



TLOS Friction Reducing Technology

MADE BY IMPULSEDOWNHOLE



IMPULSE
INNOVATIVE FRICTION
REDUCING TECHNOLOGIES

INNOVATIVE SOLUTIONS:

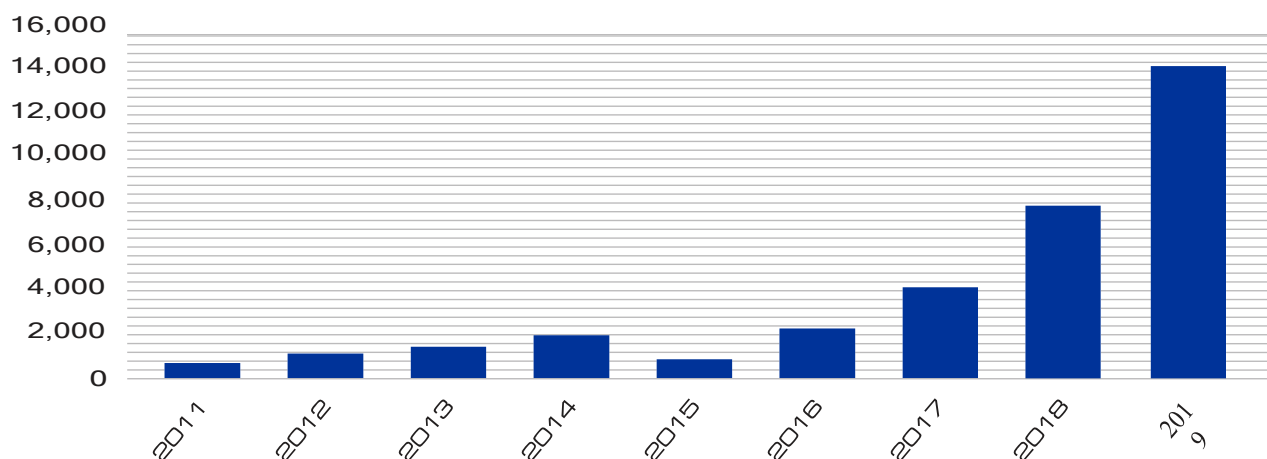
Impulse DHT is focused on reducing the overall friction encountered when horizontal drilling. The company is comprised of a group of individuals who have focused their entire careers in the oil field service sector and have a proven track record of designing and implementing new technologies.

	ACTIPULSE™	POWERPULSE™
Dual Acting Shock Tool	✓	✓
Multi-tool Configuration(s)	✓	✓
Adjustable Valve Housing	✓	✓
High Torque Series	✓	✓
On Demand Ball Drop Activation	✓	x

RUN HISTORY

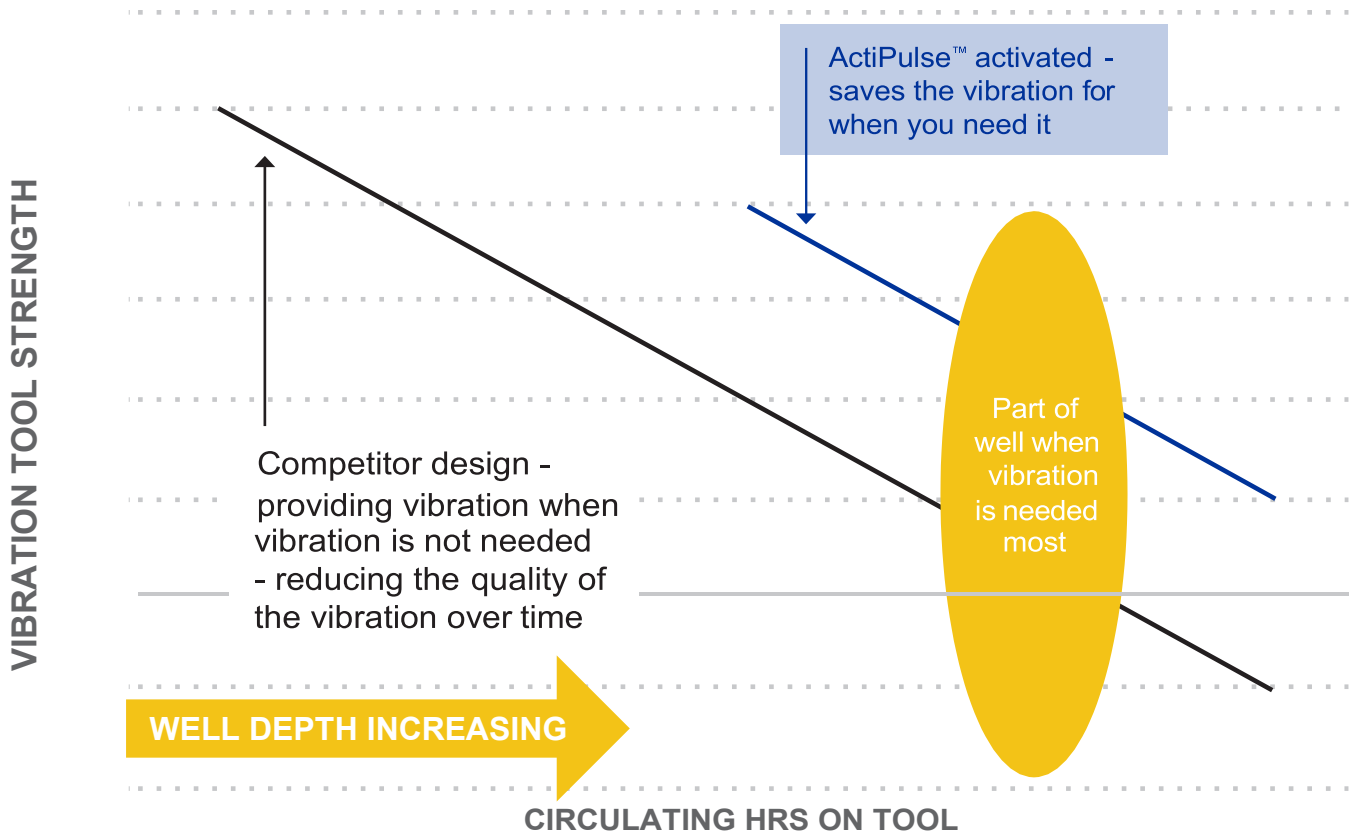
TOTAL RUNDAYS: 34,562
 (Based on years shown below)

RUN DAYS BY YEAR

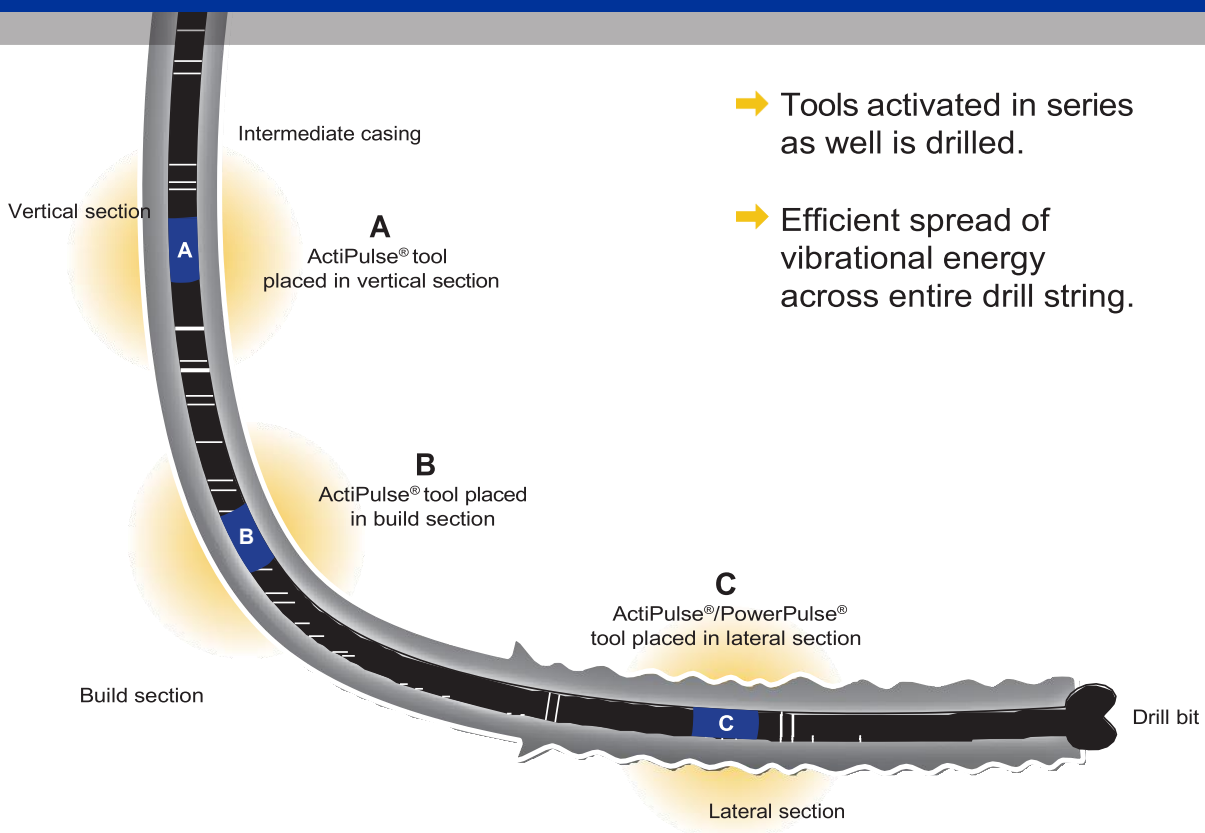


QUALITY OF VIBRATION

VIBRATIONAL TOOL ENERGY VS CIRC HRS ON TOOL



MULTI-TOOL APPROACH

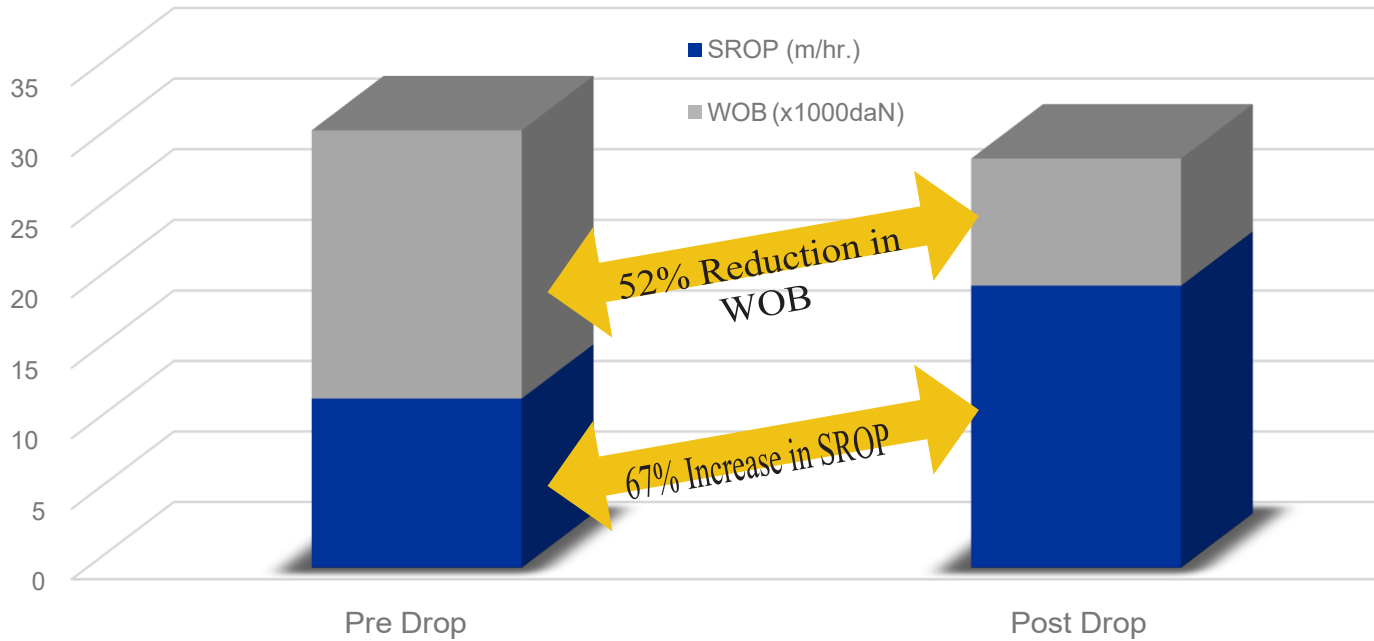


ActiPulse™ CASE STUDY

November 2017 – Alberta, Canada

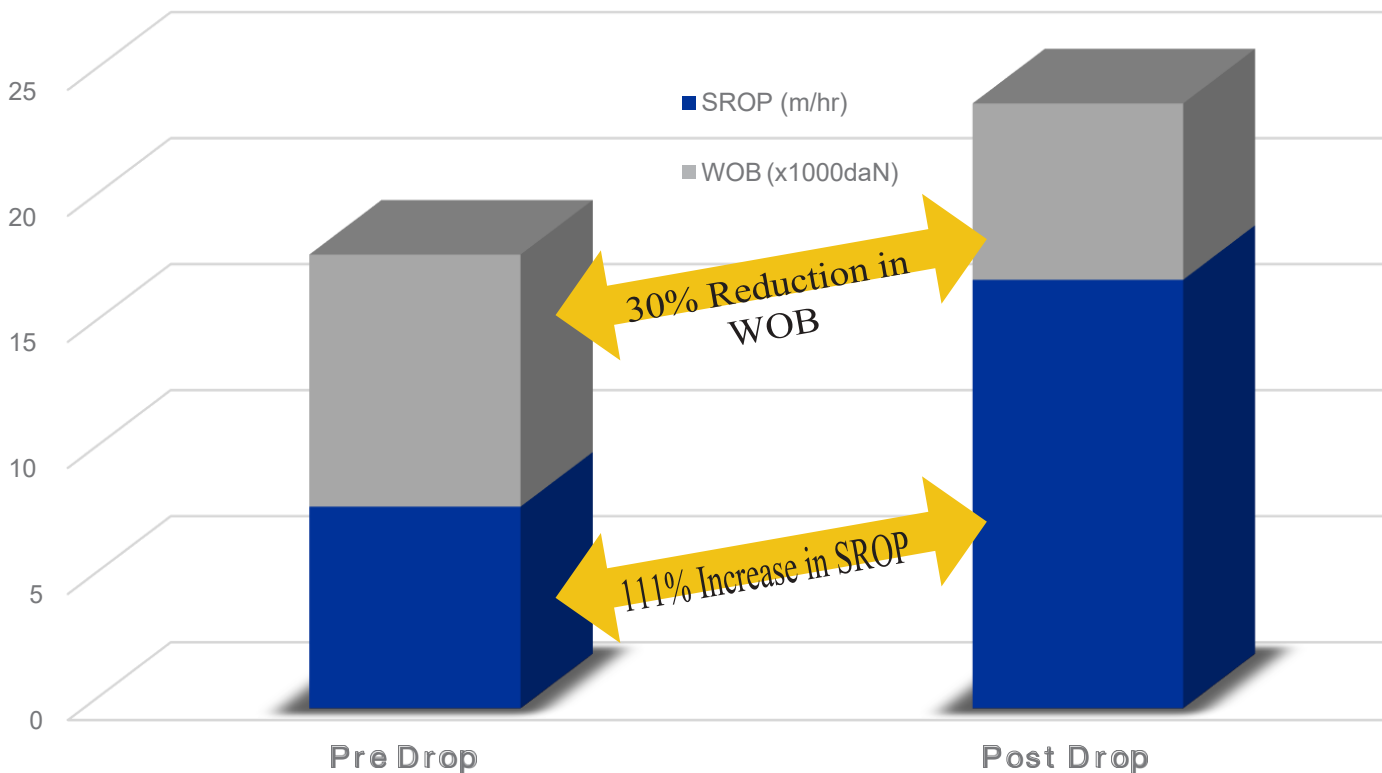
127mm ActiPulse™

ActiPulse™ Tool 592m from bit (Well depth: 1950m MD) in lateral section



165mm ActiPulse™

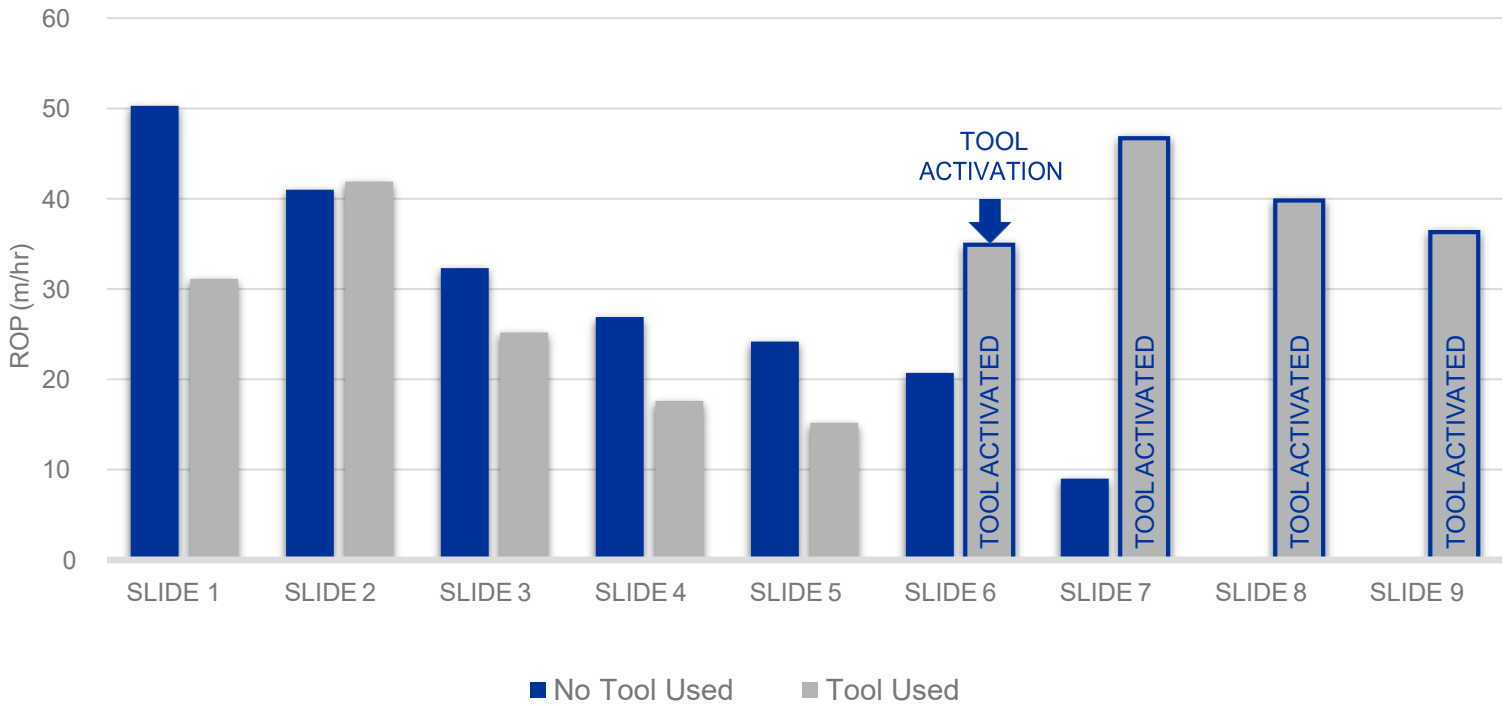
ActiPulse™ Tool 600m from bit in build section



CASE STUDY

January 2017 – Saskatchewan, Canada

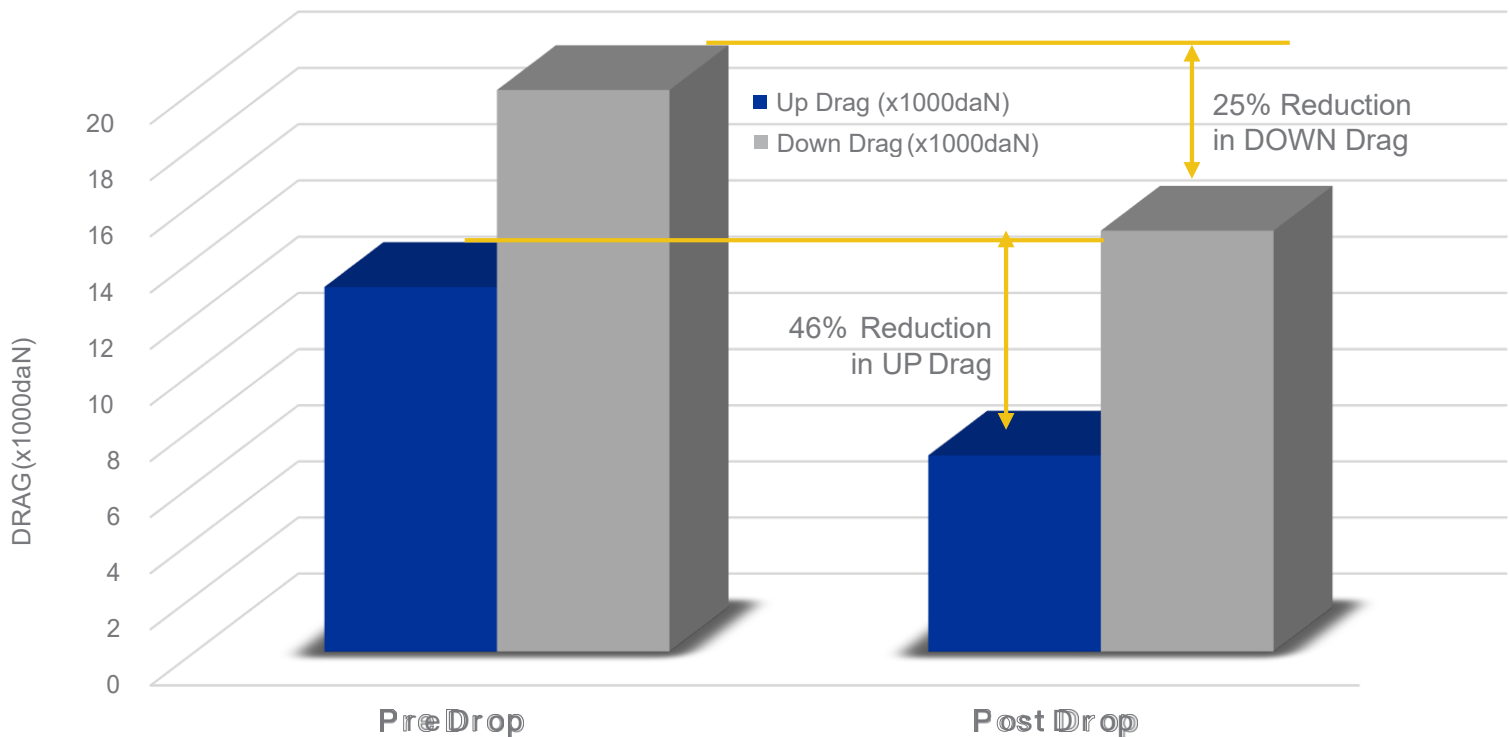
Sliding ROP Comparison



November 2017 – Alberta, Canada

Drag Comparison

ActiPulse™ Tool 600m from bit (Well depth: 2287m MD), pumps ON – Non rotating



HIGH TORQUE SERIES

Offered in both ActiPulse™ and PowerPulse™ configurations, Impulse's High-Torque Friction Reduction Tool series offers versatility for operator needs. PowerPulse™ offers constant vibration and is engaged as soon as the rig pumps are activated. The ActiPulse™ is activated via an activation ball dropped from surface. The tool is designed with the option to run multiple tools in series for long-reach horizontals or complex directional profiles. The tool is then activated as the lateral is advanced thus giving an extremely efficient spread of energy across the entire drill string. A combination of up to three PowerPulse and ActiPulse tools can be run together in series or as required for the drilling application.

**DESIGNED WITH THE CAPABILITY
TO RUN MULTIPLE TOOLS IN SERIES**

**ADJUSTABLE FLOW RESTRICTION TUNED FOR
OPERATING FLOW RATE AND MUD DENSITY**

**LOWER OPERATING PRESSURE TO ALLOW FOR
MORE EFFICIENT DRILLING OPERATIONS**

ActiPulse™

**THE FRICTION REDUCTION TOOL
YOU ACTIVATE WHEN YOU NEED IT**

PowerPulse™

CONSTANT VIBRATION



- 1** Dual acting shock tool maximizes hydraulic axial thrust Drop
- 2** Drop Ball Activation with ActiPulse™ puts you in control*
- 3** Improved material selection increases tool life
- 4** Power section designed for reliable performance
- 5** High-Torque double shoulder thread connections throughout
- 6** Adjustable valve ensures effective pressure drop

**TOOLS CAN BE RUN IN SERIES • MULTIPLE TOOL ACTIVATION
ELIMINATES COSTLY TRIPS • EFFICIENT VIBRATIONAL SPREAD**

CANADA AND USA PATENTS GRANTED, INTERNATIONAL PATENTS PENDING

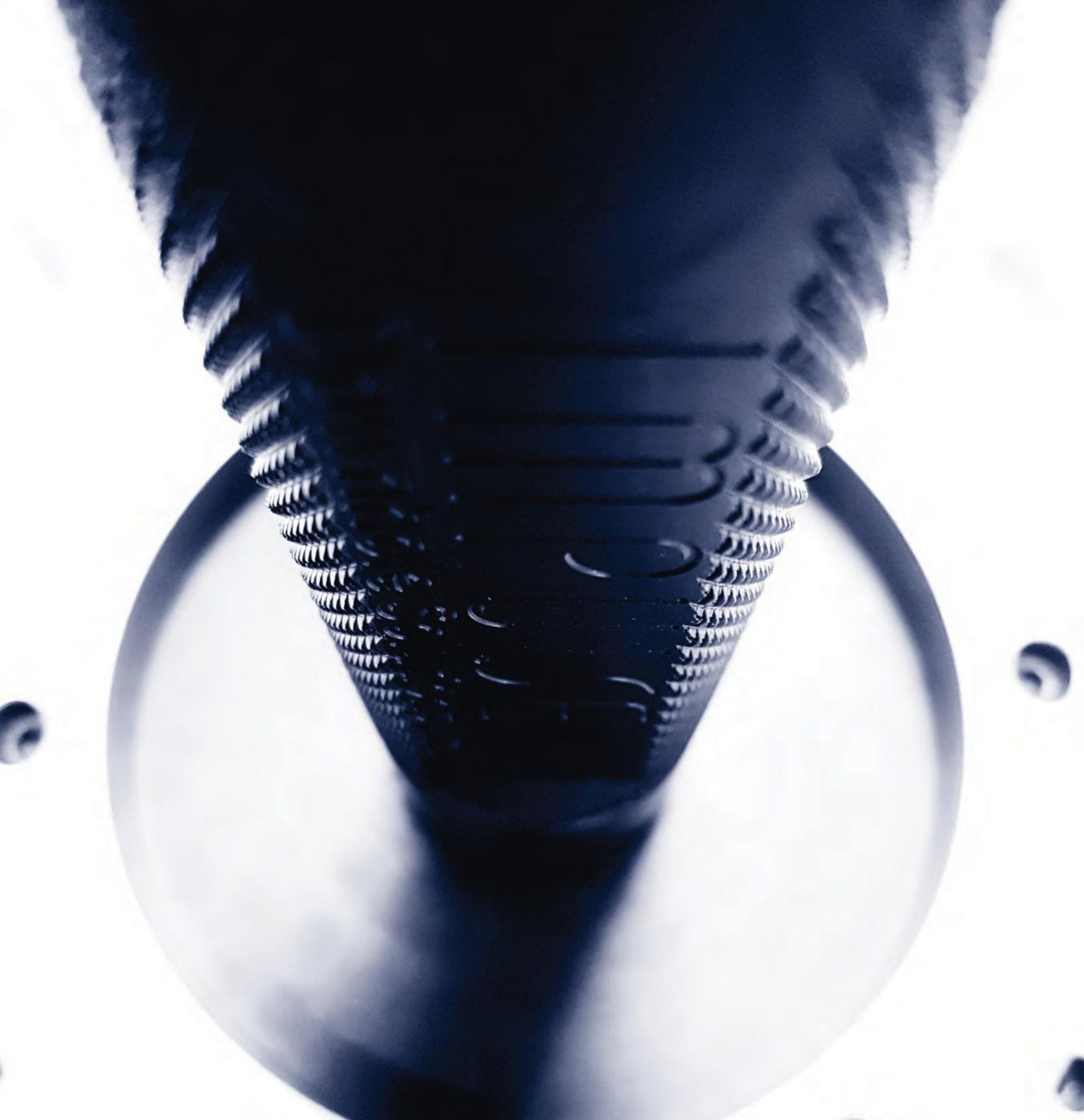
PowerPulse™ And ActiPulse™ HIGH TORQUE SERIES

	500HT	525HT	663HT
TOOL SIZE	5.00 inch (127 mm)	5.25 inch (133 mm)	6.63 inch (168mm)
LENGTH	200 inch (5.08 m)	200 inch (5.08 m)	222 inch (5.64m)
MAX FLOW	350 GPM (1.3 m3/min)	350 GPM (1.3 m3/min)	600 GPM (2.27 m3/min)
AVERAGE OPERATING FLOW	238 to 325 GPM (0.90 to 1.23 m3/min)	238 to 325 GPM (0.90 to 1.23 m3/min)	350 to 600 GPM (1.30 to 2.27 m3/min)
FREQUENCY RANGE	8 to 11 Hz	9 to 13 Hz	6 to 10 Hz
AVERAGE OPERATING FLOW PRESSURE DROP	500 to 725 psi (3500 to 5000 kPa)	500 to 725 psi (3500 to 5000 kPa)	500 to 725 psi (3500 to 5000 kPa)
MAX TEMP For hi-temp applications please contact sales for additional information	285 °F 140 °C	285 °F 140 °C	285 °F 140 °C
STANDARD END CONNECTIONS	XT39	DS40	DS50
DROP BALL SIZES	1.125 inch (29mm) 1.25 inch (32mm) Standard Ball Size 1.375 inch (35mm)	1.125 inch (29mm) 1.25 inch (32mm) Standard Ball Size 1.375 inch (35mm)	1.25 inch (32mm) 1.375 inch (35mm) Standard Ball Size 1.500 inch (38mm)
RECOMMENDED MAKE-UP TORQUE	21,000 Ft-lbs. (28,400 Nm)	21,000 Ft-lbs. (28,400 Nm)	35,000 Ft-Lbs (47,400 N-m)
TORSIONAL STRENGTH	35,000 Ft-lbs. (47,400 N-m)	35,000 Ft-lbs. (47,400 N-m)	60,000 Ft-Lbs (81,000 N-m)
BODY CONNECTIONS TORSIONAL STRENGTH	35,000 Ft-lbs. (47,400 N-m)	35,000 Ft-lbs. (47,400 N-m)	58,000 Ft-Lbs (78,000 N-m)
BODY CONNECTION TENSILE	515,000 Lbs. (230,000 daN)	584,000 Lbs. (260,000 daN)	750,000 Lbs (336,000 daN)
RECOMMENDED MAXIMUM PULL *	386,000 Lbs. (171,000 daN)	439,000 Lbs. (195,000 daN)	562,000 Lbs (250,000 daN)

SAFETY JOINTS AVAILABLE UPON REQUEST

ALL END THREAD CONNECTIONS MAY BE EITHER CERTIFIED OR INDUSTRY STANDARD COMPATIBLE

* For operating parameters outside listed specifications, consult with Impulse Representative



TLOS
iIPULSE
DOWNHOLE TOOLS