

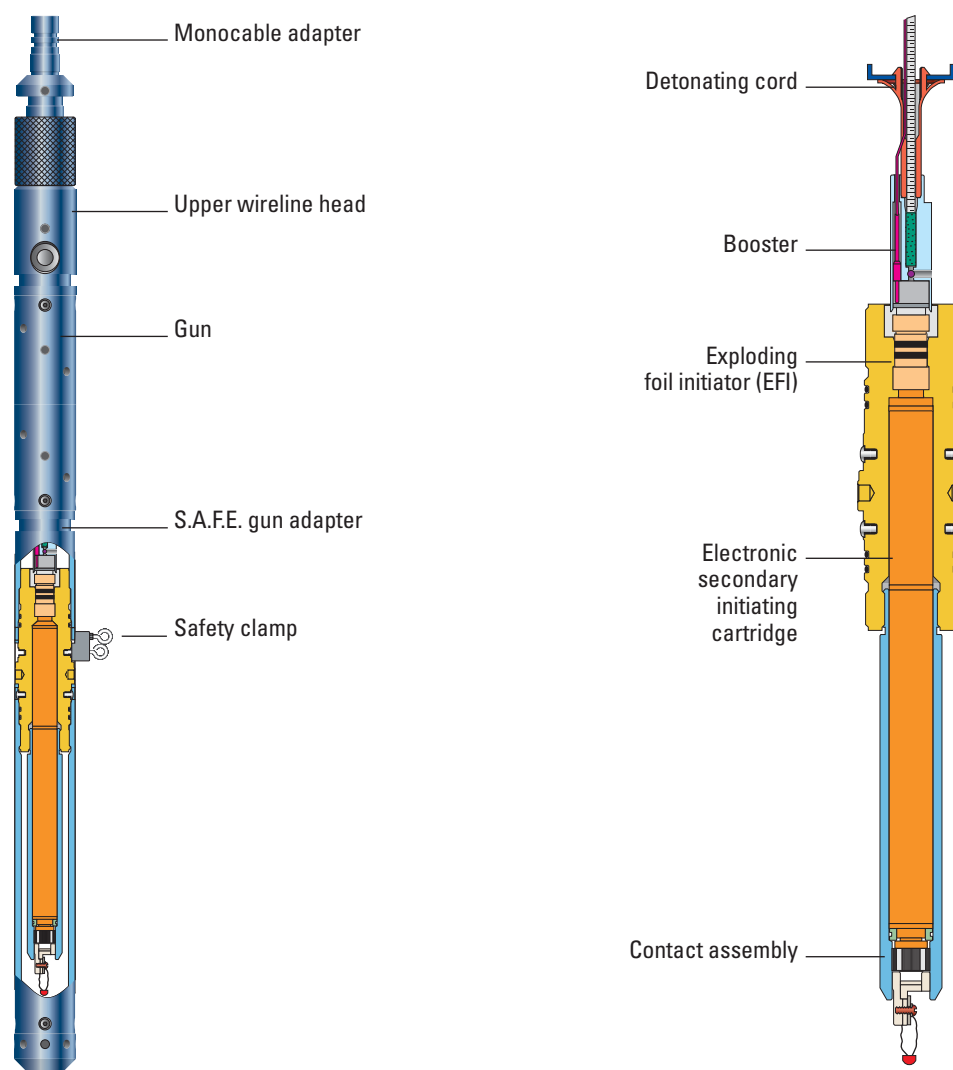
# S.A.F.E. Slapper-Actuated Firing Equipment

Detonating technology with immunity to stray electrical effects

## APPLICATION

- Detonation of perforating gun systems, setting tools, and explosive and chemical cutters

The S.A.F.E.\* detonating system was developed to provide immunity to electric potential differences created by radio frequency (RF) radiation, impressed current for cathodic protection, electric welding, high-tension power lines, and inductive coupling from large induction motors such as topdrives on drilling rigs. S.A.F.E. technology eliminates the need to shut down radio communication and other vital equipment during perforating jobs.



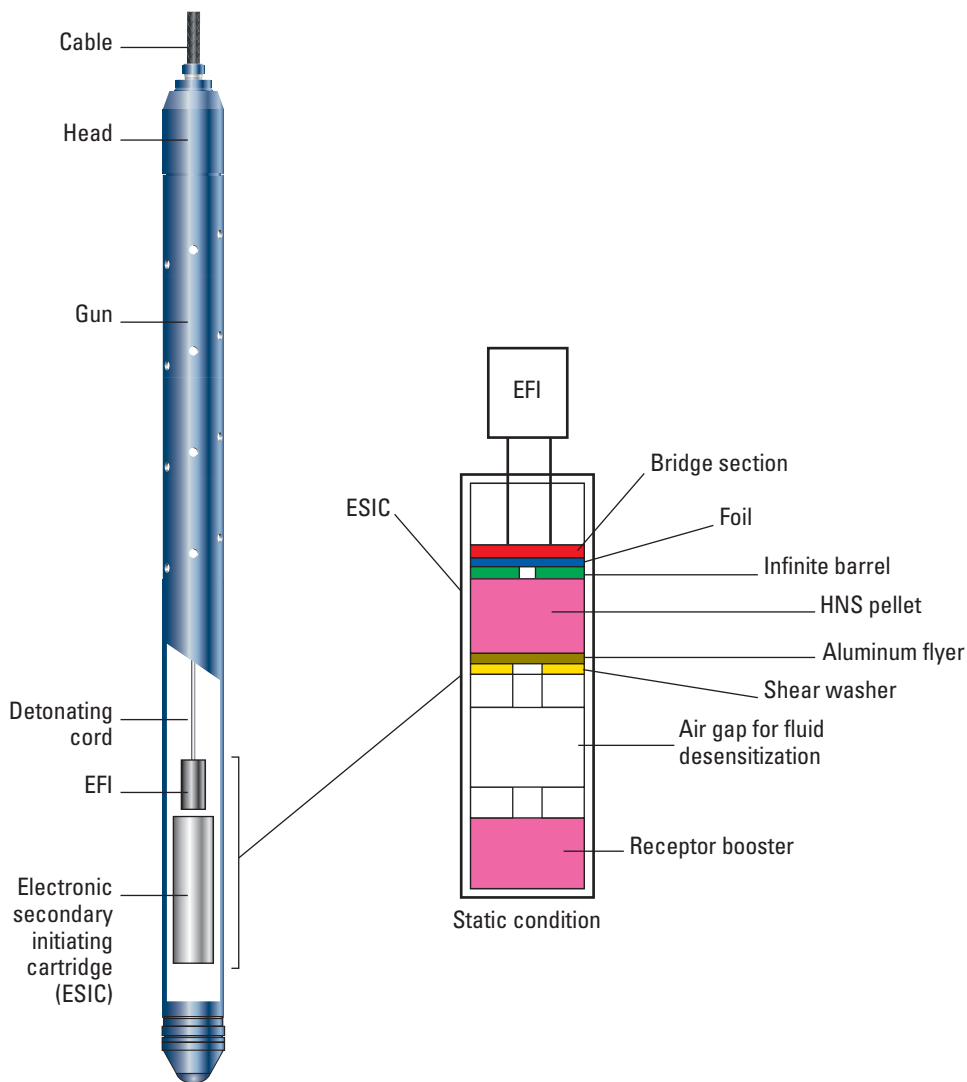
*S.A.F.E. detonating system in a bottom-up fired perforating gun.*

# S.A.F.E. Slapper-Actuated Firing Equipment

The S.A.F.E. detonating mechanism is an exploding foil initiator (EFI), which has proved resistant to stray voltages because of the high currents required for detonation. It contains no primary high explosives. The application of shooting power instantly vaporizes a metal foil, which causes a neighboring (secondary) high-explosive pellet to detonate and shear a small aluminum flyer. The flyer travels across a fluid desensitization gap in the EFI housing and strikes a booster that initiates the detonation of the gun.

As the preferred detonator for applications in which the temperature exceeds 340 degF [170 degC], the S.A.F.E. detonation system can be located at the bottom or at the top of the perforating gun, or it can be between two guns. Three versions of the detonator are available:

- carrier detonator: for hollow carrier perforating gun systems and explosive cutters
- exposed detonator: for exposed perforating gun systems
- pyrotechnic detonator: for setting tools and chemical cutters.



*EFI operation of the S.A.F.E. detonating system.*

[www.slb.com/perforating](http://www.slb.com/perforating)

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