Rupture Disc (RD) Bypass Pressure Test Valve

A TUBING STRING TESTING VALVE AND BYPASS FOR STINging INTO PRODUCTION PACKERS

OVERVIEW
The rupture disc (RD) bypass pressure test valve is a full-opening, single-shot annulus operated valve. The tool functions as a pressure-testing and a bypass valve. The tool is commonly used at the start of a drillstem test to enable the work string to be pressure tested against the closed ball valve. This tool also has a bypass below the ball valve that enables the tool string to be “stung in” to a production packer. The open bypass ports prevent hydraulic locking issues when stringing into and pulling out of production packers. To operate the tool, annulus pressure is applied, bursting the RD, closing the bypass ports, and opening the ball valve.

FEATURES AND BENEFITS
The tool is composed of three sections.

» The ball valve section is at the top of the tool and consists of a ball valve, operating pins, and collet fingers. The collet fingers expand, enabling the power mandrel to continue traveling up to open the ball valve and close the bypass ports.

» The power section consists of a power mandrel case and RD available for a wide range of pressure applications. The RD bursts at a predetermined pressure, enabling annulus pressure to be applied to a differential area on the power mandrel. The power mandrel moves up, first pushing the ball valve open and then closing a set of bypass ports.

» The bypass section is at the bottom of the tool and consists of a set of ports and a power mandrel. When the RD bursts, the power mandrel moves up, closing off the ports and communication between the annulus and the tool string.

OPERATION

» The RD bypass pressure test valve is normally set to operate at a pressure approximately 1000 psi (69 bar) above well hydrostatic at the tool. This enables the tool to be run in and then operated when pressuring up on the first annulus pressure cycle.

» Another method of running the tool is to use it for pressure testing the tool string and then use well hydrostatic while running in to operate the tool automatically. When running the tool in this mode, it is acceptable to use shear pins to determine the operating pressure. If an accurate operating pressure is required, the RD must be used.

» Requires filling from surface

Note: This tool should have only the closed ball valve in the BHA while running in. If any other closed-ball tools are run in the BHA, a bypass must be run to help avoid an air chamber between the closed balls. The air chamber trapped between the balls might cause the tool to not operate properly, operate at a very high pressure, or could cause damage to the tool.
### Equipment Specifications

<table>
<thead>
<tr>
<th>Nominal Tool Size in.</th>
<th>Outer Diameter in. (cm)</th>
<th>Inner Diameter in. (cm)</th>
<th>Makeup Length in. (cm)</th>
<th>End Connections</th>
<th>Absolute Pressure$^1$ psi (bar)</th>
<th>Differential Pressure$^2$ psi (bar)</th>
<th>Tensile Load$^3$ lb (kg)</th>
<th>Service Temperature °F (°C)</th>
<th>Flow Area in.$^2$ (cm$^2$)</th>
<th>Number of Ports</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>5.03 (12.78)</td>
<td>2.28 (5.79)</td>
<td>72.44 (184.00)</td>
<td>3 7/8 CAS</td>
<td>16,595 (1141)</td>
<td>15,000 (1034)</td>
<td>320,841 (145,531)</td>
<td>450 (232)</td>
<td>0.78 (5.06)</td>
<td>4</td>
</tr>
<tr>
<td>5 ¼</td>
<td>5.25 (13.34)</td>
<td>2.28 (5.79)</td>
<td>72.44 (184.00)</td>
<td>3 7/8 CAS</td>
<td>24,127 (1683)</td>
<td>15,000 (1034)</td>
<td>320,841 (145,531)</td>
<td>450 (232)</td>
<td>0.78 (5.06)</td>
<td>4</td>
</tr>
</tbody>
</table>

Notes:

1. Absolute pressure is the total hydrostatic plus applied pressure.
2. Differential pressure is the difference in pressure between the casing annulus and the tool ID.
3. The values of tensile, burst, and collapse strength are calculated with new tool conditions, Lame's formulas with Von-Mise’s Distortion Energy Theory for burst and collapse strength, and stress area calculations for tensile strength.

» Meets NACE MR0175 (>175°F / 79°C)
» These ratings are guidelines only. Refer to the equipment data book for individual equipment specifications.

For more information, contact your local Halliburton representative or visit us on the web at www.halliburton.com

---

Sales of Halliburton products and services will be in accord solely with the terms and conditions contained in the contract between Halliburton and the customer that is applicable to the sale.