

Advancing Reservoir Performance

Mechanical Pipe Cutter (MPC)



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- Baker Hughes Mechanical Pipe Cutter cuts a wide range of casing and drill pipe without using explosives or chemicals. This new technology cuts standard and exotic metal pipes under some of the harshest conditions, and typical cuts occur in less than ten minutes – getting jobs quickly back on track.
- Designed to precisely cut in environments up to 392° F [200° C] and at 20,000 psi [137.9 MPa], these unique cutting tools cuts pipe ranging from 2 7/8 in. [73 mm] to 7in. [177.8 mm]. The advanced design enables it to cut a wide variety of tubulars, including most weights, grades and alloys.
- The tool is programmable to optimize its operation based on the type of cut. This slim 2 1/8 in. [54 mm] diameter tool is also easily transported for quick offshore or remote deployment.

2 1/8" MPC Specifications

- Tool Length: 18.16ft
- Weight: 141 lbs
- Tool Diameter: 2 1/8" for cutting pipes 2 7/8" to 4"
- 60mm Blade for cutting pipes 4" to 4 1/2"
- Temperature F/C: 392°F [200°C]
- Pressure Rating psi: 20,000 psi
- Maximum Wall Thickness: 0.75"

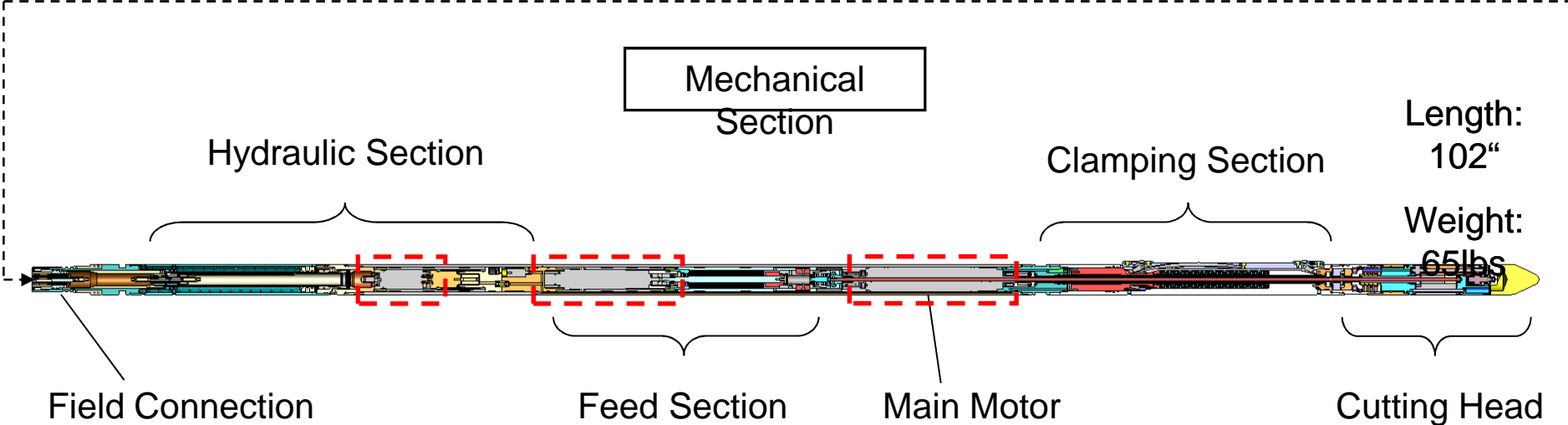
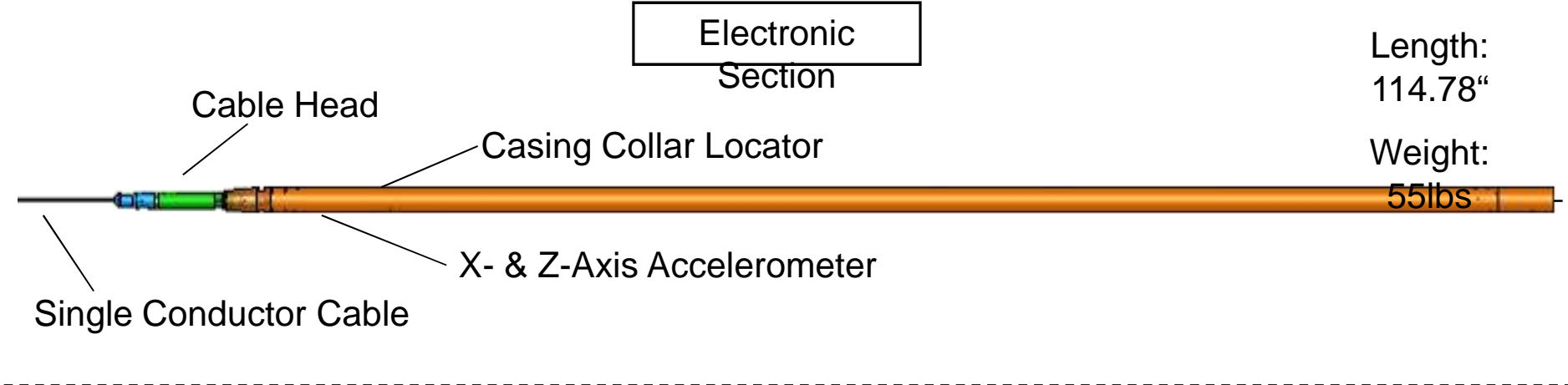
MPC Features

- Surface-monitored cut penetration precise cuts
- Cuts steel, stainless steel, and alloy pipe (chrome)
- Unlimited setting and resetting
- Non-ballistic and non-chemical
- Easily transportable (two 9-ft sections)
- Runs on any single-conductor electric wireline
- Minimal debris
- Small filing debris
- No explosive storage no hazardous chemical HSE compliance.

Benefits

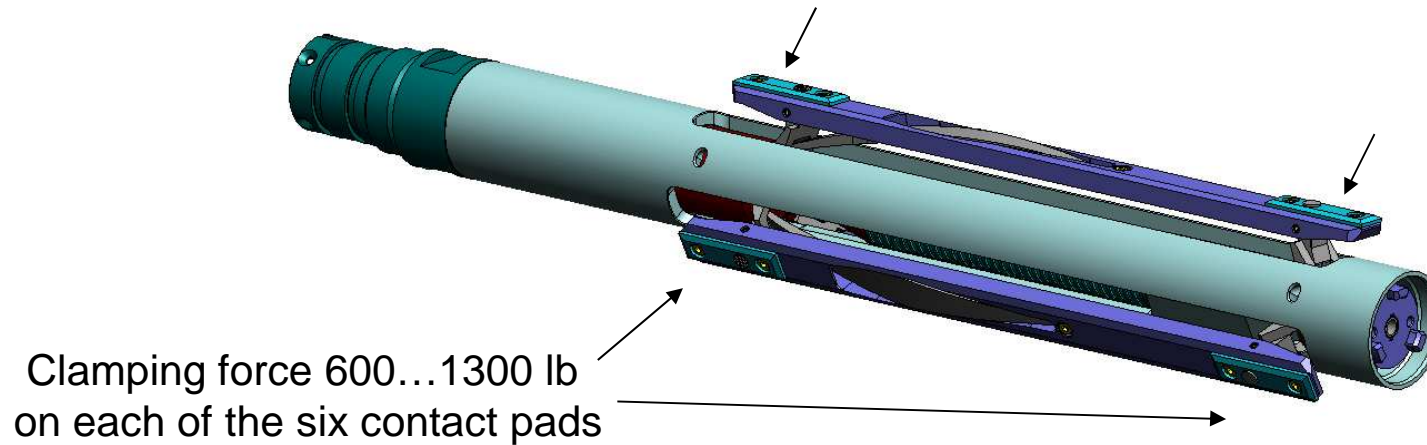
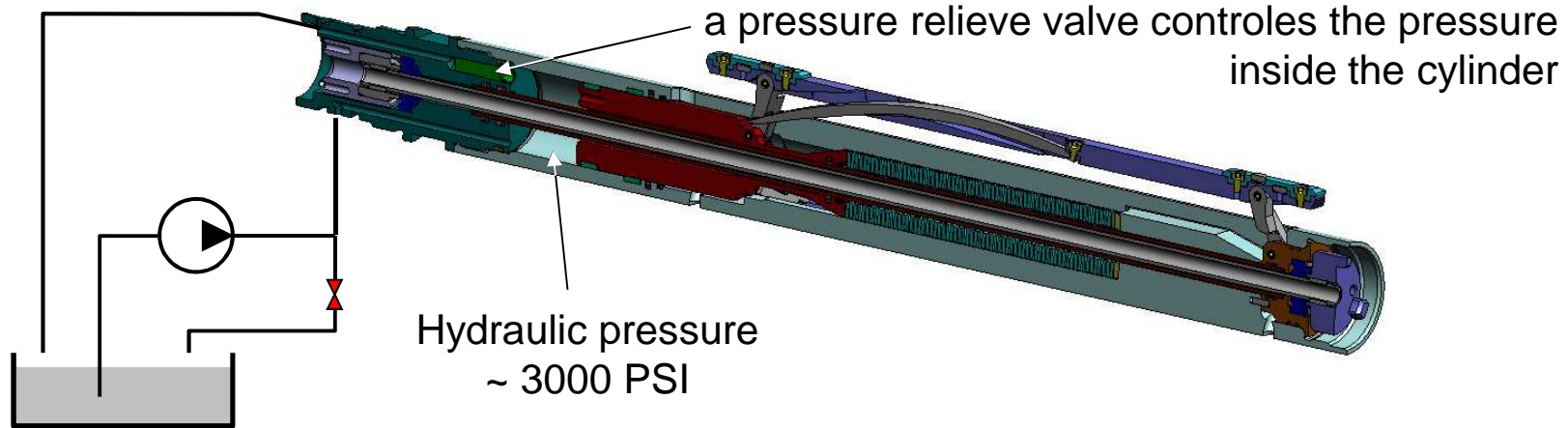
- Non-hazardous materials/rapid deployment
- Clean, precision cut/minimal debris
- No damage to other strings/cut assurance
- Cuts a variety of pipe
- Safe to cut near the surface and in impossible hardware such as Plugs.
- Average cut time less than 10 minutes – pipe dependent
- Passes through restrictions to cut larger pipe

MPC - Overview



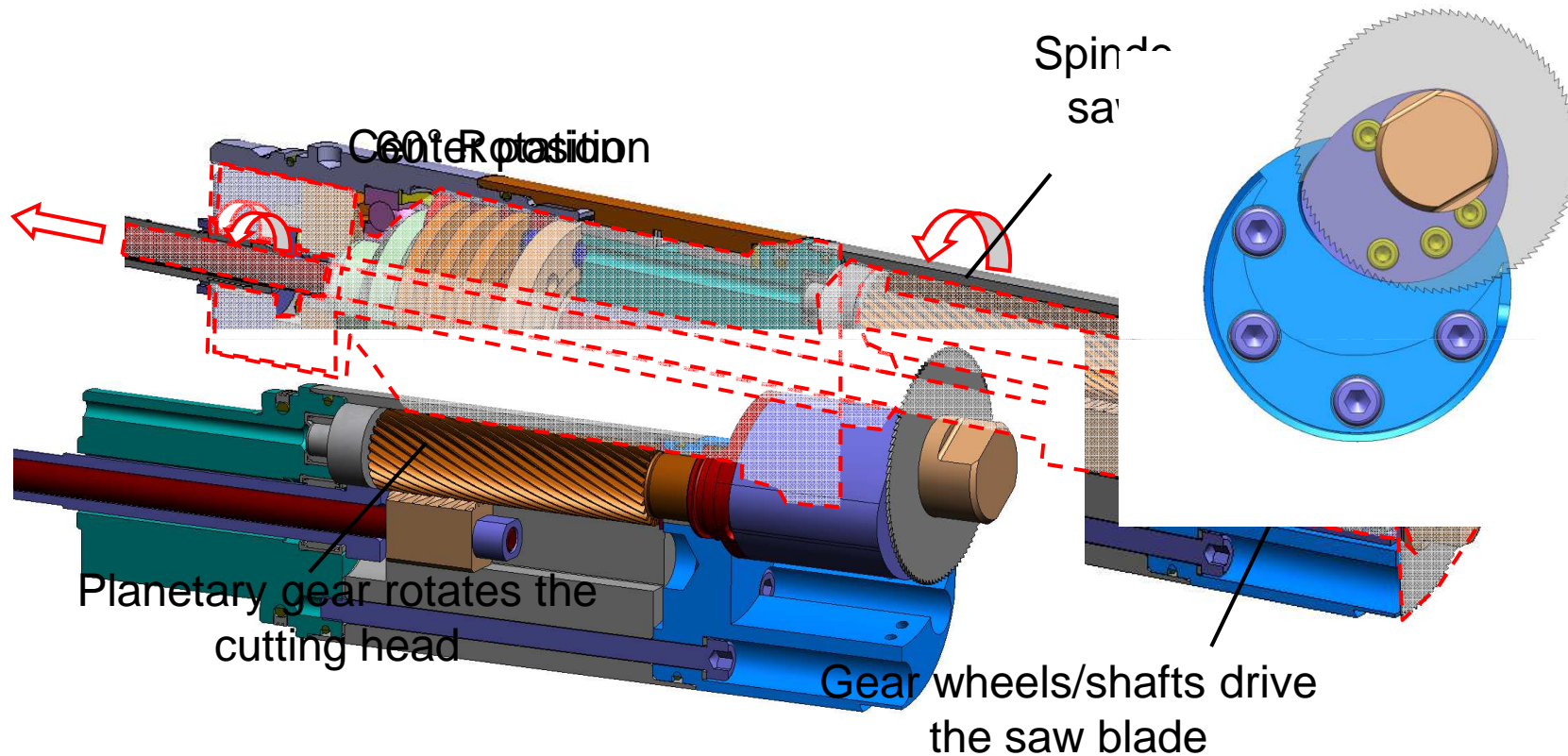
The Clamping Process

Motor is shut down, a solenoid valve opens, spring force retracts the anchor
Hydraulic pump motor runs during milling keeping tool anchored in place



The Cutting Process

- During the cutting operation the milling disk is guided on a spiral cutting path through the tubing wall



MPC Control – Main Menu

The screenshot shows the MPC Control software interface with several sections annotated by brackets:

- Control of clamping mechanism:** Includes Pipe OD (3.500 in.), Lock Arms (DEPLOY ARMS, RETRACT ARMS), and a Closed status indicator.
- Control of cutting head:** Includes Milling Disk Feed (0.10 mm/min, Actual 0.00), Main Motor (4000 RPM), Disk Diameter (50 mm), and Cutting Process (START CUT, STOP CUT).
- Output data:** Includes RPM (Main: 0, Feed: 0, Hydraulic: 0) and CHV (V) (0.0).
- Wireline Selection:** Includes a Conductor dropdown menu set to NORMAL.

Visualizations include a schematic of the clamping mechanism and a circular diagram of the cutting head.

- The software ensures to ...
 - set the appropriate parameters while cutting
 - start/stop functionalities of the MPC
 - visualize the progress of the clamping process
 - visualize the cutting progress
 - display the most important real time data

Video of MPC cutting CR13-95



Small filing Debris



Examples of Pipe cuts



J-55 & CR-13 Field Cuts











FAQ

- **How can you control the cut of the tubing without penetrating (damaging) the casing?** Before any operation is begun, the maximum cutting OD is programmed; the tool will shut down once it reaches 1/8" past the programmed OD. The operation of the tool is continually monitored from the surface and the cutting process can be suspended at any time. The cutting rate can be adjusted from surface (down to as low as 0.1mm / minute) so we can easily ensure that the cut does not 'overrun'. Finally, there are accelerometers built into the tool to show when the pipe separates, allowing termination of the cut at that point.

FAQ

- **What is the maximum thickness you can cut?** The tool can cut a wall up to 0.75" (19mm) using the 60mm blade and 0.5" (12.7mm) using the 50mm blade.
- **Are you using different blades for different grades or alloys?** Most cuts are done with the standard grade blade. HTC is still experimenting with tougher blades to cut the harder alloys such as INCONEL. All field cuts are currently done with a standard blade in either 50 or 60mm diameter.

FAQ

- **Can you cut the tubing under compression?** NO. The cutting blade will bind under compression once sufficient material has been removed during the cutting process. If this happens, it will likely break the blade (or you will have to pull the tool to break the blade).
 - The MPC must only cut when the tubular is in tension or at least above neutral.

Thank you!



Baker Atlas