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|-------------------------------------|---------------------|------------------------|-------------------------|
| Form Number<br>LLCF-039             | Issue Date 06/05/09 | Revision Date 01/01/24 | Form Number<br>LLCF-039 |
| <b>Hydrostatic Pressure Testing</b> |                     |                        |                         |

**ATTACHMENT  
A  
HYDRO TEST INFORMATION AND SAFETY CHECKLIST**

Test No. \_\_\_\_\_ Customer \_\_\_\_\_  
Date \_\_\_\_\_ Location \_\_\_\_\_  
Job No. \_\_\_\_\_ Line No./Iso No. \_\_\_\_\_ (See Attachment "D")  
Person in Charge \_\_\_\_\_

**PERSON IN CHARGE SHALL INITIAL ALL ITEMS BELOW, INDICATING THAT THEY  
HAVE BEEN REVIEWED WITH THE ENTIRE CREW.**

- \_\_\_ An experienced or qualified person shall remain in charge throughout hydro test operations.
- \_\_\_ Customer expectations clarified prior to beginning work.
- \_\_\_ Use designated hydro area when available.
- \_\_\_ Area Flagged/No non-essential Personnel allowed in area. During simultaneous operations, non-essential personnel may be allowed in the test area if their work is not associated with the pressurized system and if it can be performed without presenting hazard to themselves or others; and only with prior approval from the customer representative, company supervisor, and company management. It is, however, never acceptable for any personnel to be in the test area during the pressure-up phase. The pressure-up phase includes a minimum of a 5-minute period after pressure-up, which allows pressure to stabilize. However, 15 minutes or more may be required for decks, skids or entire systems already in place. The key factor is that the pressure has stabilized and clearly shows no signs of increase.
- \_\_\_ Skillet sizes shall be in accordance with the skillet chart provided in the Hydro-Test MINIMUM REQUIREMENT.
- \_\_\_ All connections inspected. All equipment (i.e., pumps, hoses, bleed-off valves, gauges, fittings) shall meet and/or exceed pressure rating and has been inspected.
- \_\_\_ All required personal protective equipment in use (i.e., chemical gloves, goggles, apron, face shield, etc.) when chemicals are used and/or as required (i.e., safety glasses, hard hats, safety shoes).
- \_\_\_ All areas have operable bleed-off points prior to pressure-up.
- \_\_\_ Pump and Recorder set up outside of test area, out of the line of fire.
- \_\_\_ All personnel remain out of the test area during pressure-up stage, including Hydro Crew.
- \_\_\_ Never tamper with or tighten any bolts, fittings, hoses or piping while under pressure or during pressure-up stages.
- \_\_\_ Entire Hydro Crew has reviewed and discussed all items above and signifies by signing below.
- \_\_\_ Thaxton Test Plug Minimum Requirement thoroughly reviewed and complied with. (When utilized)

|                         |                                     |                        |                         |
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**ATTACHMENT B  
PRESSURE TEST DATA**

HYDRO TEST LINE AND SPOOL LISTING

Test No. \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

\_\_\_\_\_ **Visual Test Only (No Recorders or Dead Wt. Used)**

Temperature Recorder Serial No. \_\_\_\_\_

Gauge Serial No. \_\_\_\_\_ PSI. Range \_\_\_\_\_

PSI. Recorder Serial No. \_\_\_\_\_ PSI. Range \_\_\_\_\_

Dead Wt. Serial No. \_\_\_\_\_ PSI. Range \_\_\_\_\_

**NOTE: A copy of the calibration certificate of each of the above shall be attached to this document.**

Test Pressure \_\_\_\_\_ PSI.

Test Range Min. \_\_\_\_\_ PSI.

Max. \_\_\_\_\_ PSI.

Start Pressure: Date \_\_\_\_\_ Time \_\_\_\_\_ A.M. \_\_\_\_\_ P.M. \_\_\_\_\_

End Pressure: Date \_\_\_\_\_ Time \_\_\_\_\_ A.M. \_\_\_\_\_ P.M. \_\_\_\_\_

Weather Conditions: \_\_\_\_\_ Ambient Temperature: \_\_\_\_\_

Comments:

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Customer Rep. \_\_\_\_\_ Date: \_\_\_\_\_

COMPANY Rep. \_\_\_\_\_ Date: \_\_\_\_\_

|                         |                                     |                        |                         |
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|                         | <b>Hydrostatic Pressure Testing</b> |                        |                         |

**ATTACHMENT C  
HYDRO TEST MONITORING DATA**

**INCREMENT PRESSURE/TEMPERATURE**

Sheet No. \_\_\_\_\_ of \_\_\_\_\_ Test No. \_\_\_\_\_

| Date | Time | Pressure | Temperature | Dead Wt. | Remarks |
|------|------|----------|-------------|----------|---------|
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Customer Rep. \_\_\_\_\_

Date: \_\_\_\_\_

Company Rep. \_\_\_\_\_

Date: \_\_\_\_\_

|                         |                                     |                        |                         |
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|                         | <b>Hydrostatic Pressure Testing</b> |                        |                         |

**ATTACHMENT D  
HYDRO TEST LINE NO. / ISO NO. LIST/SPOOL LISTING**

Sheet No. \_\_\_\_\_ of \_\_\_\_\_ Test No. \_\_\_\_\_

| Line No. | Spool Sheet | Partial Test | Remarks |
|----------|-------------|--------------|---------|
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Customer Rep: \_\_\_\_\_ Date: \_\_\_\_\_

Company Rep: \_\_\_\_\_ Date: \_\_\_\_\_

|                                     |                     |                        |                         |
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| <b>Hydrostatic Pressure Testing</b> |                     |                        |                         |

## HYDRO TESTING WITH THE THAXTON PRESSURE TEST PLUG

- A complete review of the Hydro Test Minimum Requirement shall be performed.
- Only Thaxton Pressure Test Plugs shall be utilized. These plugs are to be utilized in designated hydro test areas only and shall be used on sections of pipe prior to mounting. Such plugs shall not be used on Hydro test of decks or large hydro test projects, since employees are required in the test area on a more frequent basis. Shall only be used under controlled circumstances approved by management and safety.
- Thaxton Pressure Test Plugs shall not be used without approved safety gags designed to prevent accidental discharge of the plug. **SAFETY GAGS SHALL BE UTILIZED AT ALL TIMES.**
- The pipe end and the plug shall be cleared of burrs, sharp edges, dirt, sand, rust, scale, etc. that may damage the seal cup or interfere with the proper operation of the stopper.
- The seal cup and o-rings shall be kept lubricated with an o-ring sealant at all times.
- Install stopper. Holding stopper at a slight angle, place edge of seal cup on lip of pipe and insert plug evenly.
- Insert stopper insuring that grips are flush with pipe end.
- Tighten hex nut until grips are firmly seated.
- Install safety gag. Loosen clamp nuts and slide unit over end of pipe.
- Place ring over end of stopper insuring that it rests against the stopper. Insure that the ring is not allowed to remain in contact with the valve or hose.
- Slide clamp back until the chain is slightly tight. Always leave room to tighten stopper hex nut.
- Tighten clamp nuts insuring that the safety gag is secured and will not move.
- Connect desired valves to hoses insuring plug remains secure. Inspect all valve plugs and hoses for damage and insure each exceeds the pressure rating required for the test intended.
- Fill piping with water allowing all air to be vented before pressurizing.
- Close vent line, inspect all lines, gags, plugs, and hoses insuring they are in good condition, appropriately tightened and secured, and facing in directions in which they would least likely injure personnel should they accidentally discharge.
- **Never stand in front of any test plug, hose, valve, etc. during any phase of the test.**
- Area shall be flagged to prevent unintended access and all personnel shall be removed from test area, during the pressure up phase including the test crew. Test pump shall be set up outside the test area.
- Begin testing by slowly increasing pressure.
- The hex nut shall be tightened in stages in between pressure up phases as needed due to leaks and or to prevent leakage.
  - Accessing hex nuts for tightening shall only be performed by designated individuals with the test supervisor's approval and knowledge.
  - At no time during the test shall any one step in the line of fire. Never stand in front of the plug or hose.
  - Only the stopper can be tightened under pressure. At no time under any circumstance shall other fittings or hoses be tightened under pressure.
  - Only utilize hand pressure to tighten hex nut. Never strike nut or wrench to tighten or utilize cheatas.

|                         |                                     |                        |                         |
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|                         | <b>Hydrostatic Pressure Testing</b> |                        |                         |

## Removal

- Shut off the pressure source.
- Slowly open valve to release stored pressure. Rapid release of pressure could cause plug to accidentally discharge.
- Completely drain the pipe assembly.
- Loosen hex nut two or three turns.
- Using a rubber mallet, tap the mandrel forward and the hex nut on both sides. This will break the seal and release any friction.
- Slide stopper out of pipe.

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|                         | <b>Hydrostatic Pressure Testing</b> |                        |                         |

| 150# RATING / 428# MAX TEST PRESSURE |                   |                  |         |           |
|--------------------------------------|-------------------|------------------|---------|-----------|
| PIPE<br>SIZE                         | SKILLET<br>THICK. | SKILLET<br>DIAM. | GASKET  |           |
|                                      |                   |                  | OD      | ID        |
| ½"                                   | ¼"                | 1-3/8"           | 1-1/4"  | ¾"        |
| ¾"                                   | ¼"                | 1-11/16"         | 1-9/16" | 1"        |
| 1"                                   | ¼"                | 2"               | 1-7/8"  | 1-1/4"    |
| 1-1/2"                               | ¼"                | 2-7/8"           | 2-3/4"  | 2-1/8"    |
| 2"                                   | ¼"                | 3-5/8"           | 3-3/8"  | 2-3/4"    |
| 3"                                   | ¼"                | 5"               | 4-3/4"  | 4"        |
| 4"                                   | 3/8"              | 6-3/16"          | 5-7/8"  | 5"        |
| 6"                                   | ½"                | 8-1/2"           | 8-1/4"  | 7-3/16"   |
| 8"                                   | ½"                | 10-5/8"          | 10-3/8" | 9-3/16"   |
| 10"                                  | 5/8"              | 12-3/4"          | 12-1/2" | 11-5/16"  |
| 12"                                  | ¾"                | 15"              | 14-3/4" | 13-3/8"   |
| 14"                                  | 7/8"              | 16-1/4"          | 16"     | 14-5/8"   |
| 16"                                  | 1"                | 18-1/2"          | 18-1/4" | 16-5/8"   |
| 18"                                  | 1"                | 21"              | 20-3/4" | 18-11/16" |
| 20"                                  | 1-1/8"            | 23"              | 22-3/4" | 20-11/16" |
| 24"                                  | 1-3/8"            | 27-1/4"          | 27"     | 24-3/4"   |
| 600# RATING/2220# MAX TEST PRESSURE  |                   |                  |         |           |
| PIPE<br>SIZE                         | SKILLET<br>THICK. | SKILLET<br>DIAM. | GASKET  |           |
|                                      |                   |                  | OD      | ID        |
| ½"                                   | ¼"                | 1-3/8"           | 1-1/4"  | ¾"        |
| ¾"                                   | ¼"                | 1-11/16"         | 1-9/16" | 1"        |
| 1"                                   | ¼"                | 2"               | 1-7/8"  | 1-1/4"    |
| 1-1/2"                               | 3/8"              | 2-7/8"           | 2-3/4"  | 2-1/8"    |
| 2"                                   | 3/8"              | 3-5/8"           | 3-3/8"  | 2-3/4"    |
| 3"                                   | ½"                | 5"               | 4-3/4"  | 4"        |
| 4"                                   | 5/8"              | 6-3/16"          | 5-7/8"  | 4-3/4"    |
| 6"                                   | 7/8"              | 8-1/2"           | 8-1/4"  | 6-7/8"    |
| 8"                                   | 1-1/8"            | 10-5/8"          | 10-3/8" | 8-7/8"    |
| 10"                                  | 1-3/8"            | 12-3/4"          | 12-1/2" | 10-13/16" |
| 12"                                  | 1-5/8"            | 15"              | 14-3/4" | 12-7/8"   |
| 14"                                  | 1-7/8"            | 16-1/4"          | 16"     | 14-1/4"   |
| 16"                                  | 2-1/8"            | 18-1/2"          | 18-1/4" | 16-1/4"   |
| 18"                                  | 2-3/8"            | 21"              | 20-3/4" | 18-1/2"   |
| 20"                                  | 2-5/8"            | 23"              | 22-3/4" | 20-1/2"   |
| 24"                                  | 3-1/8"            | 27-1/4"          | 27"     | 24-3/4"   |

| 300# RATING / 1110# MAX TEST PRESSURE |                   |                  |         |           |
|---------------------------------------|-------------------|------------------|---------|-----------|
| PIPE<br>SIZE                          | SKILLET<br>THICK. | SKILLET<br>DIAM. | GASKET  |           |
|                                       |                   |                  | OD      | ID        |
| ½"                                    | ¼"                | 1-3/8"           | 1-1/4"  | ¾"        |
| ¾"                                    | ¼"                | 1-11/16"         | 1-9/16" | 1"        |
| 1"                                    | ¼"                | 2"               | 1-7/8"  | 1-1/4"    |
| 1-1/2"                                | ¼"                | 2-7/8"           | 2-3/4"  | 2-1/8"    |
| 2"                                    | ¼"                | 3-5/8"           | 3-3/8"  | 2-3/4"    |
| 3"                                    | 3/8"              | 5"               | 4-3/4"  | 4"        |
| 4"                                    | ½"                | 6-3/16"          | 5-7/8"  | 5"        |
| 6"                                    | ¾"                | 8-1/2"           | 8-1/4"  | 7-3/16"   |
| 8"                                    | 7/8"              | 10-5/8"          | 10-3/8" | 9-3/16"   |
| 10"                                   | 1"                | 12-3/4"          | 12-1/2" | 11-5/16"  |
| 12"                                   | 1-1/4"            | 15"              | 14-3/4" | 13-3/8"   |
| 14"                                   | 1-3/8"            | 16-1/4"          | 16"     | 14-5/8"   |
| 16"                                   | 1-1/2"            | 18-1/2"          | 18-1/4" | 16-5/8"   |
| 18"                                   | 1-3/4"            | 21"              | 20-3/4" | 18-11/16" |
| 20"                                   | 2"                | 23"              | 22-3/4" | 20-11/16" |
| 24"                                   | 2-1/4"            | 27-1/4"          | 27"     | 24-3/4"   |
| 900# RATING/3330# MAX TEST PRESSURE   |                   |                  |         |           |
| PIPE<br>SIZE                          | SKILLET<br>THICK. | SKILLET<br>DIAM. | GASKET  |           |
|                                       |                   |                  | OD      | ID        |
| ½"                                    | ¼"                | 1-3/8"           | 1-1/4"  | ¾"        |
| ¾"                                    | ¼"                | 1-11/16"         | 1-9/16" | 1"        |
| 1"                                    | ¼"                | 2"               | 1-7/8"  | 1-1/4"    |
| 1-1/2"                                | 3/8"              | 2-7/8"           | 2-3/4"  | 1-7/8"    |
| 2"                                    | 3/8"              | 3-5/8"           | 3-3/8"  | 2-5/16"   |
| 3"                                    | 5/8"              | 5"               | 4-3/4"  | 3-3/4"    |
| 4"                                    | ¾"                | 6-3/16"          | 5-7/8"  | 4-3/4"    |
| 6"                                    | 1-1/8"            | 8-1/2"           | 8-1/4"  | 6-7/8"    |
| 8"                                    | 1-3/8"            | 10-5/8"          | 10-1/8" | 8-3/4"    |
| 10"                                   | 1-3/4"            | 12-3/4"          | 12-1/4" | 10-7/8"   |
| 12"                                   | 2"                | 15"              | 14-1/2" | 12-3/4"   |
| 14"                                   | 2-1/4"            | 16-1/4"          | 15-3/4" | 14"       |
| 16"                                   | 2-1/2"            | 18-1/2"          | 18"     | 16-1/4"   |
| 18"                                   | 2-7/8"            | 21"              | 20-1/2" | 18-1/4"   |
| 20"                                   | 3-1/4"            | 23"              | 22-1/2" | 20-1/2"   |
| 24"                                   | 3-3/4"            | 27-1/4"          | 26-3/4" | 24-3/4"   |

|                         |                                     |                        |                         |
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**SKILLET TABLE**

| 1500# RATING/5558# MAX TEST PRESSURE |                   |                  |         |         |
|--------------------------------------|-------------------|------------------|---------|---------|
| PIPE<br>SIZE                         | SKILLET<br>THICK. | SKILLET<br>DIAM. | GASKET  |         |
|                                      |                   |                  | OD      | ID      |
| 1/2"                                 | 1/4"              | 1-3/8"           | 1-1/4"  | 3/4"    |
| 3/4"                                 | 1/4"              | 1-11/16"         | 1-9/16" | 1"      |
| 1"                                   | 1/4"              | 2"               | 1-7/8"  | 1-1/4"  |
| 1-1/2"                               | 3/8"              | 2-7/8"           | 2-3/4"  | 1-7/8"  |
| 2"                                   | 1/2"              | 3-5/8"           | 3-3/8"  | 2-5/16" |
| 3"                                   | 3/4"              | 5"               | 4-3/4"  | 3-5/8"  |
| 4"                                   | 1"                | 6-3/16"          | 5-7/8"  | 4-5/8"  |
| 6"                                   | 1-3/8"            | 8-1/2"           | 8-1/4"  | 6-3/4"  |
| 8"                                   | 1-3/4"            | 10-5/8"          | 10-1/8" | 8-1/2"  |
| 10"                                  | 2-1/8"            | 12-3/4"          | 12-1/4" | 10-1/2" |
| 12"                                  | 2-5/8"            | 15"              | 14-1/2" | 12-3/4" |
| 14"                                  | 2-7/8"            | 16-1/4"          | 15-3/4" | 14-1/4" |
| 16"                                  | 3-1/4"            | 18-1/2"          | 18"     | 16"     |
| 18"                                  | 3-5/8"            | 21"              | 20-1/2" | 18-1/4" |
| 20"                                  | 4-1/8"            | 23"              | 22-1/2" | 20-1/4" |
| 24"                                  | 4-7/8"            | 27-1/4"          | 26-3/4" | 24-1/4" |

| 2500# RATING/9255# MAX TEST PRESSURE |                   |                  |         |         |
|--------------------------------------|-------------------|------------------|---------|---------|
| PIPE<br>SIZE                         | SKILLET<br>THICK. | SKILLET<br>DIAM. | GASKET  |         |
|                                      |                   |                  | OD      | ID      |
| 1/2"                                 | 1/4"              | 1-3/8"           | 1-1/4"  | 3/4"    |
| 3/4"                                 | 3/8"              | 1-11/16"         | 1-9/16" | 1"      |
| 1"                                   | 3/8"              | 2"               | 1-7/8"  | 1-1/4"  |
| 1-1/2"                               | 1/2"              | 2-7/8"           | 2-3/4"  | 1-7/8"  |
| 2"                                   | 5/8"              | 3-5/8"           | 3-3/8"  | 2-5/16" |
| 3"                                   | 1"                | 5"               | 4-3/4"  | 3-5/8"  |
| 4"                                   | 1-1/4"            | 6-3/16"          | 5-7/8"  | 4-5/8"  |
| 6"                                   | 1-3/4"            | 8-1/2"           | 8-1/4"  | 6-3/4"  |
| 8"                                   | 2-1/4"            | 10-5/8"          | 10-1/8" | 8-1/2"  |
| 10"                                  | 2-3/4"            | 12-3/4"          | 12-1/4" | 10-5/8" |
| 12"                                  | 3-1/4"            | 15"              | 14-1/2" | 12-1/2" |
| 14"                                  |                   |                  |         |         |
| 16"                                  |                   |                  |         |         |
| 18"                                  |                   |                  |         |         |
| 20"                                  |                   |                  |         |         |
| 24"                                  |                   |                  |         |         |

**NOTES:**

1. Gasket dimensions are based on Flexitallic gaskets.
2. All skillets are based upon A-36 plate.
3. Skillets not listed above requires verification by engineering company or designee.
4. Hydro test pressure is based on 100 degrees F. Higher temperatures reduce test pressure.
5. Ensure that hydrotest does not exceed flange test pressure