

Anchor-Linear Actuator Tool

ReSOLVE iX extreme-performance instrumented wireline intervention service

Powerful integration of high-expansion anchor and high-force linear actuator for controlled, efficient, and effective pushing and pulling actions



Temperature:
Rated to 350 degF [177 degC]



Pressure:
Rated to 20,000 psi [138 MPa]



Certification:
NACE MR0175 compliant



Real time:
Control and verification



Linear actuator displacement:
1-mm inferred resolution

Applications

- Anchor
 - Nearly 3 in [7.62 cm] of expansion for slim completion access
 - Minimized tubing impression while enabling maximized linear force application
- Linear actuator
 - Opening, closing, locking out, and replacing valves
 - Pulling retrievable plugs
 - Fishing operations

Benefits

- Enables high force in wells, even in highly deviation sections
- Reduces risk for intervention
- Provides access to bottom sections of hostile-condition wells
- Controls action to prevent completion damage when anchoring by design
- Prevents anchor slippage
- Provides insight into downhole conditions to enable taking effective action

- Offers adaptability and customizability to meet project requirements and objectives

Features

- Sour-service qualified
- HPHT rated
- Combinable with
 - WIRed* wireline inline release device
 - TuffTRAC iX* extreme-performance wireline tractor

How it improves well intervention

The anchor-linear actuator tool is part of the ReSOLVE iX* extreme-performance instrumented wireline intervention service. Whether in HPHT, deviated, restricted-access, or sour well conditions, it provides real-time monitoring, dynamic tool control, and verified downhole actuation to set new standards for success in well intervention operations. Sensors incorporated into the ReSOLVE iX service tools enable the engineer to monitor tool activity and the progress of downhole operations while responsively controlling the tool for optimal performance. By integrating monitoring and control, ReSOLVE iX service eliminates the reliance on estimates and assumptions that is typical with conventional winch-controlled intervention methods such as slickline. Furthermore, its actions are not impacted by deviation or process adherence, as each action is controlled via an intuitive dashboard that delivers repeatable and consistent results. The service also detects unexpected behavior and provides insight into downhole conditions so you can remediate issues using the most effective solution. Conveyance is on wireline by gravity or on tractor in highly deviated and horizontal wells.

How the anchor and linear actuator work

By integrating the anchor and linear actuator modules, ReSOLVE iX service reliably applies controlled axial force to well components. The linear actuator can be combined with the ReSOLVE iX service smart shifting tool; slickline tools; and any third-party shifting, pulling, and interface tools.

The anchor module opens with the industry's largest expansion, spanning nearly 3 in [7.62 cm] from the tool OD to the tubing. Up to 50,000 lbf [222,411 N] of anchoring force is precisely applied by the innovative low-stress anchor grips that minimize impact on the tubing and ensure linear force application. Once anchoring is confirmed to surface by ReSOLVE iX service's real-time measurements, the linear actuator module can be extended or retracted multiple times as necessary to apply a large, controlled force of up to 16,000 lbf [71,171 N] to a specific well component. Continuous measurements of displacement and applied force validate completion of the operation.

What it replaces

Conventional winch-operated slickline tools do not collect or use downhole measurements within an in-tool hierarchical control ecosystem. ReSOLVE iX service's seamless integration of the anchor and linear actuator modules resolves this gap to improve operational efficiency, reduce operational risks, and remove need of a jar.

Furthermore, it's integration with the TuffTRAC iX tractor makes its application possible in deviated sections of the well where downward actions become uncertain or access becomes impossible due to gravity.



ReSOLVE iX service's anchor-linear actuator tool can be combined with ReSOLVE iX service's smart shifting tool, slickline, and third-party tools and accessories.

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What else I should know

ReSOLVE iX service's anchor-linear actuator tool is easily configurable to adapt to all potential downhole conditions. It connects to a wide variety of custom, fit-for-purpose design equipment. For unique applications,

a dedicated Schlumberger engineering team can design and qualify customization kits upon request. System integration testing can also be performed for particular applications.

Specifications	
	ReSOLVE iX Anchor-Linear Actuator Tool [†]
Output	Anchor: radial force, radial position, displacement
	Linear actuator: axial force, extension and retract measurement
	Head tension
	Casing collar locator (CCL) and optional gamma ray
	Wellbore pressure
	Wellbore temperature
	Accelerometer for anchor slippage indication
Anchor module	Max. opening diameter: [‡] 5.2 in [132 mm]
	Opening diameter measurement resolution: [‡] 0.01 in [0.254 mm]
	Max. anchoring force: ^{‡,§} 50,000 lbf [222,411 N]
	Max. closing force: ^{‡,§} 25,000 lbf [111,205 N]
Linear actuator module	Stroking length: 12 in [305 mm]
	Min. linear actuator displacement measurement resolution: ^{††}
	Indirect measurement: 0.05 in (1.27 mm)
	Direct measurement: 0.35 in [8.89 mm]
	Max. axial force: ^{††} 16,000 lbf [71,171 N]
Mud type and weight	All
Pressure rating	20,000 psi [138 MPa]
Temperature range	32 to 350 degF [0 to 177 degC]
Hole size—min.	2.2 in [55.9 mm]
Outside diameter [†]	2½ in [53.97 mm]
Length—min. [‡]	35.2 ft [10.73 m]
Weight [†]	307 lbm [139 kg]
Tension	25,000 lbf [111,205 N]
Compression	18,000 lbf [80,068 N]
Special applications	NACE MR0175 compliant for H ₂ S and CO ₂ resistance
	Fishing capability: Optional 3½- or 2½-in [79.38- or 53.97-mm] WIREd wireline inline release devices above and below tractors

[†] All values are for standard specifications and are subject to change without notice. A dedicated engineering team is available for customizing tools to address your challenges.

[‡] Configuration dependent

[§] Measured and controlled in real time in the acquisition software

^{††} Linked to stroking speed

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