



THE TOTAL FLUID SOLUTIONS COMPANY

Drilling, Filtration, Reclamation Services

TSS Downhole Hammer Division

Specializing in Air Hammers and Fluid Hammers

Downhole hammers increase rate of penetration, especially in wellbores that are difficult for conventional drilling bits. TSS offers a broad range of downhole hammers compatible with both conventional air and foam drilling, as well as an experimental fluid hammer that features a fail-safe hex-key design and increases ROP by as much as 50%.

Additionally, TSS also has a full line of ancillary equipment, including a downhole diverter which improves drilling performance by creating a "venture-effect," lowering the differential pressure between the mandrel and the drilling bit.

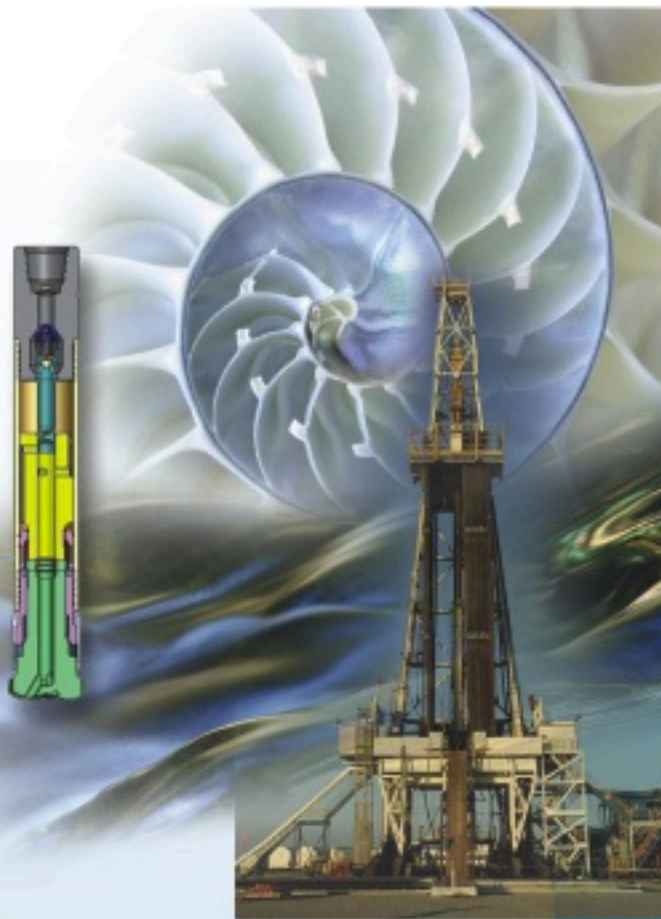
Overall, the TSS Downhole Hammer Division gives you more choice and flexibility to maximize your drilling performance.

Air Hammer Benefits Include:

- Faster ROP; 2-5 times faster than on muds
- Detects low pressure zones
- Minimizes formation damage
- Improves deviation control
- Improves bit performance with more footage per bit
- Avoids expensive mud loss in lost circulation zones

Fluid Hammer Benefits Include:

- 100% fluid operated
- Increases ROP by as much as 50%
- High frequency rate
- Variable impact loads
- 8.8 feet in length
- Working stroke of .4" to 3.5"
- Pressure Drop 300-100 psi
- Flow Rate 125-640 gpm
- High temperature applications
- Tool is inactive off bottom
- If fluid hammer ceases to function, normal drilling can continue
- Enhances straighter vertical well due to lower than average WOB



Total Separation Solutions, LLC

6650 W. Sam Houston Parkway N. • Suite 450 • Houston, TX 77041 • Phone: 832-467-3400 • Fax: 832-467-4800

www.totalsep.com