



## 4.50" Dual Pyrotechnic Delay Firing Head

The 4-1/2" Dual Pyrotechnic Delay Firing Head provides a detonation system for TCP applications requiring hydraulic pressure to fire the guns. This firing head assembly is designed for well conditions that are not suitable for detonating bars and for applications where a backup firing head is required.

The firing heads use precision shear pins to provide a desired actuating pressure ( $\pm 5\%$ ) for a perforating assembly. An appropriate actuating pressure will be a function of hydrostatic pressure, auxiliary pressure actuated tools, casing pressure limits, and a safety factor. All pressure constraints and variables must be considered when determining an appropriate actuating pressure. When actuated, the firing heads initiate a 1" CAD pyrotechnic delay fuse. The fuse provides a 6-minute delay before detonating the gun system.

### FEATURES/BENEFITS

- Minimum pinning requirement of \*4,875 psi.
- Cannot be detonated at surface without applying pressure.
- Must apply the required pressure at the tool to actuate firing heads.
- Ideal for vertical, deviated, and horizontal wells.
- Can be run on top or bottom of GEODynamics TCP guns.
- Can be used to detonate multiple gun systems.
- Can be used on work string, coiled tubing, and sucker rod conveyance methods.
- Can be used to actuate perforating assemblies, setting tools, and cutters.
- Not affected by electrical sources or radio frequencies - Radio silence not required.

*\*Minimum of five (5) pins required to survive drop test.*

# 4.50" Dual Pyrotechnic Delay Firing Head

## SPECIFICATIONS

Tool Size	4-1/2" / 114.30 mm
Firing Head Type	Dual (primary + back up)
Outside Diameter	4-1/2" / 114.30 mm
Overall Length	58.09" / 147.55 cm
Make Up Length	58.09" / 147.55 cm
Minimum Operating Pressure	*4.875 psi / 33.61 MPa
Maximum Operating Pressure	20,000 psi / 137.90 MPa
Shear Pin Value	975 psi @ 70°F
Delay Time	Six (6) minute pyrotechnic delay
Calculated Tensile	385,000 lbs
Pressure Ratings	<p>Collapse: 20,000 psi                      Burst: N/A                      Seal Ratings:</p> <ul style="list-style-type: none"> <li>• 10,000 psi @ 290°F without backup rings</li> <li>• 20,000 psi @ 375°F with PEEK backup rings</li> </ul>
Thread Connections	<p>2-7/8" EUE 8 Rd (uphole)                      3-15/16" - 6P ACME 2G                      (Downhole box, 4-1/2" gun tandem)</p>

