UltraTRAC
All-terrain well tractor
Applications
High-force extended-reach tractor conveyance:
- Perforating
- Cement and corrosion evaluation
- ReSOLVE* instrumented wireline intervention service
  - Nonexplosive plug setting
  - High-force axial shifting
  - Selective shifting with a universal shifting tool (UST)
  - Milling
- ABC* analysis behind casing services
- Openhole formation evaluation
- Openhole formation testing
- Borehole imaging services
- Production logging

Benefits
- Eliminates the need for expensive drillpipe or coiled tubing conveyance and the inherent risk of equipment damage
- Reduces fishing risk with reverse tractoring capability
- Minimizes slippage by applying active traction control
- Reliably conveys tools in challenging borehole environments, including washed-out openhole intervals and debris-filled cased holes, and across multiple borehole diameters in a single descent
- Increases the efficiency of rig up and rig down
  - Modular design adapted for short rig-up heights
  - Built-in critical systems
  - Combinability with most wireline openhole and cased hole services
- Saves time with logging while tractoring by acquiring data in both up and down passes
Features

- Highest tractor output force available for fully traversing extended-reach wells
- Reverse tractoring for operational risk reduction
- Active traction control for improved maneuverability and reduced slippage
- Dynamic suspension and innovative wheel design for complex wellbore geometries and conditions
- Tandem configuration for extending accessibility and navigating restrictions and formation washouts
- Modular design with up to eight UltraTRAC drive sections
- Low sensitivity to wellbore conditions
- Versatility to run on any wireline cable
- Simple and robust, with API-certified integrated safety features for explosives service and shock qualified for perforating operations
- Significantly reduced power requirements compared with conventional systems
- Fast deployment and reduced surface equipment footprint

Delivering the farthest reach in the industry, modular UltraTRAC* all-terrain well tractor service provides the highest tractor force available in combination with reverse tractoring, dynamic suspension, and traction control. The UltraTRAC Mono* tractor system adds logging-while-tractoring functionality.

Although specifically engineered for openhole operations, the UltraTRAC tractor performs with the same reliability in cased hole environments, making it the ideal tractor for conveying most wireline openhole and cased hole services, especially in extended-reach wells and for heavy payloads.

UltraTRAC wheels are available in multiple diameters and proprietary designs optimized for well geometry and conditions.
Real-time automatic radial force regulation and dynamic suspension systems continuously optimize the performance of the UltraTRAC tractor as it progresses through the operating environment of the well.
**Conveyance power and control**

Employing the highest tractor force available, UltraTRAC tractors readily convey high payloads in challenging borehole conditions across high-angle, extended-reach wells. By eliminating the conventional reliance on coiled tubing and drillpipe conveyance, UltraTRAC powered conveyance simplifies and streamlines operations to reduce cost, time, and risk.

The traction force applied by the bidirectional, high-torque tractor is precisely controlled from the surface. Sensors incorporated in the UltraTRAC tractor enable the engineer to monitor tractor response and the progress of downhole operations as the automatic radial force regulation and dynamic suspension systems continuously configure the tractor in real time for optimal performance in its operating environment. In combination with a telemetry cartridge, UltraTRAC Mono service delivers logging-while-tractoring functionality to greatly increase the efficiency of production logging and well-integrity monitoring.

**Deployment versatility**

Engineered to withstand the impact of perforating gun detonation as well as the vibration generated in rugose boreholes, UltraTRAC tractors have low sensitivity to well conditions. This makes the highly compatible UltraTRAC tractors ideal for deploying Schlumberger openhole and cased hole services, including:

- petrophysical formation evaluation
- formation testing
- borehole imaging
- perforating
- pipe recovery
- production logging
- cement and corrosion evaluation
- ReSOLVE instrumented wireline intervention
- plug setting
- ABC analysis behind casing services.

Because the UltraTRAC all-terrain well tractor is a fully integrated system, only a single crew is necessary for both tractor operation and the conveyed services.

Real-time telemetry and data acquisition enable the operator to visualize the downhole well environment and intervene as needed to adjust conveyance and the parameters for the deployed services.
# UltraTRAC Configurations

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Length</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Drive</td>
<td>15.35 ft [4.68 m]</td>
<td>265 lbm [120 kg]</td>
</tr>
<tr>
<td>3 Drive</td>
<td>18.80 ft [5.73 m]</td>
<td>335 lbm [152 kg]</td>
</tr>
<tr>
<td>4 Drive</td>
<td>22.25 ft [6.78 m]</td>
<td>405 lbm [184 kg]</td>
</tr>
<tr>
<td>4-Drive Tandem</td>
<td>25.39 ft [7.73 m]</td>
<td>458 lbm [208 kg]</td>
</tr>
<tr>
<td>6-Drive Tandem</td>
<td>32.29 ft [9.84 m]</td>
<td>598 lbm [271 kg]</td>
</tr>
<tr>
<td>8-Drive Tandem</td>
<td>39.19 ft [11.95 m]</td>
<td>738 lbm [335 kg]</td>
</tr>
</tbody>
</table>
New design for environment-specific access

The modular UltraTRAC system provides previously unavailable adaptability for the operating environment and job objectives. The UltraTRAC design goal of optimal performance across all terrains is realized by specifying the number and configuration of the drive sections. A tandem sub can be added to increase functionality by enabling independent surface control of the drives above the tandem sub from those below. Up to eight UltraTRAC drive sections can be run to pull long cables and push heavy loads in extended-reach wells.

For conveyance in enlarged open holes and big casing sizes, the arms of the UltraTRAC drive section extend variably and independently to cover hole diameters up to 15 in [38 cm]. This large opening range optimizes the negotiation of anomalies in the wellbore geometry.

UltraTRAC drive sections can be fitted with multiple wheel diameters and proprietary designs optimized for the well geometry and borehole conditions. Wheel diameter is selected to account for the expected formation rock properties.

Terrain-specific wheel profiles decrease the occurrence of slippage. One of the proprietary wheel designs optimized for well geometries and borehole conditions is a debris-evacuation wheel profile that helps the tractor advance in intervals where sand or proppant particles, cuttings, or mud solids have accumulated.

Compatible with all multiconductor cables, the UltraTRAC tractor does not require specialized cable for deployment. The UltraTRAC Mono tractor can also be run on monocable for perforating and logging operations, including logging while tractoring.
Exceptional navigation in challenging terrain

UltraTRAC tractor systems have three exclusive design features:

- **Traction control** enables real-time adjustment of the radial force applied by the tractor arms. If slippage is detected, the radial force can be increased to increase the traction. Once the difficult section of the well is successfully traversed, the radial force can be decreased to avoid unnecessary wear of the wheels and other drive components and to conserve energy.

- **The dynamic suspension** maintains the constant radial force that the arms apply to the walls of the well, independent of the borehole size. The UltraTRAC drives can achieve the same tractoring force in well IDs that vary from 3.6 to 15 in [9.1 to 38 cm].

- **Bidirectional** capability is used to decrease operational risk by retrieving the tractor in case of stickiness, abnormally high friction, or borehole collapse. In **reverse tractoring** mode, the full traction force of the UltraTRAC tractor complements the cable head tension in retrieving downhole equipment to effectively prevent having to resort to fishing operations.

*The tandem configuration of the UltraTRAC all-terrain tractor easily negotiates washouts.*
The short, modular UltraTRAC configuration incorporates multiple peripheral systems into the tractor architecture for electrical release, head tension, shock absorption, casing collar log (CCL), and addressable tractor perforating safety switch. The resulting system integration not only makes the short tractor length possible but also increases the safety and reliability of tractor operation. The tension load cell located in the UltraTRAC upper head provides valuable real-time information about tool motion, slippage, and additional loading caused by the winch. An addressable cable-release device prevents unintentional pull-off when gun firing causes the toolstring to jump. It also enables reliable cable release if the tool is stuck in an extended-reach horizontal well and the tension force available at the head by pulling on the cable is insufficient to break the weakpoint. The UltraTRAC tractor is also compatible with Schlumberger inline release devices to reliably disconnect from tools or perforating guns that are run below the tractor upon surface command or based on a battery-operated timer. The perforation safety components prevent accidental application of the high voltage used for the drive motors to the perforating guns. Other safety features are the multiple-use shock absorber and fail-safe opening system, which automatically closes the arms if power is lost.

The versatile UltraTRAC all-terrain tractor is the only tractor that provides reliable conveyance capability in openhole formations and high-debris cased hole environments in horizontal and extended-reach wells.

The UltraTRAC all-terrain well tractor is a CE certified tool that meets the Low Voltage, Machinery, and Pressure Equipment Directives of the European Union.
Case Studies

Image logs conveyed on UltraTRAC tractor acquired in one-third the time for drillpipe or coiled tubing deployment in the Mississippian Lime, Oklahoma

Spyglass Energy Group wanted to optimize formation evaluation for its wells drilled in the Mississippian Lime play in Osage County, Oklahoma. A quad-combo log was typically run in the lateral section of the wells. The operator wanted to build on these key petrophysical measurements by image logging. However, acquiring the additional horizontal logging measurements on either drillpipe or coiled tubing conveyance posed high equipment and rig time costs.

Whereas logging on drillpipe typically takes 36 h, the UltraTRAC all-terrain tractor can convey the toolstring at up to 2,400 ft/h in the conditions present in the Mississippian Lime boreholes. The tractor-conveyed tools return real-time data in comparison with memory logging using drillpipe carrier conveyance in horizontal wells for more timely decision making. Although the conveyance reach of the UltraTRAC tractor is farther than what is possible with coiled tubing, UltraTRAC tractor operations are more efficient and safer, in addition to significantly reducing rig time.
The high-quality FMI images obtained with UltraTRAC tractor conveyance in the horizontal section provide insight as to the texture and heterogeneity of the Mississippian Lime reservoir.
An operator in the Mississippian Lime play was moving from the exploration to appraisal stage of a horizontal drilling program and wanted to improve logging efficiency without compromising data acquisition. Logging the horizontal section of a well using conventional drillpipe carrier conveyance typically took more than 48 h of rig time to run quad-combo and imaging logs.

Although the horizontal section was approximately 3,500 ft in length, because UltraTRAC all-terrain tractors apply the highest tractor output force available, they would be able to reliably convey logging tools for the entire section. In comparison with memory logging on drillpipe conveyance, real-time data from UltraTRAC conveyance would enable more timely decision making. The streamlined efficiency of UltraTRAC tractor operations would also improve safety through significant reductions in logistics and rig time.

The UltraTRAC all-terrain tractor is configured with large-diameter wheels in preparation for conveying the FMI imager in open hole.
A ThruBit SureLog™ quad-combo was run first in the 3,500-ft lateral section of three wells to acquire density, neutron, resistivity, and sonic data. High-quality FMI image logs were then acquired to complement the SureLog logs for formation evaluation, lithology identification, and mechanical properties estimation. The FMI tool was conveyed on the UltraTRAC tractor through 7-in casing and 8 ¾- and 6 7⁄8-in open hole. The ThruBit and UltraTRAC logging runs totaled only 24 h, about half the time required for drillpipe conveyance, and saved the operator USD 40,000 in rig costs.
# UltraTRAC Specifications

<table>
<thead>
<tr>
<th>Applications</th>
<th>UltraTRAC Tractor</th>
<th>UltraTRAC Mono Tractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Openhole logging</td>
<td>Cased hole perforating, logging, and intervention</td>
<td>Cased hole perforating, logging while tractoring and intervention</td>
</tr>
<tr>
<td>Maximum speed, † ft/h [m/h]</td>
<td>3,200 [975]</td>
<td>2,400 [730]</td>
</tr>
<tr>
<td>Temperature, degF [degC]</td>
<td>347 [175]</td>
<td>302 [150]</td>
</tr>
<tr>
<td>Pressure, psi [kPa]</td>
<td>20,000 [138]</td>
<td>20,000 [138]</td>
</tr>
<tr>
<td>Hole size—min., in [cm]</td>
<td>3.6 [9.1]</td>
<td>3.6 [9.1]</td>
</tr>
<tr>
<td>Hole size—max., in [cm]</td>
<td>15 [38.1]</td>
<td>15 [38.1]</td>
</tr>
<tr>
<td>Outside diameter, ‡ in [cm]</td>
<td>3.375 [8.57]</td>
<td>3.375 [8.57]</td>
</tr>
<tr>
<td>Maximum pull per drive section, † lbf [N]</td>
<td>400 [1,780]</td>
<td>400 [1,780]</td>
</tr>
<tr>
<td>Maximum force, lbf [N]</td>
<td>3,200 [14,230]</td>
<td>2,400 [10,675]</td>
</tr>
<tr>
<td>Power, cable requirements</td>
<td>AC, heptacable</td>
<td>DC, multiconductor cable (mono and hepta)</td>
</tr>
</tbody>
</table>

† Depending on wheel size

‡ Depending on the configuration and excluding the 2.8-ft [0.85-m] logging head. The incorporated CCL, head tension cell, addressable cable-release device, and shock absorber are standard features that do not add extra length.

*Mark of Schlumberger
Other company, product, and service names are the properties of their respective owners.
Copyright © 2013 Schlumberger. All rights reserved. 13-FE-0007