

Q-Borehole Explorer

High-output, wide-bandwidth truck vibrator

Q-Borehole Explorer

Applications

- All US land borehole seismic applications requiring a high-output, wide-bandwidth, low-distortion vibroseis source
- Look-ahead and acoustic impedance (AI) inversion applications requiring strong, low-frequency energy down to deep targets

Benefits

- Better imaging beneath high-velocity and highly attenuating overburden areas
- Robust platform that supports new sweep designs
- Excellent ground coupling
- More stable vibroseis wavelets
- Eliminated need for trailer transport to and from the wellsite
- Excellent mobility off-road from eight-wheel drive

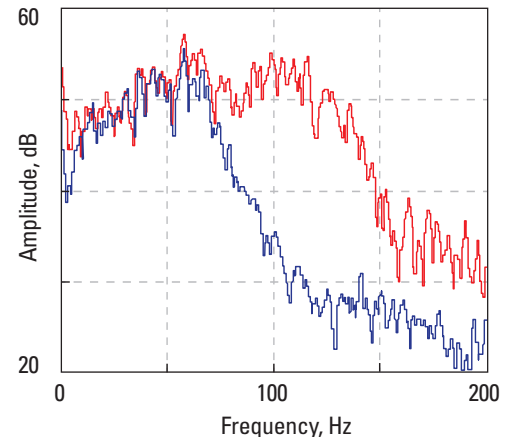
Features

- High-amplitude, low-distortion wavelets
- Extended bandwidth sweeps
- Safety improvements incorporated in the design
- Conformity to US highway and emissions laws
- Optimized hydraulic flow to vibrator actuator
- Four drive axles for optimal weight distribution
- Low ground pressure

Vertical seismic profile (VSP) operations face new challenges associated with the exploration of deeper and more complex formations. These subsurface challenges require the acquisition of higher amplitude, wider bandwidth data, which in turn requires high-quality seismic sources.

The new Q-Borehole Explorer* truck vibrators meet these challenges because they provide improved safety, data quality, and efficiency over conventional VSP vibrators. Numerous mechanical and

hydraulic improvements and the transmission capability for the low-frequency-enhancing MD Sweep* maximum-displacement methodology perfected by WesternGeco mean that Q-Borehole Explorer truck vibrators deliver the high-output, wide-bandwidth, low-distortion vibroseis signal required for modern borehole seismic operations.



The frequency bandwidth improvement provided by the Q-Borehole Explorer truck vibrator is readily evident in this borehole data recorded with the VSI versatile seismic imager in a 5,000-ft well. The conventional linear sweep (blue) is limited to 8 to 80 Hz, whereas the MD Sweep frequency (red) has a range from 1.5 to 150 Hz.*

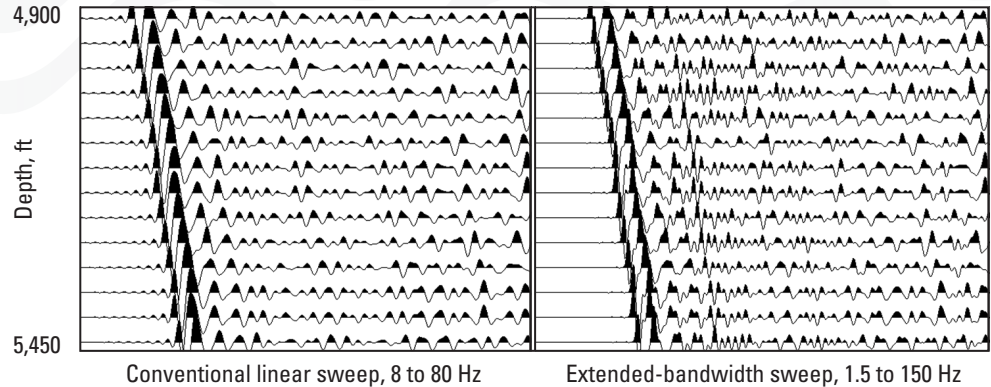
Advantages over the frequency bandwidth limitations of conventional VSP vibrators

The output energy of a conventional VSP vibrator has numerous constraints:

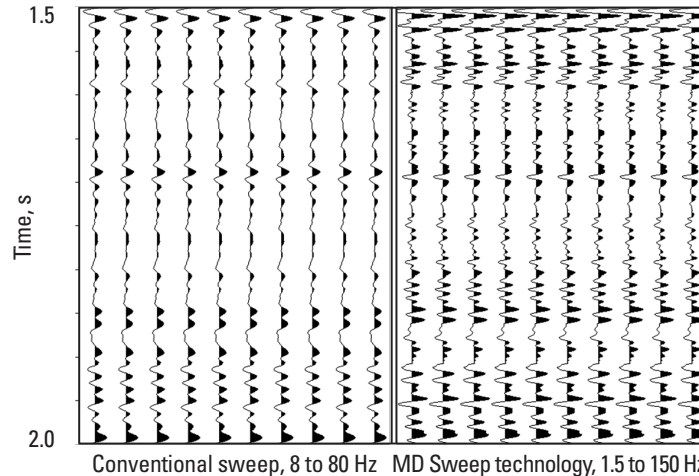
- limited typically to 6 to 8 Hz by mechanical conditions, such as the maximum reaction mass displacement
- limited at both low and high frequency extremes by the baseplate design and hydraulic flow rate restrictions.

The unique Q-Borehole Explorer design is not affected by these limitations, and instead delivers the following advantages:

- high-amplitude, low-distortion vibroseis wavelets
- energy transmission capability down to 1 Hz and up to 150 Hz
- optimized vehicle carrier for safety, hold-down weight, ground clearance, and off-road mobility
- ability to be driven directly to the wellsite.



The first break from the MD Sweep extended bandwidth output by the Q-Borehole Explorer truck vibrator (right) is much cleaner than in the conventional sweep (left) in the 5,000-ft well.



Fidelity and resolution are similarly greatly improved in the MD Sweep corridor stack compared with that of the conventional source from the 5,000-ft well.

Q-Borehole Explorer

Specifications

Vehicle length	438 in [11.13 m]
Vehicle wheelbase	265 in [6.73 m]
Vehicle width	101 in [2.56 m]
Vehicle height	151 in [3.84 m]
Vehicle gross weight	59,000 lbm [27,000 kg]
Hold-down weight	54,000 lbm [24,500 kg]
Peak hydraulic force	60,000 lbf [267,000 N]
Baseplate clearance, moving	13 in [33 cm]
Maximum vehicle speed [†]	70 mi/h [113 km/h]
Emission compliance	Deck and vehicle engines: California and US EPA continental standards
Ambient operating temperature	−30 to 130 degF [−34 to 54 degC]

[†]Subject to local regulations and road conditions



*Mark of Schlumberger
Other company, product, and service names
are the properties of their respective owners.
Copyright © 2012 Schlumberger. All rights reserved. 12-FE-0076

www.slb.com/qbexplorer

Schlumberger