

# GREGG DRILLING LLC

## AUTOMATIC HAMMER SHEAR WAVE SOURCE

### Automatic Hammer Seismic Source

Gregg Drilling operates an automatic seismic hammer for seismic cone penetration testing (SCPT). The autohammer is a device consisting of a hammer, strike plate, springs and gears powered by an electric motor and housed in a metal box. This system allows the operator to remotely generate seismic waves, with a single polarity. Two hammers can be used to create polarized waves.

### Specifications

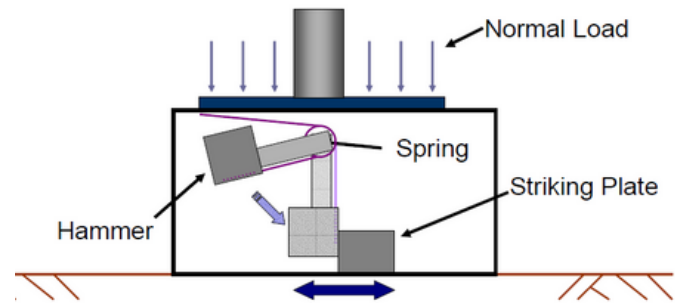
- 6kg (13lb) weighted hammer
- 90V DC internal motor
- Closed-ended steel monotube body
- Metal screen textured base for enhanced ground surface connection
- Springs used to accelerate the hammer motion
- 30kg (66lb) total weight of complete unit

### Operation

The unit is placed at a known distance from the cone and secured to the ground surface with a normal force using available pistons, beams or other load.

With power applied, gears connected to the electric motor turn and raise then release the hammer. Once the hammer is released by the smaller gear, powerful springs accelerate the weight towards the internal striking plate. As the hammer strikes the plate, a shear wave is generated and propagates into the soil below. Once activated, the hammer can continue to strike the plate at regular intervals until turned off. The rate of striking can be controlled by the electrical motor and control unit.

Geophones present in the cone will detect the arrival of the shear wave at the cone depth and display the shear wave on the computer screen for the operator's approval. Shear wave velocity can be calculated by determining the difference in arrival times between tests at two distinct depths.



Above: Cross sectional diagram of the autohammer concept in motion.

From: *Enhanced Integration of Shear wave velocity profiling in direct-push site characterization systems*, A. McGillivray, Georgia Tech 2007

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