

Blak-JAK PowerLast fluid end increases runtime in high-pressure Marcellus trial

Fewer expendable changeouts and reduced NPT after 16 months

Background

Longer laterals, higher pressures, and abrasive environments are intensifying the demands on drilling rig equipment. Mud pumps, the heart of the rig's hydraulic system, are operating harder and for longer periods, leading operators and drilling contractors to evaluate equipment designs that support longer component life and more predictable maintenance planning.

NOV partnered with Precision Drilling to evaluate the Blak-JAK PowerLast fluid end in the Marcellus Shale. The fluid end was deployed on a 1,600-hp mud pump operating primarily with a 4.75-in. liner and a 12-in. stroke.

Solution

Unlike larger fluid ends on the market, the Blak-JAK PowerLast fluid end is rated up to 10,000 psi in a smaller, lighter design. Its compact footprint eases handling, simplifies inspection, and enhances safety for rig crews.

The Blak-JAK fluid end features a first-of-its-kind Valve Integrated Dampener (VID), which helps manage fluid velocity and flow through the valve and seat to reduce pressure spikes and lower stress on the three-module assembly. This innovation improves volumetric efficiency and enables quieter, more stable pump performance, especially at elevated pressures.

Results

After 16 months of operation, the Blak-JAK PowerLast fluid end exceeded performance expectations, delivering twice the runtime of conventional modules. Expendable consumption declined significantly during the trial, with reductions of 67% in valves, 70% in seats, 55% in pistons, and 17% in zirconia liners. Fewer component replacements translated directly into lower maintenance costs and reduced nonproductive (NPT) time.

Rig crews also noted maintenance-related differences during routine inspections. The fluid end's smaller, lighter configuration supported easier access, valve seats were simpler to remove and assess, and weep hole placement improved visibility for identifying early-stage leaks.

Following the trial, Precision Drilling elected to extend use of the Blak-JAK PowerLast fluid end to the remaining two mud pumps on the trial rig and to an additional rig as part of a continued evaluation.

Case study facts

Location: Pennsylvania

Customer: Precision Drilling

Timeframe: April 2024–August 2025

Operating conditions:

- Pumping pressure: 7,300 psi
- Mud type: Diesel-based OBM
- Solids content: 38% retort solid
- Additives/chemicals: calcium chloride, calcium hydroxide, barium sulfate, gilsonite, emulsifiers

Results:

- The drilling contractor ordered five fluid ends
- Improved crew safety
- Reduced NPT
- Expendable consumption decreased
- Volumetric efficiency improved by 10%–20% at higher pressures

