



ENGINEERING INNOVATION
WORLDWIDE

TIW[®] XPak[™]

Liner Hanger System

TIW XPak[™] System

The TIW XPak[™] Expandable Liner Hanger System is designed to run with standard liner applications and incorporates industry-proven expandable technology to provide a liner top anchor/sealing device unmatched in the industry. The TIW XPak[™] system is used anywhere a robust liner top seal is needed or where a slimhole design is required to mitigate ECD issues. The TIW system has been used on land and offshore around the world from the U.S. and Canada to the Middle East and North Sea.

The unique design of the TIW XPak[™] System allows a relatively short expanded section to provide a pressure differential rating equal to the well bore casing design and a hanging load capacity equal to or greater than conventional liner hangers. The slim profile, with no external parts, allows an increased bypass area in most sizes and

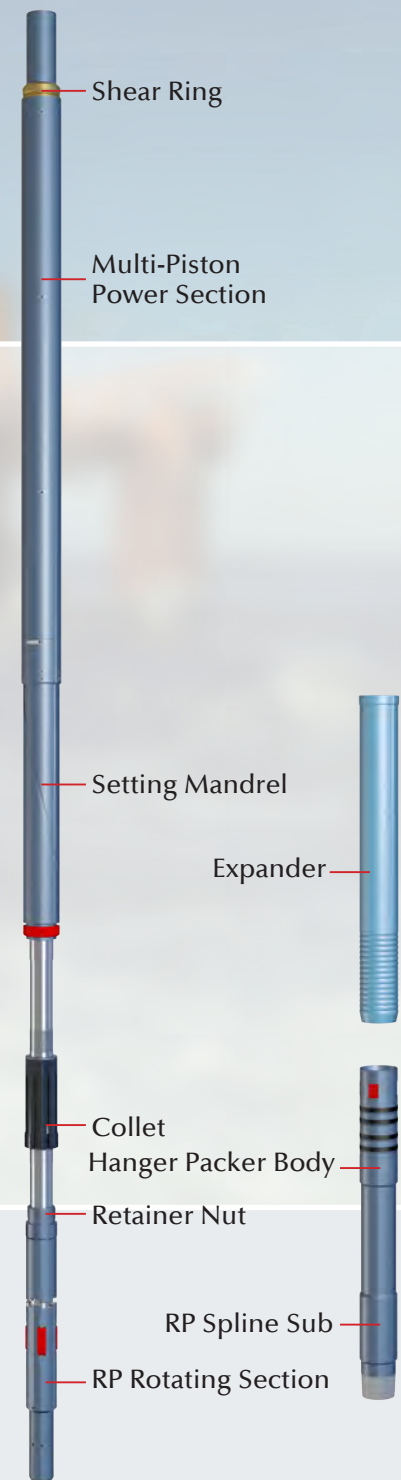
the robust running tool design provides high torque capabilities for rotation and/or drilling with liner operations.

The TIW XPak[™] Liner System is manufactured from standard OCTG material and can match most casing grades. The system is also available in CRA material.

The Ultimate Liner Top Seal

The expandable section of the hanger generally ranges from 16 to 24 inches in length. Dovetailed slips provide high load capacity and the combination of metal to metal seal with elastomer back up seals after expansion provide a high pressure gas tight seal at the liner top.

The expander mandrel is left in place after expansion and provides full support across the expanded tube which eliminates the low collapse rating associated with other expandable systems.



Benefits

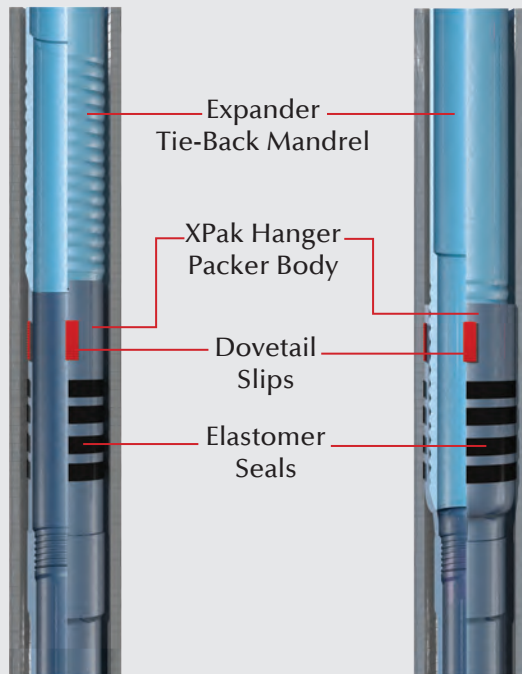
- High torque capabilities for rotation and/or drill down operations
- Manufactured from standard OCTG material
- High pressure integrity equal to casing design
- High load capability with ability to support long liners

Applications

- Deepwater
- Extended Reach
- Lost Circulation
- Multi-Stage Cementing
- Drilling with liner
- HP/HT
- Wash/Ream
- Multi-Stage Fracturing

TIW XPak™ System Multi-Piston Setting Tool

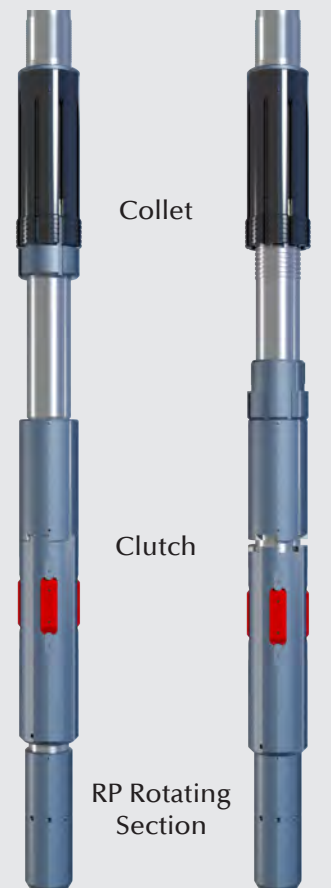
TIW XPak™ System Hanger Packer



Pre-Expansion

Post-Expansion

The XPak™ Liner Hanger Packer is furnished with hardened slips and multiple sealing devices that are expanded into an anchoring and sealing engagement to provide load capacities equal to or greater than conventional hanger systems and pressure ratings equal to the well bore casing design. The expander incorporates metal to metal ball seals on the lower portion that remain in the hanger body after expansion. The ball seals provide a gas tight seal between the expanded hanger and the expander mandrel. The upper portion of the expander mandrel is provided with a honed receptacle suitable for a seal nipple with either conventional elastomer seals or a metal to metal dynamic ball seal.



Run-in

Release

The TIW XPak™ Multi-Piston Setting Tool provides the power to drive the expander mandrel into the hanger body. Liner size, percent of expansion and casing design determine the surface pressure normally ranging from 3000 to 4500 PSI. Activation of the setting tool is controlled with a shear ring allowing for the necessary circulating pressures required for cement displacement or drilling operations without concern of premature expansion of the hanger. The setting tool provides dual releasing capabilities for releasing the tool from the hanger after the expansion is completed. The Auto Release feature incorporates a ratchet ring in the upper portion of the collet and a set of ratchet threads on the setting tool mandrel. The RP Rotating Profile Sub located below the hanger and the RP Dog Section of the setting tool provides rotation and/or drill down capability. A hydraulic clutch release feature has been added to disengage the RP Dogs during the hanger expansion process and allow the setting tool to be released with rotational release.