-1/4 percent Chromium, 1/2 percent Molybdenum, and Composition C - Carbon Molybdenum.

2/ Nonferrous Alloy except Aluminum.

3/ Studs shall be Class 2 or 3 fit on the nut end and Class 5 fit on the stud end, except that a Class 3 fit with a thread locking compound may be used where temperatures do not exceed 250 degrees Fahrenheit. The thread locking compound shall conform to MIL-S-22473. Check Class 3 fit stud ends in accordance with SAE-J2270.

4/ Fasteners of Nickel Copper Aluminum shall be the only type used on sea chest and hull valves.

5/ Nuts of Nickel Copper Alloy conforming to QQ-N-281 Class A or B, or Nickel Copper Aluminum conforming to QQ-N-286 shall be the only type used on sea chest and hull valves.

TABLE 2 - MASTER GAGE SELECTION FOR HYDROSTATIC TESTS

Maximum Test Pressure (lb/in ² g)		Master Gage Range (lb/in ² g)***		Master Gage Maximum Graduation Size (lb/in ² g)
From*	To**	From	To	
5000	9500	0	10000	100
3000	5800	0	6000	30
2500	4800	0	5000	30
1500	2800	0	3000	20
1000	1800	0	2000	15
750	1300	0	1500	10
500	800	0	1000	10
250	500	0	600	5
150	250	0	300	2
100	175	0	200	2
75	125	0	160	1
50	80	0	100	1
20	50	0	60	0.5
10	25	0	30	0.2
7	10	0	15	0.1
5	7	0	10	0.1

NOTES:

1. Master gage and back-up gages shall track within two percent of each other.
 2. System maximum test pressures shall be determined by applicable overhaul specification, building specification, or other governing documents.
- * Values agree with the requirement that gage range shall not exceed 200 percent of maximum test pressure except for gage ranges 0 to 60 and below.
- ** Values allow for reading pressures up to relief valve setting.
- *** Exceptions to the values given in this table may be approved locally by Design, based on an evaluation of test pressure, gage range, and specific application.

TABLE 3
HANDWHEEL CLOSING FORCE

Total Tangential Force Handwheel Diameter (Inches)	Total Torque on Rim of Handwheel (Pounds)	on Handwheel Nut (Foot Pounds)
2 and below	90	7.5
3	98	12
4	106	18
5	112	23
6	118	29
7	121	35
8	124	41
9	127	48
10	130	54
11	133	60
12	135	68
14	138	81
16	141	94
18	144	108
21	147	128
24	150	150
27	150	169
30	150	188
36	150	225