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NAVSEA
STANDARD ITEM

FY-06

ITEM NO: 009-48
DATE: 29 JUL 2004
CATEGORY: II

1. SCOPE:

1.1 Title: Pressure Seal Bonnet 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

2.3 803-6074287, Repair Guide, Pressure Seal Valves

2.4 803-5001021, Pressure Seal Rings Standard and Oversize Valve Pressure Class 600-1500

2.5 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 and body inlay area 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:

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3.3.1 Straighten stem to within 0.002 inch total indicator reading. Polish stem to a 32 Root-Mean-Square (RMS) 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 Inspect and repair sealing surfaces of pressure seal ring as follows:

(V) "VISUAL INSPECT"

3.3.4.1 Inspect valve body to verify that stainless steel inlay is free of steam cuts and cracks and diameter of inlay area is round to within 0.003 inch and free of non-design taper. Measure diameter at top and bottom of inlay area in increments of 45 degrees, on each circle.

3.3.4.2 **For the inlay**, correct out-of-round, non-design tapered condition and provide 32 RMS finish. Finished **inlay** diameter shall provide 0.002 to 0.005 inch clearance on the standard size diameter for seal rings described by 2.3.

3.3.4.3 Machine valve bonnet tapered area for concentricity and design angle to within 0.002 inch total indicator reading and 32 RMS finish.

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

(V) "INSPECT CONTACT"

3.3.5.1 Inspect contact using blueing method.

3.3.5.2 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.

3.3.5.3 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 fasteners in accordance with Table One.

3.4.1 Install new seal ring in accordance with 2.3, **using 2.4 for guidance.**

3.4.1.1 The SUPERVISOR must approve fitting new seal ring to inlay bores above first oversize.

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3.4.1.2 Attach a metal identification tag to the valve bonnet indicating the size of seal ring installed, straight or tapered body neck, name of installing activity, and date of installation.

3.4.2 Install new valve stem packing conforming to MIL-P-24503/24583 combination in accordance with Chapter 6 of 2.5.

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 **3** 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 **less than 1-1/2 inches is** 10 cc maximum per hour.

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.

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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).

4.5 Reference 2.4 provides guidance with respect to applicable APLs and other information not in direct conflict with the material and hardness requirements for seal rings specified in 2.3.

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TABLE ONE

VALVE BODY MATERIAL

	<u>1/</u> Alloy Steel	Carbon Steel
<u>2/</u> Studs and Bolts to MIL-DTL-1222	Grade B-16	Grade B-16
Nuts to MIL-DTL-1222	Grade 4 or 7	Grade 4 or 7
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/ 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 **ASTM D5363**. Check Class 3 fit stud ends in accordance with SAE-J2270.

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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 **2** 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.

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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