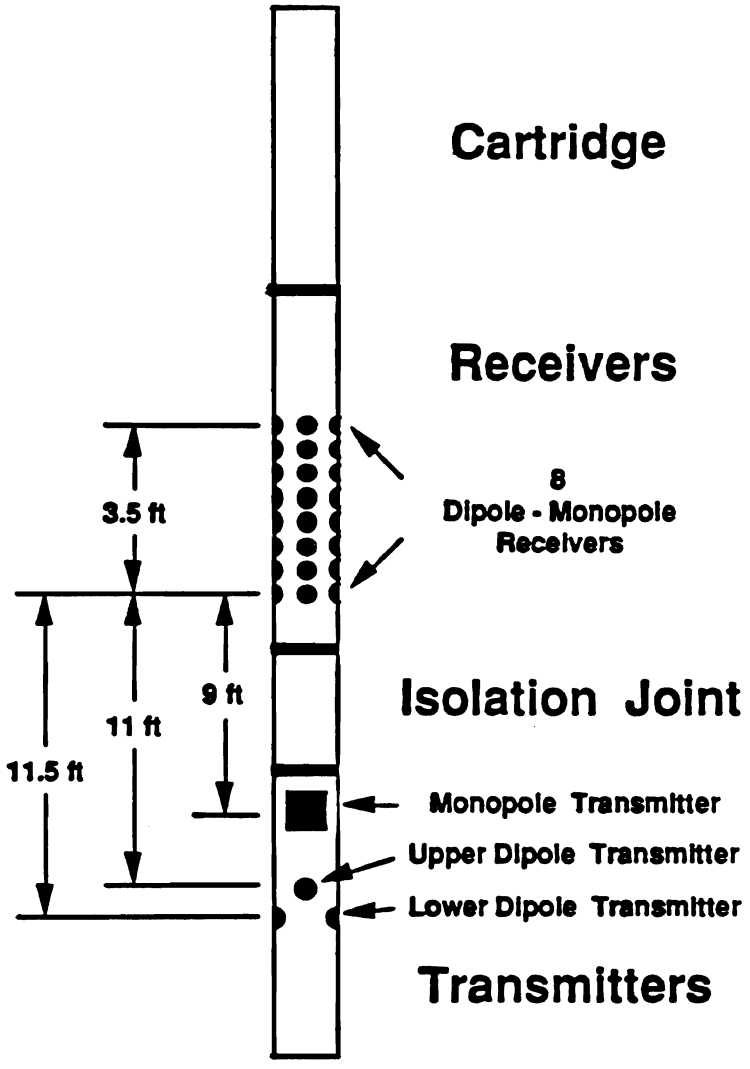
ISOLATION JOINT FOR FLEXURAL AND COMPRESSIONAL ISOLATION

Presented by: Al Wignall
Co-Author: Jeff Aron
Company: Schlumberger

Abstract:

An isolation joint was designed for an oil well logging tool operation in a downhole environment. The joint is capable of up to 1000-lb. loads and has more than 50db of attenuation for both flexural and compressional vibration in the frequency range of 500 to 20 khz.

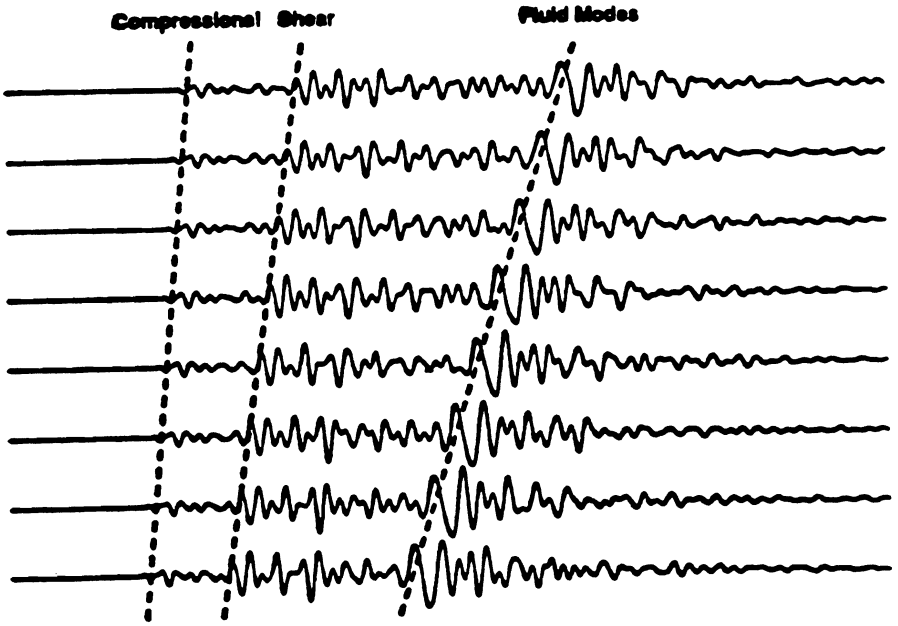
Schlumberger Well Service - Engineering
5000 Gulf Freeway
P.O. Box 2175
Houston, Texas 77252-2175



Tool Specifications

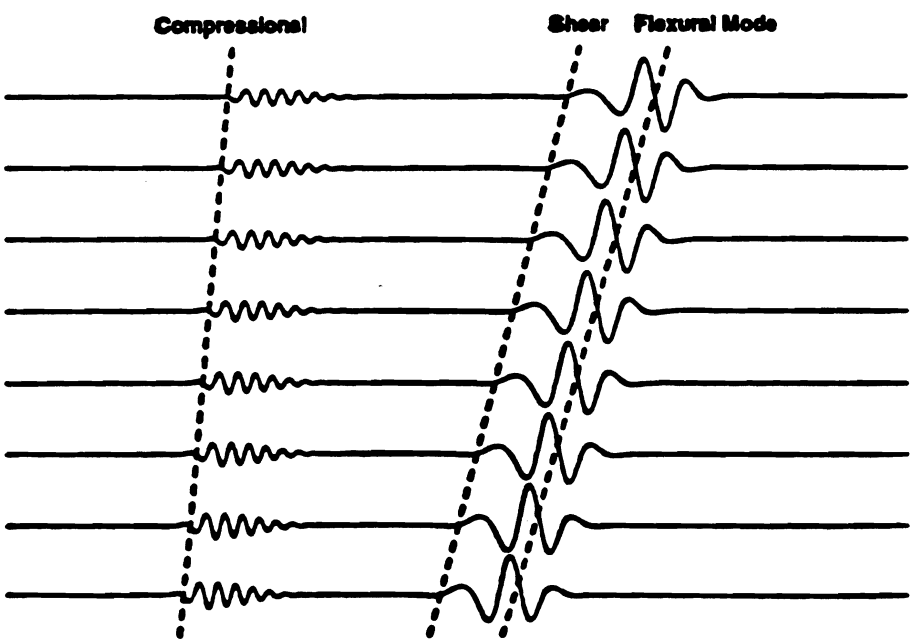
Temperature Rating	350°F (175°C)
Pressure Rating	20,000 psi (13.8 kPa)
Tool Diameter	3 5/8 in. (9.2 cm)
Tool Length	51 ft. (15.5 m)
Maximum Logging Speed	1800 ft/hr for a 8-Waveform set
Digitizer Precision	12 bits
Digitizer Sampling Interval Limits	10 μS - 32.2 mS/sample
Digitized Wave Duration Limits	15,000 samples/all waveforms
Acoustic Bandwidth	80 Hz - 5 kHz - Dipole and Stoneley 8 kHz - 30 kHz - High Frequency Monopole

FIGURE 1



Monopole Waveforms from a Fast Formation

FIGURE 2



Dipole Waveforms from a Slow Formation.

FIGURE 3

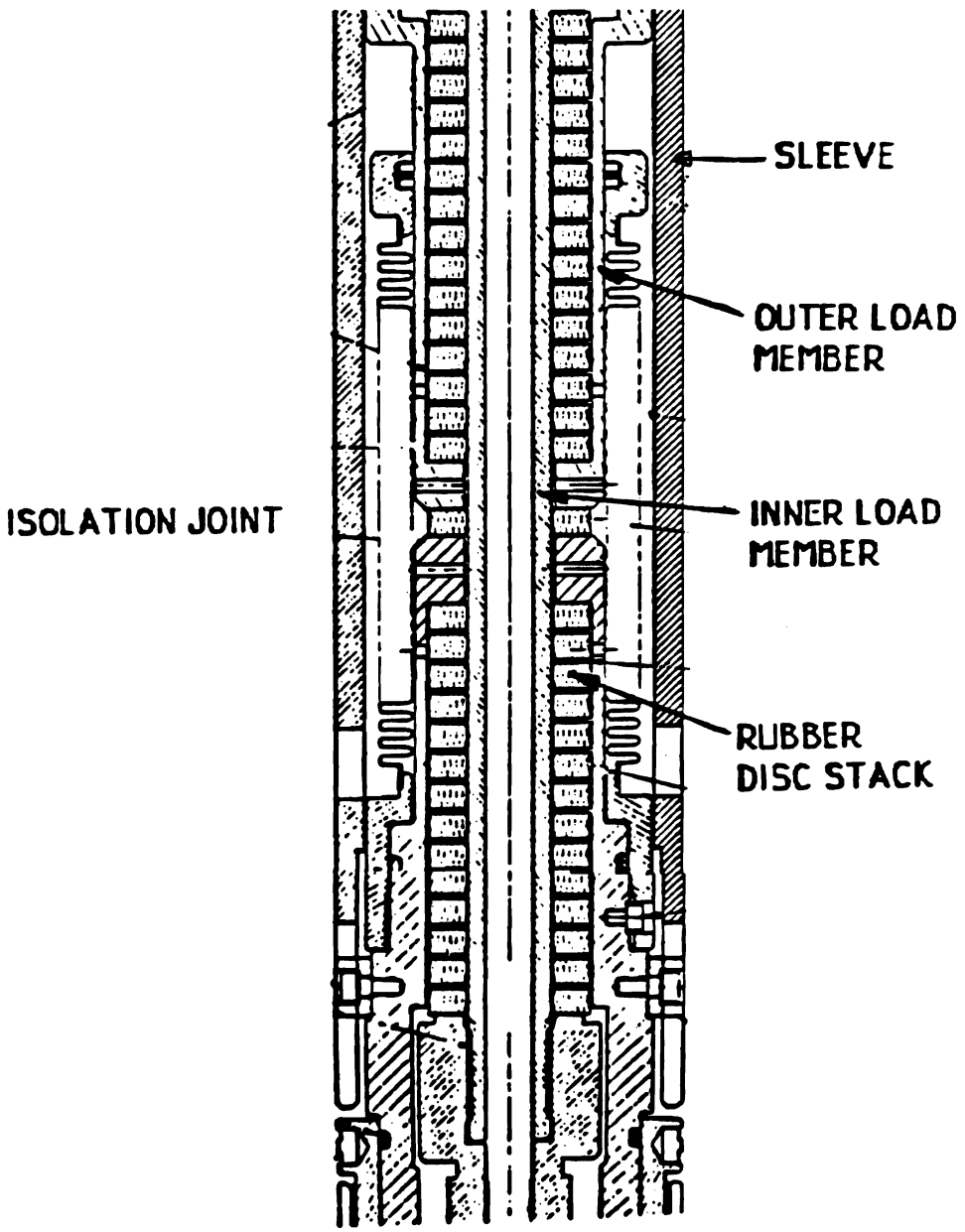

ISOLATION JOINT
SLEEVE
OUTER LOAD MEMBER
INNER LOAD MEMBER
RUBBER DISC STACK

FIGURE 4

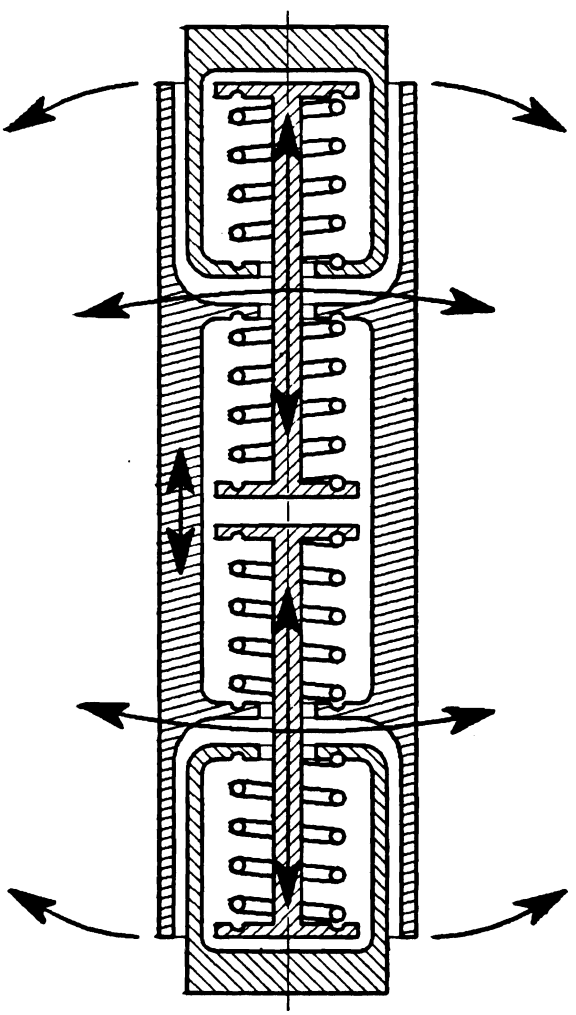


FIGURE 5

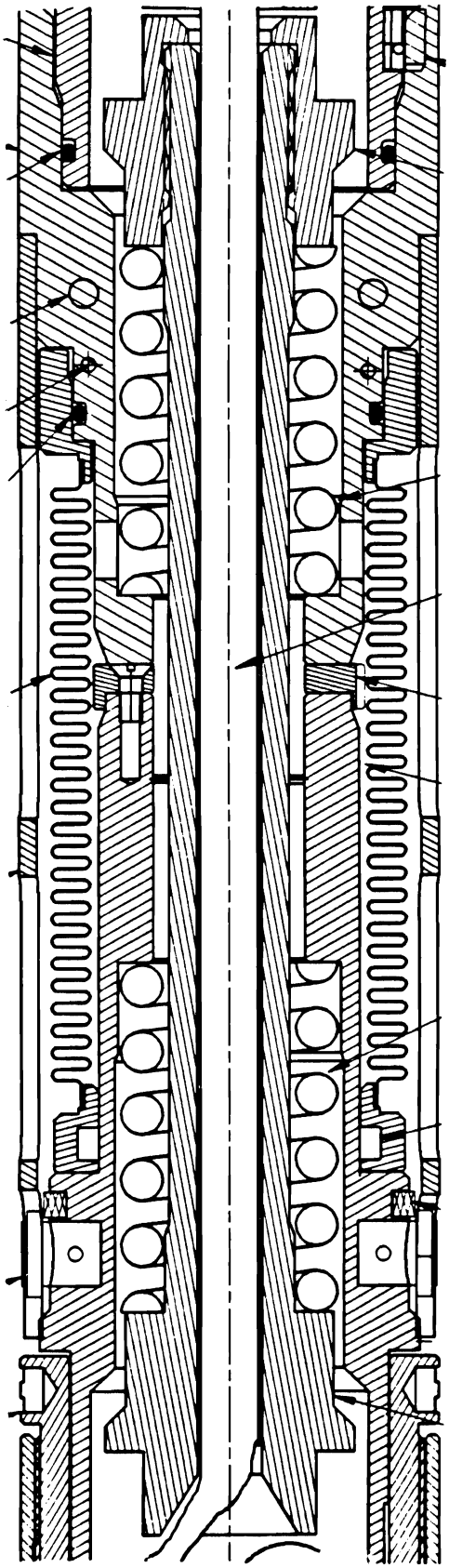
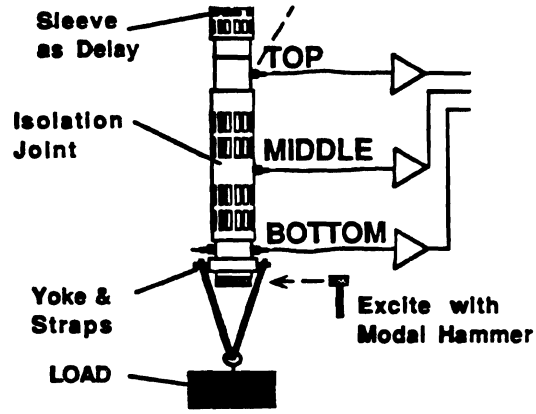


FIGURE 6


Sleeve as Delay
TOP
Isolation Joint
MIDDLE
BOTTOM
Yoke & Straps
Excite with Modal Hammer
LOAD

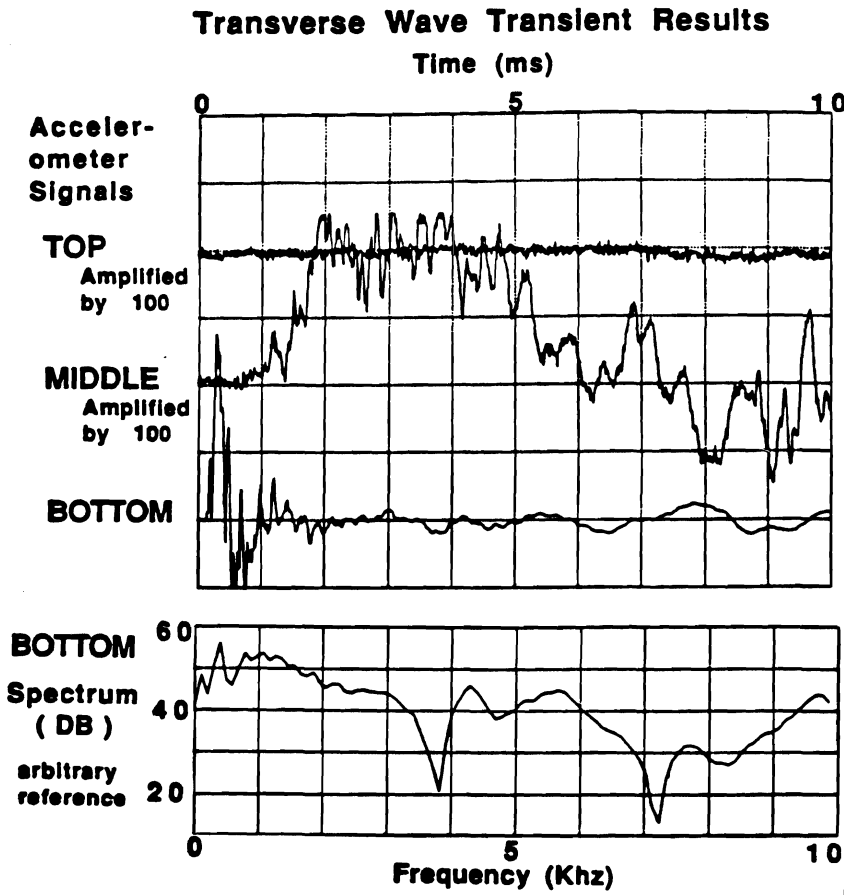
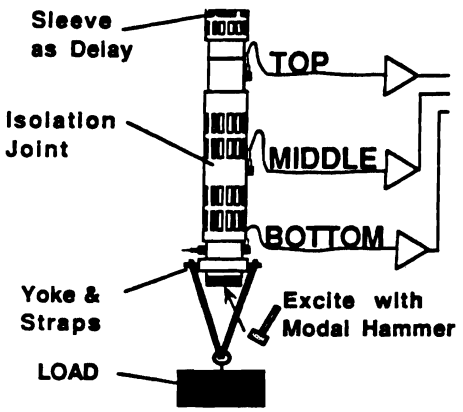

Transverse Wave Transient Results
Time (ms)
0
5
10
Acceler-ometer Signals
TOP
Amplified by 100
MIDDLE
Amplified by 100
BOTTOM
BOTTOM Spectrum (DB)
arbitrary reference
60
40
20
0
5
10
Frequency (Khz)

FIGURE 7


Sleeve
as Delay
TOP
Isolation
Joint
MIDDLE
BOTTOM
Yoke &
Straps
Excite with
Modal Hammer
LOAD

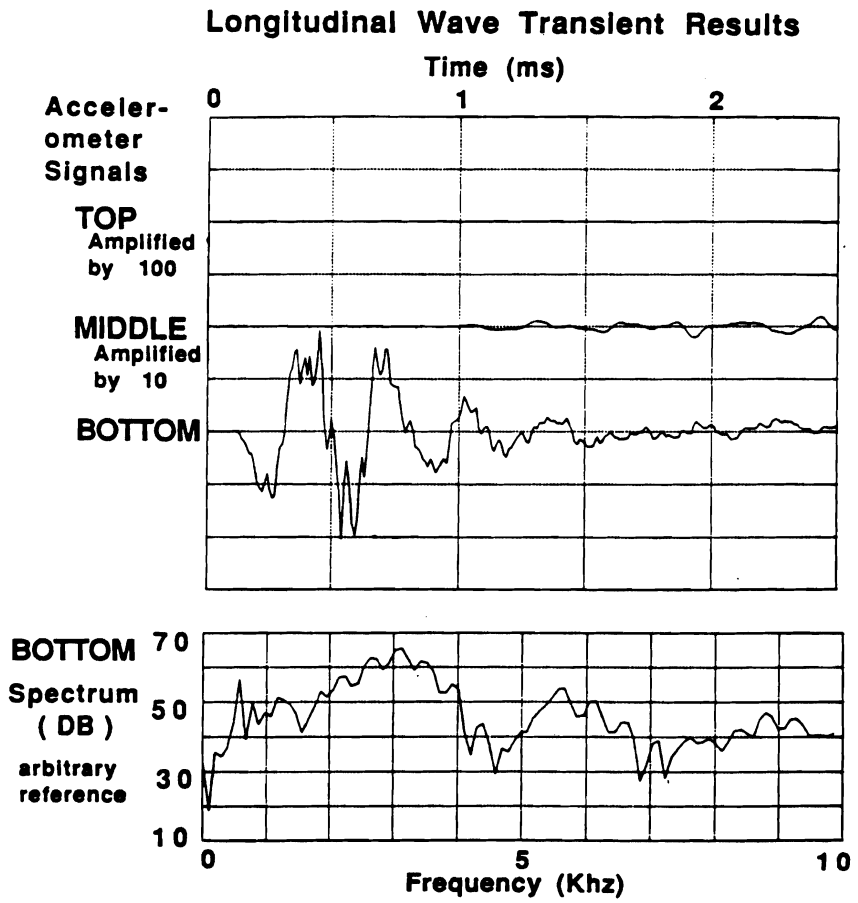

Longitudinal Wave Transient Results
Time (ms)
0
1
2
Acceler-
ometer
Signals
TOP
Amplified
by 100
MIDDLE
Amplified
by 10
BOTTOM
BOTTOM
Spectrum
(DB)
arbitrary
reference
70
50
30
10
0
5
10
Frequency (Khz)

FIGURE 8