Faster and Further

Drill Bit Technologies to Drive Efficiency

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March 2022

The Evolution of the iPhone: Every Model from 2007–2022
By Conner Carey Updated 01/11/2022
https://www.iphonelife.com/content/evolution-iphone-every-model-2007-2016

Faster and Further

Drill Bit Technologies to Drive Efficiency

Increase production and come in under budget

Responsive service delivery

Applications Engineering and Design Engineering

Delivering drilling insights through detailed applications analysis and product development

Baker Hughes

Abrasive Sands

Save A Trip

APPLICATION

East Texas

Haynesville/Bossier

Travis Peak

Transition

Cotton Valley

CHALLENGES

Abrasive Sandstones

Hard Interbeds

Downhole Vibrations

DETAILS

- 6,600’ fast erratic ROP to Travis Peak
- 1,400’ @ 50 ft/hr - Slow consistent ROP thru Cotton Valley
- WOB range 40 – 85 klbs (limit 55 klbs for 5” drillpipe)
- In-bit sensing: bit goes from stick slip to whirl in/out of stringers

9-7/8” D506X

Maximize Diamond Density

6 Blades, 16mm Cutters

Longer Profile

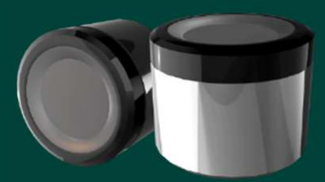
Back-up Cutters

Shaped Inserts

Stay Sharp

Wear Resistant Diamond

Heat Resistant Geometry



Maintain Stability

Back-Up Ovoids

6” Gage

Baker Hughes

Carbonates

Consistent One Bit Section

APPLICATION

New Mexico

Delaware Basin

Shale

Limestone

Sandstone

CHALLENGES

Discontinuous Drilling

Efficiency in Carbonates

DETAILS

- 6,400’ @ 135 ft/hr
- 7” motor w/ 1.15° AKO for 15° tangent
- Impact damage through transitions
- Sharp cutting edge needed in carbonates

8-3/4” D507VTWX

Maximize Diamond Density

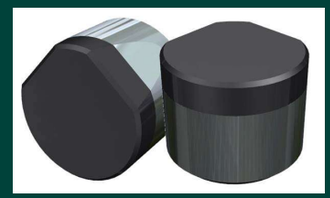
7 Blades, 16mm Cutters

Medium Profile

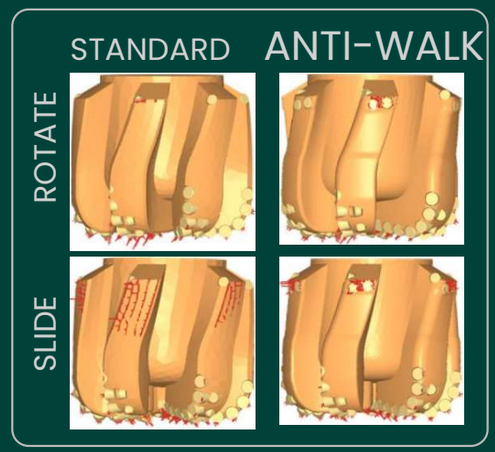
Back-Up Cutters

Cutting Efficiency

Scribe Geometry



Directional Control



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Lateral on Motor

15,000 ft Lateral in One Run

APPLICATION

West Texas

Delaware Basin

CHALLENGES

Directional Control

Heterogenous “Ratty” Interbeds

Ring-Out/Core-Out Damage

Cyclic Torsional Fatigue

DETAILS

- ROP: 136 ft/hr
- HRS: 110
- High torque output from 5.5” motor
- Off-center drilling in rotation mode w/ 1.83° AKO

6-3/4” DD406TW

Axial Directional Control

Flatter Profile

Depth of Cut Control

Shaped Inserts

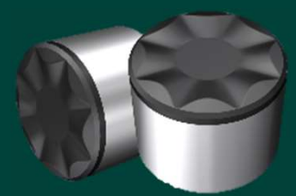
Lateral Directional Control

Anti-Walk Gauge

Stay Sharp

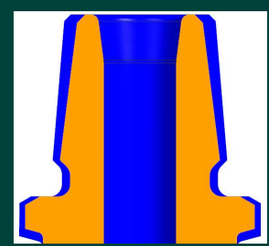
Impact Resistant

Diamond & Geometry



Reliability

NC Connection



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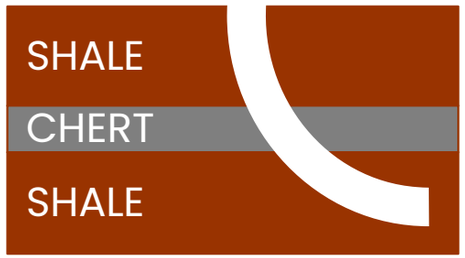
Curve on Motor

Consistently Land The Curve

APPLICATION

Oklahoma

Woodford Shale



CHALLENGES

Holding Toolface

Impact Damage in Chert

DETAILS

- PDCs erratic toolface in soft shales
- 15 – 30 hr curves
- 14° – 16° BUR
- 100% sliding
- 2.02 – 2.38 AKO
- 150 – 250 motor RPM

8-3/4" K5M425E

Toolface Control

Dual cutting action of 5 blades and 2 cones reduces reactive torque and delivers consistent build rates

"Rolling depth of cut control"

Durability

Dense TCI cutting structure and offset PDC layout provides protection through hard chert

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Rotary Steerable

Two Miles A Day

APPLICATION

West Virginia

Appalachian Basin - Marcellus

CHALLENGES

Stability

Cleaning

Aggressiveness

Steerability

DETAILS

- AutoTrak Curve push/point system
- 12,118’ in 24 hrs
- ROP: 505 ft/hr
- Making a connection every 11 minutes

8-1/2” ATD505

Stability & Aggressive

Optimized cutting structure layout with lower backrakes

Hydraulic Efficiency

Large open junkslots for cuttings evacuation

Steerability

Under-sized step gage to balance bit tilt and stability

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