

Articulating Compensator



The Challenge >>

Top Drive and Casing Connection Alignment

Risk of thread damage during top drive casing running operations depends on several variables. Rig shifting during the drilling operation and pipe curvature both cause casing connection thread misalignment. Casing connection designs are expected to exhibit differing sensitivities to a given misalignment. Therefore, casing running operations are expected to exhibit various sensitivities to bending loads; however, we believe that taking a proactive approach to preventing problems is a high value activity.

Casing connection threads are most vulnerable to damage during initial engagement and disengagement when thread 'corners' can contact. Rig and connection axis misalignment can apply bending loads to connection threads during stabbing and makeup. Similarly, when nubbins are used to grip the casing, even moderate rig misalignment generates large side loads when the top drive is at the rig floor to disengage the nubbin from the casing box. Both cases contribute to premature thread wear and increase the chance of damage.

The need for articulation was first recognised during a premium casing running operation using a top drive and nubbin arrangement that locked the casing onto the top drive quill axis. Computer monitoring of connection make up in that application identified potential problems for casing of 7 inch and larger diameter. When connections were broken out for inspection approximately 20% of the 7 inch and nearly all the 9 5/8 inch samples had sustained thread damage. Engineering investigation identified bending loads during thread engagement as most probably cause of the observed damage.

As a diagnostic task, a set of power tongs was rigged in and the top of the pipe was allowed to translate freely. The connection threads were free to align with each other and damage problems ceased immediately. Identical connections were subsequently made-up successfully on the same rig using a casing running tool with an integrated articulation capability.

The Solution >>

Articulating Compensator

Volant has developed the Articulating Compensator to reduce the risk of running casing utilizing top drive equipment. Whether the operator chooses to utilize nubbins or a casing running tool, the Articulating Compensator can be installed in line to reduce the risk of connection damage by enabling off axis alignment through the tool. A built in axial load compensator enables "soft stabbing" of the casing further reducing the risk of connection damage.



Articulating Compensator Features >>

- > Torsion Capacity 40,000ftlb
- > Hoisting Capacity 500,000lbs
- > Total Swing 6 inches
- > Pressure Compensated Axial Stroke 6 inches
- > Upper Connection 4.5" I.F. Box
- > Lower Connection X-Over to specified connection
- > Overall length 39" (c/w x-over to 4.5" I.F. pin)

Note: Higher capacity tools can be made upon request.