SMITH BITS
A Schlumberger Company

Impax

Percussion drilling hammer system

APPLICATIONS

- Medium-hard to hard formations
- Vertical holes and lateral sections
- Directional holes

BENEFITS

- Eliminates components most likely to fail during tough drilling conditions
- Drills in deep hot-hole applications
- Improves handling in water mist and influx
- Lasts longer in harsh environments

FEATURES

- Integral steel valve design that eliminates the need for blow tubes
- Bit retention system retrieves bit head without fishing if the bit shanks, reducing cost of fishing or sidetracking
- Bypass choke system allows high air volume for good hole cleaning in deep wells during high ROP
- Sustainable piston velocity enables system to maintain ROP when converting from dust to mist drilling

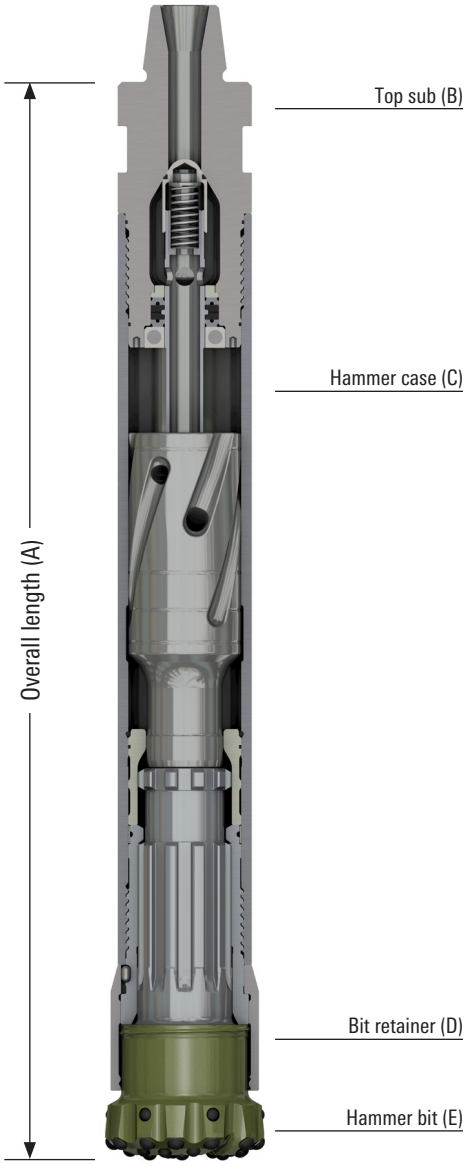
The Impax* percussion drilling hammer system has a simplified design with fewer components for a more durable performance in harsh environments. The percussion drilling tool uses high-shock energy for air drilling operations, and features a bypass choke system allowing continuous air flow to the annulus for improved hole cleaning. The system uses high operating pressure and air volume to drill deep wells while maintaining high ROP and sufficient annular velocity to keep holes clean.

Integral steel valve design reduces trips out of hole

The integral steel valve design is a key feature that eliminates the need for blow tubes, a component that often fails in tough drilling conditions, forcing operators to trip out of hole to replace it. Instead, the valving function is accomplished by an external guide sleeve surrounding the piston nose. The sleeve does not receive direct impact forces, and its steel body is not prone to failure from temperature or by erosion from water. Eliminating the blow tubes also enhances the system's ability to handle water mist, influx and high temperatures in deep wells.

Bit retainer system eliminates need for bit fishing in event of shanking

The Impax hammer system includes a proven bit retainer system that retrieves the bit head in the event that the bit shanks. The system's primary retention mechanism is a set of split retaining rings at the top of the hammer bit. The bit retainer is a sleeve that is trapped between the shoulders of the driver sub and the hammer case. It catches the bit head if a shank, or a fracture in the spline area, prevents the primary retention rings from functioning. The secondary catch mechanism is a rope thread machined on the retainer ID and on the hammer bit OD. Right-hand rotations of the drillstring during the trip out of the hole virtually eliminates any chance of the bit head coming out of the retainer.



The 8-in Impax hammer system has a floating feed tube to ensure the piston and feed tube are in proper alignment, which reduces wear and risk of premature failure.

Impax

Floating feed tube decreases wear and downtime

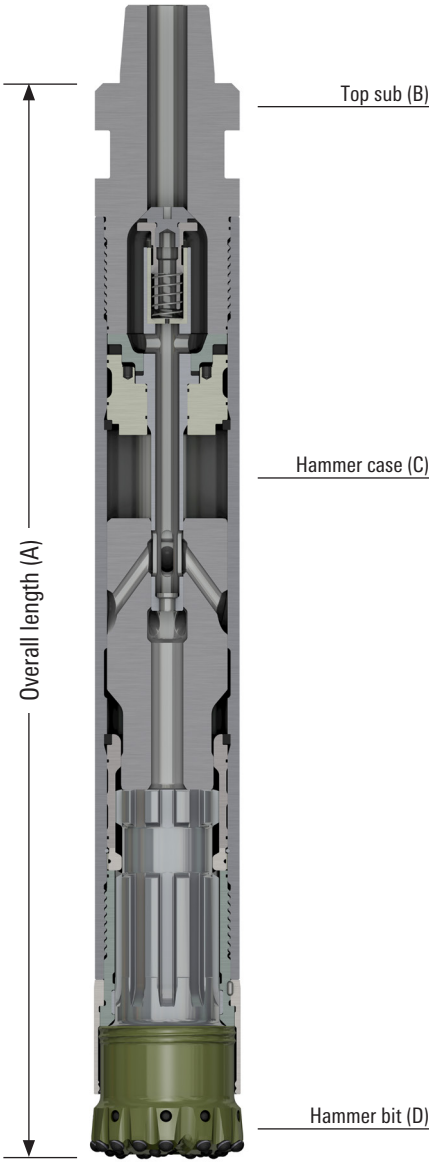
The Impax hammer system has an improved air delivery system that features a patented floating feed tube. The tube is designed to reduce wear and downtime related to wear on the piston and air delivery components.

Since high-back pressure, circulation volume, and the water produced from misting and influx are causes of hammer failure, the system's lower chamber was designed to handle 10–20% more water than conventional systems. When water incursion forces conventional hammers to be tripped out of the well, the Impax hammer system's combined capabilities enables it to endure deephole drilling conditions while delivering reliable performance. The Impax hammer systems are available in 8-, 10-, and 12-in sizes.

Impax Specifications

		8 in	10 in	12 in
Pressure drop, psi		250	250	250
CFM range		2,000–5,000	2,500–5,500	2,500–6,000
Choke sizes, in		Up to ½	Up to ⅝	Up to ¾
Beats/min		1,400–1,800	1,400–1,800	1,400–1,800
Tool weight, lbm		500	770	1,350
(A) Overall length (including bit), ft [in]	On bottom	4.83 [58] 7⅞–8⅞-in bits	5.58 [67] 9½–11-in bits	6.92 [83] 12¼–12⅜-in bits
				7 [84] 14¾–15-in bits
				7.08 [85] 17½-in bit
	Off bottom	5 [60] 7⅞–8⅞-in bits	5.75 [69] 9½–11-in bits	7.08 [85] 12¼–12⅜-in bits
				7.16 [86] 14¾–15-in bits
				7.25 [87] 17½-in bit
(B) Available top subs		4½-in API Reg pin	6⅝-in API Reg Pin	6⅝-in API Reg Pin
(C) Hammer case, in (OD × Length)		7.125 × 40.3	9 × 47.5	10.75 × 60.53
(D) Hammer bit	Bit size, in	7⅞–8⅞	9⅜–11	12¼–17½
	Shank	IR380	N100	QL120, N125
Internal makeup, ft.lbf		20,000	35,000	45,000
Pin conn makeup, ft.lbf		21,000†	47,000†	47,000†
Maximum hole loading rate, gpm		150	200	250

† Must be used with top sub wrench



The 12-in Impax hammer system's integral steel valve design increases the hammer's resistance to failure from high temperature or erosion from water.

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