TUBULAR RUNNING SERVICES

dDwC™ DIRECTIONAL DRILLING-WITH-CASING SYSTEM

Isolate problematic zones while drilling vertical and extended-reach wells

Weatherford®

A NEW DIRECTION FOR
WELL-CONSTRUCTION EFFICIENCY

Trip your directional-drilling BHA in or out of hole while the casing string remains at bottom.

Simultaneous drilling and casing operations satisfy your need for speed but lack directional capabilities.

Our dDwC™ technology accommodates a complete directional-drilling bottomhole assembly (BHA) to precisely achieve your directional drilling objectives. The system enables you to not only drill and ream with casing but also retrieve the bottomhole assembly (BHA) without pulling the entire casing string.

Well suited for vertical, directional, and extended-reach drilling wells, the dDwC™ system enables replacing damaged or worn BHA components while the casing string remains at bottom. Once at total depth (TD), you can recover expensive advanced measurement and drilling systems and cement the borehole.

DwC TECHNIQUES REDUCE OVERALL DRILLING COSTS AND RISKS

Our drilling-with-casing systems accelerate well construction, reduce risk exposure, and mitigate potential hazards. These technologies help you to run, ream, drill, set, and cement your casing or liners in a single trip.

ENHANCE OPERATIONAL SAFETY

Reduce your risk exposure compared to conventional drilling. DwC systems minimize rig-floor equipment, require fewer trips, and reduce manual handling of tubulars. The technology also lessens trip-related surges and swabbing effects that can lead to wellbore instability and well-control threats.

CONSTRUCT YOUR WELLS FASTER

Each foot drilled is simultaneously cased off. DwC systems eliminate conventional drillstring tripping along with the associated trip margin required to mitigate swabbing effects when tripping out of the hole.

TURN TROUBLE ZONES INTO COMFORT ZONES

Problem zones stay behind the pipe. DwC systems overcome depleted zones, pressure transitions, and wellbore instability without mud additives, cement, or resins. The casing remains consistently at the bottom and reduces sticking to help it reach the target depth in a single run.

SIMPLIFY WELL ARCHITECTURE

Your tubular inventory can be reduced. Our technology can reduce surface-casing size or eliminate contingency casing or liner strings. The system can also eliminate a casing or liner string by successfully drilling into or through a pressure transition or lost-circulation zone.

PROMOTE THE PLASTERING EFFECT

Sealing off trouble zones averts the need to run a contingency string. Using a proprietary software system, we customize a lost-circulation materials to create an ideal particle-size distribution. This material reduces fluid-loss rates, creates a strong wellbore, widens the mud-weight window, and prevents potential kicks.

DRILLING SPEED MEETS CONTROL

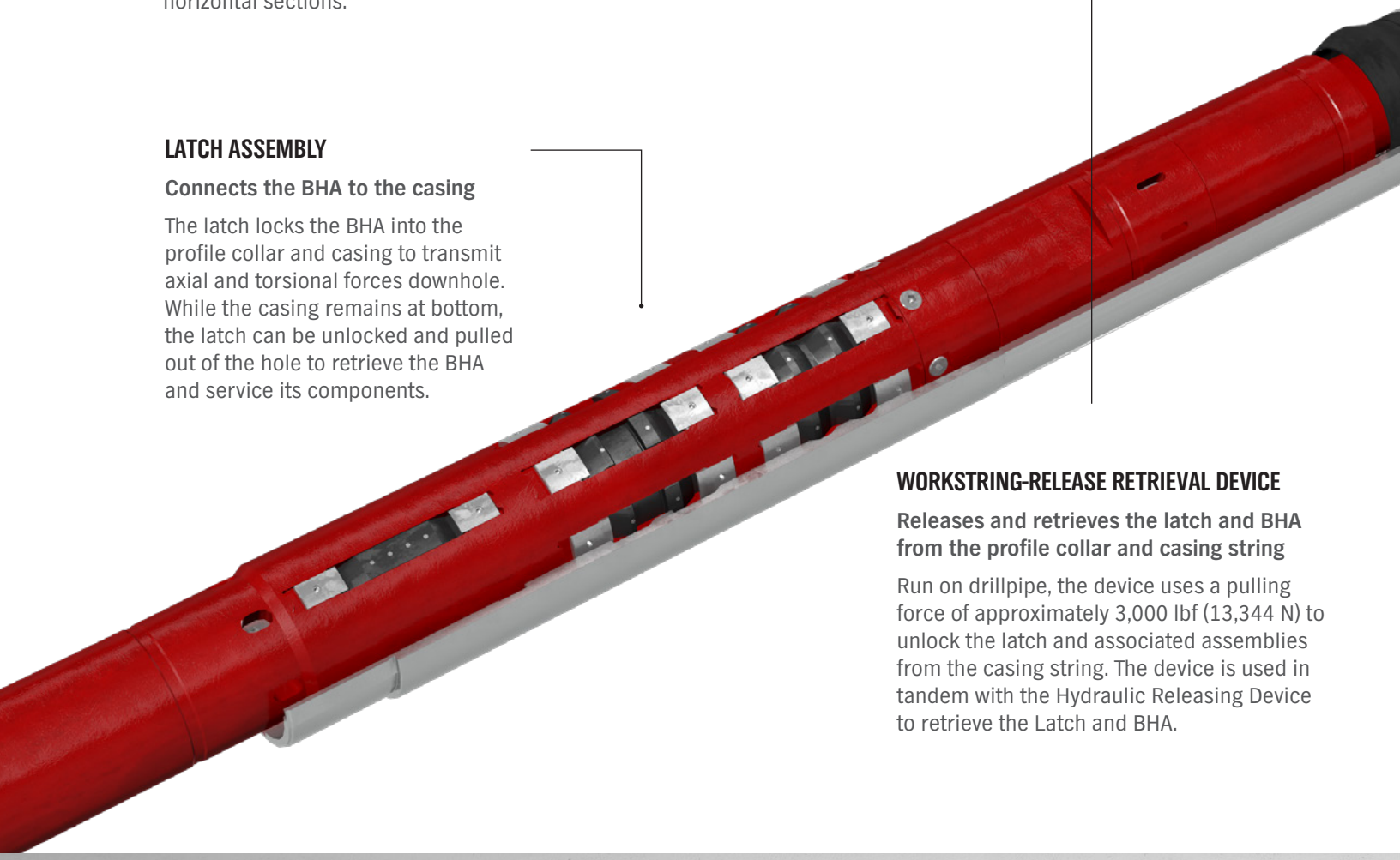
Problem zones stay behind the pipe while tripping the BHA in or out of hole.

Comprised of four key parts, the dDwC™ system simultaneously drills and cases directional wells with vertical, directional, and horizontal sections.

LATCH ASSEMBLY

Connects the BHA to the casing

The latch locks the BHA into the profile collar and casing to transmit axial and torsional forces downhole. While the casing remains at bottom, the latch can be unlocked and pulled out of the hole to retrieve the BHA and service its components.



WORKSTRING-RELEASE RETRIEVAL DEVICE

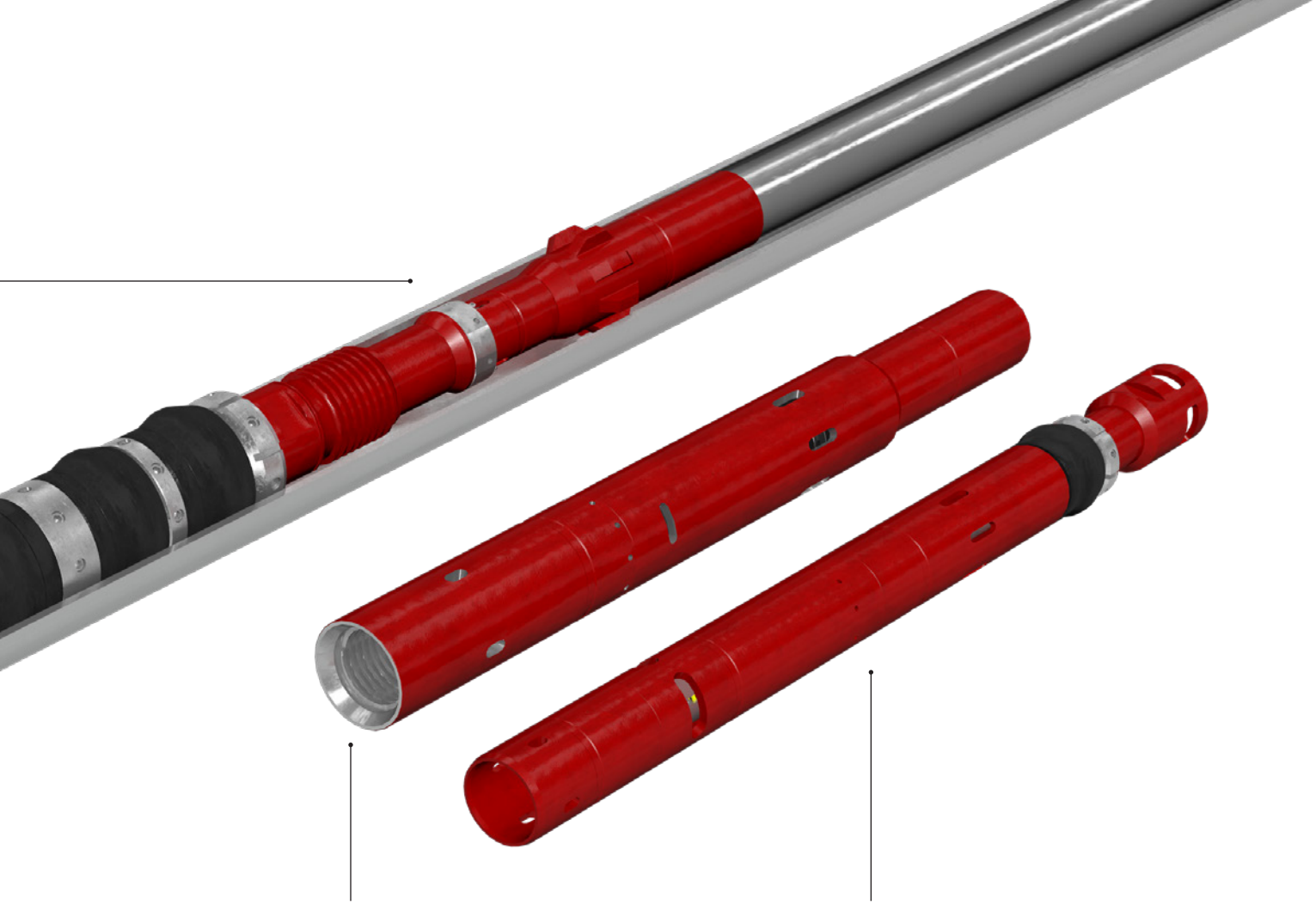
Releases and retrieves the latch and BHA from the profile collar and casing string

Run on drillpipe, the device uses a pulling force of approximately 3,000 lbf (13,344 N) to unlock the latch and associated assemblies from the casing string. The device is used in tandem with the Hydraulic Releasing Device to retrieve the Latch and BHA.

DIRECTIONAL DwC SYSTEM ACCESSORIES

DwC latchable cement plug latch into a dedicated cement-plug profile collar to enable flexible cement placement based on shoe-track length requirements.

The DwC RipTide® drilling reamer—developed specifically for the dDwC system—is a shortened polycrystalline-diamond-compact (PDC) reamer that passes through an 8.38-in. (212.9-mm) drift and opens to a 12.25-in. (311-mm) diameter.



HYDRAULIC LOCKING DEVICE

Locks the latch and BHA into the profile collar

Tripped via drillpipe inside casing, the device is run on top of the latch assembly and new BHA until the latch is seated in the profile collar. A ball drop and pressure sequence locks the device in the profile collar, closes bypass ports allowing dDwC™ operation to continue. Tripped via drillpipe inside casing, the device is run with the latch assembly and replacement BHA until the latch is seated and locked in the profile collar.

HYDRAULIC RELEASING DEVICE

Releases the latch from the profile collar

After reaching target depth, the HRD is released from the rotary table using a launching device above the casing stump. Continued pumping and pressure buildup initiates the release of the latch from the profile collar. An abrupt drop in standpipe pressure indicates the release of the BHA from the casing string, and the string can then be lowered to cover the rathole left by the BHA stickout.

The DwC casing reamer reams the rathole in front of the underreamer and can be used for backreaming.

DwC centralizers minimize casing wear. DwC centralizers provide required casing standoff, reduce torque and minimize casing wear.

The DwC well-control device circulates kill mud during a well-control event in which the drillpipe is positioned inside the casing.

REPLACE BHA COMPONENTS AT ANY STAGE OF DRILLING WITH THE dDwC™ SYSTEM.

Should a drilling BHA component fail, the dDwC™ system enables the BHA to be retrieved and replaced while the casing remains at bottom.

OPERATING SEQUENCE

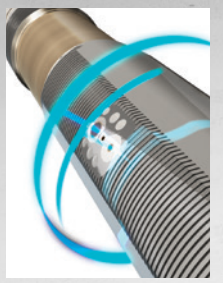
TRIP THE WORKSTRING-RELEASE RETRIEVAL DEVICE IN THE HOLE.

The device connects to the latch assembly, which then unlocks from the profile collar. Jetting ports on the bullnose clean debris to facilitate stabbing in and engaging with the GS spear.

APPLY TENSION TO THE DRILLPIPE WORKSTRING.

Tension releases the latch assembly and BHA from the casing. The BHA is retrieved to the surface while the casing remains at the bottom of the hole.

WEATHERFORD DRILLING SERVICES MAXIMIZE RESERVOIR EXPOSURE AND REACH YOUR PREFERRED TARGET



LWD SYSTEMS—including the Wave™ series sensors—deliver real-time petrophysical, geosteering, imaging, geophysical, and geomechanical data.

MAGNUS RSS executes reliable high-performance drilling with precise directional control.

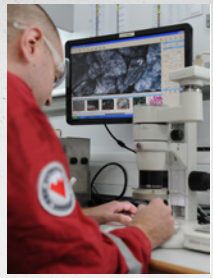
CONNECT A REPLACEMENT BHA.

The replacement BHA, hydraulic locking device, and latch assembly are tripped downhole on a drillpipe workstring until mechanically locking into the profile collar. A steel ball is then dropped, which causes pressure buildup that triggers the locking mechanism. Pressure bleed-off confirms proper locking of the BHA and latch.

RETRIEVE THE WORKSTRING TO THE SURFACE.

The workstring turns to the right to unscrew the hydraulic locking device, which enables the workstring to trip out of the hole. Directional drilling with the dDwC™ system continues until TD.

BOREHOLE ENLARGEMENT SYSTEMS— featuring the RipTide drilling reamer and JetStream® circulation sub—deliver single-trip reaming and hole cleaning.



SURFACE LOGGING SYSTEMS offer comprehensive technologies—from conventional mud logging to advanced wellsite geochemical analysis—to maximize drilling efficiency.

MAXIMIZE WELL-CONSTRUCTION EFFICIENCY

The Weatherford dDwC™ drilling-with-casing system provides simultaneous drilling and casing operations with a directional-drilling BHA. To learn how our technology can work for you, please connect with us at **weatherford.com/dDwC.**

CONNECT WITH WEATHERFORD

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