MillRite® Milled Exit Multilateral System with Junction Isolation

IN SHALE AND TIGHT GAS PLAYS, FRACTURE EACH LEG OF YOUR MULTILATERAL WELL WITHOUT COMPROMISING THE INTEGRITY OF THE JUNCTIONS

SYSTEM APPLICATION

The MillRite® milled exit multilateral system with junction isolation (JI) is part of the Halliburton advanced reservoir drainage solutions. It is a combined multilateral drilling and completion system capable of constructing a high-quality junction and also providing the required pressure isolation for selective stimulation. The system is designed for use in wells that are to be developed as multilaterals specifically for the exploitation of shale and tight gas resources.

The low permeability of shale and tight gas plays makes multiple stage fracture stimulation of the formation a necessary step for recovering hydrocarbons. With the MillRite JI system, the expensive fracturing stimulation treatment becomes more economical, as multiple horizontal laterals can be drilled from one location. However, all multilateral junctions must be isolated from the stimulation fluids and pressure. To isolate the junction, a temporary Level 5 completion is installed by using the Junction Isolation Tool (JIT). The JIT requires no increase in hole/casing size and no limitations to casing while enabling selective access to both laterals for the high pressure stimulations without restricting the high pump rates required.

The MillRite JI system uses Halliburton Latch Coupling technology, an important advantage in those wells that must be re-entered to be selectively stimulated. The Latch Coupling is a unique profile that is built into the ID of a well's casing, providing a repeatable reference for the depth and orientation of multilateral equipment. Whipstocks and other downhole tools can be consistently landed and oriented by latching into the coupling. It provides full-bore, unrestricted casing access to the lower main bore and maintains casing pressure integrity, allowing the well to be completed and produced in any manner.

The MillRite JI system incorporates a special window-milling machine that allows the creation of a near-rectangular window at a defined depth and azimuth on a repeatable basis. Precise control of the window geometry and position makes the MillRite system especially useful for multilateral wells in which lateral re-entry is required and is particularly important when using the custom-designed JIT. The MillRite system windows are machined with an elongated full-gauge aperture along their entire length and are exactly in line with the axis of the casing. Problems often associated with conventionally milled windows, such as elliptical and spiraled window geometry with no control over precise depth, azimuth, and full-gauge section length, are eliminated. The straighter, longer window geometry delivered by the MillRite system helps to prevent the dogleg severity problems that can occur when running lateral liners or tools into the lateral bore through conventionally milled windows.

MILLRITE JI SYSTEM BENEFITS

» Multilateral drilling and completion processes are combined into one system capable of constructing the junction and providing the required pressure isolation for selective stimulation.

» Two-trip window machining for precise, controlled window geometry and position to allow for repeatable lateral re-entry throughout the life of the well.

» Latch Coupling technology allows repeatable orientation of downhole tools relative to the casing window with no casing ID restriction.

» Patented JIT isolates the junction from fracturing pressures allowing high-pressure and high-volume fracturing jobs.
**MillRite® JI System Specifications**

**TAML Level 2/4**

<table>
<thead>
<tr>
<th>System Casing Size in (mm)</th>
<th>7 (177.8)</th>
<th>7 (177.8)</th>
<th>9-5/8 (244.5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Casing Weight Range lb/ft (kg/m)</td>
<td>26 to 29 (38.69 to 43.16)</td>
<td>32 (47.62)</td>
<td>43.5 to 53.5 (64.73 to 79.62)</td>
</tr>
<tr>
<td>Lateral Liner Type</td>
<td>Drop Liner/Cemented Liner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lateral Hole Size in (mm)</td>
<td>6 to 6-1/8 (152.4 to 156)</td>
<td>5-7/8 (149.2)</td>
<td>8-1/2 (215.9)</td>
</tr>
<tr>
<td>Lateral Liner Size in (mm)</td>
<td>4-1/2 (114.3)</td>
<td>4-1/2 (114.3)</td>
<td>7 (177.8)</td>
</tr>
<tr>
<td>Lower Main Bore Access in (mm)</td>
<td>Full Gauge 6.059 (153.9)</td>
<td>Full Gauge 5.969 (151.6)</td>
<td>Full Gauge 8.525 (216.5)</td>
</tr>
</tbody>
</table>

**MillRite® JI System Features**

- Applicable to TAML Level 2 or Level 4 multilateral junctions.
- Precise azimuth and depth control with latch coupling, which allows for full ID access to main bore and can be stacked throughout the wellbore.
- Latch Couplings can be installed for use at a later time to create a junction without affecting normal drilling and completion operations.
- Track-guided milling system for precise window geometry and length.
- Durable machining head with integral circulation paths.
- Integral barriers and junk subs for debris collection and control.
- Selective isolation of each multilateral junction up to 10,000 psi applied differential pressure.

**Typical MillRite JI System Installation (TAML Level 2)**

1. Run casing, install Latch Couplings as required.
2. Drill and complete main bore hole section with Swellpacker® system and RapidSuite™ system.
3. Survey (MWD or gyro) and clean latch. Apply offset to milling/drilling tools.
4. Run milling machine to create window, retrieve milling machine.
5. Run drilling whipstock and mills, gauge window and drill rathole.
6. Drill lateral wellbore.
7. Run lateral liner with Swellpacker system and RapidSuite system.
8. Run JIT for lateral fracturing, perform multi-stage fracturing job.
9. Retrieve JIT.
10. Retrieve drilling whipstock.
11. Run JIT for main bore fracturing, perform multi-stage fracturing job.
12. Retrieve JIT.

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

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