

# Flow-Through Circulating Valve

For the Falcon uncemented multistage stimulation system

## APPLICATIONS

- Uncemented horizontal, deviated, and vertical wells for
  - zonal isolation during multistage fracturing
  - isolated matrix acidizing treatments
  - casing integrity issues when stimulation is required
  - stimulation of sandstone, carbonate, and shale plays

## BENEFITS

- Reduced costs because packer damage is minimized since piston force on liner assembly is eliminated during initial fracture
- Reduced costs because drilling mud can be reused after being cleaned out of horizontal section before system is set

## FEATURES

- Valve ratings to 10,000 psi [68,948 kPa] and 350 degF [177 degC]
- Internal components protected from well conditions while running in hole
- Estimated closing pressure of ~1,500 psi [10.34 MPa] initiated by a ball dropped from surface after system reaches TD
- Ball seat sizes that are easily interchanged at wellsite to accommodate change in number of stages being stimulated without new valves needed
- Positive closure mechanism that ensures the isolation needed to set system in place

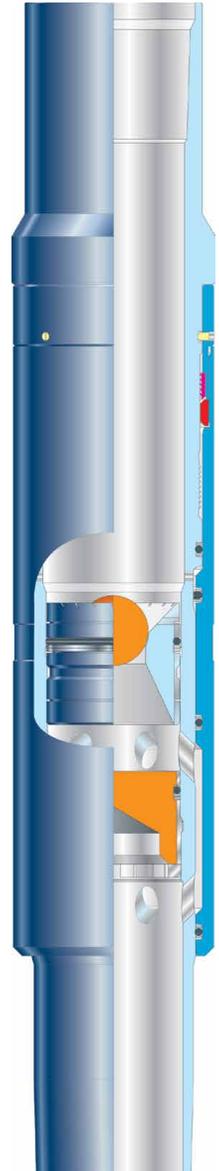
The flow-through circulating valve is a component of the Falcon\* uncemented multistage stimulation system, which is run in hole on a liner and is used for selective stage stimulation. The valve allows fluids to circulate while the system is run in hole, allowing the drilling mud to be replaced with completion fluid before the fracturing operation. It then closes to isolate the internal casing from the annulus.

When the liner reaches the desired position, a ball is dropped from the surface and pumped down until it lands on the ball seat. As pressure is applied, the ball causes a sleeve to move down and permanently close the circulation valve. Pressure can then build up to set the hydraulic packers and to actuate the hydraulic frac valve.

Differently sized ball seats can be inserted to accommodate the specific number of stages being fractured.

### Flow-Through Circulating Valve Specifications

Size, in	3.5	4.5	5.5
Max. OD, in [mm]	4.60 [116.84]	5.625 [146.05]	7.51 [190.75]
Min. ID (after millout), in [mm]	2.782 [70.66]	3.75 [95.25]	4.575 [116.21]
Length, ft [m]	3.195 [0.961]	2.79 [0.85]	2.79 [0.85]
Max. burst pressure rating, psi [kPa]	10,000 [68,948]	10,000 [68,948]	10,000 [68,948]
Temperature rating, degF [degC]	325–350 [162–177]	325–350 [162–177]	350 [177]
Connections	Multiple connections available on request		
Closing pressure, psi [kPa]	1,290–1,450 [8,894–9,997]	1,346–1,873 [9,281–12,916]	1,219–1,706 [8,406–11,766]
Body tensile strength, lbf [kN]	152,500 [678]	246,000 [1,094]	636,175 [2,829]
Body torsional strength, lbf.ft [N.m]	10,000 [13,558]	10,000 [13,558]	10,000 [13,558]



Flow-through circulating valve.