



UNIQUE WELDING & FABRICATING LTD

1545 Britania Rd East • Unit #30-31 • Mississauga (Toronto) • Ontario • L4W 3C6
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TEST PROCEDURE / REPORT 4" MANIFOLD HYDROSTATIC TEST

PART No **MAN413**
Quantity Tested: **1 unit**
Test Date: **Aug 02-2008**

Purpose:

This test method provides a procedure to verify the standard working pressure of 75 PSI, to establish the maximum working pressure before relief valve (Retainer bolt) becomes open able, and to test for the maximum pressure before the manifold will begin to swell (burst point) using a hand operated hydrostatic test pump.

Test Equipment:

- Pneumatic Tested, 4" x 3 Compartment Manifold Assembly c/w 1/4"NPT test inlet couplings (Figure #1).
- Manual Operated Hydrostatic Test Pump
- 4 Victaulic Cap Ends
- 4 Victaulic Couplings
- High Pressure hose c/w 9/16-18 JIC 37° swivel ends
- 2 Brass Ball Valves, 1/4" NPT (600 PSI)
- 1 Straight Adaptors, 1/4" NPT male x 9/16" JIC male
- 3 Straight Adaptors, 1/4" NPT male x 1/4" NPT male
- 1 Female Pipe Tee Union, 1/4" NPT
- Pressure Gauge (0-400 PSI)
- Thread Sealant (with PTFE)

Procedure:

Notes: use thread sealant for all connections

- 1) Close all Manifold Valves tight.
- 2) Connect Straight Adaptor 1/4" NPT x 1/4" NPT, Ball Valve (pressure hold), Straight Adaptor 1/4" NPT x 9/16 JIC, and High Pressure Hose to Right Test Coupling on Manifold (figure #2).
- 3) Connect Straight Adaptor 1/4" NPT x 1/4" NPT, 1/4" NPT Female Pipe Tee Union, Ball Valve (bleed off), and Pressure Gauge to Left Test Coupling on Manifold (figure #3).
- 4) Connect the High Pressure Hose & City Water hose to the Hydrostatic Test Pump.
- 5) Open both Pressure Hold valve (Figure #2) & Bleed-off valve (figure #3).
- 6) Turn on the City Water running @ 52°-56°F (11°-13°C) to begin filling Manifold with water to purge air from manifold.
- 7) Close bleed-off valve (Figure #3) after all air is purged.



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- 8) Pump the Hydrostatic Test Pump to the manifolds rated working pressure of 75 PSI at the same time monitor the 3 Relief Valves (Retainer Bolts) for open able state (leakage) and PSI value (figure #4). Record the result as “No Leaks” or PSI value at which it opened (Pressures Between 0-75 PSI).
- 9) If Retainer Bolts (Relief Valves) becomes open able (leakage) skip steps 10-11 and record Constant Working pressure as “Leaks”.
- 10) Close the Pressure Hold Valve (Figure #2) to hold pressure @ 75 PSI for 1 hour, and record the working pressure result as “No Leaks” or “Leaks”.
- 11) Open Pressure Hold Valve (Figure #2) and pump the Hydrostatic Test Pump until either the three retainer bolts (Relief Valves) become open able (leakage) Record the PSI value at which the Relief Valve(s) become open able.

Manifold Swelling Test

Note: for safety purposes, swelling test will be done to determine point before burst.

- 12) Connect the Victaulic Cap Ends and the Victaulic Couplings to the 3 manifold Victaulic inlets (Figure #5).
- 13) Open all valves wide open
- 14) Pump Hydrostatic Test Pump to increase pressure and carefully monitor the Manifold for first signs of Swelling (Figure #7). Record Pressure values at which this occurs (Figure #8) and maximum pressure tested.
- 15) Close the Pressure Hold Valve (Figure #2) to hold pressure @ the maximum pressure to be tested for 1 hour, check manifold for leaks and record results in conclusion.
- 16) Finish test by opening Bleed-off valve to remove pressure from manifold, and disassemble test.

Test procedure pictures



Figure #1



Figure #2



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Figure #3



Figure #4



Figure #5



Figure #6



Figure #7



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Results and Conclusion:

<u>Pressure relief Valve (retainer Bolt) leakage</u>						
Unit #	Pressure between 0-75 (PSI)	Constant Working Pressure at 75 (PSI)	Relief valve fully opened (PSI)	Swelling occurred (PSI) range value	Max Pressure Tested (PSI)	Recommended Max Working pressure (PSI)
1	No leaks	No leaks	90	180-190	210	120

No swelling or leaks via relief valves (retainer bolt), Gap Gaskets, Seals, and welds occurred during the standard working pressure test of 75 PSI. For safety, the manifold was pressurized to maximum of 210 PSI and no destructive burst occurred nor leakage at any point. Swelling occurred between 180-190 PSI as seen in figure #7.

Therefore Unique Welding & Fabricating Ltd. recommends a maximum safe working pressure of 75 PSI, and maximum safety burst working pressure of 120 PSI