



Wireline Tractor and Tractor applications

Product Catalogue



Aker Well Service AS was founded in 1980 and is strategically headquartered in the Forus industrial area close to Stavanger, the centre of the petroleum industry in Norway. The company is a world class provider of leading-edge well intervention technology and faces continuous growth. We can offer our clients a complete range of well intervention services – covering wireline, wireline tractor and cased hole logging services.

In our efforts towards world class performance we offer experienced personnel with a strong HSE mindset. At Aker Solutions' full-scale test and training centre, the Well Intervention Academy, our personnel receive hands-on training in a realistic environment which makes them capable to meet every requirement needed.

**Aker Well Service AS is ISO 9001:2000
and 14001:2004 certified.**

Aker Well Service has had an ongoing continuous development program for tractor and tractor applications since 1998. In 1999 AC tractors were abandoned with the introduction of PowerTrac® DC tractor technology, which was superseded by PowerTrac® Advance™ tractors in January 2003. The PowerTrac® Advance™ release was a major milestone in Aker Well Service tractor history, introducing a tractor which has the best performance combination in the industry.

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The PowerTrac® Advance™ release was a major milestone in Aker Well Service tractor history



Aker Well Service has had an ongoing continuous development program for tractor and tractor applications since 1998

Why Wireline Tractor?

Wireline Tractor is a deployment tool used to push well intervention equipment several kilometres along highly deviated and horizontal sections of oil or gas wells. This cutting edge technology can in many cases eliminate the need for more heavy-equipped and expensive Coiled Tubing operations, saving our Clients both time and money.

The Aker Well Service (AWS) in-house developed Tractor – the PowerTrac® Advance™ – is powered via a mono-conductor Wireline cable and is compatible with most 3rd party tools, being flexible and fit for numerous types of operations.

In addition to equipment deployment the tractor technology development is steadily progressing, expanding our range of services. Scale Milling, Brushing and Honing for removal of debris in the wellbore utilizing a Rotational Tractor are cost-effective, time saving services compared to traditional methods. Other services like Gas-Lift Valve replacement and manipulation of Sliding Sleeves in horizontal sections are now possible utilizing the PowerTrac® Stroker, also an Aker Well Service developed tool.

In 2009; AWS introduced the PowerTrac® Advance™ 434 Open Hole Tractor – a tractor that is able to operate in Open Hole wells with the ability to reverse in case the cable is key-seated. In the same year we also introduced Logging while Tractoring – a ground-breaking new technology that makes it possible to log in real time simultaneously as the tractor is operating, all on standard single conductor Wireline.

Statements

“The use of tractor devices ensures particularly good resource utilization because they improve the recovery factor on a field. “

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“Cost comparisons conducted by the Well Intervention Department have shown that the company saves approximately NOK 500 million annually on such operations.

In addition, the group’s earnings are increased by NOK 300 million annually due to;

- The cost effectiveness of tractor operations making it feasible to recover even small production volumes of oil, hence improving the recovery factor for marginal reserves.
- Tractor operations require less lead time to mobilise so that new production and injection wells are brought on stream faster. “

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“... they can also demonstrate good results for health, safety and the environment, because equipment is lighter, simpler and crews smaller than what is required with alternative methods such as coiled tubing or snubbing.”

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Quality performance

Aker Well Service wireline tractor operations 2003-Q2 2010 High operation factor

1604 tractor jobs
3735 runs exceeding
a total of 3125 km

→ 97%

Wireline Tractor – Introduction

Shortest wireline tractor in the market

PowerTrac®
Advance™ 218

- Applications and Key features:
- Small diameter casings
 - Cost-effective wireline conveyance in horizontal wells
 - Built to withstand shock
 - Pulling power can be increased with a proportional speed reduction
 - Small OD allows higher flow rates
 - Flexible arms allow ID variations in well
 - Compatible with 3rd party tools
 - DC voltage operated
 - Hydraulic drive mechanism
 - Tractors can be connected in tandem
 - Helicopter transportable

Technical information:

Length*:	3.95 m	12.95 ft
Weight:	50 kg	110 lbs
OD:	54 mm	2.125"
Pressure rating:	1034 bar	15 000 psi
Temperature rating:	177 °C	350 °F
Pull force*:	238 kg	525 lbs
Operating ID (min/max):	61 mm/190.5 mm	2.4"/7.5"
Speed*:	>20 m/min	>65 ft/min

* Depending on configuration



PowerTrac® Advance™ 318
introduced in 2003

PowerTrac®
Advance™ 318

- Applications and Key features:
- Cost-effective wireline conveyance in horizontal wells
 - Operations in cased hole
 - Built to withstand shock
 - Pulling power can be increased with a proportional speed reduction
 - Flexible arms allow ID variations in well
 - DC voltage operated
 - Hydraulic drive mechanism
 - Multi-conductor feed-through, compatible with 3rd party logging tools
 - Tractors can be connected in tandem
 - Helicopter transportable
 - Can be used with rotation adapter
 - Possibility for adding a fast sampling gauge (PPS55) in a top sub
 - Logging while Tractoring in real-time on mono-conductor cable

Technical information:

Length*:	4.34 m	14.23 ft
Weight*:	111 kg	244 lbs
OD:	85.1 mm	3.35"
Pressure rating:	1034 bar	15 000 psi
Temperature rating:	177 °C	350 °F
Pull force*:	>900 kg	>2000 lbs
Operating ID (min/max)*:	96.4 mm/259.1 mm	3.4"/10.2"
Speed*:	>20 m/min	>65 ft/min

* Depending on configuration



Wireline tractor for casing
sizes up to 13 3/8”

PowerTrac®
Advance™ 318 XR

- Applications and Key features:
- Cost-effective wireline conveyance in horizontal wells
 - For operations in Open Hole/large diameter casings
 - Built to withstand shock
 - Pulling power can be increased with a proportional speed reduction
 - Flexible arms allow ID variations in well
 - DC voltage operated
 - Hydraulic drive mechanism
 - Multi-conductor feed-through, compatible with 3rd party logging tools
 - Tractors can be connected in tandem
 - Helicopter transportable
 - Can be used with rotation adapter
 - Possibility for adding a fast sampling gauge (PPS55) in a top sub
 - Logging while tracting in real-time on mono-conductor cable

Technical information:

Length*:	5.33 m	17.48 ft
Weight*:	140 kg	308.6 lbs
OD:	193.7 mm	7.625"
Pressure rating:	1034 bar	15 000 psi
Temperature rating:	177 °C	350 °F
Pull force*:	900 kg	>2000 lbs
Operating ID (min/max)*:	195.6 mm/353.6 mm	7.7"/13.92"
Speed*:	>18 m/min	>60 ft/min

* Depending on configuration



Open Hole
Wireline Tractor

PowerTrac®
Advance™ 434

- Applications and Key features:
- Operations in Open Hole/large diameter casings
 - Bi-directional – full reverse capacity which will avoid the potential for key seated cable
 - Large diameter 4 ¾" drive rollers – roll easily over wellbore profile changes in cased or open hole
 - Hydraulically actuated arms follow ID variations in well independently
 - Multi-conductor feed-through, compatible with 3rd party logging tools
 - DC operated
 - Tractors can be connected in tandem
 - Helicopter transportable
 - Patent pending

Technical information:

Length:	6.5 m	21.3 ft
Weight:	220 kg	484 lbs
OD:	120 mm	4 ¾"
Pressure rating:	1 700 bar	25 000 psi
Temperature rating:	177 °C	350 °F
Tractor Speed*:	10 m/min	33 ft/min
Max Hole ID:	368 mm	14 ½"
Min Hole ID:	152 mm	6"
Max Pull*:	>909 kg	>2000 lbs
Fishing Strength:	27 200 kg	60 000 lbs

* Depending on configuration



Scale Removal Services



Since the introduction of our scale milling service in 2006 we have removed more than 5000 meters of scale

PowerTrac® ConeCrusher



Effective scale removal tool

- Applications and Key features:**
- Scale removal for small and large scale areas
 - RPM measurements in real time for optimizing milling performance
 - Customer specific bit sizes are available within three weeks notice
 - To be used in combination with PowerTrac® Advance™ Wireline Tractor
 - Compatible with all E-line cable types
 - Patented technology

Technical information:

Sizes currently available:	2.24"
	2.4"
	3.6"
	3.86"
	4.0"
	4.2"
	4.4"
	4.5"
	4.65"
	5.72"
	5.85"
	6.0"
	6.05"

Scale and debris removal without need for injection or flow

PowerTrac® DebrisCollector™



- Applications and Key features:**
- Milling without need for injection or flow
 - Various fronts for customized service
 - Various sizes can be delivered upon request
 - Debris is compiled in the collecting tube
 - Milling speed dependent on scale properties and volume
 - RPM surface read-out ensures effective control of milling progress
 - Can be used in both horizontal and vertical wells
 - Patented technology

Technical information:

Length*:	4.07 m	13.4 ft
Weight*:	89 kg	196.6 lbs
OD:	101.6 mm	4"
Pressure rating:	1034 bar	15 000 psi
Temperature rating:	177 °C	350 °F
Min casing/tubing ID*:	104.1 mm	4.1"
Vol. w/two sections*:	12 liters	2.6 gallon

* Depending on configuration

PowerTrac® HoleOpener



Straighter and more uniform scale removal

- Applications and Key features:**
- Scale removal in combination with PowerTrac® ConeCrusher
 - Making the milled hole straighter and more uniform
 - Centralizing the milling assembly
 - Customer specific bit sizes are available within three weeks notice
 - Patented technology

Technical information:

Sizes currently available:	3.6"
	3.86"
	4.65"
	5.72"
	6.05"
Operating ID:	Size dependent

Brushing Services

Effective brushing and honing services with excellent track records. The combination of rotation and stroking action has proven to be highly effective.

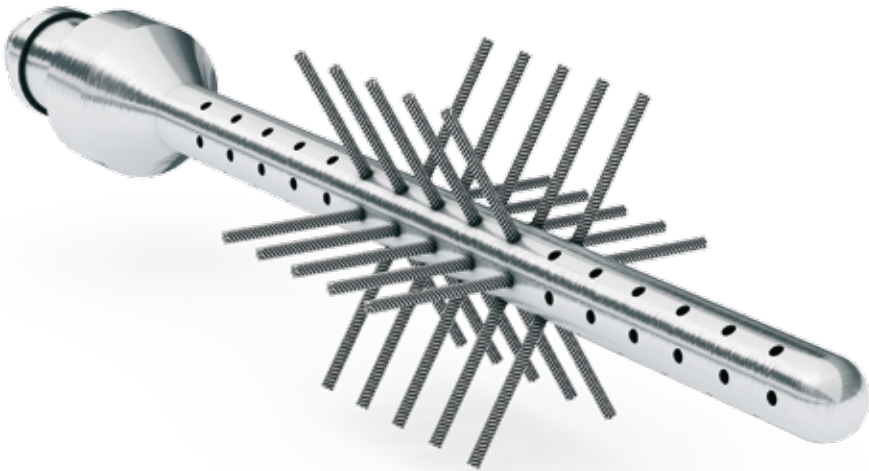
PowerTrac® Brush™

Effective and easy cleaning of seal bores and nipple profiles

- Applications and Key features:**
- Scale removal
 - Cleaning of seal bores and nipple profiles
 - General cleaning purpose
 - Tool OD equals brush area ID
 - To be used in combination with PowerTrac® Advance™ Wireline Tractor
 - Compatible with all E-line cable types
 - Adjustable brush length
 - Customized OD

Technical information:

Weight:	15 kg	33 lbs
Length:	1 m	3.28 ft
Pressure rating:	1034 bar	15 000 psi
Temperature rating:	177 °C	350 °F
Min casing/tube size:	88.9 mm	3.5"



The Axial Hone tool smooths and polishes the seal bore

PowerTrac® Axial Hone

- Applications and Key features:**
- Compatible with all E-line cable types
 - Restore damaged DHSV seal bores
 - Prepare straddle or plug setting area
 - Combination of rotation and stroking action
 - Stroking action 0.5 m
 - Self-flushed design to avoid jamming
 - Adjustable external no-go for positioning
 - Customized OD
 - To be used in combination with PowerTrac® Advance™ Wireline Tractor

Technical information:

Weight:	30 kg	66 lbs
Length:	2 m	6.56 ft
Pressure rating:	1034 bar	15 000 psi
Temperature rating:	75 °C	167 °F
Hone length:	0.25 m	9.8"
Min casing/tubing ID:	86.4 mm	3.4"
Max casing/tubing ID:	259.1 mm	10.2"



PowerTrac® Axial TwinHone

Double honing action in one run

- Applications and Key features:**
- Simultaneously honing of both Seal Bore areas in Down Hole Safety Valves
 - Compatible with all E-line cable types
 - Restore damaged DHSV seal bores
 - Prepare straddle or plug setting area
 - Combination of rotation and stroking action
 - Stroking action 0.5 m
 - Self-flushed design to avoid jamming
 - Adjustable external no-go for positioning
 - Customized OD
 - To be used in combination with PowerTrac® Advance™ Wireline Tractor

Technical information:

Weight:	60 kg*	132 lbs
Length*:	3 m	9.84 ft
Pressure rating:	1034 bar	15 000 psi
Temperature rating:	75 °C	167 °F
Hone length	2x0.25 m	2x9.8"
Min casing/tubing ID:	86.4 mm	3.4"
Max casing/tubing ID:	259.1 mm	10.2"

* Depending on configuration





Aker Well Service delivers different types of Strokers, all with excellent track records

Hydraulic Shifting Tool



Multiple sleeves can be shifted upwards and downwards in one run

Applications and Key features:

- Unique sleeve shifting device. Designed to be applicable to all known smart well sleeves and sliding sleeve profiles
- Opening and closing of sliding sleeves
- Multiple manipulation of sleeves in one run
- Bi-directional
- Fail-safe release system
- To be used in combination with PowerTrac® Stroker

Technical information:						
Tools						
2.50						
Length:	1.75 m	5.74 ft	1.5 m	4.92 ft	1.5 m	4.92 ft
OD:	63.5 mm	2.5"	85.85 mm	3.38"	112 mm	4.41"
Pressure rating:	1034 bar	15 000 psi	1723 bar	25 000 psi	1723 bar	25 000 psi
Temperature rating:	177 °C	350 °F	177 °C	350 °F	177 °C	350 °F
Profile ID:	71.4 mm	2.81"	93.67 mm	3.688"	115.82 mm	4.56"

PowerTrac® Stroker with up to 1 meter bi-directional stroke length

- Applications and Key features:**
- PowerTrac® Stroker tool will anchor in the tubing, stroke bi-directionally repeatedly
 - Maximum operating tubing ID can be increased with extended anchor pads with the same tool OD
 - Fail-safe release mechanism
 - Pulling of plugs
 - Can be delivered with electrical feed-through
 - Logging while tractoring in real-time on mono-conductor cable
 - Possibility for adding a fast sampling gauge (PPS55) in a top sub (318 Stroker)
 - Patent pending

Technical information:		212		212 HD		318		318 HD	
Tools									
Length:	5.36 m	17.6 ft	5.36 m	17.6 ft	6.7 m	22 ft	7.73 m	25.4 ft	
Weight:	86 kg	190 lbs	86 kg	190 lbs	179 kg	395 lbs	179 kg	395 lbs	
OD:	63.5 mm	2.5"	63.5 mm	2.5"	85 mm	3.346"	99 mm	3.9"	
Pressure rating:	1035 bar	15 000 psi	1035 bar	15 000 psi	1724 bar	25 000 psi	1724 bar	25 000 psi	
Temperature rating:	177 °C	350 °F	177 °C	350 °F	177 °C	350 °F	177 °C	350 °F	
Min ID casing/tubing size:	66.5 mm	2.62"	66.5 mm	2.62"	86.4 mm	3.4"	86.4 mm	3.4"	
Max ID casing/tubing size:	104 mm	4.1"	104 mm	4.1"	152.4 mm	6"	168 mm	6.6"	
Bi-directional force:	5.0 tons	11 000 lbs	6.1 tons	14 300 lbs	12.7 tons	28 000 lbs	16.1 tons	35 500 lbs	
Stroke length:	508 mm	20"	508 mm	20"	508 mm	20"	1016 mm	40"	
El. feed through:	No	No	No	No	Yes	Yes	Yes	Yes	

Modified Kick Over Tool



Reinforced kick-over mechanism to ensure optimal alignment of the side pocket mandrel valve

Applications and Key features:

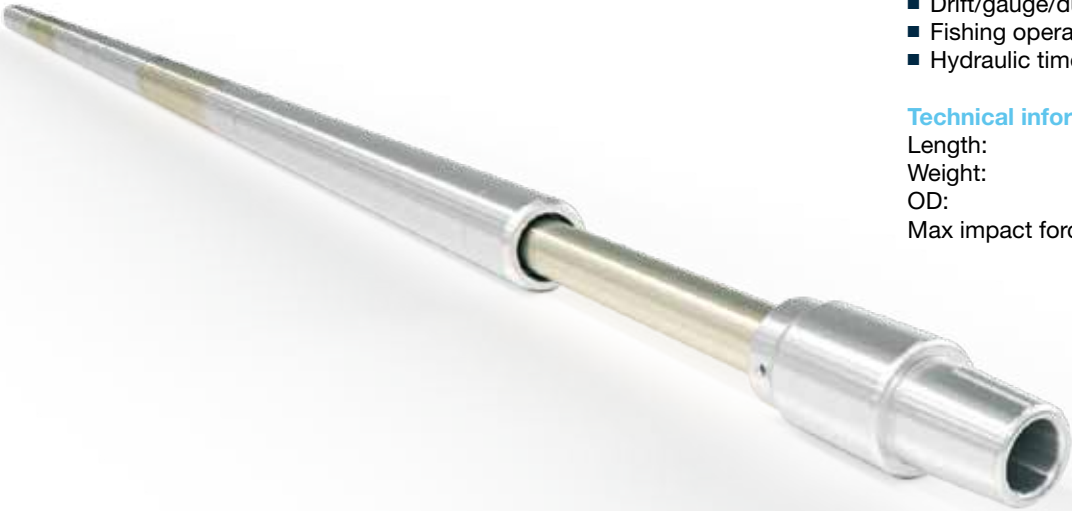
- Re-inforced kick-over mechanism – can be operated in highly deviated or even horizontal wells
- Setting and retrieving GLVs
- Improved tool orientation
- Can be used in combination with PowerTrac® Stroker
- Patented technology

Auxiliary Equipment

Aker Well Service can provide a range of auxiliary tools and services to customize operations according to our Client's needs

PowerTrac® Jar

- Bi-directional tractor jar
- Applications and Key features:**
- The PowerTrac® Jar is designed to provide controllable and accurate impact forces both downwards and upwards in highly deviated and horizontal well sections, in combination with the PowerTrac® Advance™
 - Pulling/retrieving of flow control equipment
 - Setting/retrieving of plugs
 - Opening and closing of sliding sleeves
 - Drift/gauge/dummy run
 - Fishing operations
 - Hydraulic time delay for activation
- Technical information:**
- | | | |
|-------------------|-----------|------------|
| Length: | 4.80 m | 15.75 ft |
| Weight: | 70 kg | 154 lbs |
| OD: | 73 mm | 2.875" |
| Max impact force: | 19 050 kg | 42 000 lbs |



Orientation of wireline tractor in side pockets

PowerTrac® Orientation Sub



- Applications and Key features:**
- Orientation of wireline tractors in side pockets
 - Eliminates need for tandem tractors for passing side pockets
 - Saves tool space when running through side pockets
 - Finger collapse when pulling out of hole
 - Easy connection and setup
 - Fail-safe mechanism
 - Patented technology
- Technical information:**
- | | | |
|---------------------|----------|------------|
| Length: | 0.35 m | 13.8" |
| Weight: | 22 kg | 48.5 lbs |
| OD: | 114 mm | 4.48" |
| Pressure rating: | 1034 bar | 15 000 psi |
| Temperature rating: | 177 °C | 350 °F |

PowerTrac® String Shot Sub

- Easy scale removal in side pockets
- Applications and Key features:**
- Scale removal around the valve lock in the side pocket mandrel
 - Orientation of detonating cord
 - Uses side pocket mandrel guiding slot
 - Easy connection and setup
 - Can be run in combination with PowerTrac® Advance™ Wireline Tractor
 - Fail-safe mechanism
 - Patent pending
- Technical information:**
- | | | |
|---------|--------|--------|
| Length: | 2.0 m | 78.7" |
| Weight: | 31 kg | 68 lbs |
| OD: | 114 mm | 4.48" |



Friction sub for operations in challenging well conditions

Instruments Dynamics Controller



- Applications and Key features:**
- Friction tool for:
- Tractoring “uphill”
 - Logging in high flow rates
 - Plug setting in cross-flow
 - Under-balance perforating
 - Surface controlled activation/deactivation
 - Addressable telemetry
 - Multiple IDC tools can be placed in the toolstring
 - Fail-safe mechanism
- Technical information:**
- | | | |
|---------------------|----------------|------------|
| Length: | 0.91 m | 35.83” |
| OD: | 79.4 mm | 3 1/8” |
| Pressure rating: | 1379 bar | 20 000 psi |
| Temperature rating: | 177 °C | 350 °F |
| Range: | 101.6-223.5 mm | 4-8.8” |

Tension and Compression Monitors



Downhole monitoring of tension and compression while tractoring

- Applications and Key features:**
- Real-time tension and compression measurements while tractoring
 - at the cable head
 - below the tractor
 - Two independent subs for reading cable head tension and passenger tension
 - Surface read-out while running tractor
 - Very robust, high reliability MWD sensors hi-g
 - Integrated ambient pressure and temperature measurement
- Technical information:**
- | | | |
|---------------------|----------|------------|
| Length master: | 1128 mm | 3.7 ft |
| Length slave: | 1036 mm | 3.4 ft |
| Weight: | 36.3 kg | 80 lbs |
| OD: | 79.4 mm | 3 1/8” |
| Pressure rating: | 1379 bar | 20 000 psi |
| Temperature rating: | 177 °C | 350 °F |

Surface controllable release tools for mono- or multi-conductor cable

Mono- and Multi-conductor Release Tools



- Applications and Key features:**
- The ART-HD (Addressable Release Tool) and the MRT (Multi-conductor Release Tool) are intended for use in horizontal and highly deviated wells in conjunction with PowerTrac® Advance™ where the controllable release of all of or part of a stuck toolstring is required. The tools can replace the cable weak point, thereby improving operational safety, or be used to release a specific section of a tool-string below a tractor, such as a partially set plug or expanded gun string.
- Surface controlled release point
 - Replace cablehead weak point
 - Up to 7 different ARTs or MRTs possible in one toolstring
 - Dummy/drift strings
 - Plug and perforation compatible
 - Leaves a 1 3/16” (ART) or 2 3/8” (MRT) fishing neck when released

- Technical information ART-HD:**
- | | | |
|---------------------|----------|------------|
| Length: | 0.68 m | 2.23 ft |
| Weight: | 8.2 kg | 18 lbs |
| OD: | 54 mm | 2.125” |
| Pressure rating: | 1034 bar | 15 000 psi |
| Temperature rating: | 177 °C | 350 °F |
- Technical information MRT:**
- | | | |
|----------------------------|-----------|------------|
| Length: | 0.90 m | 2.94 ft |
| Weight: | 17.3 kg | 38 lbs |
| OD: | 85.7 mm | 3 3/8” |
| Pressure rating: | 1379 bar | 20 000 psi |
| Temperature rating: | 177 °C | 350 °F |
| Tensile strength released: | 22 700 kg | 50 000 lb |
| Max working load: | 7 700 kg | 17 000 lb |

PowerTrac® ReleaseSub



Intelligent release mechanism

- Applications and Key features:**
- Replaces cablehead weak point
 - Releases from stuck toolstring
 - Leaves a 1 3/8” fishing neck when released
 - Several RSS can be run simultaneously in the tool string
 - Can be used in a mechanical tool string
 - Intelligent release mechanism, does not require surface command
 - Programmable release threshold; temperature, pressure and time
 - Battery powered with built-in battery power saving arrangement
 - Field proven technology
 - Increased payload on mono conductor cable
 - Patented technology

- Technical information:**
- | | | |
|---------------------|-----------|------------|
| Length: | 1000 mm | 41” |
| Weight: | 13 kg | 30 lbs |
| OD: | 54 mm | 2 1/8” |
| Pressure rating: | 1034 bar | 15 000 psi |
| Temperature rating: | 177 °C | 350 °F |
| Tensile strength: | 15 000 kg | 33 000 lbs |

Fast sampling memory gauge
for Wireline Tractor

PPS55



A custom made gauge carrier, the PowerTrac® MemorySub, is available for the PPS55 gauges. The sub can be integrated in the Aker Solutions' PowerTrac® Advance™ memory wireline tractor and PowerTrac® Stroker, enabling logging of pressure and temperature data while tracting.

Technical information:		
Length:	241.3 mm	9.5"
OD:	19.05 mm	0.75"
Pressure rating:	1030 bar	15 000 psi
Pressure accuracy:	±0.1%	
Pressure resolution:	0.005%	
Pressure drift:	< 3 psi/year	
Temperature rating:	150 °C	300 °F
Temperature accuracy:	±0.5 °C	
Temperature resolution:	0.05 °C	
Sensor:	Silicon-Sapphire	
Memory capacity:	4 000 000 data sets	
Sample rate:	up to 500 data sets/sec	

PowerTrac®
SwitchSub™



SwitchSub enabling
towing of downhole tools

- Applications and Key features:
- Designed specifically to allow PowerTrac® Advance™ tractor conveyance of long flexible geophone arrays
 - Placed between the mono cable head and the upper head of the geophone array
 - The PTA Wireline Tractor is placed at the lower head of the geophone array and is used to pull the array into highly deviated or horizontal completions
 - Controlled by surface command, and either connects the geophones to the wireline for surveying purposes, or connects to the PTA tractor through multiple feed-troughs in the geophone array electrical bridle to tow the array deeper in the wellbore
 - Compatible with most 3rd party logging tools on mono-conductor and multi-conductor cables

Technical information:		
Length:	0.75 m	29.25 in
Weight:	20 kg	44 lb
OD:	80 mm	3 1/8"

Precise cutting of downhole
tubular without using dangerous
chemicals or explosives

DECT – Downhole
Electric Cutting Tool*

- Applications and Key features:
- Electrical tubing cutter
 - No need for dangerous chemicals or explosives
 - Clean cut of machine shop quality, no damage on casing
 - Radio silence not required
 - Multiple cuts possible in a single run
 - Neutral or max 10% over-pull on tubing recommended
 - Approximate cutting time in 5" #19.5 lbs tubing is 3.5 minutes
 - Helicopter transportable
 - Standard mono conductor cable
 - Single run wireline intervention
 - Cutting operations are monitored at the surface for blade advancement, power & cutting noise level
 - User serviceable

Technical information:		
Weight:	62 kg	136.8 lbs
Length:	4.42 m	14.50 ft
OD:	68.26 mm	2 11/16"
Pressure rating:	1034 bar	15 000 psi
Temperature rating:	150 °C	300 °F
Max pipe wall thickness:	19.05 mm	0.75"
Head size OD:	70 or 82.55 mm	2.75" or 3.25"
Anchoring range both heads:	76-127mm	2.99"-5.00"
Cutting range 2.75" head:	76-130 mm	2.99"-5.1"
Cutting range 3.25" head:	88.9-142.2 mm (154.9 mm w/extension)	3.5"-5.6" (6.1" w/extension)

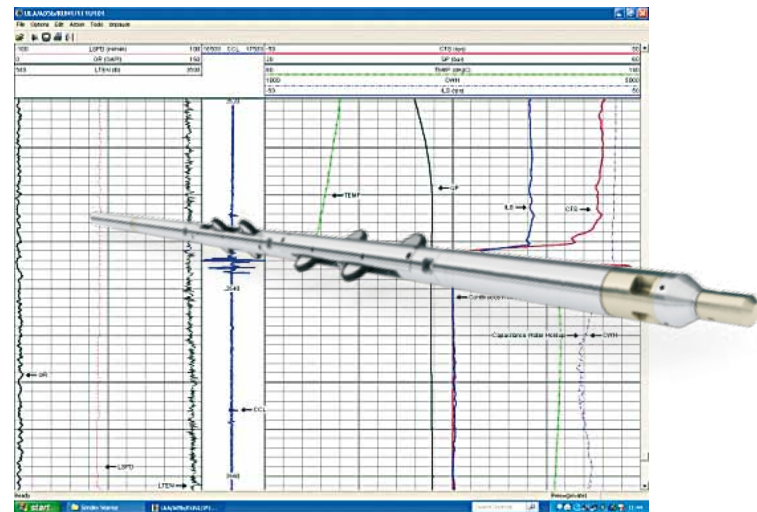
*GE Oilfield Technology



Logging while Tractoring (LwT)

PowerTrac® Advance™ and Production Logging on mono-conductor cable

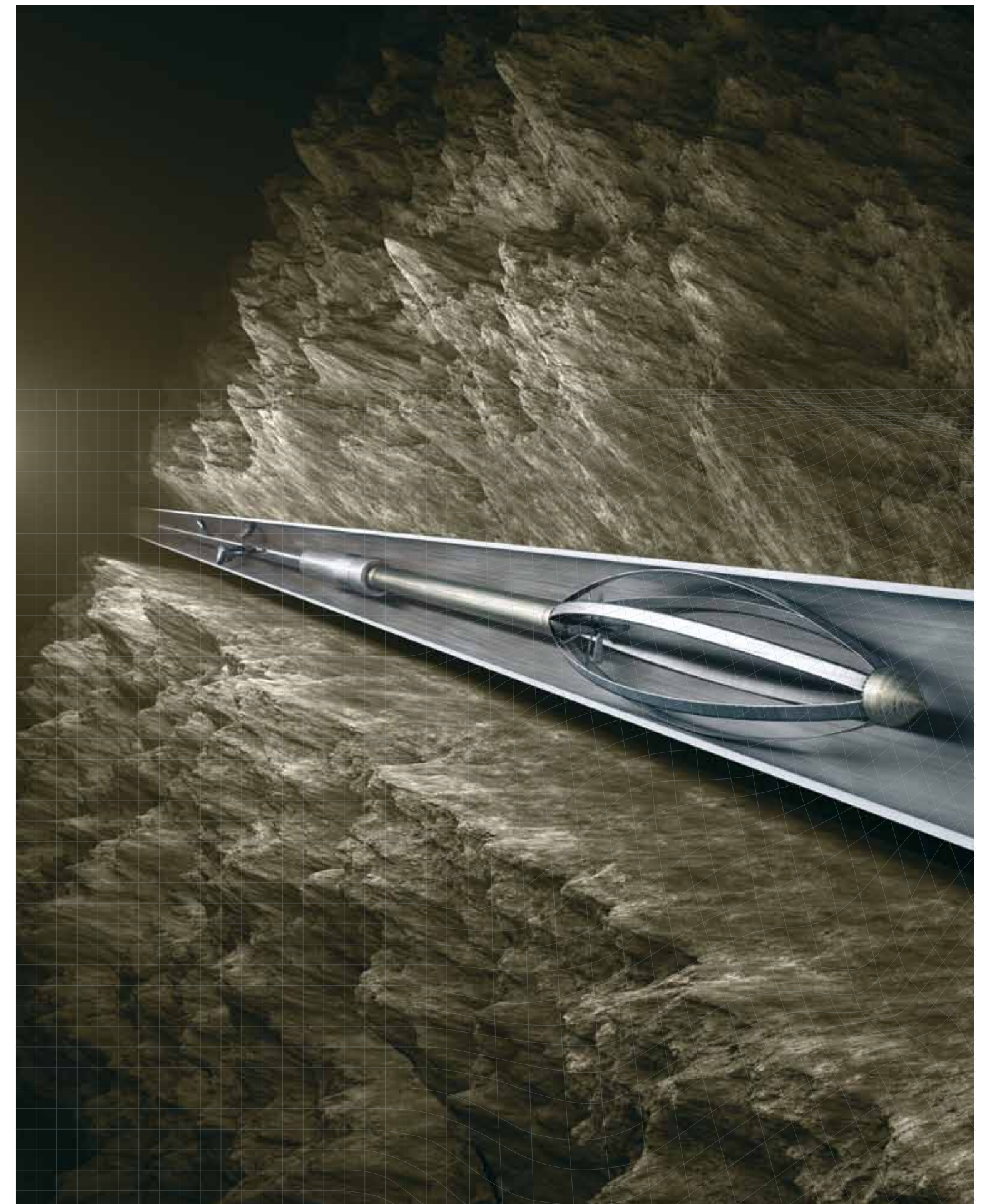
The PowerTrac® Advance™ system (Wireline Tractor and/or Stroker) has the advantage that it is operated on mono-conductor cables with low DC currents. Aker Well Service has developed a sub that makes us capable of performing PLTs (Production Logging) simultaneously as the tractor is deploying the tools downhole – on Mono-Cable. This has previously not been possible in highly deviated and horizontal sections of a well utilizing mono-cable.



Unique advantages:

- Data quality greatly improved when logging in undisturbed flow
- Smooth continuous down passes with adjustable speed
- Applicable on all standard mono-conductor cables
- Cased hole or barefoot completions up to 9 5/8"
- Flexible logging company choice – compatible with all UltraWire™ telemetry tools
- All conventional PLT sensors
- Horizontal logging tools – MAPS
- Easy rig-up – standard wireline equipment
- Proven technology/track record

Logging while Tractoring
on mono-conductor cable



Aker Well Service: Intervention Solutions

Slickline and Wireline Services

In addition to our excellent Wireline Tractor Services, AWS can offer Slickline, Wireline and Cased Hole Logging Services. We have been operational on the Norwegian Continental Shelf (NCS) since 1980, and have gained extensive experience throughout the years. AWS is the biggest supplier of Wireline Services on the NCS, and we are continuously expanding our areas of work. Our Wireline Equipment Park exists of state-of-the art technology with 27 complete packages (including Pressure Control Equipment), 5 of those being Fast-Track winches and 12 fully-electrical winches.

The winches can be operated as remote-controlled where the Operators can operate the Winch from a remote location, supervising the operation through cameras and with several monitors displaying the operational parameters. The operational parameters can be transferred live to other locations like an onshore operation centre.

All our equipment comply with the NORSOK Standards.

Cased Hole Logging Services

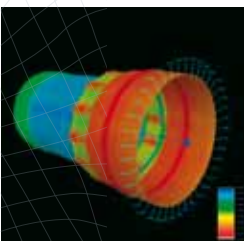
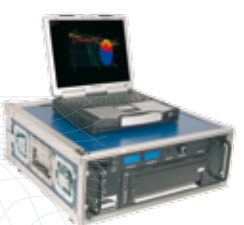
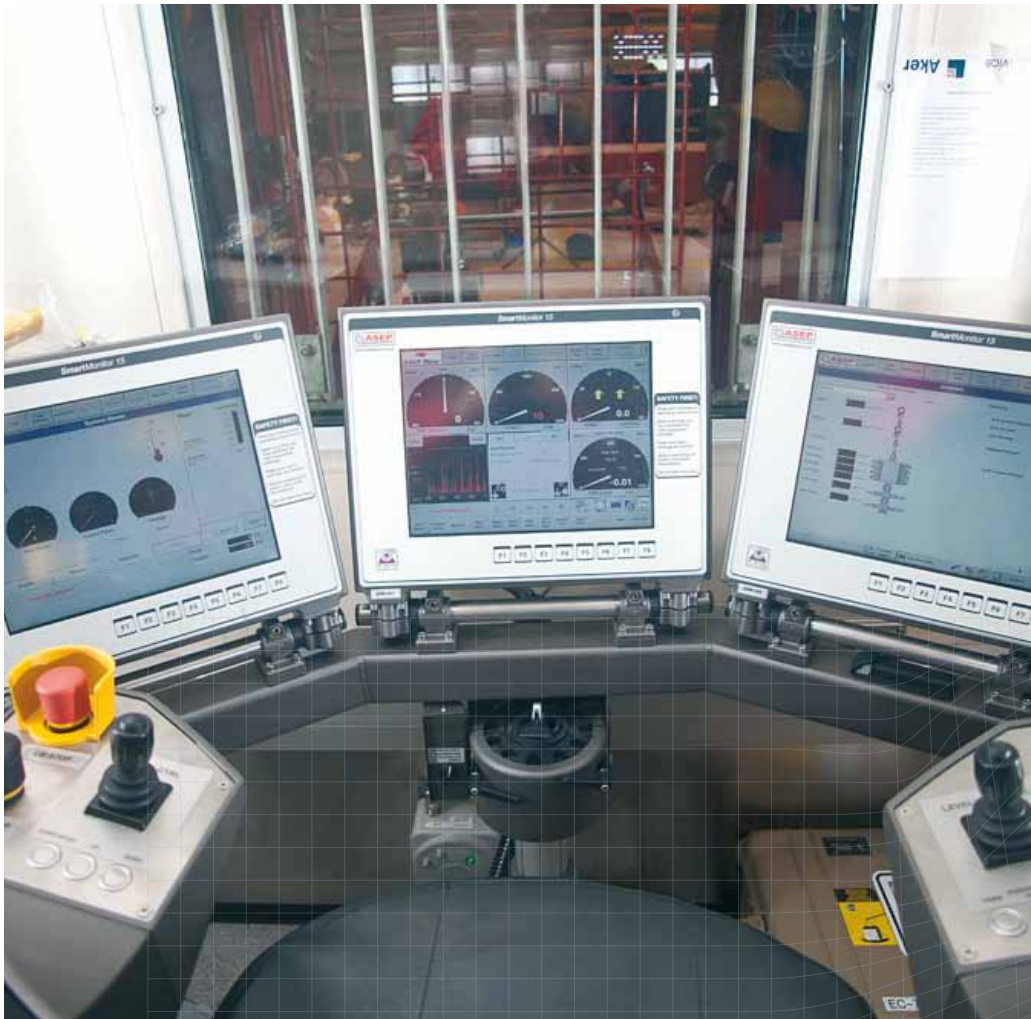
AWS has been offering Logging Services since 1996 and we have an excellent track record. We are continuously expanding our range of services, and can now offer:

- Production Logging (PLT)*
 - MAPS: Logging in highly deviated and horizontal wells*
 - Memory Read Out (MRO) or
 - Surface Read Out (SRO)
 - Complete Analysis utilizing Emeraude or Platou (Customer's choice)
- Well Integrity Logging*
 - Multifinger Caliper (MFC)
 - Magnetic Thickness Tool (MTT)
 - Memory Read Out (MRO) or
 - Surface Read Out (SRO)
 - Complete Analysis
- Combination of PLT and MFC in same run
- Plug setting
- Perforating
- Tubing Puncher
- Tubing Cutter Services
 - Radial Cutting Torch (RCT)
 - Downhole Electric Cutting Tool (DECT)*
 - Split Shot
- Memory Gauge Services
 - Robust for drift runs
 - Long Term sampling
 - Fast Sampling
 - Gauge Hangers (AWS patented Technology)
- Correlation

All our Logging Services are fully compatible with the PowerTrac® Advance™ services. All our equipment comply with the NORSOK Standards.

*GE Oilfield UltraWire Technology (previously Sondex)

Aker Well Service can deliver Slickline, E-line and Cased Hole Logging Services



Solutions in practice

Aker Solutions Centre of Excellence for Well Service Technology

Aker Solutions has built a test- and training-centre situated at the base in Forus, Stavanger, Norway – The Well Intervention Academy (WIA). The centre has two main purposes; education and training of offshore personnel and testing and development of new technology. The centre utilizes the latest technology available including remote operation of winches, tractors and logging in addition to electric winches and more.

Training:

The combination of theoretical and practical training has a great HSE advantage; the number of potential accidents

offshore can be reduced when the operator gets hands-on experience in real-life surroundings.

Testing:

The test facilities are excellent for testing and development of Wireline Tractor Technology, and includes:

- Well intervention tower (28 m high)
- Two wells, 400 m and 40 m deep, with completion similar to offshore wells
- Horizontal surface wells for tractor testing
- Classrooms, Workshop, Showroom

WIA offers a wide range of courses for external personnel. Test facilities are also available for external use.



Excellent and unique
Test and Training facilities for
Wireline Tractor and other
Well Intervention Services



Examples of achievements

Logging while Tractoring



Logging GE Sondex UltraWire™ production tools while tractoring

Where: Siri
Client: DONG Energy
When: November 2008
Job Objective: Log GE Sondex PLT while tractoring
Job background: Lately there has been an increasing demand from our customers to do Logging while Tractoring (LwT), meaning recording data in real-time while the tractor is in operation.
Prior to this job, it has not been possible to log Sondex UltraWire™ (UW) logging tools while tractoring on mono-conductor cable.
Job Summary:
The PowerTrac® Advance™ (PTA) wireline tractor, a drift and Sondex' UW PL tools (temperature, GR, CCL and inline spinner sensors), were deployed down to 2210 mRKB with conventional wireline on a 5/16" mono-cable. At 2210 mRKB; the PTA was activated and conveyed the BHA down to 2800 mRKB at a speed of 10 m/min; simultaneously logging the PL tools. The response from the sensors was excellent and the job a success.
Being able to log while tractoring on mono-cable opens up numerous opportunities. PL data are generally better logging against the flow: you are logging in undisturbed flow and spinner sensitivity is improved. In addition data are secured already whilst running in hole and time is saved on logging operations.

Milling of scale by Riserless Well Intervention



ConeCrusher and HoleOpener

Where: Åsgard-Smørbukk
Client: StatoilHydro
When: May 2008
Job Objective: Mill scale (CaCO₃) in tubing above perforated interval in order to be able to re-perforate well
Job Summary: Traditionally, these types of operations are done from a floater and with coiled tubing. This operation was performed from a vessel – the Island Frontier – on wireline. The well had been undergoing several scale inhibitor squeeze jobs, and was prior to this job shut in due to lack of scale inhibitors. Success in the scale milling job was crucial for achieving the intervention objectives and to be able to put the well back into production. The PowerTrac® Advance™ Wireline Tractor assembly with a PTA318, 5.72" HoleOpener and 5.72" ConeCrusher milled 23 meter of scale from 4044 – 4067 m in high temperatures (151°C). The milling job was a success, and made the rest of the operations possible. After re-perforation, the oil production increased from 468 Sm³/d to 1204 Sm³/d.
This is the first scale milling operation performed on Wireline Tractor from a vessel, and proves how effective and simple this can be done.
StatoilHydro was very pleased with the operation.

Building an excellent track record

Cutting ASV Packer with Downhole Electric Cutting Tool



Cutting ASV Packer
Where: Ekofisk M-08
Client: ConocoPhillips
When: October 2008
Job Objective: Cut a 5 ½" 17 lbs PTC ASV Packer using electric cutting tool
Job Summary: An ASV Packer needed to be cut in order to do a recompletion. The packer was positioned at 360 ft RKB, in a 5 ½" 17# tubing. It was crucial for the operation that the cut was performed within a range of no more than 10 cm. In order to precise the cut; the tool was positioned using the no-go nipple at 339 ft and a spacer. Aker Well Service cut the packer successfully with the DECT 001. The ID of the packer was 4.84", and the thickness 0.475". The time spent on the cut was 8 ½ minutes, the total operation lasted 3.2 hours. The operation was performed according to time-plan and without any HSE incidents. Cutting tubing by this approach has great HSE advantages; there is no potential hazardous chemicals or explosives involved.

World's first Gas Lift Valve change-out with PowerTrac® Stroker and Kick-Over Tool



PowerTrac® Stroker and Kick-Over Tool
Where: Norne J-2H
Client: StatoilHydro
When: 30th of April 2006
Job Objective: Changing Gas Lift Valve at high deviation
Job Summary: At a depth of 2750m and 60 degree deviation, the Aker Well Service PowerTrac® Advance™ Wireline Tractor together with PowerTrac® Stroker and a Schlumberger Camco Kick-Over Tool (KOT) for X-lift gas lift valve, successfully retrieved a pre-installed dummy valve and replaced this by setting a X-lift GLV in the SPM. This is the first time that the new PowerTrac® Stroker has been used together with a KOT and run in a well in the North Sea. The PowerTrac® Stroker is designed to provide stroke force both downwards and upwards. It can also be used in combination with PowerTrac® Advance™. Yet another example of how the PowerTrac® Tractor Technology improves to reach operational objectives in a safe and efficient manner.

Manipulation of ICV Sliding Sleeve with Stroker and HST



Hydraulic Shifting Tool
Where: Snorre B K-6
Client: StatoilHydro
When: October 8 2007
Job Objective: Open ICV (Interval Control Valve) mechanically due to failure of hydraulic manipulation
Job Summary: Aker Well Service ran the Hydraulic Shifting Tool (HST) and the PowerTrac® Stroker on the PowerTrac® Advance™ 318 Wireline Tractor in the Snorre B K6 well, operating stuck ICV (Sliding Sleeve). After several unsuccessful attempts by other methods, the client mobilized the Aker Well Service newly developed HST service. In one run the malfunctioning ICV was located and manipulated open. The total time spent in well was 6 hrs. The operation were performed without any HSE incidents or downtime. This operation was the first with the 4.56 HST service.

Two settings in one run with Stroker with Feed-through



Stroker with Feed-through
Where: Heidrun A-22
Client: StatoilHydro
When: 9th of May 2008
Job Objective: Set a BB-packer with Stroker and Halliburton DPU inside a leaking straddle
Job Summary: Aker Well Service ran the BHA consisting of the PowerTrac® Stroker with feed-through, Halliburton's DPU, a BB-packer and a snap latch with seal. At depth, the stroker was activated and the Snap latch was latched into top straddle. The DPU was activated and the packer successfully set. Total time spent on the operation – including drift run - was 12 hrs. It was performed without any HSE incidents or downtime. As a result of the operation; the GOR decreased from 800 to 400 Sm³/Sm³. This operation was the first with Stroker with feed-through, and proves that it is possible to combine two services in one run.



This is Aker Solutions

Aker Solutions is a leading global provider of engineering and construction services, technology products and integrated solutions. The business within Aker Solutions comprises several industries, including Oil & Gas, Refining & Chemicals, Mining & Metals and Power Generation.

The parent company in the group is Aker Solutions ASA. Aker Solutions has aggregated annual revenues of approximately NOK 54 billion and has approximately 22 000 employees and 8 500 contract staff in about 30 countries.

Aker Solutions is part of Aker (www.akerasa.com), a group of premier companies with a focus on energy, maritime and marine-resources industries. The Aker companies share a common set of values and long traditions of industrial innovation. As an industrial owner controlling 40.27 percent of the shares in Aker Solutions through Aker Holding AS, Aker ASA takes an active role in the development of Aker Solutions.

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