Compressive and shear wave velocity measurements as brine-saturated measurements (volume 1) and as soltrol-saturated measurements (volume 2) of core from the Exxon Company USA OCS Y-0280-1 (Antares No. 1) for 7372'-8371' and from the Exxon Company USA OCS Y-0280-2 (Antares No. 2) for 10948'-11449'.

Received 6 December 1991 Total of 237 pages in report

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Test Procedures

Thirty-two rock chips were received from Texaco. Upon arrival at New England Research the samples were inspected and nineteen were chosen for further analysis. Shales were selected whenever possible. Nominal one-half inch diameter by one-half inch long plugs were cut from the chips. The ends were ground flat and parallel to within 0.001". The samples were placed in a vacuum oven at 40°C to dry and the dry masses were recorded.The grain volume was determined using a Micromeritics model 1305 Multivolume Gas Pycnometer. The sample was then vacuum saturated in a 20,000 ppm NaCl Brine solution.

Velocity measurements on the saturated samples were made in the following sequence. The titanium transducer ends were thoroughly cleaned and a 0.001" thick piece of silver foil was placed on the titanium. A thin film of ultrasonic couplant was placed between the titanium and the silver foil. The saturated sample was jacketed with Tygon tubing to produce a nominal one-inch diameter sample. Then the sample was jacketed with Norprene tubing. The jacketed sample was placed between the two titanium end caps and the tubing was clamped to the end caps with wire. The sample was then raised to the first measurement confining pressure of 1100 psi and the pore pressure was raised to 100 psi. Compressional and shear waves were sequentially propagated through the sample, digitized, and displayed. The arrival times were picked and the signals were plotted. After a set of measurements, the confining pressure was raised to the next highest pressure and the process was repeated.

The two ultrasonic shear waves, S1 and S2, were propagated in the same direction as the P wave along the core sample axis, but the sense of shear for each are mutually perpendicular.

The compressional (P) and shear (S1 and S2) wave velocities for the sample at any pressure was obtained by measuring the one-way travel time of a P or S wave along the rock core axis and then dividing it into the sample length. A source and receiver pair of like crystals (P, S1, or S2) were selected through switches. The source crystal was excited by a fast risetime electrical pulse generated with a Panametrics 5055PR pulser-receiver. The crystal produced a broadband (600 kHz to 1.2 MHz) ultrasonic pulse that propagates through the adjacent titanium end piece, through the rock sample along the core axis, through the titanium end piece at the opposite end of the core, and into the receiver crystal. The electrical signal produced by the receiver crystal is amplified and filtered by the receiving section of the Panametrics 5055PR, then fed into a LeCroy 9400 digital oscilloscope. The oscilloscope digitized the ultrasonic waveform at a frequency of 100 MHz and displayed the digitized signal for analysis.

The travel time was read directly from the oscilloscope display by reading the first break in the P and S wave signal. The break was defined by a threshold voltage that was 1.25% of the overall peak-to-peak amplitudes of the first three half-cycles of the signal. The arrival time was picked at the point where this threshold voltage was exceeded relative to the baseline voltage. The resolution of the pick was ± 0.01 microsecond. The P and S wave velocities are precise to within approximately ±0.5% and 1% respectively.

The transit times of the P and S waves through the titanium end pieces were subtracted from the total travel time measured on the oscilloscope to arrive at transit times through the sample. Travel times through the titanium end pieces were obtained by placing the transducers face to face and measuring as a function of confining pressure. Velocities were calculated by dividing sample length by sample transit time.

Calculations

Input parameters for all calculations are:

1. the length measured by NER
2. the diameter measured by NER
3. the dry weight measured by NER
4. the grain volume measured by NER

Weighing of the dry sample was accomplished with a Sartorius Model L 610 D electronic top-loading balance. The balance is readable to 1 mg and was calibrated on October 30, 1990. The dry weight measured by NER was not subject to any corrections.

The grain volume of the sample was measured directly using a Micromeritics model 1305 Multivolume Gas Pycnometer. Helium was used as the measurement gas.

From the grain volume and sample weight, the grain density could be determined using the following relation:

$$\rho_{Grain} = \frac{Wt_{Dry}}{V_{Grain}}$$

where ρ_{Grain} is the density of the grain matrix, Wt_{Dry} is the dry weight of the sample and V_{Grain} is the volume occupied by the grain matrix.

The bulk volume of the sample was determined using the relation:

$$V_{Bulk} = \pi l r^2$$

where V_{Bulk} is the bulk volume of the sample, l is the measured sample length and r is the measured sample radius.

The bulk density was determined using the relation:

Notes on the Samples

We could not obtain a core from sample 7372 from the Antares-1 well. We will attempt to substitute sample 7256 as per your letter of 1-3-91.

Sample 7525 was damaged prior to measurement. We could obtain P-waves, but not S-waves. We will attempt to remeasure this sample.

Sample 7927 was damaged prior to measurement. We could obtain P-waves, but not S-waves. We will attempt to remeasure this sample. If this is not possible, we will substitute another sample as per your letter of 1-3-91.

Sample 11186 had a small chip broken off one end before measurement. This chip was repaired with five-minute epoxy and a successful measurement was obtained.

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 1
Depth(ft):	7466
Orientation:	VERTICAL
Rock Type:	Shale
Pore Fluid:	20k ppm NaCl
Date:	5/15/91
Sample Length (in)	0.453
Sample Diameter (in)	0.478
Sample Weight: Vacuum Dry (g)	3.295
Dry Bulk Density (g/cm3)	2.47
Grain Density (g/cm3)	2.78
Porosity (%)	11.1

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisotropy
1100	100	1000	12459	6741	6741	1.85	0.0
4100	100	4000	12753	7017	7043	1.81	0.4
7600	100	7500	13246	7359	7316	1.81	0.6
10100	100	10000	13482	7550	7505	1.79	0.6
15100	100	15000	13727	7800	7767	1.76	0.4

COMMENTS:

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 1
Depth(ft):	7525
Orientation:	VERTICAL
Rock Type:	Shale
Pore Fluid:	20k ppm NaCl
Date:	5/10/91
Sample Length (in)	0.577
Sample Diameter (in)	0.478
Sample Weight: Vacuum Dry (g)	4.019
Dry Bulk Density (g/cm3)	2.37
Grain Density (g/cm3)	2.80
Porosity (%)	15.5

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisotropy
1100	100	1000					
4100	100	4000	10522				
7600	100	7500	10879				
10100	100	10000	11028				
15100	100	15000					

COMMENTS:

No S-wave was recorded. We will remeasure this sample.

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 1
Depth(ft):	7927
Orientation:	VERTICAL
Rock Type:	Shale
Pore Fluid:	20k ppm NaCl
Date:	5/14/91
Sample Length (in)	0.454
Sample Diameter (in)	0.479
Sample Weight: Vacuum Dry (g)	3.350
Dry Bulk Density (g/cm3)	2.50
Grain Density (g/cm3)	2.77
Porosity (%)	9.8

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisotropy
1100	100	1000	10309				
4100	100	4000	10598				
7600	100	7500	10934				
10100	100	10000	11095				
15100	100	15000	11361				

COMMENTS:

No S-wave was recorded. We will remeasure this sample.

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 1
Depth (ft):	8060
Orientation:	VERTICAL
Rock Type:	Limestone
Pore Fluid:	20k ppm NaCl
Date:	5/2/91
Sample Length (in)	0.984
Sample Diameter (in)	0.484
Sample Weight: Vacuum Dry (g)	7.804
Dry Bulk Density (g/cm3)	2.63
Grain Density (g/cm3)	2.67
Porosity (%)	1.6

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisotropy
1100	100	1000	18982	6771	9785	2.29	30.8
4100	100	4000	19026	9774	10000	1.92	2.3
7600	100	7500	19026	9820	10012	1.92	1.9
10100	100	10000	19026	9832	10025	1.92	1.9
15100	100	15000	19025	9832	10025	1.92	1.9

COMMENTS:

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 1
Depth(ft):	8221
Orientation:	VERTICAL
Rock Type:	Shale
Pore Fluid:	20k ppm NaCl
Date:	5/14/91
Sample Length (in)	0.541
Sample Diameter (in)	0.483
Sample Weight: Vacuum Dry (g)	4.233
Dry Bulk Density (g/cm3)	2.61
Grain Density (g/cm3)	2.78
Porosity (%)	6.1

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisotropy
1100	100	1000	12119	5552	5566	2.18	0.3
4100	100	4000	12284	5780	5780	2.13	0.0
7600	100	7500	12488	5870	5979	2.11	1.8
10100	100	10000	12699	5963	6059	2.11	1.6
15100	100	15000	12918	6117	6167	2.10	0.8

COMMENTS:

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 1
Depth(ft):	8283
Orientation:	VERTICAL
Rock Type:	Shale
Pore Fluid:	20k ppm NaCl
Date:	5/3/91
Sample Length (in)	0.526
Sample Diameter (in)	0.481
Sample Weight: Vacuum Dry (g)	4.012
Dry Bulk Density (g/cm3)	2.56
Grain Density (g/cm3)	2.82
Porosity (%)	9.1

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisotropy
1100	100	1000	11976	5907	6013	2.01	1.8
4100	100	4000	12313	6148	6218	1.99	1.1
7600	100	7500	12453	6408	6552	1.92	2.2
10100	100	10000	12779	6592	6692	1.92	1.5
15100	100	15000	13046	6796	6969	1.90	2.5

COMMENTS:

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 1
Depth(ft):	8371
Orientation:	VERTICAL
Rock Type:	Sandstone
Pore Fluid:	20k ppm NaCl
Date:	4/29/91
Sample Length (in)	0.382
Sample Diameter (in)	0.482
Sample Weight: Vacuum Dry (g)	2.584
Dry Bulk Density (g/cm3)	2.26
Grain Density (g/cm3)	2.73
Porosity (%)	17.2

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisotropy
1100	100	1000	13489	7689	7708	1.75	0.2
4100	100	4000	13841	8100	8100	1.71	0.0
7600	100	7500	13962	8377	8333	1.67	0.5
10100	100	10000	14404	8466	8422	1.71	0.5
15100	100	15000	14404	8604	8557	1.68	0.5

COMMENTS:

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 2
Depth(ft):	10979
Orientation:	VERTICAL
Rock Type:	Shale
Pore Fluid:	20k ppm NaCl
Date:	5/2/91
Sample Length (in)	0.439
Sample Diameter (in)	0.479
Sample Weight: Vacuum Dry (g)	3.260
Dry Bulk Density (g/cm3)	2.51
Grain Density (g/cm3)	2.74
Porosity (%)	8.4

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisotropy
1100	100	1000	11432	5844	6047	1.92	3.4
4100	100	4000	11688	6037	6264	1.90	3.6
7600	100	7500	11955	6211	6452	1.89	3.7
10100	100	10000	11995	6307	6533	1.87	3.5
15100	100	15000	12443	6452	6676	1.90	3.4

COMMENTS:

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 2
Depth(ft):	11082
Orientation:	VERTICAL
Rock Type:	Fine-grained sandstone
Pore Fluid:	20k ppm NaCl
Date:	5/7/91
Sample Length (in)	0.769
Sample Diameter (in)	0.482
Sample Weight: Vacuum Dry (g)	5.491
Dry Bulk Density (g/cm3)	2.39
Grain Density (g/cm3)	2.79
Porosity (%)	14.3

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisotropy
1100	100	1000	12868	7065	7176	1.81	1.5
4100	100	4000	13781	7902	7971	1.74	0.9
7600	100	7500	14178	8301	8388	1.70	1.0
10100	100	10000	14304	8443	8533	1.69	1.1
15100	100	15000	14531	8625	8544	1.69	0.9

COMMENTS:

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 2
Depth(ft):	11106
Orientation:	VERTICAL
Rock Type:	Shale
Pore Fluid:	20k ppm NaCl
Date:	5/6/91
Sample Length (in)	0.508
Sample Diameter (in)	0.480
Sample Weight: Vacuum Dry (g)	3.770
Dry Bulk Density (g/cm3)	2.50
Grain Density (g/cm3)	2.78
Porosity (%)	10.0

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisotropy
1100	100	1000	11024	5352	5427	2.05	1.4
4100	100	4000	11289	5600	5652	2.01	0.9
7600	100	7500	11727	5791	5839	2.02	0.8
10100	100	10000	11891	5929	6056	1.98	2.1
15100	100	15000	12306	6171	6262	1.98	1.5

COMMENTS:

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 2
Depth(ft):	11186
Orientation:	VERTICAL
Rock Type:	Sandstone with mud clasts
Pore Fluid:	20k ppm NaCl
Date:	5/3/91
Sample Length (in)	0.723
Sample Diameter (in)	0.486
Sample Weight: Vacuum Dry (g)	4.613
Dry Bulk Density (g/cm3)	2.10
Grain Density (g/cm3)	2.68
Porosity (%)	21.7

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisotropy
1100	100	1000	13155	7466	7522	1.76	0.7
4100	100	4000	13724	8087	8153	1.69	0.8
7600	100	7500	13979	8333	8438	1.67	1.2
10100	100	10000	14110	8427	8595	1.66	2.0
15100	100	15000	14244	8534	8682	1.65	1.7

COMMENTS:

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 2
Depth(ft):	11235
Orientation:	VERTICAL
Rock Type:	Sandstone
Pore Fluid:	20k ppm NaCl
Date:	5/3/91
Sample Length (in)	0.638
Sample Diameter (in)	0.483
Sample Weight: Vacuum Dry (g)	4.820
Dry Bulk Density (g/cm3)	2.52
Grain Density (g/cm3)	2.81
Porosity (%)	10.5

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisotropy
1100	100	1000	13668	7784	7912	1.74	1.6
4100	100	4000	14254	8399	8534	1.68	1.6
7600	100	7500	14769	8759	8861	1.68	1.2
10100	100	10000	15019	8936	9027	1.67	1.0
15100	100	15000	15366	9151	9263	1.67	1.2

COMMENTS:

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 2
Depth(ft):	11264
Orientation:	VERTICAL
Rock Type:	Red Shale
Pore Fluid:	20k ppm NaCl
Date:	5/3/91
Sample Length (in)	0.572
Sample Diameter (in)	0.480
Sample Weight: Vacuum Dry (g)	4.376
Dry Bulk Density (g/cm3)	2.58
Grain Density (g/cm3)	2.91
Porosity (%)	11.4

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisotropy
1100	100	1000	11626	5722	5750	2.03	0.5
4100	100	4000	12098	6011	6088	2.00	1.3
7600	100	7500	12446	6280	6330	1.97	0.8
10100	100	10000	12745	6390	6415	1.99	0.4
15100	100	15000	12988	6575	6630	1.97	0.8

COMMENTS:

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 2
Depth(ft):	11305
Orientation:	VERTICAL
Rock Type:	Sandstone
Pore Fluid:	20k ppm NaCl
Date:	5/8/91
Sample Length (in)	0.844
Sample Diameter (in)	0.483
Sample Weight: Vacuum Dry (g)	5.431
Dry Bulk Density (g/cm3)	2.14
Grain Density (g/cm3)	2.70
Porosity (%)	20.7

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisotropy
1100	100	1000	13097	7563	7595	1.73	0.4
4100	100	4000	13397	7929	8002	1.68	0.9
7600	100	7500	13500	8075	8150	1.66	0.9
10100	100	10000	13604	8140	8207	1.66	0.8
15100	100	15000	13657	8197	8265	1.66	0.8

COMMENTS:

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 2
Depth(ft):	11330
Orientation:	VERTICAL
Rock Type:	Sandstone
Pore Fluid:	20k ppm NaCl
Date:	5/8/91
Sample Length (in)	0.863
Sample Diameter (in)	0.481
Sample Weight: Vacuum Dry (g)	5.259
Dry Bulk Density (g/cm3)	2.05
Grain Density (g/cm3)	2.67
Porosity (%)	23.4

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisotropy
1100	100	1000	12683	7361	7338	1.73	0.3
4100	100	4000	13005	7792	7766	1.67	0.3
7600	100	7500	13220	7955	7991	1.66	0.5
10100	100	10000	13269	8009	8026	1.66	0.2
15100	100	15000	13417	8117	8135	1.65	0.2

COMMENTS:

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 2
Depth(ft):	11384
Orientation:	VERTICAL
Rock Type:	Sandstone
Pore Fluid:	20k ppm NaCl
Date:	4/30/91
Sample Length (in)	0.822
Sample Diameter (in)	0.480
Sample Weight: Vacuum Dry (g)	5.810
Dry Bulk Density (g/cm3)	2.38
Grain Density (g/cm3)	2.72
Porosity (%)	12.5

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisotropy
1100	100	1000	11626	5722	5750	2.03	0.5
4100	100	4000	12098	6011	6088	2.00	1.3
7600	100	7500	12446	6280	6330	1.97	0.8
10100	100	10000	12745	6390	6415	1.99	0.4
15100	100	15000	12988	6575	6630	1.97	0.8

COMMENTS:

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

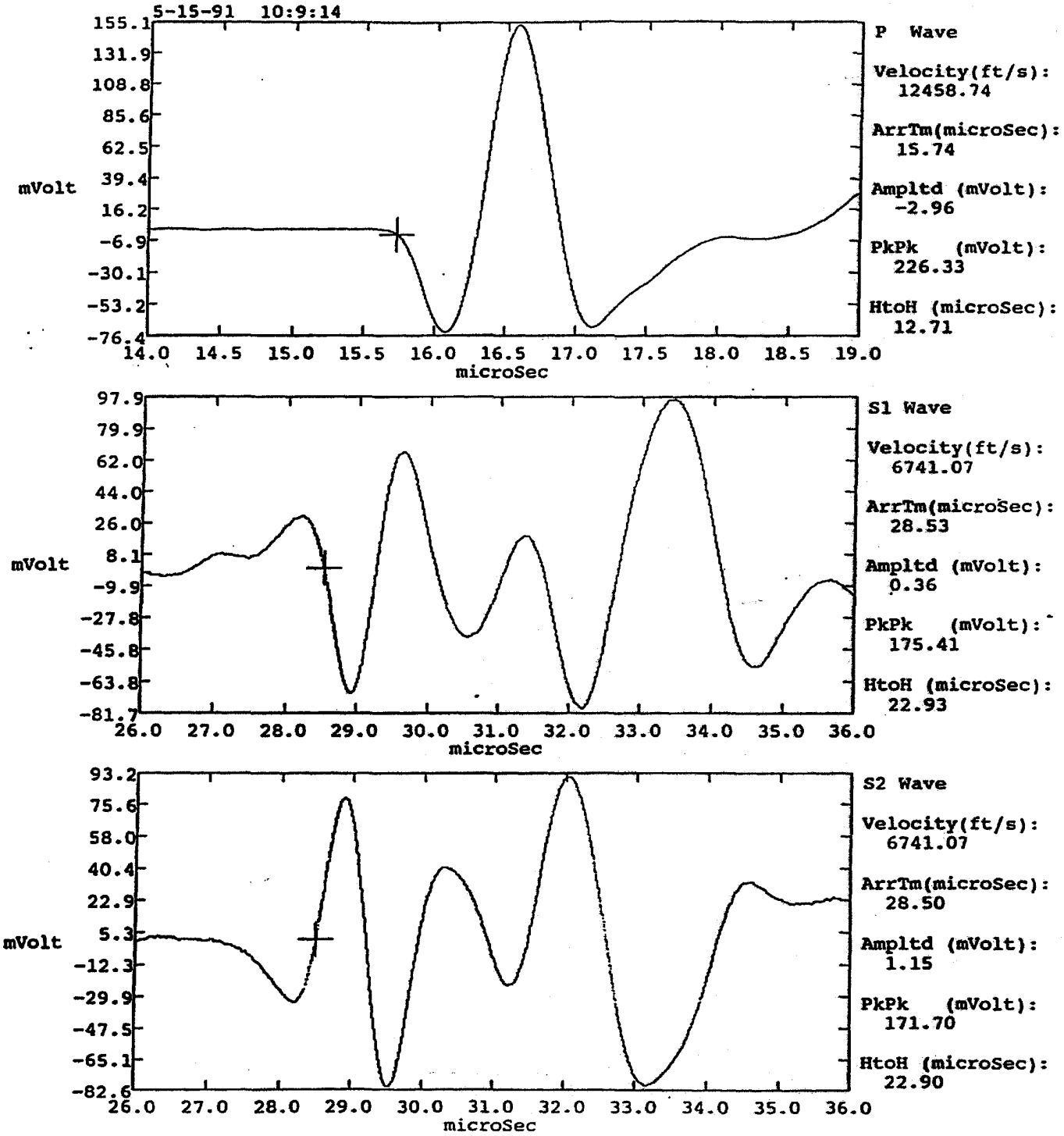
Well:	Exxon Antares 2
Depth (ft):	11449
Orientation:	VERTICAL
Rock Type:	Fine-grained sandstone
Pore Fluid:	20k ppm NaCl
Date:	5/2/91
Sample Length (in)	0.926
Sample Diameter (in)	0.484
Sample Weight: Vacuum Dry (g)	6.896
Dry Bulk Density (g/cm3)	2.47
Grain Density (g/cm3)	2.73
Porosity (%)	9.6

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisotropy
1100	100	1000	14926	8710	8983	1.69	3.0
4100	100	4000	15101	8729	9242	1.68	5.6
7600	100	7500	15250	8809	9422	1.67	6.5
10100	100	10000	15403	8900	9468	1.68	6.0
15100	100	15000	15684	9047	9598	1.68	5.7

COMMENTS:

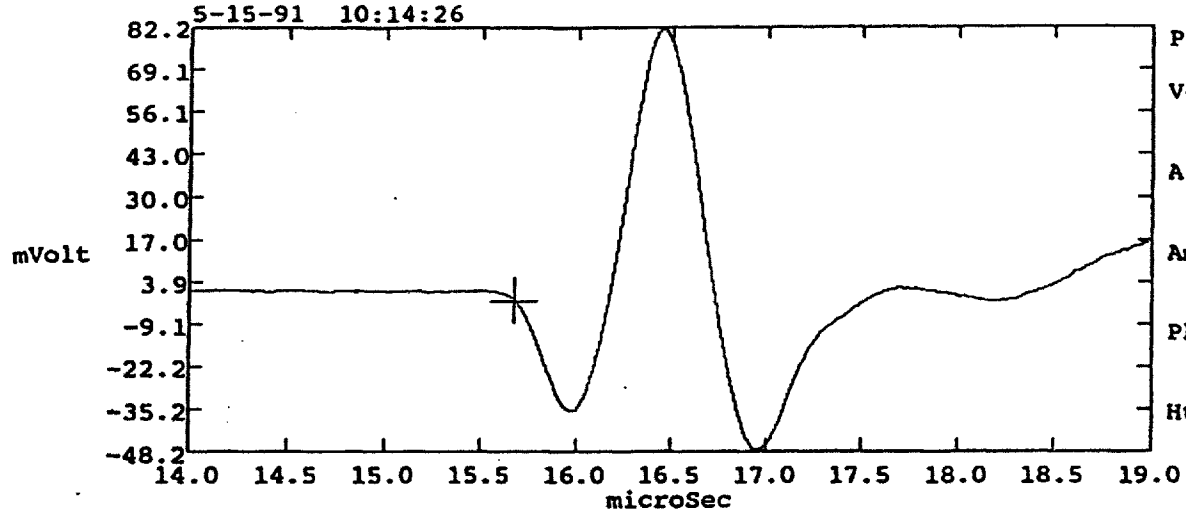
Well: EXXON ANTARES 1
Sample: 7466 Length:0.453 inch Fluid: BRINE
Conf Pr:1100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 7466.1BA Pick: Manual 5-15-91 12:43:56
20kppm NaCl Brine

5-15-91 10:9:14

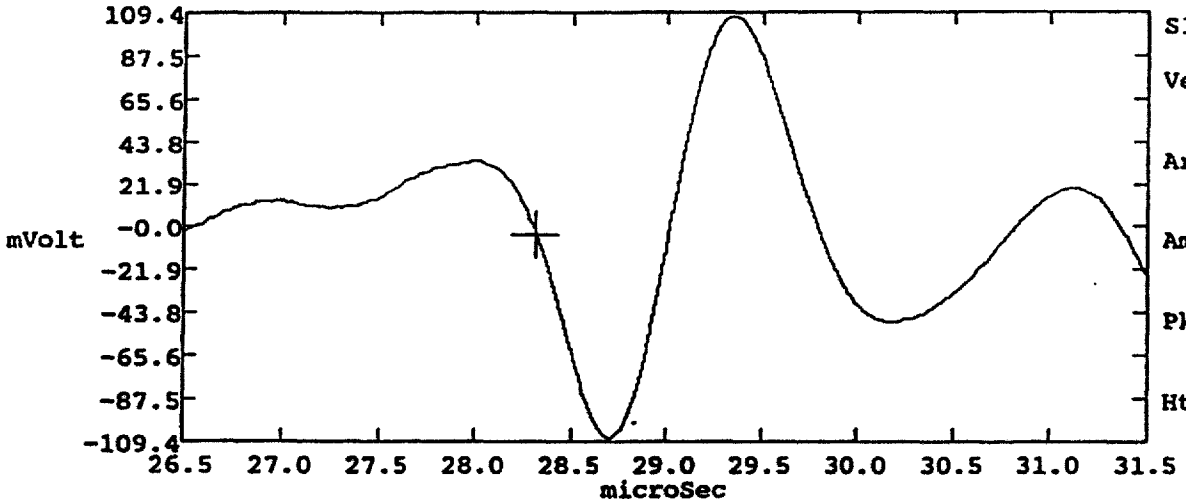


Well: EXXON ANTARES 1
Sample: 7466 Length:0.453 inch Fluid: BRINE
Conf Pr:4100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 7466.2B Pick: Manual 5-15-91 10:14:28
20kppm NaCl Brine

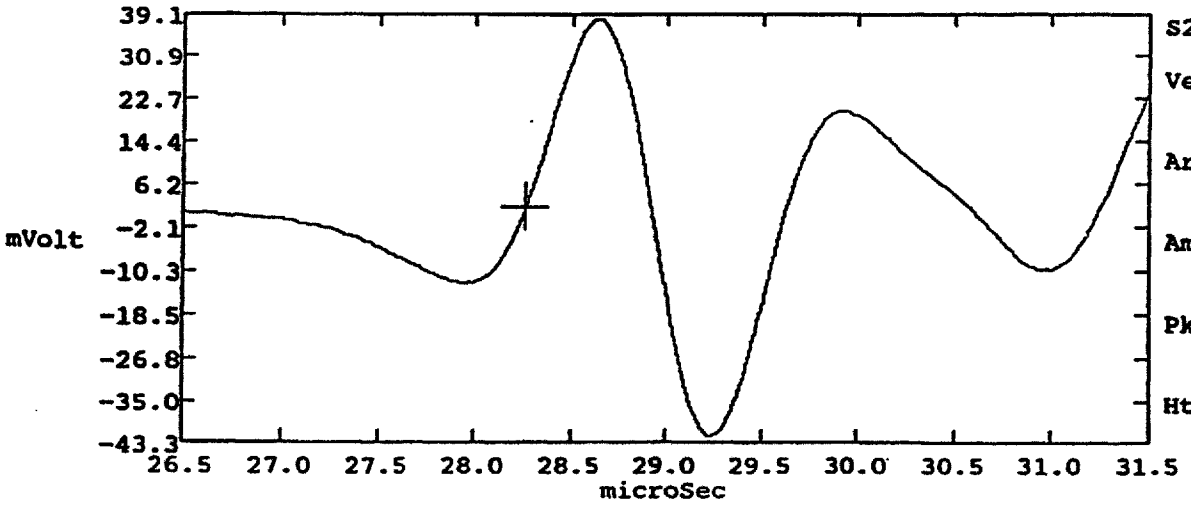
5-15-91 10:14:26



P Wave
Velocity(ft/s): 12753.38
ArrTm(microSec): 15.67
Ampltd (mVolt): -1.89
PkPk (mVolt): 128.36
HtoH (microSec): 12.71

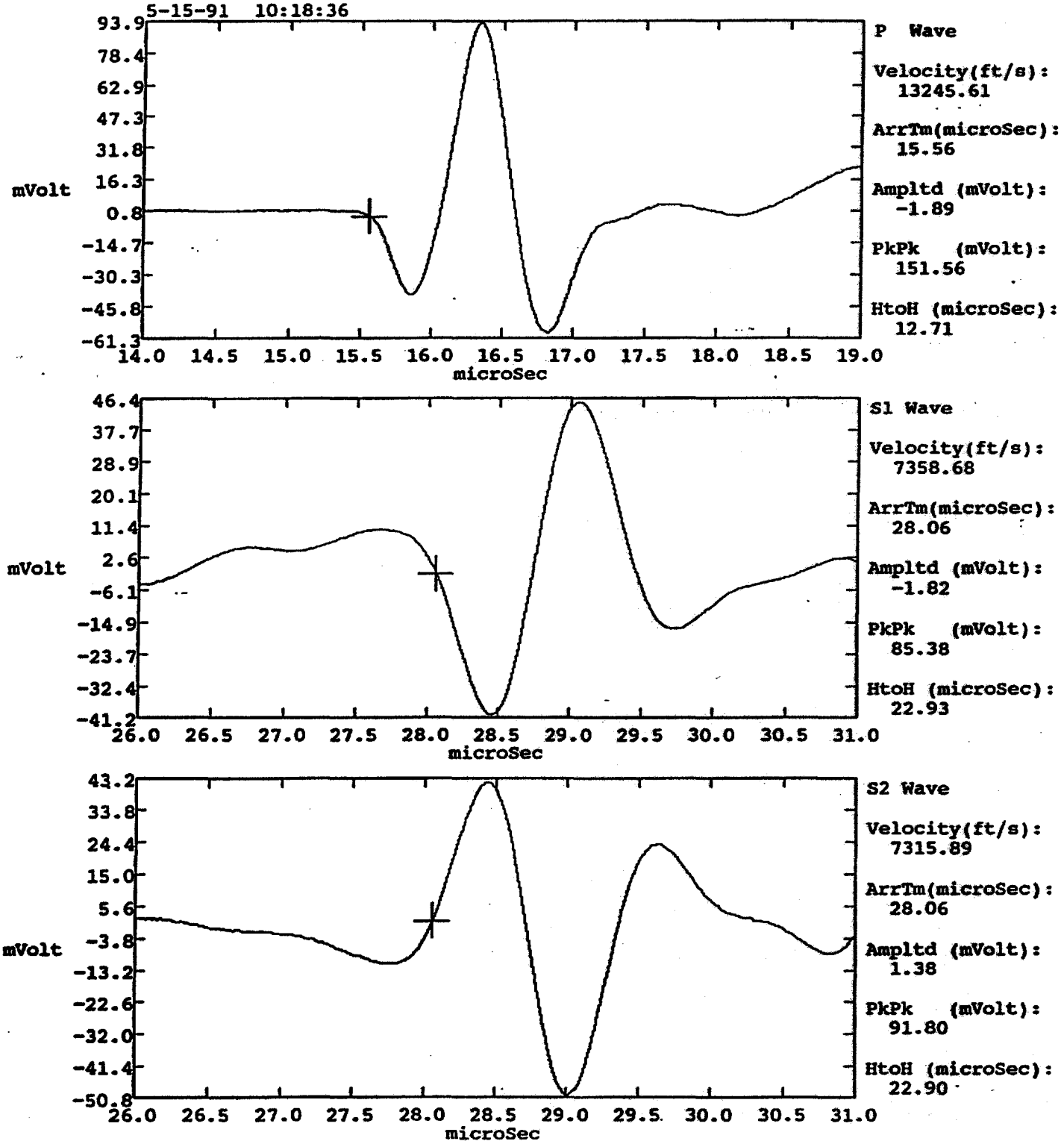


S1 Wave
Velocity(ft/s): 7016.73
ArrTm(microSec): 28.31
Ampltd (mVolt): -4.27
PkPk (mVolt): 214.56
HtoH (microSec): 22.93

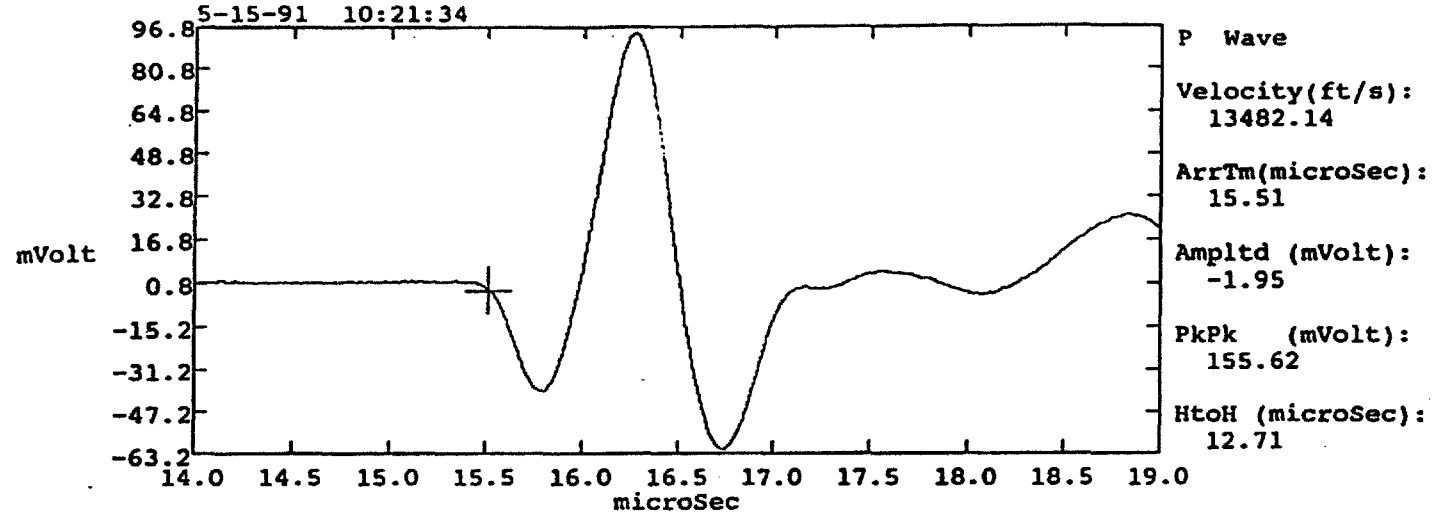


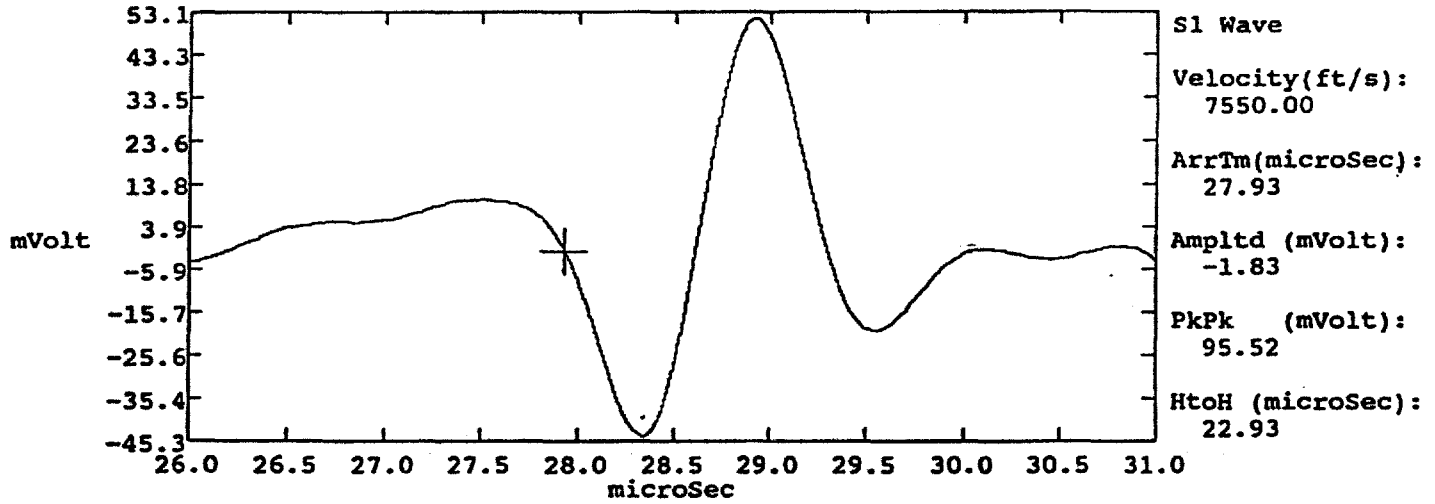
S2 Wave
Velocity(ft/s): 7042.91
ArrTm(microSec): 28.26
Ampltd (mVolt): 1.80
PkPk (mVolt): 79.83
HtoH (microSec): 22.90

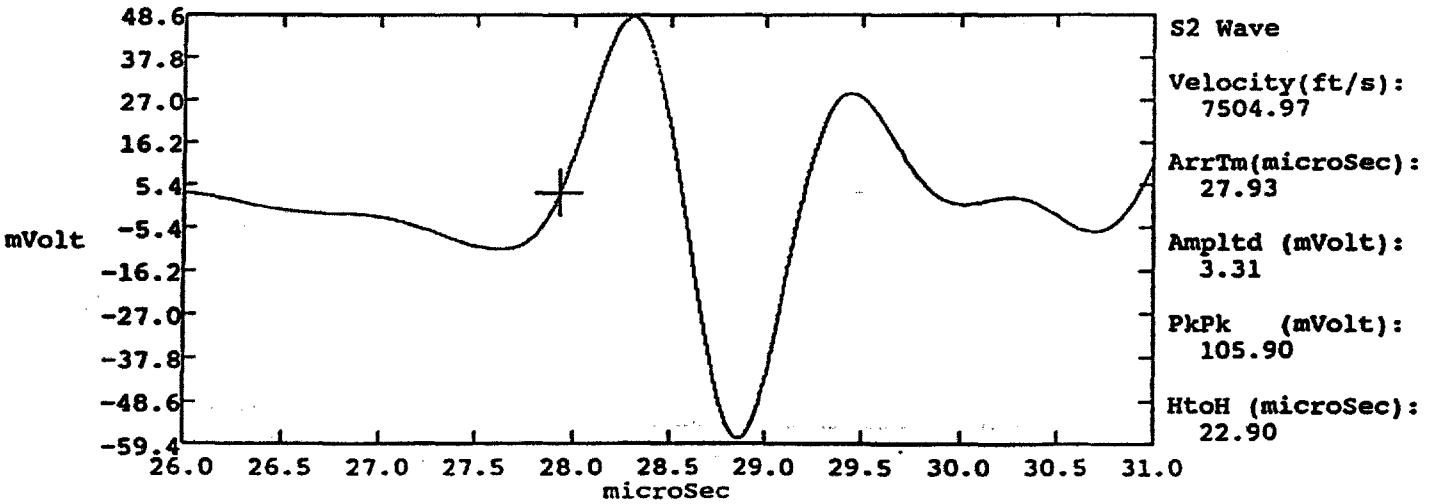
Well: EXXON ANTARES 1
Sample: 7466 Length:0.453 inch Fluid: BRINE
Conf Pr:7600.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 7466.3B Pick: Manual 5-15-91 10:18:36
20kppm NaCl Brine



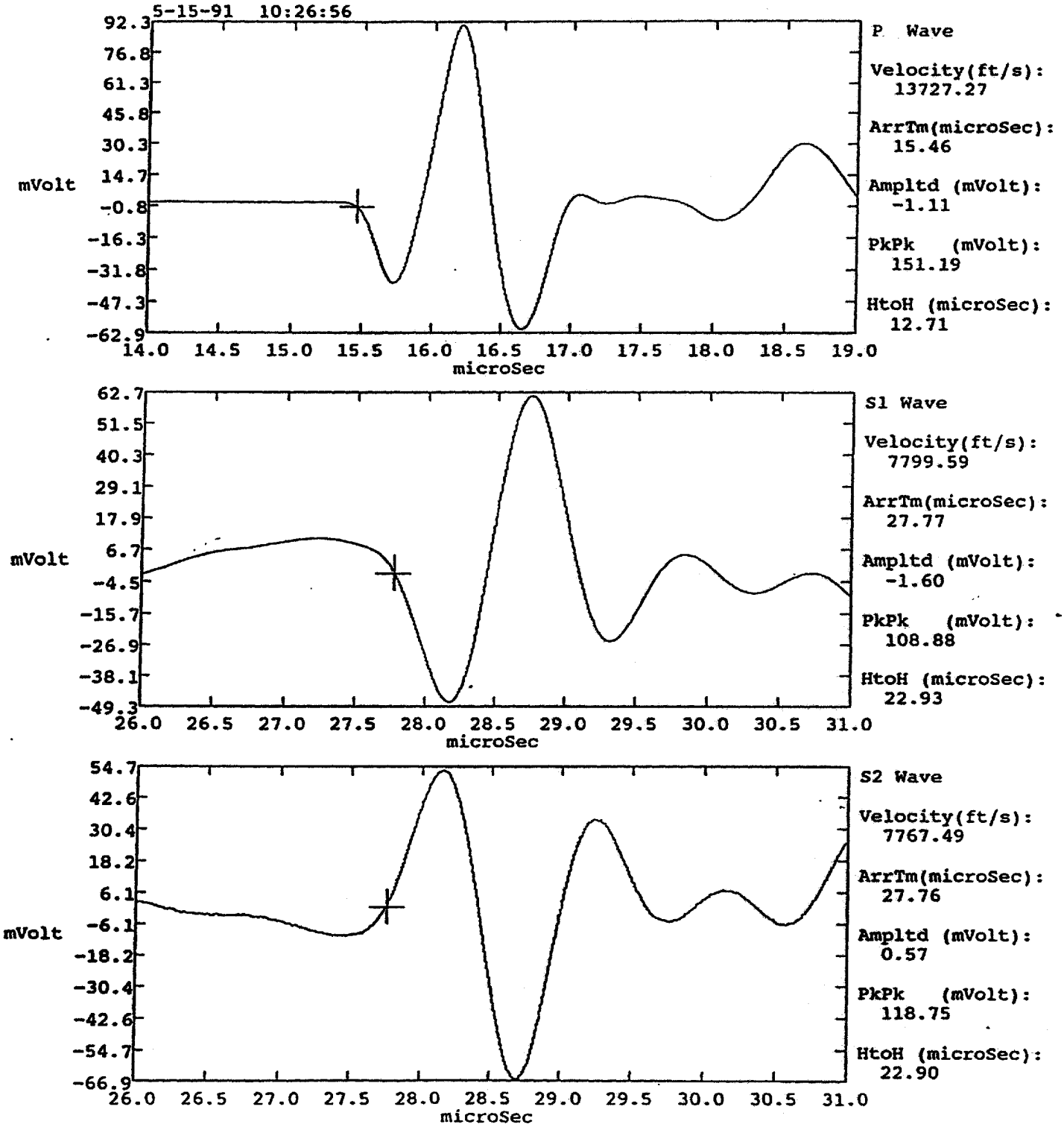
Well: EXXON ANTARES 1
Sample: 7466 Length:0.453 inch Fluid: BRINE
Conf Pr:10100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 7466.4BA Pick: Manual 5-15-91 12:36:8
20kppm NaCl Brine



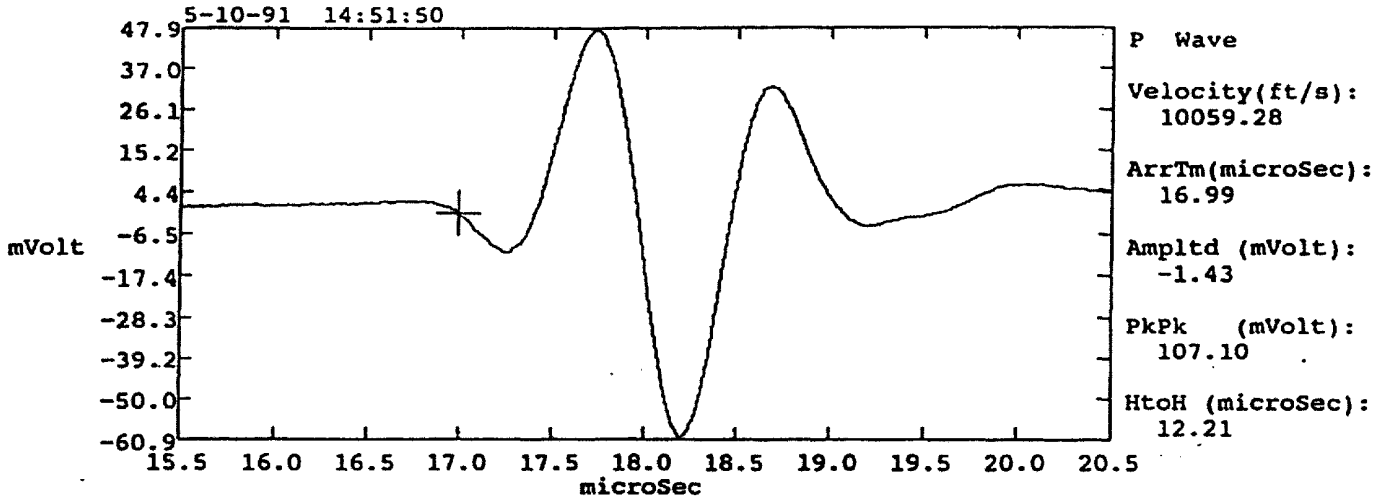




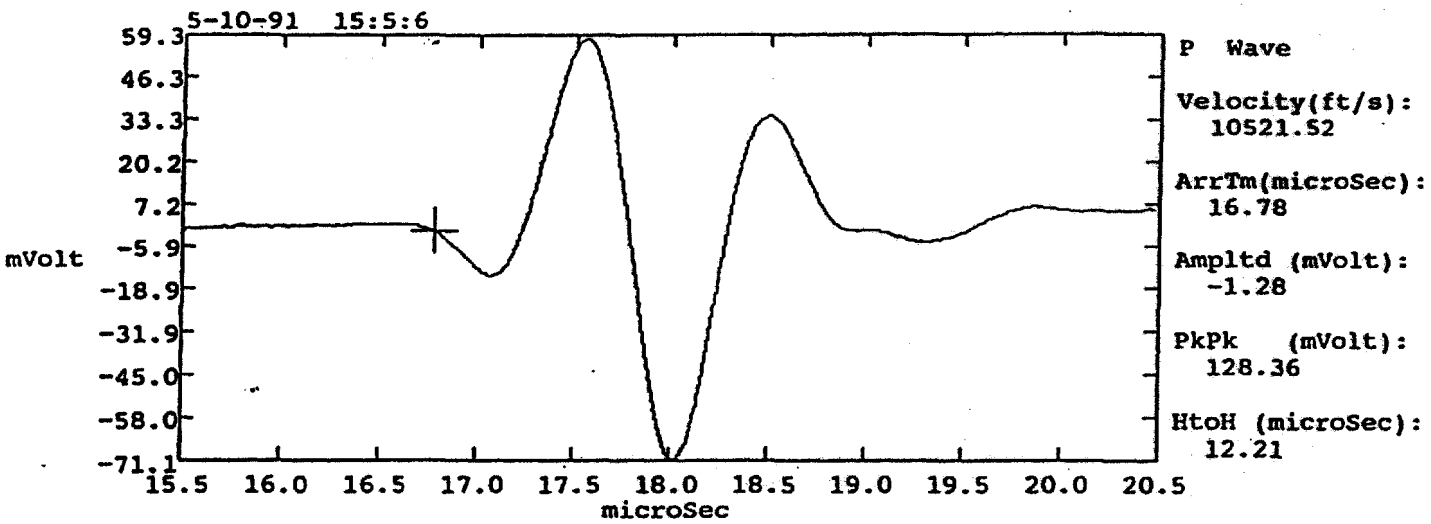
Well: EXXON ANTARES 1
Sample: 7466 Length:0.453 inch Fluid: BRINE
Conf Pr:15100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 7466.5BA Pick: Manual 5-15-91 12:38:4
20kppm NaCL Brine



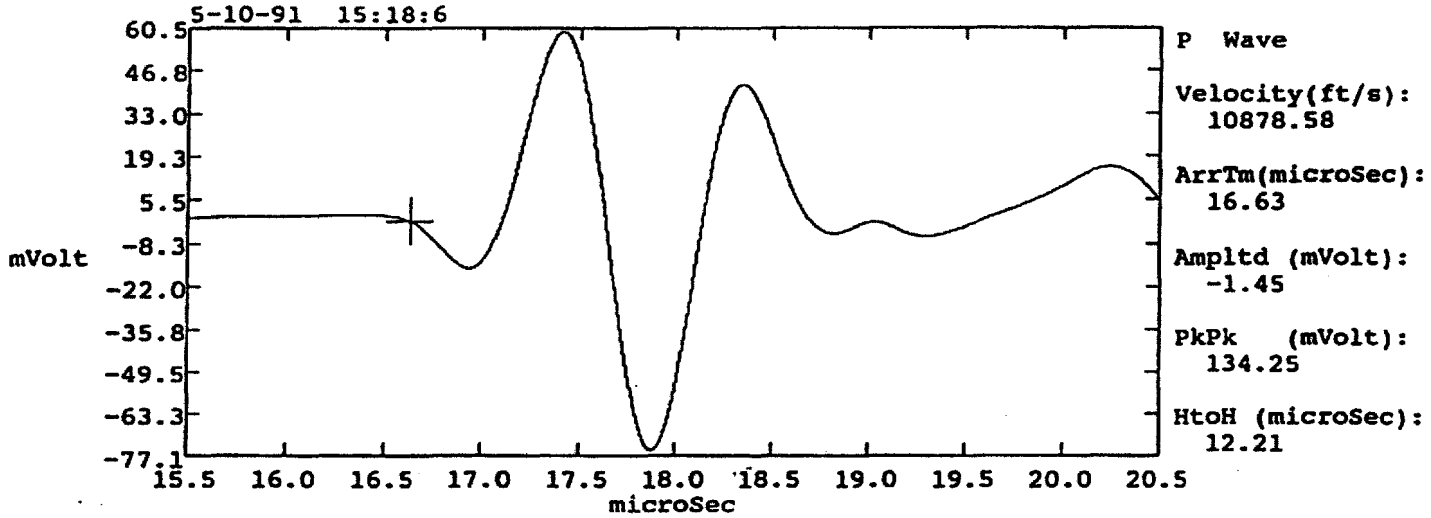
Well: EXXON ANTARES 1
Sample: 7525 Length:0.577 inch Fluid: BRINE
Conf Pr:1100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 7525.1B Pick: Manual 5-10-91 14:51:50
20kppm NaCl Brine



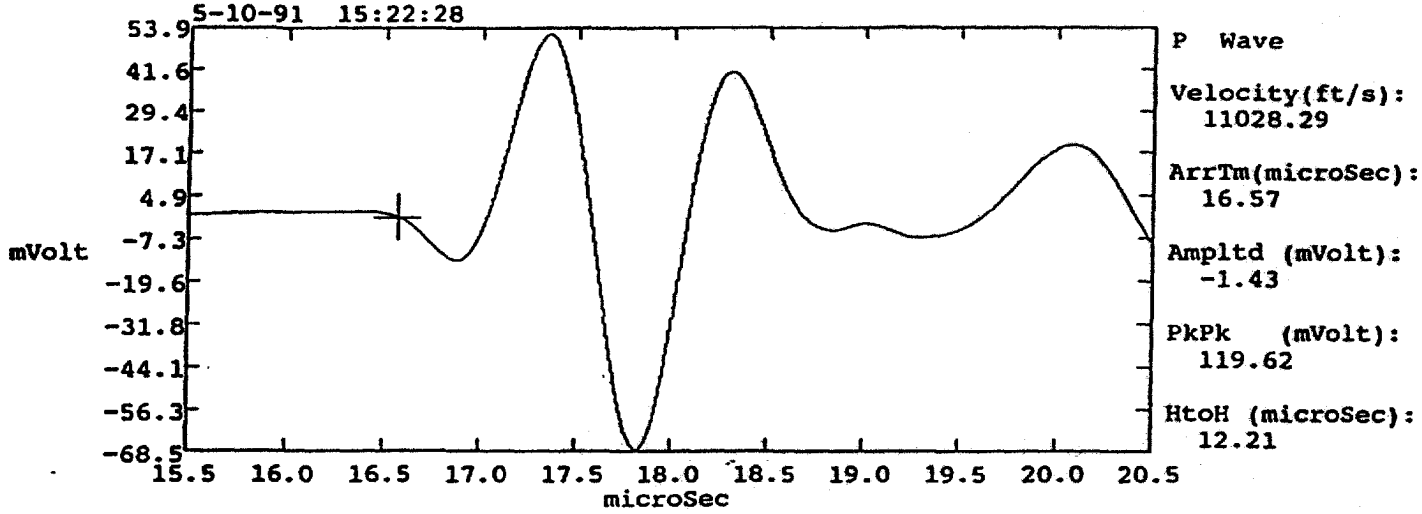
Well: EXXON ANTARES 1
Sample: 7525 Length:0.577 inch Fluid: BRINE
Conf Pr:4100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 7525.2B Pick: Manual 5-10-91 15:5:6
20kppm NaCI Brine



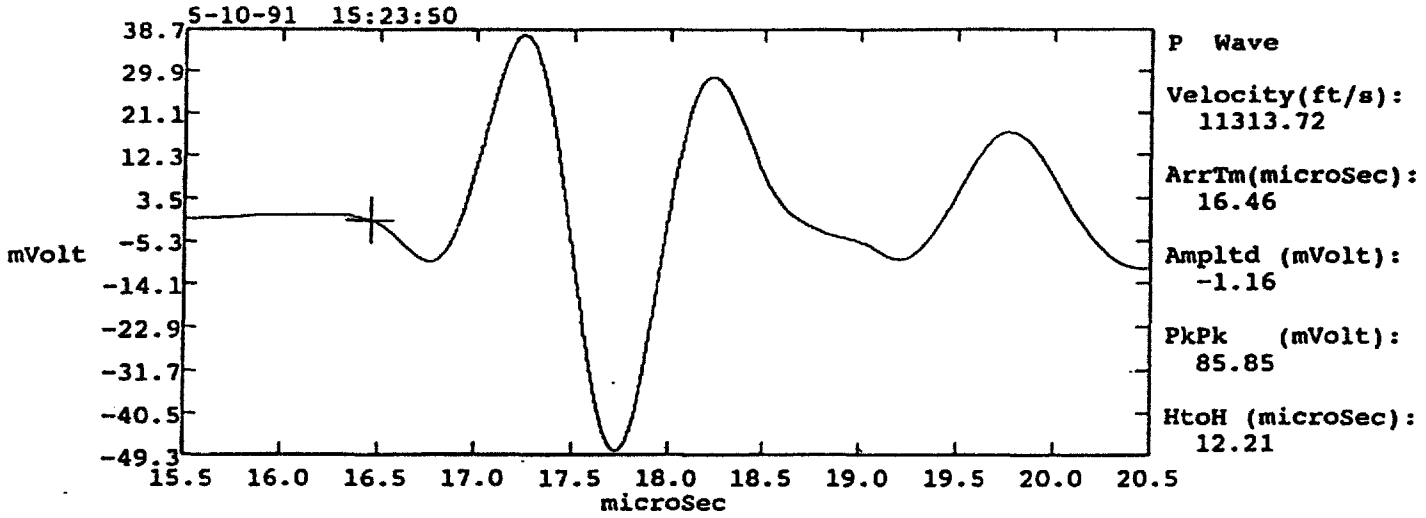
Well: EXXON ANTARES 1
Sample: 7525 Length:0.577 inch Fluid: BRINE
Conf Pr:7600.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 7525.3B Pick: Manual 5-10-91 15:21:10
20kppm NaCl Brine



Well: EXXON ANTARES 1
Sample: 7525 Length:0.577 inch Fluid: BRINE
Conf Pr:10100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 7525.4B Pick: Manual 5-10-91 15:22:28
20kppm NaCI Brine

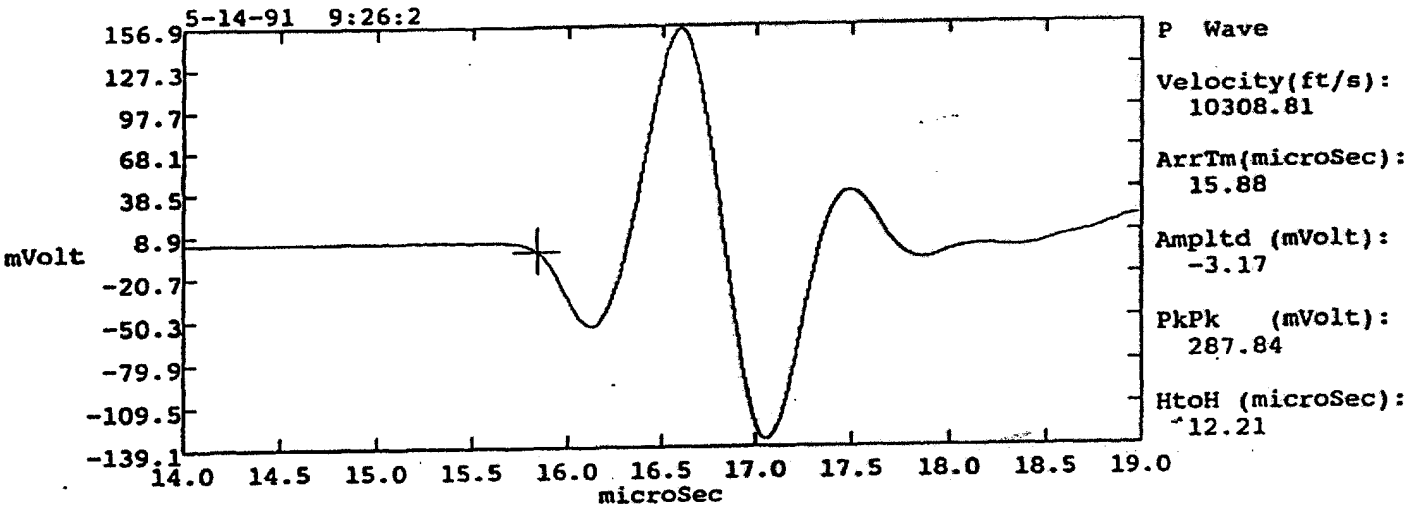


Well: EXXON ANTARES 1
Sample: 7525 Length:0.577 inch Fluid: BRINE
Conf Pr:15100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 7525.5B Pick: Manual 5-10-91 15:23:50
20kppm NaCI Brine

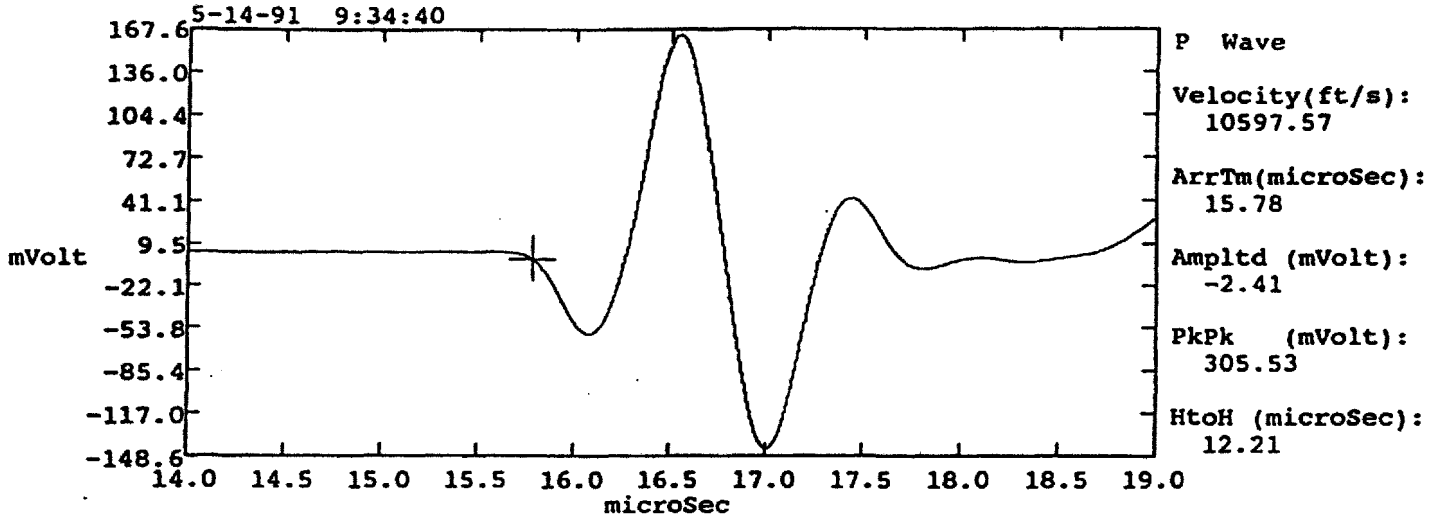


Well: EXXON ANTARES 1
Sample: 7927
Conf Pr:1100.00 psi
File: 7927.1B
20kppm NaCl Brine

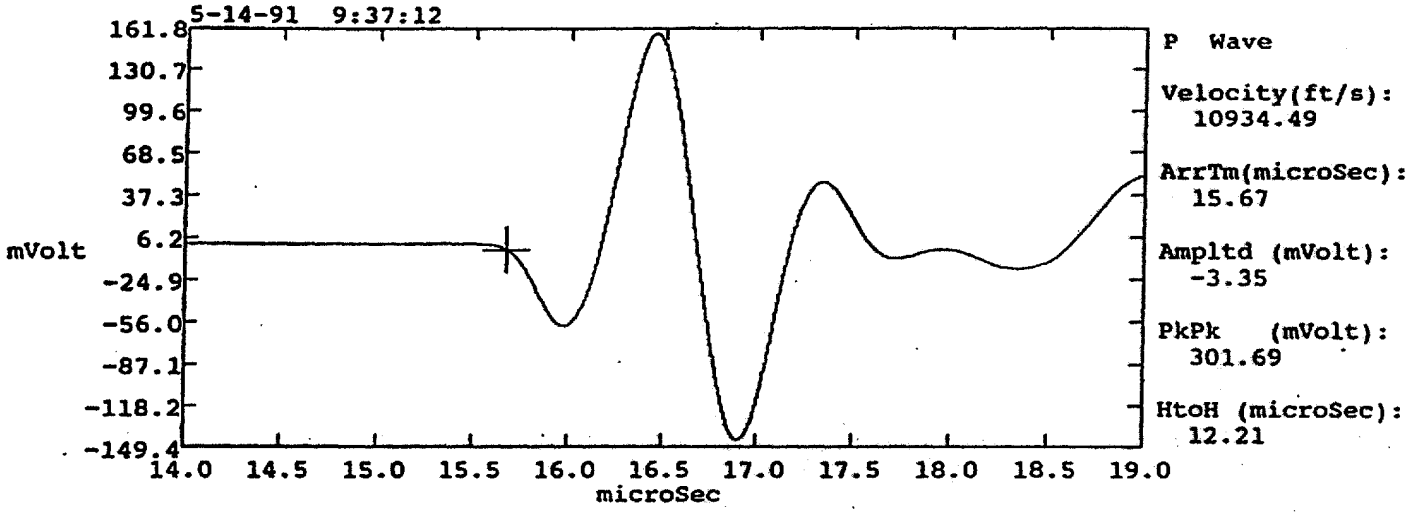
Length:0.454 inch Fluid: BRINE
Pore Pr :100.00 psi Temp :21.00 C
Pick: Manual 5-14-91 9:26:2



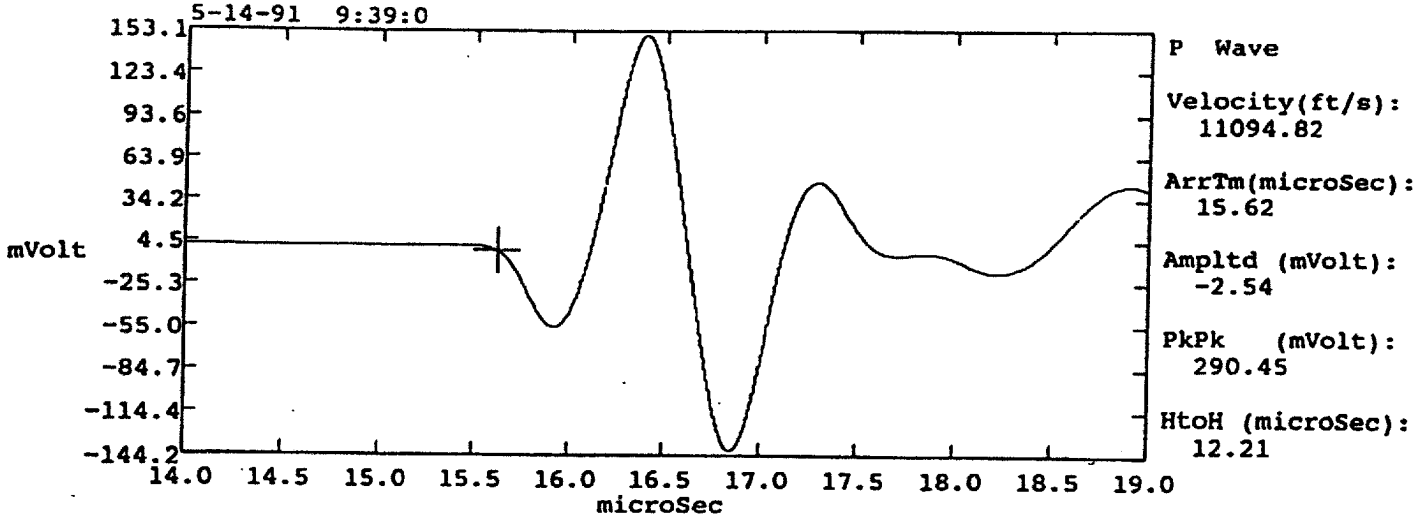
Well: EXXON ANTARES 1
Sample: 7927 Length:0.454 inch Fluid: BRINE
Conf Pr:4100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 7927.2B Pick: Manual 5-14-91 9:34:40
20kppm NaCl Brine



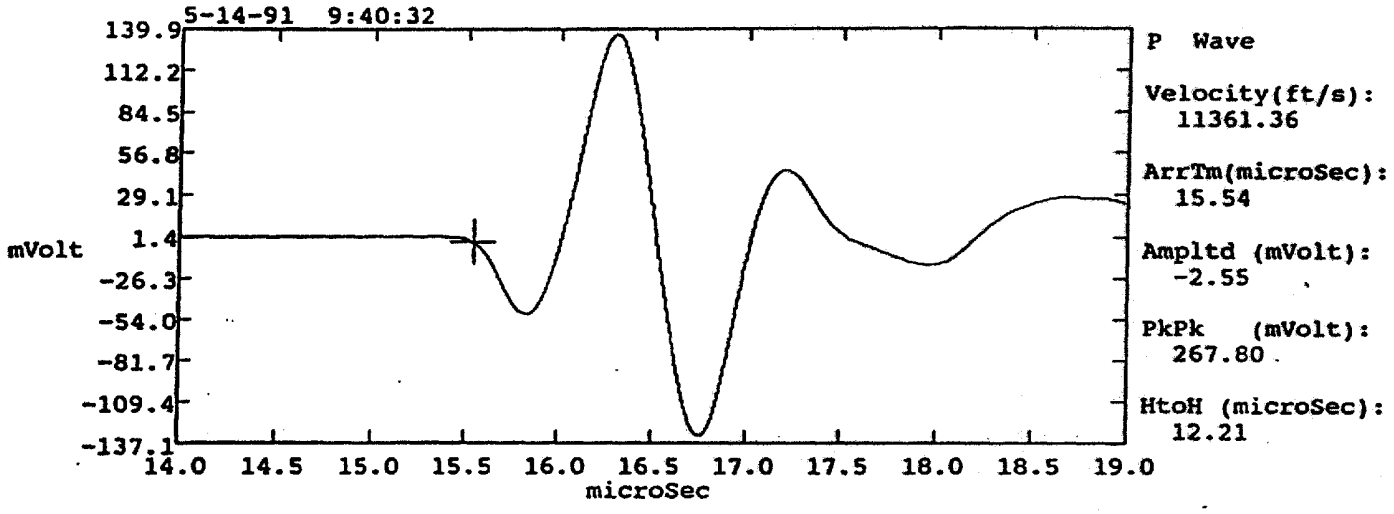
Well: EXXON ANTARES 1
Sample: 7927 Length:0.454 inch Fluid: BRINE
Conf Pr:7600.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 7927.3B Pick: Manual 5-14-91 9:37:58
20kppm NaCI Brine



Well: EXXON ANTARES 1
Sample: 7927 Length:0.454 inch Fluid: BRINE
Conf Pr:10100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 7927.4B Pick: Manual 5-14-91 9:39:2
20kppm NaCl Brine

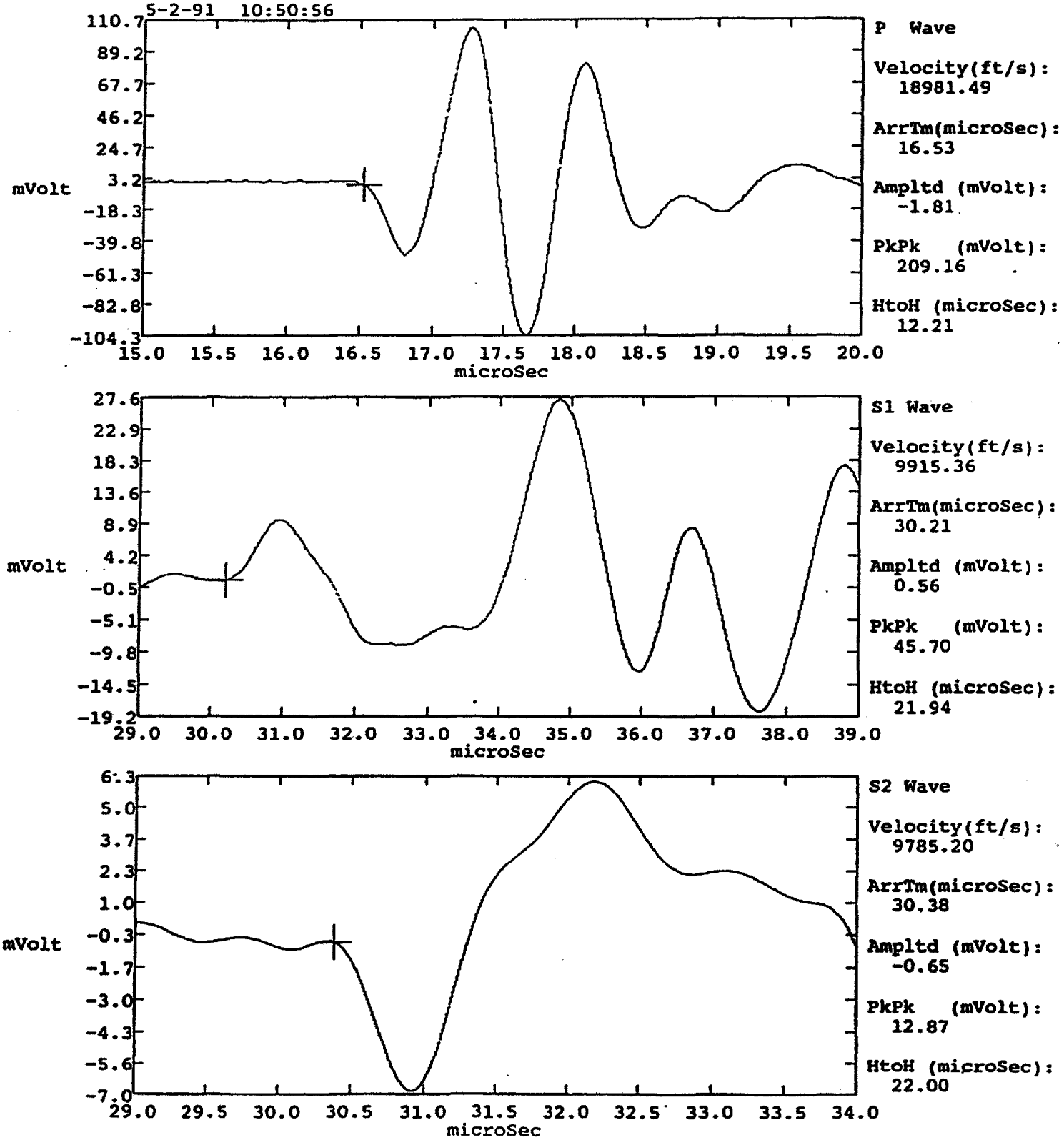


Well: EXXON ANTARES 1
Sample: 7927 Length:0.454 inch Fluid: BRINE
Conf Pr:15100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 7927.5B Pick: Manual 5-14-91 9:40:34
20kppm NaCI Brine

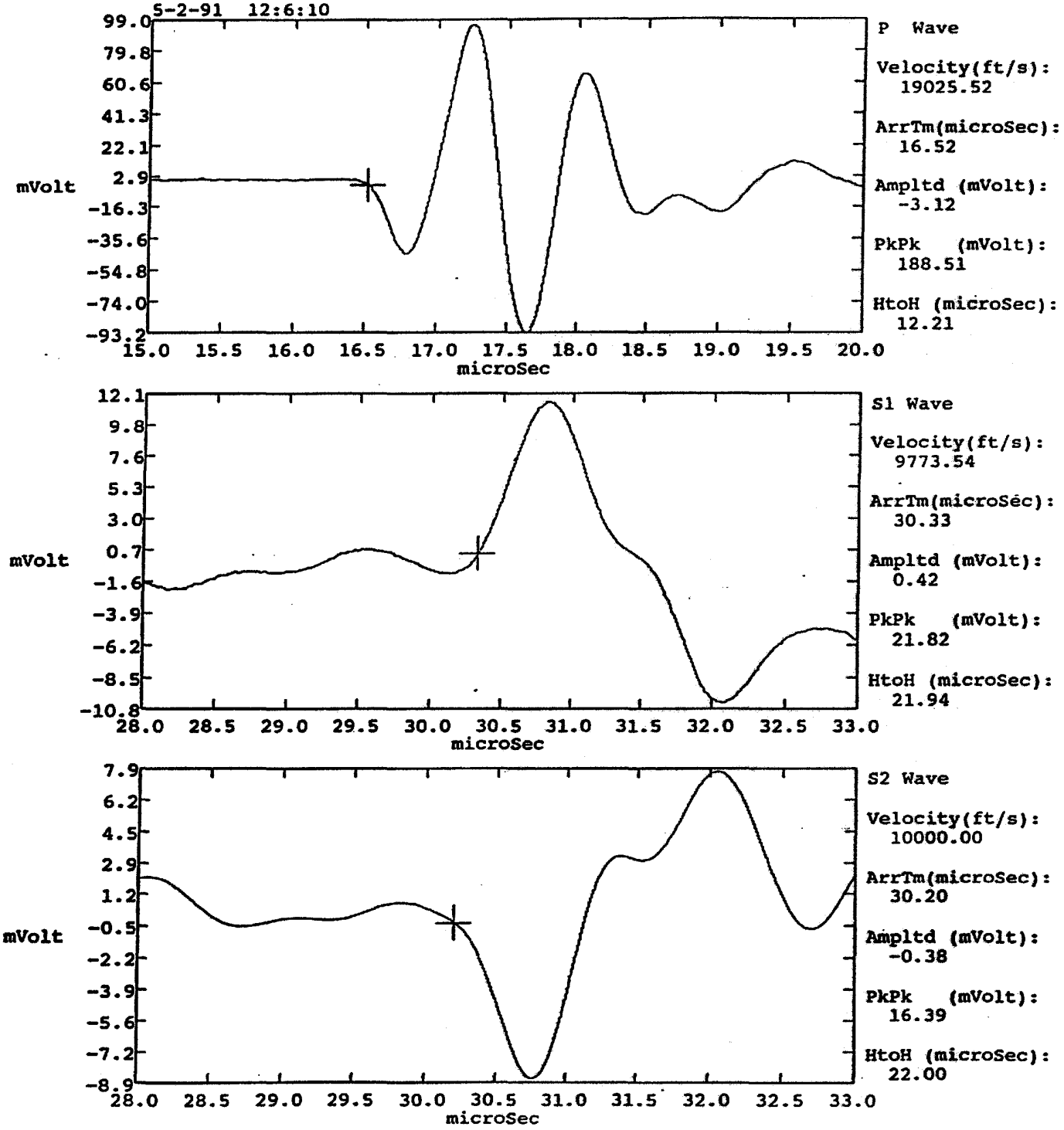


Well: EXXON ANTARES 2
Sample: 8060 Length:0.984 inch Fluid: BRINE
Conf Pr:1100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8060.1BA Pick: Manual 5-16-91 13:16:4
20kppm NaCI Brine

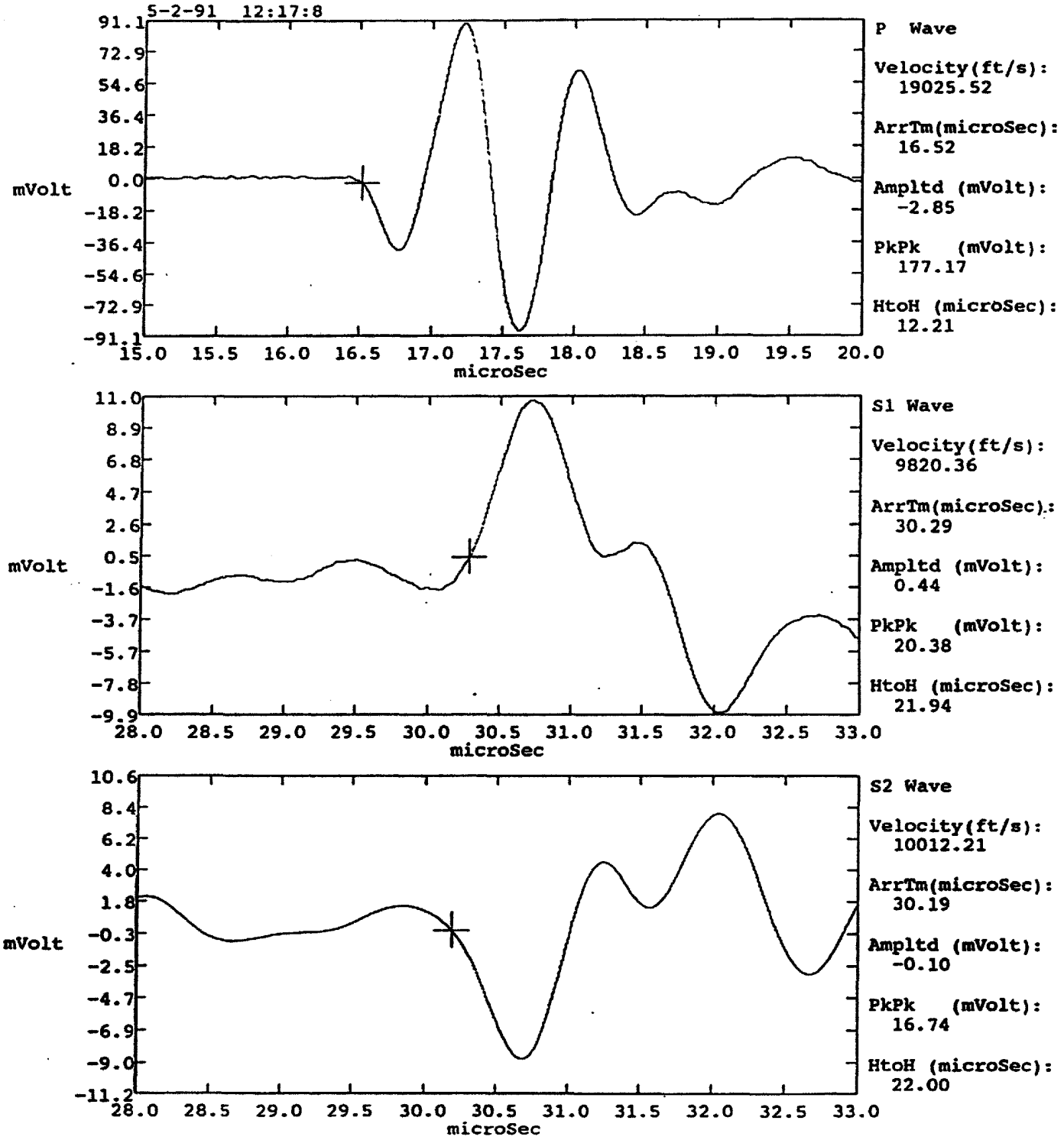
5-2-91 10:50:56



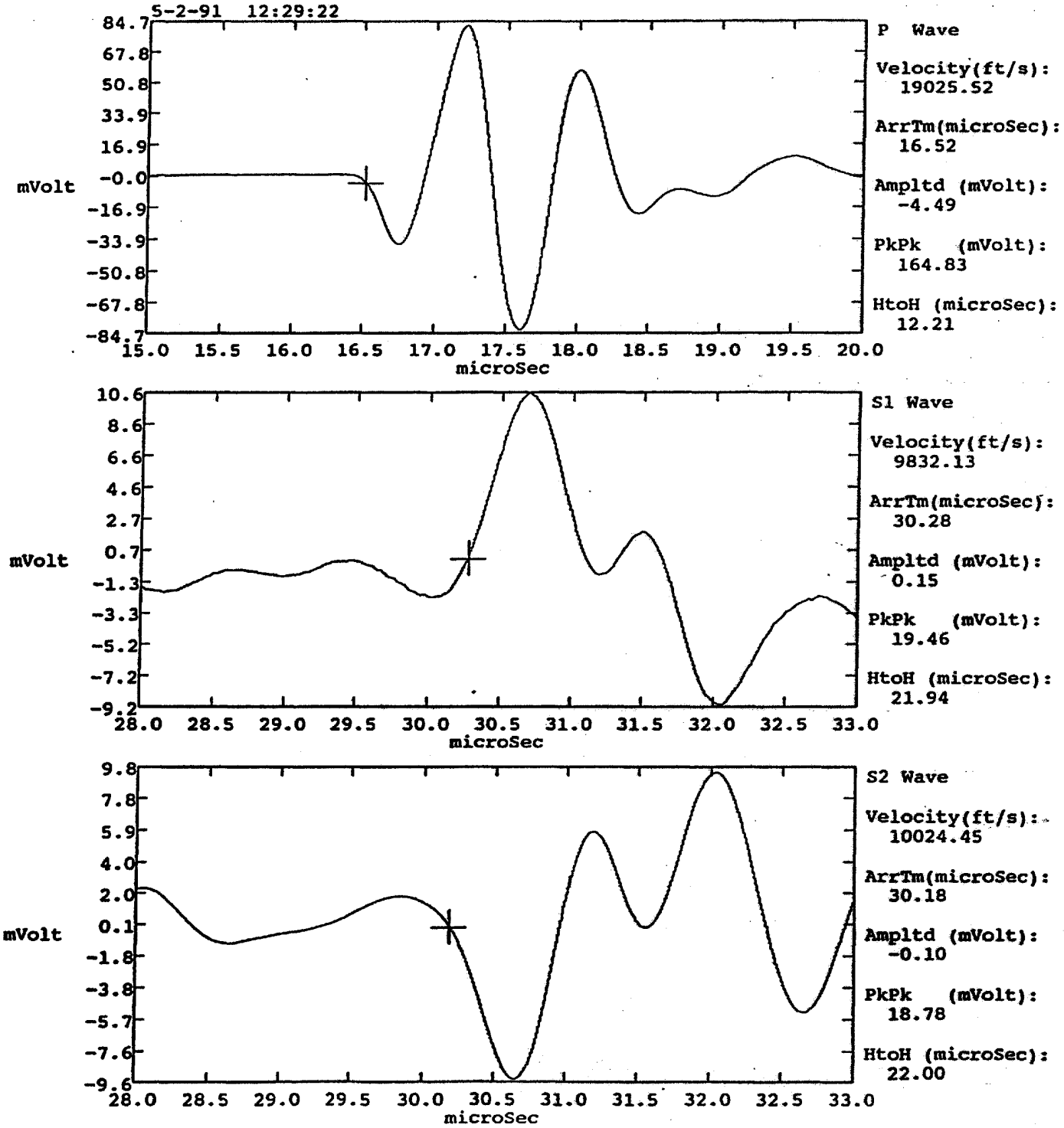
Well: EXXON ANTARES 2
Sample: 8060 Length:0.984 inch Fluid: BRINE
Conf Pr:4100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8060.2B Pick: Manual 5-2-91 12:24:34
20kppm NaCI Brine



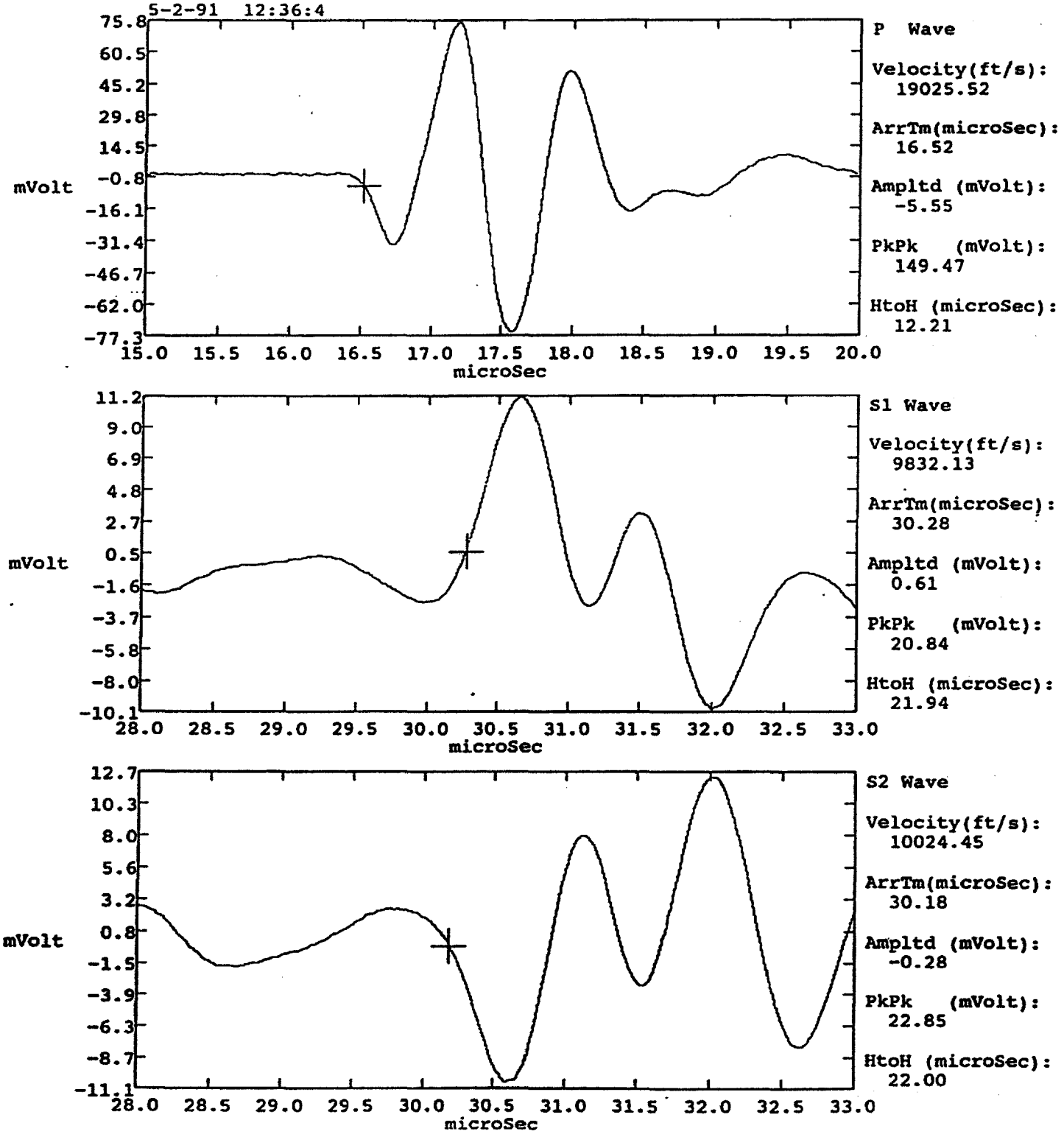
Well: EXXON ANTARES 2
Sample: 8060 Length:0.984 inch Fluid: BRINE
Conf Pr:7600.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8060.3B Pick: Manual 5-2-91 12:17:8
20kppm NaCl Brine



Well: EXXON ANTARES 2
Sample: 8060 Length:0.984 inch Fluid: BRINE
Conf Pr:10100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8060.4B Pick: Manual 5-2-91 12:29:22
20kppm NaCl Brine

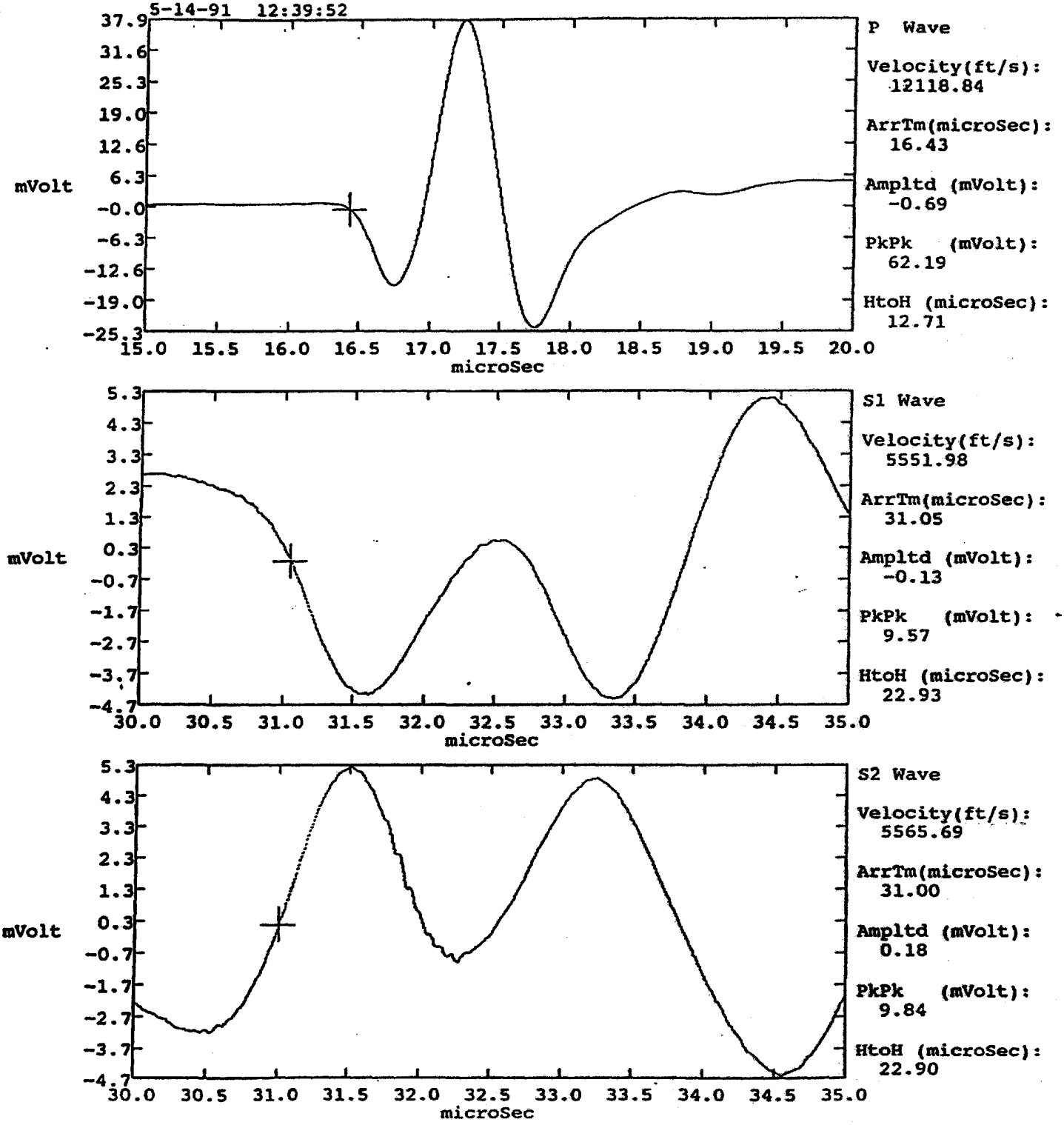


Well: EXXON ANTARES 2
Sample: 8060 Length:0.984 inch Fluid: BRINE
Conf Pr:15100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8060.5B Pick: Manual 5-2-91 12:36:6
20kppm NaCI Brine

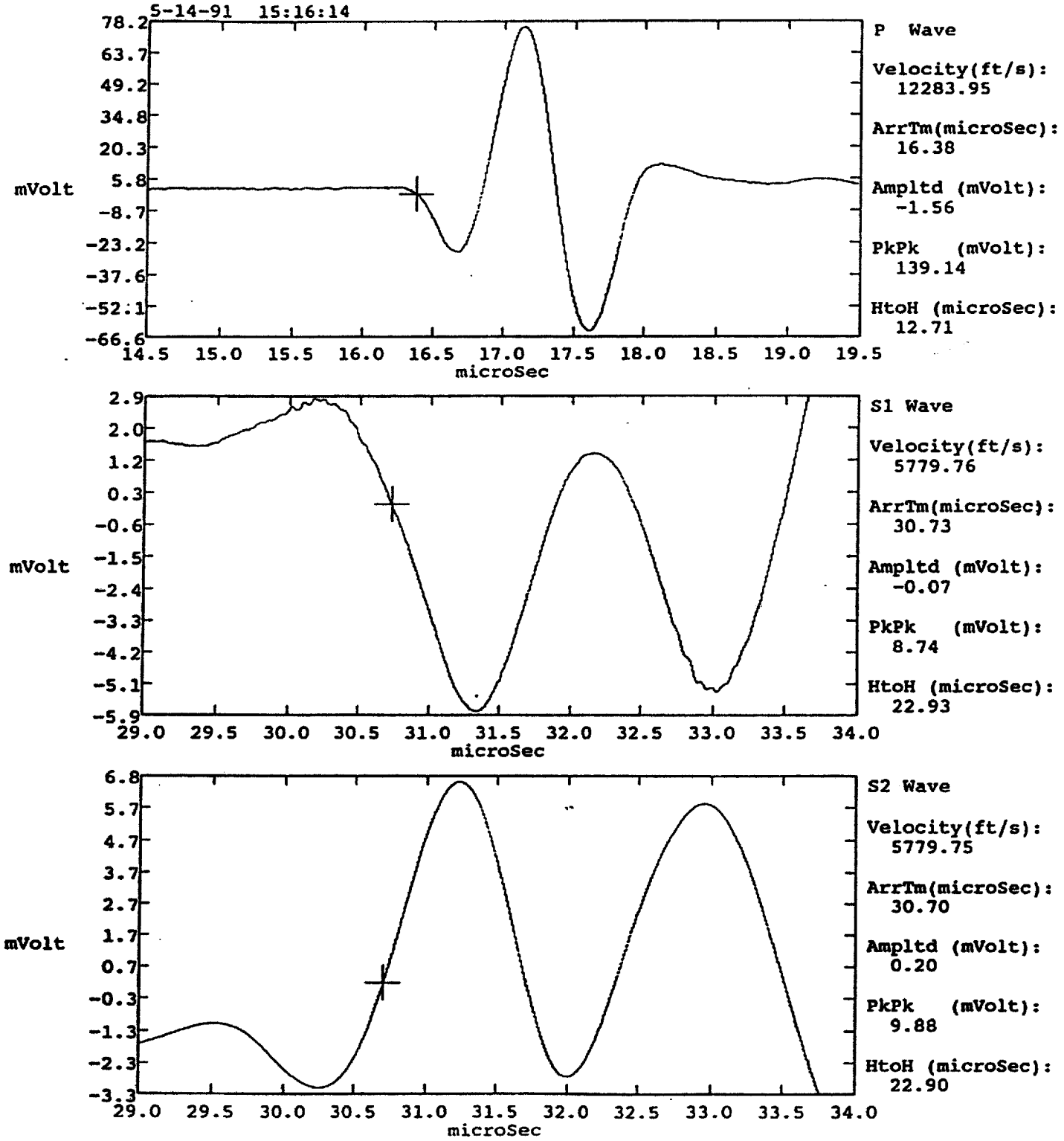


Well: Exxon antares 1
Sample: 8221 Length:0.541 inch Fluid: Brine
Conf Pr:1100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8221.1B Pick: Manual 5-14-91 15:11:42
20kppm NaCl Brine

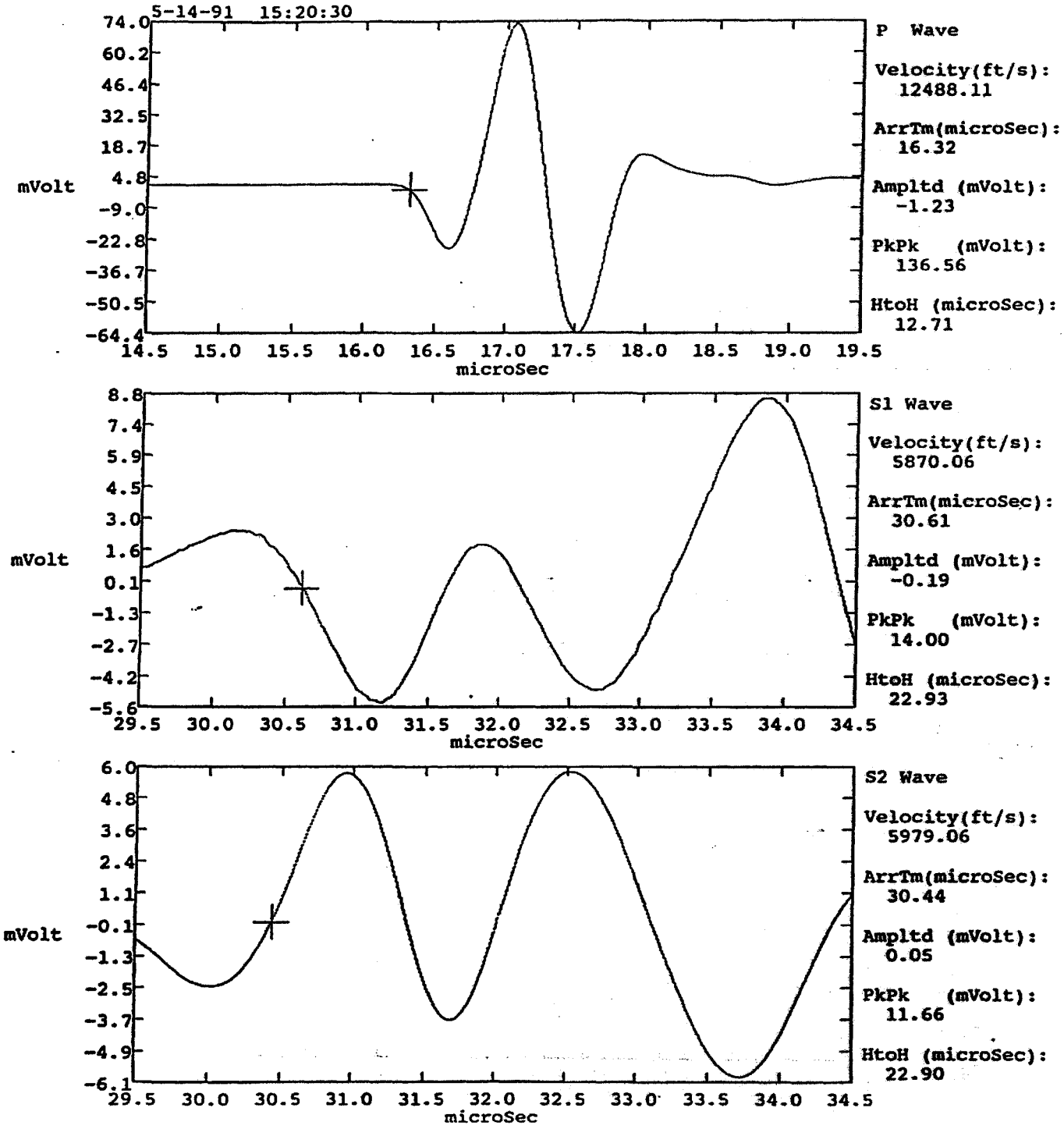
5-14-91 12:39:52



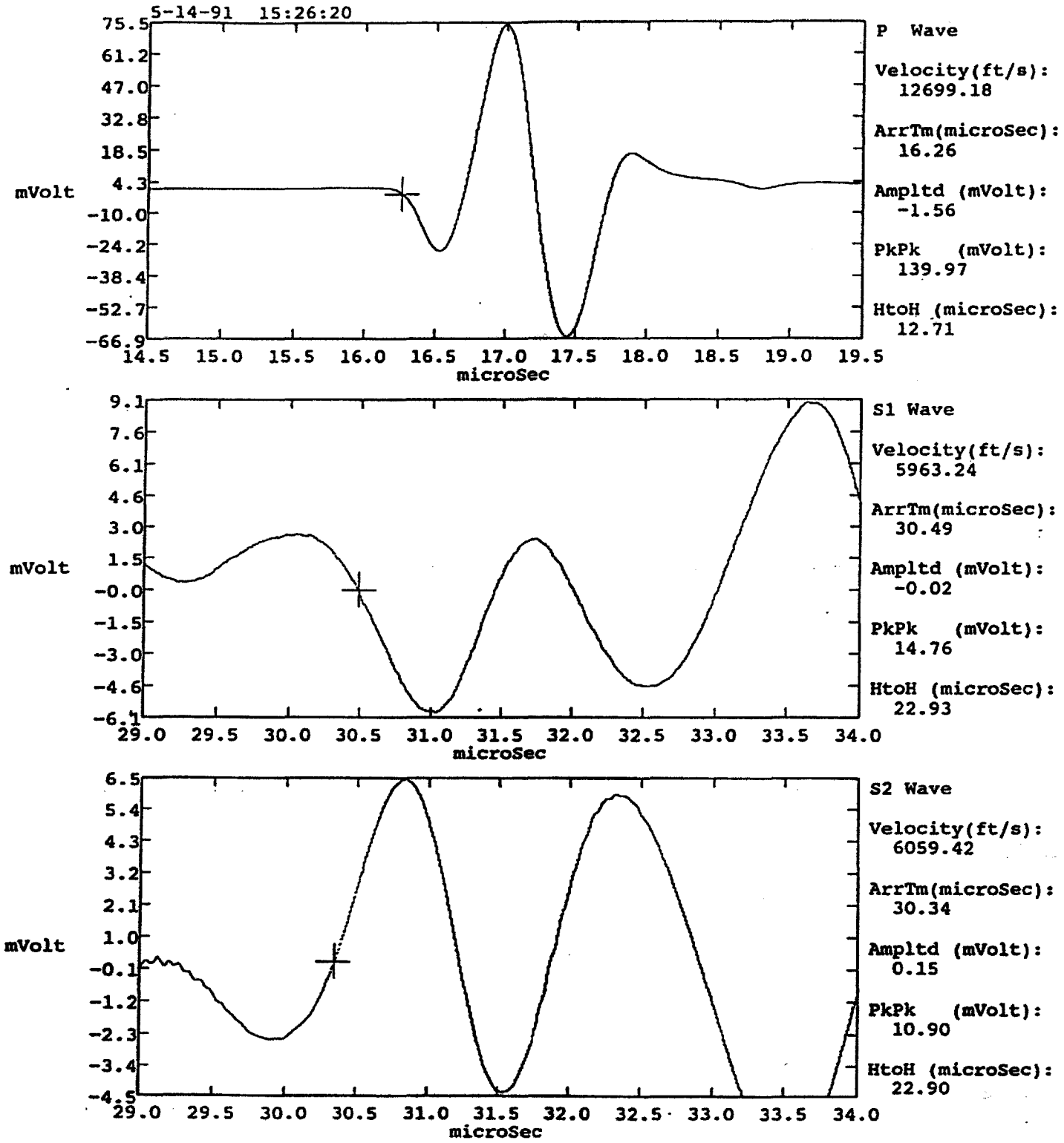
Well: Exxon antares 1
Sample: 8221 Length:0.541 inch Fluid: Brine
Conf Pr:4100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8221.2B Pick: Manual 5-14-91 15:16:16
20kppm NaCl Brine



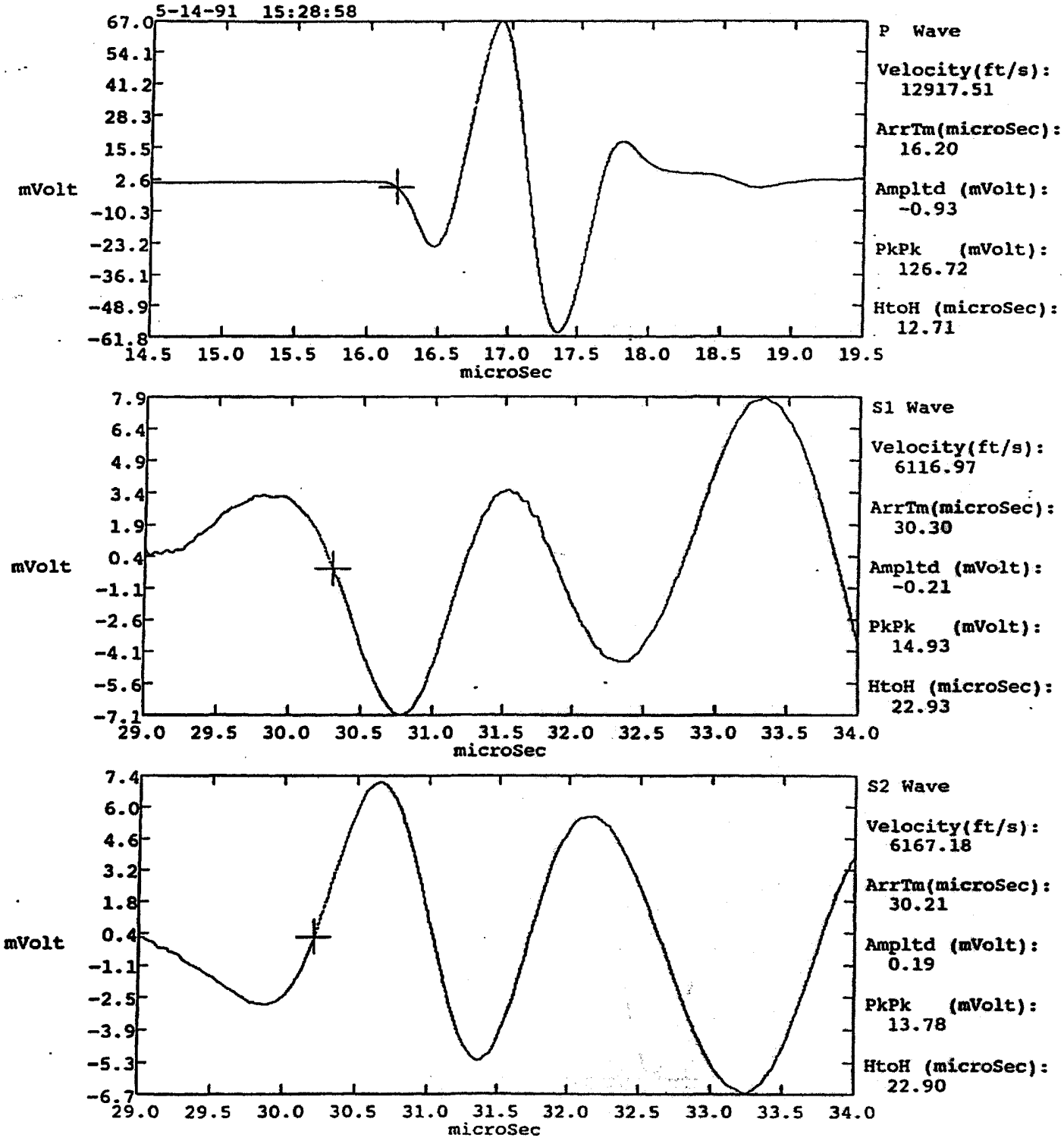
Well: Exxon antares 1
Sample: 8221 Length:0.541 inch Fluid: Brine
Conf Pr:7600.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8221.3B Pick: Manual 5-14-91 15:20:30
20kppm NaCl Brine



Well: Exxon antares 1
Sample: 8221 Length:0.541 inch Fluid: Brine
Conf Pr:10100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8221.4B Pick: Manual 5-14-91 15:26:22
20kppm NaCI Brine

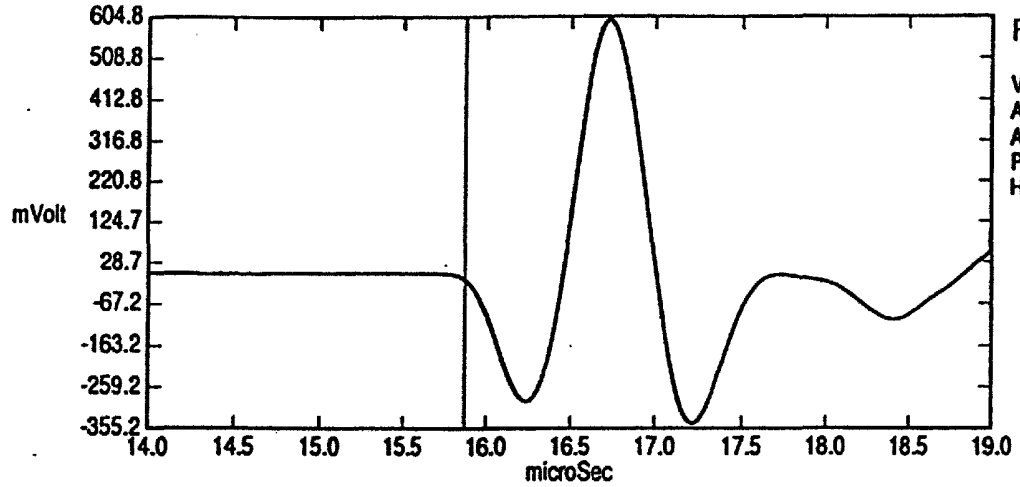


Well: Exxon antares 1
Sample: 8221 Length:0.541 inch Fluid: Brine
Conf Pr:15100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8221.5B Pick: Manual 5-14-91 15:28:58
20kppm NaCI Brine



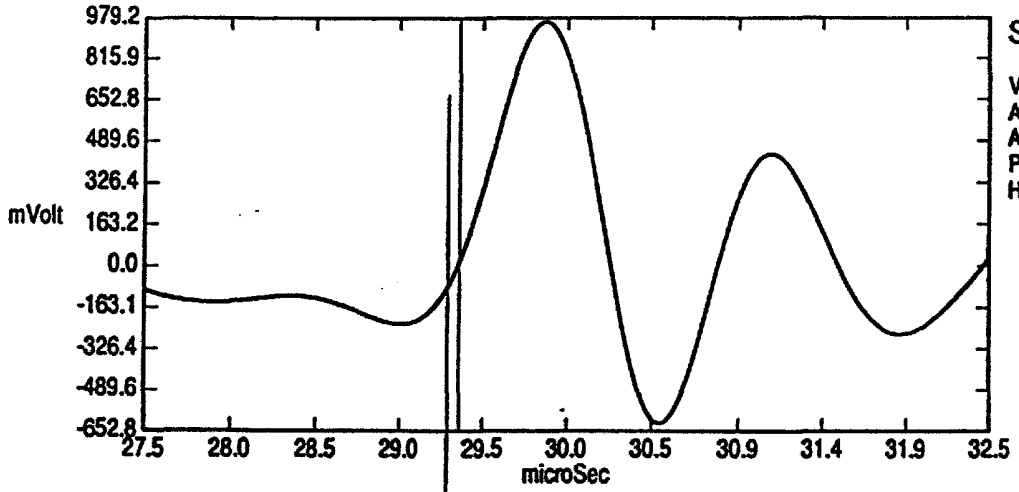
Well : EXXON ANTARES 2
Sample : 8283
Fluid : BRINE
File : 8283.1b
20kppm NaCl Brine

Length : .53 inch
Conf Pr : 1100 psi
Pore Pr : 100 psi
Temp : 21 C



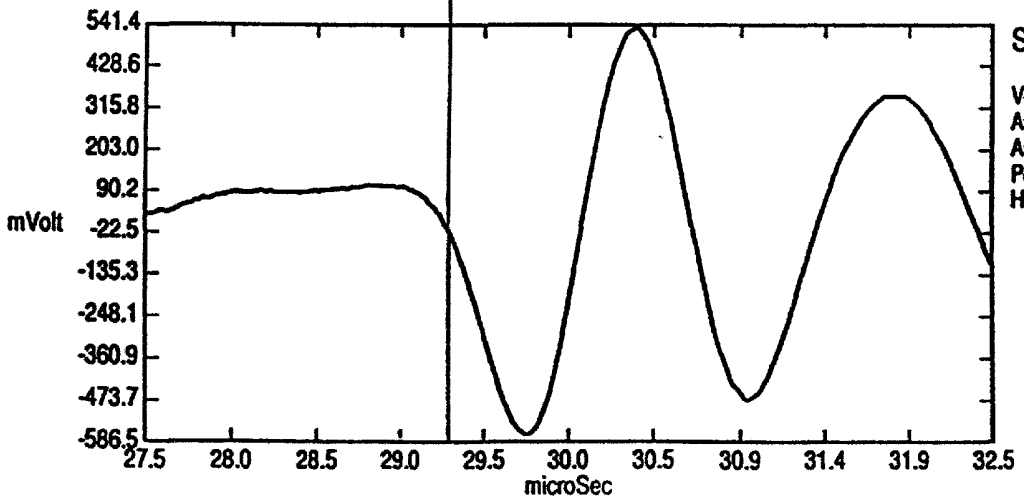
P wave

Velocity	: 11976.3	ft/sec
Arrival Time	: 15.87	microSec
Amplitude	: 57.31	mVolt
Peak to Peak	: 93.72	mVolt
Head to Head	: 12.21	microSec



S1 wave

Velocity	: 5907.45	ft/sec
Arrival Time	: 29.36	microSec
Amplitude	: 65.68	mVolt
Peak to Peak	: 50.0	mVolt
Head to Head	: 21.94	microSec

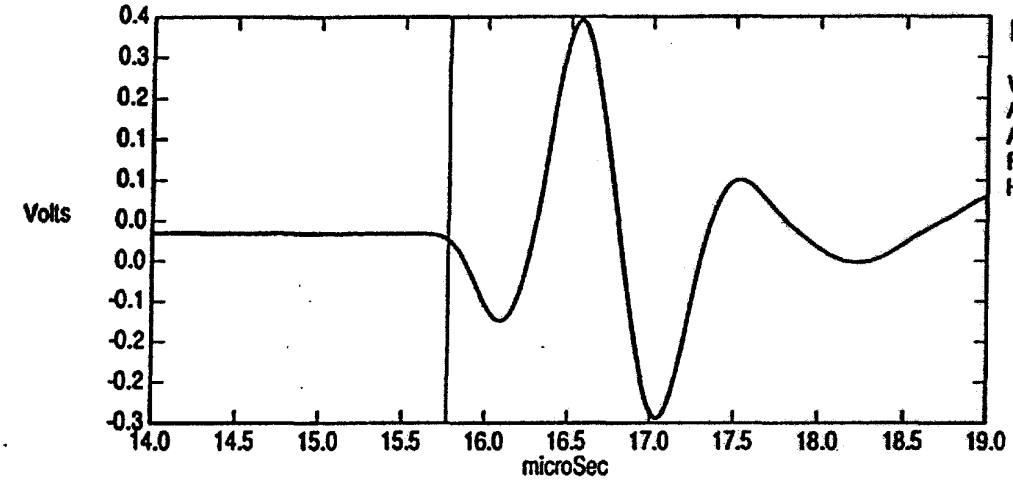


S2 wave

Velocity	: 6012.8	ft/sec
Arrival Time	: 29.29	microSec
Amplitude	: 80.62	mVolt
Peak to Peak	: 34.69	mVolt
Head to Head	: 22.0	microSec

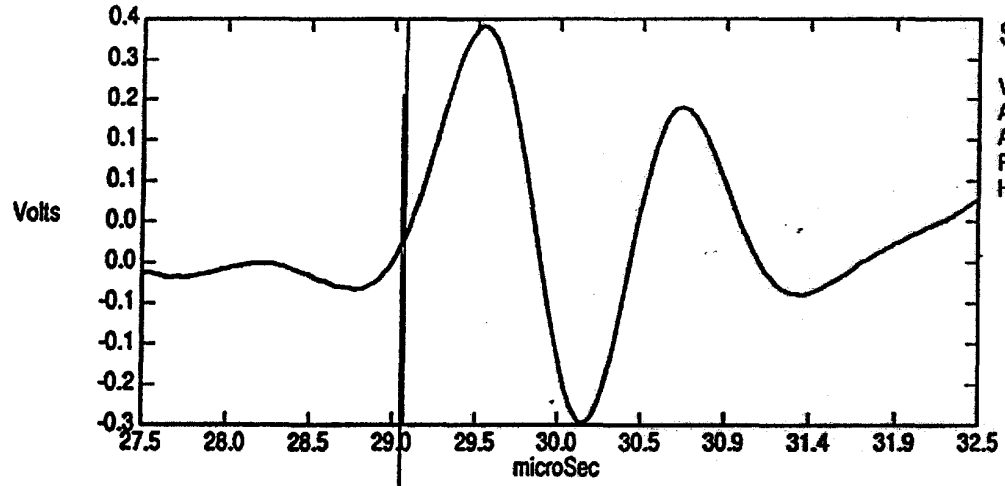
Well : EXXON ANTARES 2
Sample : 8283
Fluid : BRINE
File : 8283.2b
20kppm NaCl Brine

Length : .53 inch
Conf Pr : 4100 psi
Pore Pr : 100 psi
Temp : 21 C



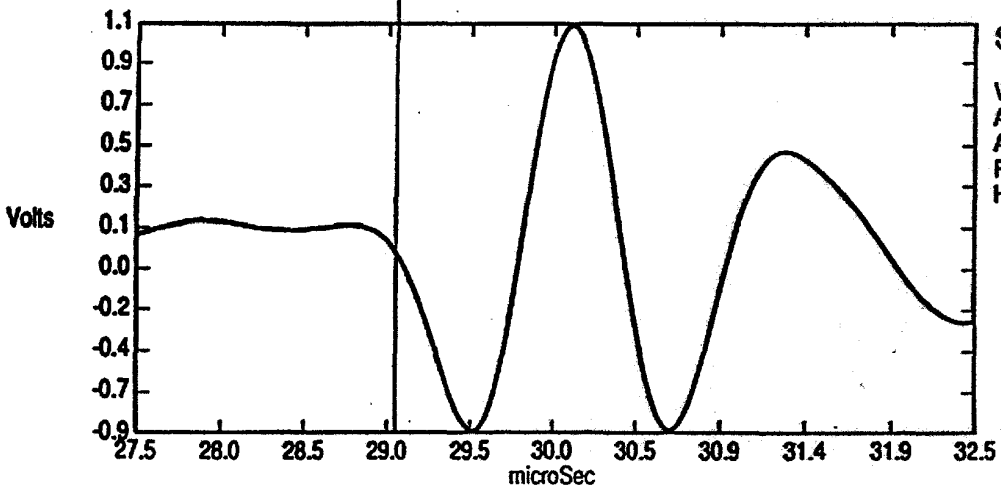
P wave

Velocity	: 12312.7	ft/sec
Arrival Time	: 15.77	microSec
Amplitude	: 72.65	Volts
Peak to Peak	: 0.23	Volts
Head to Head	: 12.21	microSec



S1 wave

Velocity	: 6147.73	ft/sec
Arrival Time	: 29.07	microSec
Amplitude	: 73.43	Volts
Peak to Peak	: 0.07	Volts
Head to Head	: 21.94	microSec

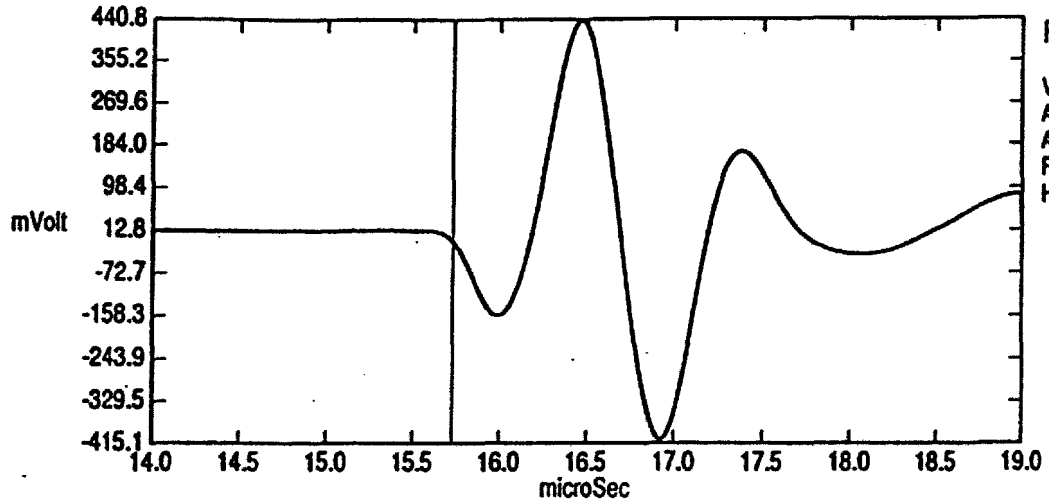


S2 wave

Velocity	: 6217.49	ft/sec
Arrival Time	: 29.05	microSec
Amplitude	: 70.36	Volts
Peak to Peak	: 0.06	Volts
Head to Head	: 22.0	microSec

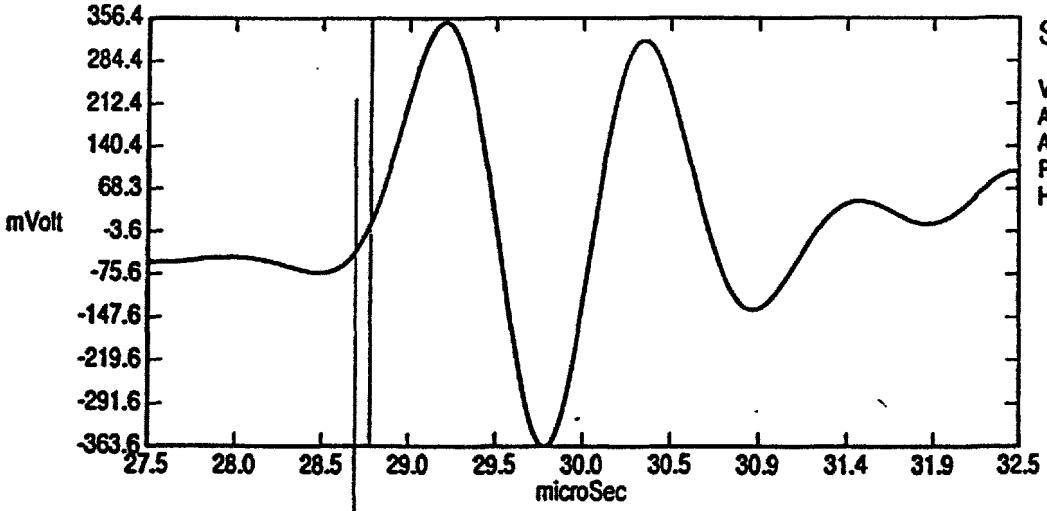
Well : EXXON ANTARES 2
Sample : 8283
Fluid : BRINE
File : 8283.3b
20kppm NaCl Brine

Length : .53 inch
Conf Pr : 7600 psi
Pore Pr : 100 psi
Temp : 21 C



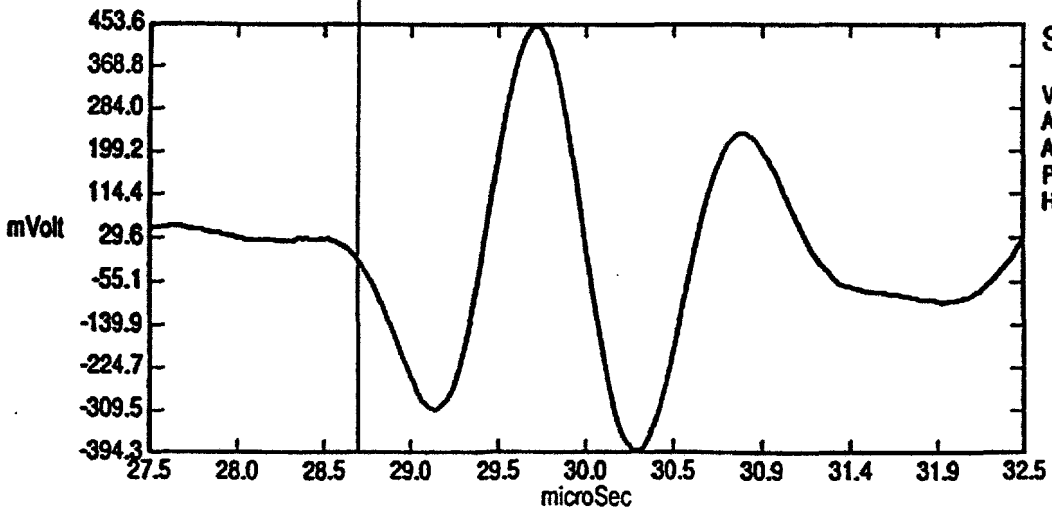
P wave

Velocity	: 12452.7	ft/sec
Arrival Time	: 15.73	microSec
Amplitude	: 75.59	mVolt
Peak to Peak	: 266.69	mVolt
Head to Head	: 12.21	microSec



S1 wave

Velocity	: 6408.38	ft/sec
Arrival Time	: 28.78	microSec
Amplitude	: 83.1	mVolt
Peak to Peak	: 71.16	mVolt
Head to Head	: 21.94	microSec

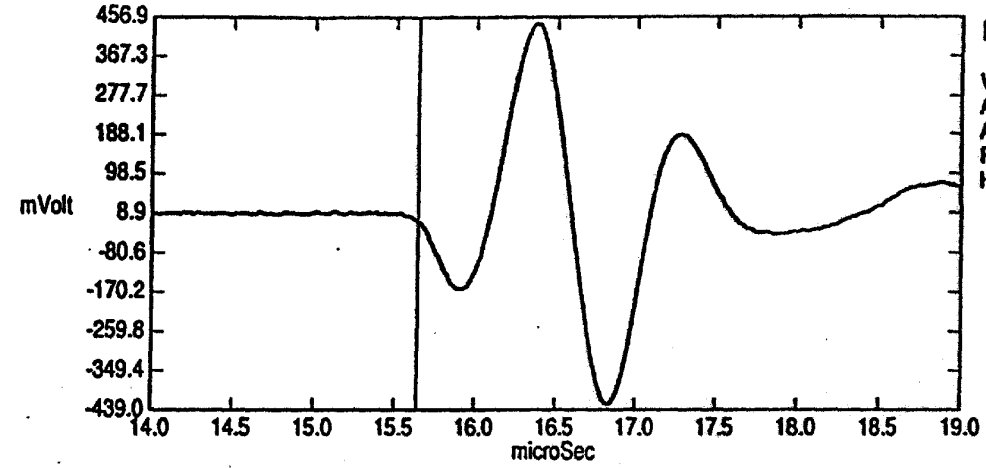


S2 wave

Velocity	: 6552.06	ft/sec
Arrival Time	: 28.69	microSec
Amplitude	: 71.87	mVolt
Peak to Peak	: 83.8	mVolt
Head to Head	: 22.0	microSec

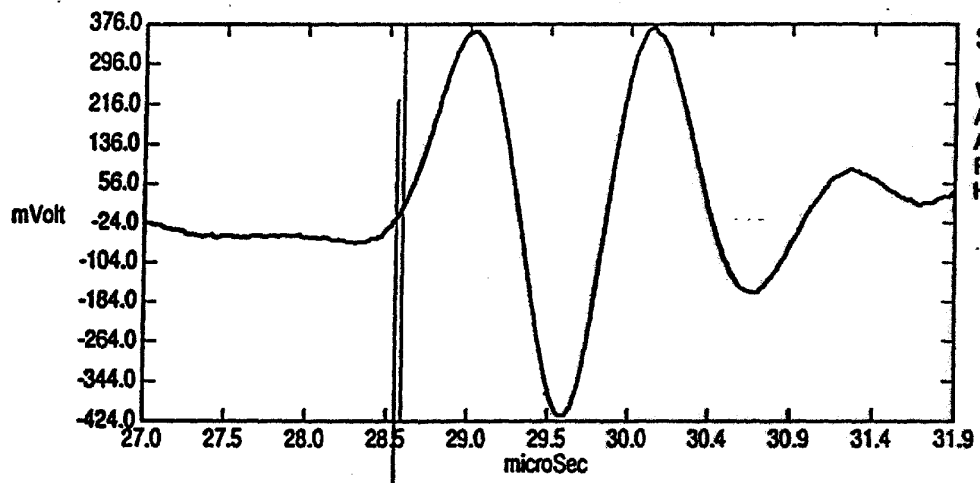
Well : EXXON ANTARES 2
Sample : 8283
Fluid : BRINE
File : 8283.4b
20kppm NaCl Brine

Length : .53 inch
Conf Pr : 10100 psi
Pore Pr : 100 psi
Temp : 21 C



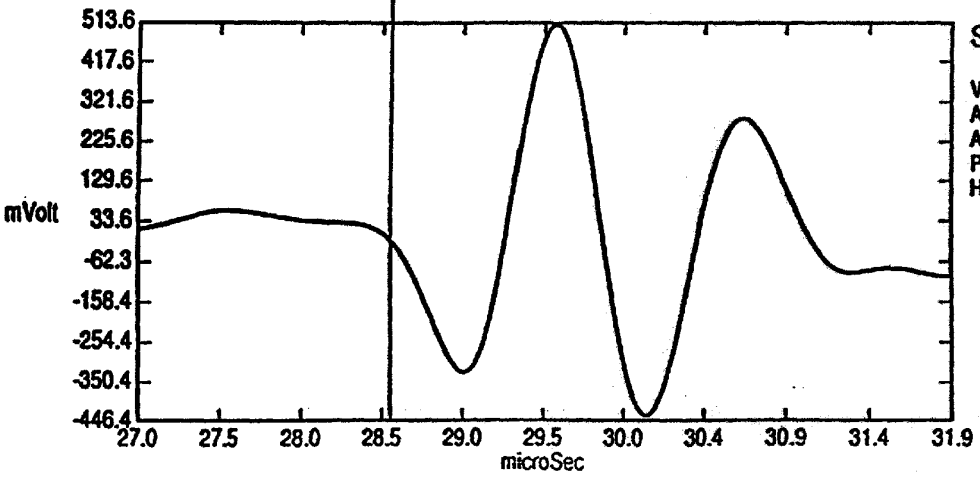
P wave

Velocity	: 12779.4	ft/sec
Arrival Time	: 15.64	microSec
Amplitude	: 76.25	mVolt
Peak to Peak	: 274.48	mVolt
Head to Head	: 12.21	microSec



S1 wave

Velocity	: 6591.47	ft/sec
Arrival Time	: 28.59	microSec
Amplitude	: 86.25	mVolt
Peak to Peak	: 78.12	mVolt
Head to Head	: 21.94	microSec

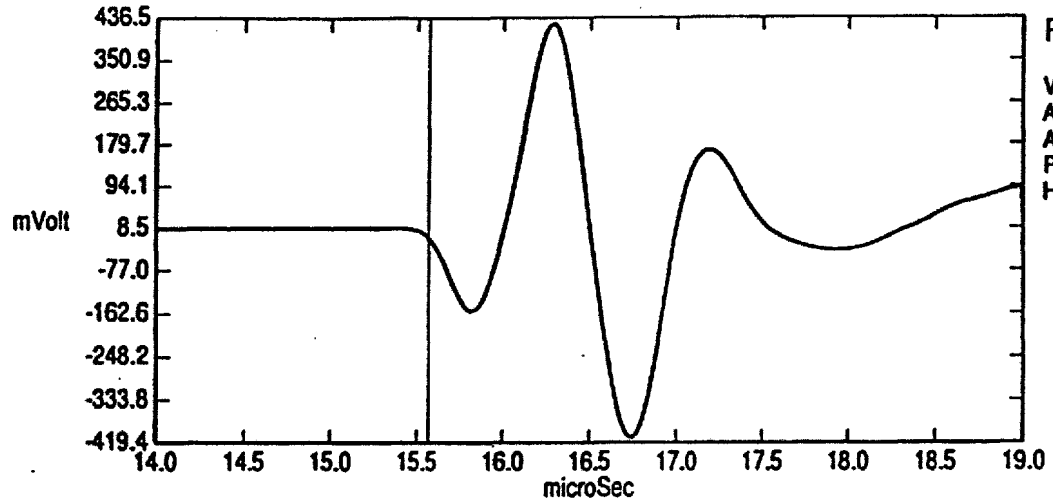


S2 wave

Velocity	: 6692.11	ft/sec
Arrival Time	: 28.55	microSec
Amplitude	: 72.53	mVolt
Peak to Peak	: 93.94	mVolt
Head to Head	: 22.0	microSec

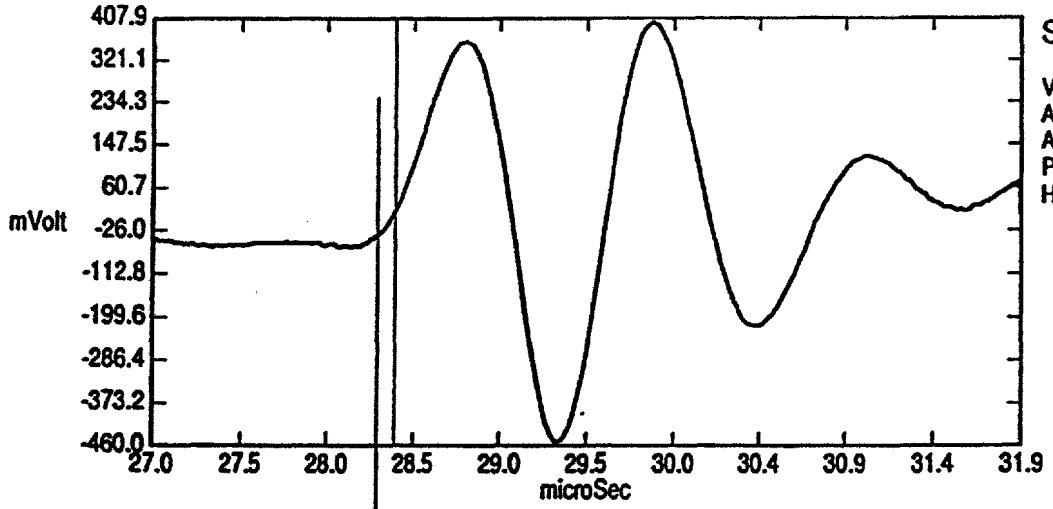
Well : EXXON ANTARES 2
Sample : 8283
Fluid : BRINE
File : 8283.5b
20kppm NaCl Brine

Length : .53 inch
Conf Pr : 15100 psi
Pore Pr : 100 psi
Temp : 21 C



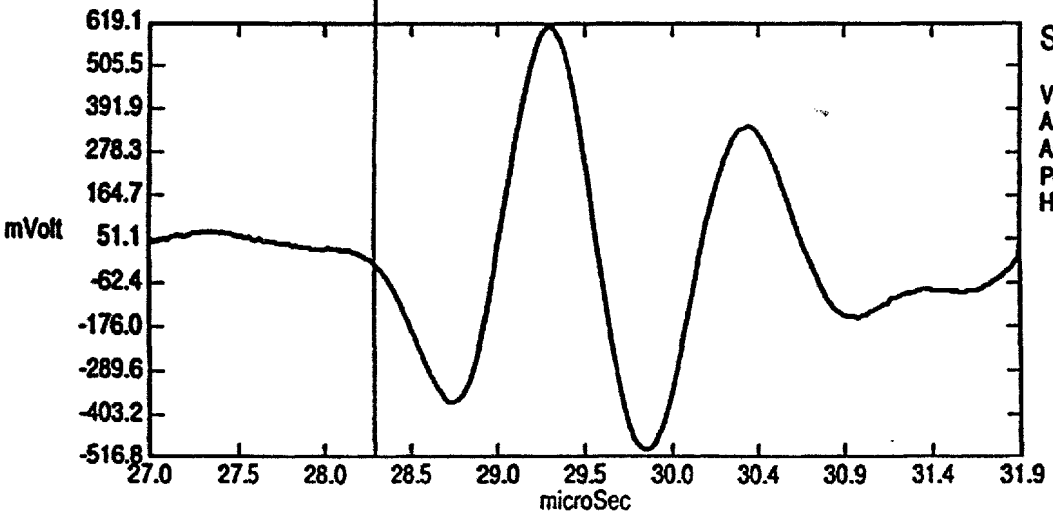
P wave

Velocity	: 13045.6	ft/sec
Arrival Time	: 15.57	microSec
Amplitude	: 76.16	mVolt
Peak to Peak	: 263.05	mVolt
Head to Head	: 12.21	microSec



S1 wave

Velocity	: 6795.86	ft/sec
Arrival Time	: 28.39	microSec
Amplitude	: 86.87	mVolt
Peak to Peak	: 84.76	mVolt
Head to Head	: 21.94	microSec

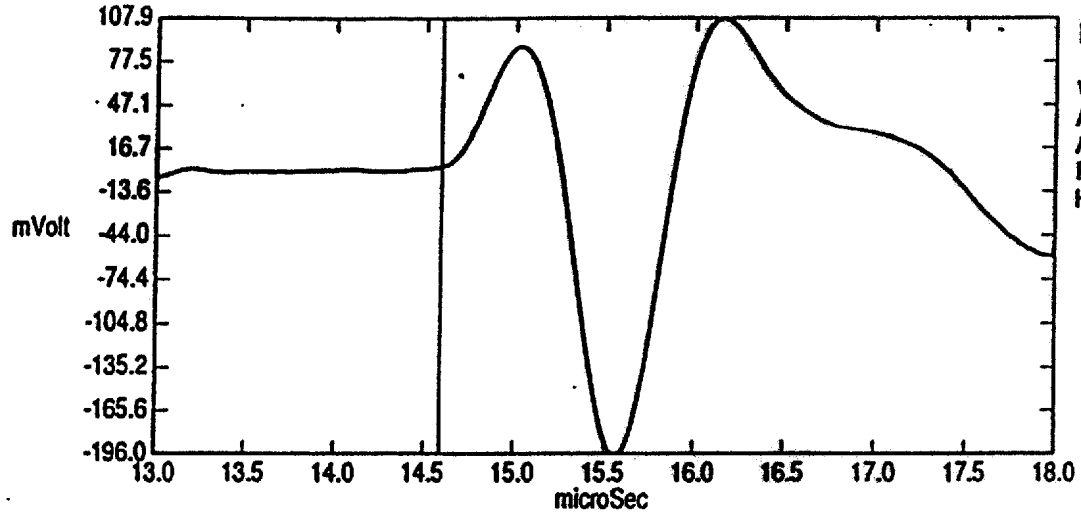


S2 wave

Velocity	: 6968.73	ft/sec
Arrival Time	: 28.29	microSec
Amplitude	: 70.62	mVolt
Peak to Peak	: 110.93	mVolt
Head to Head	: 22.0	microSec

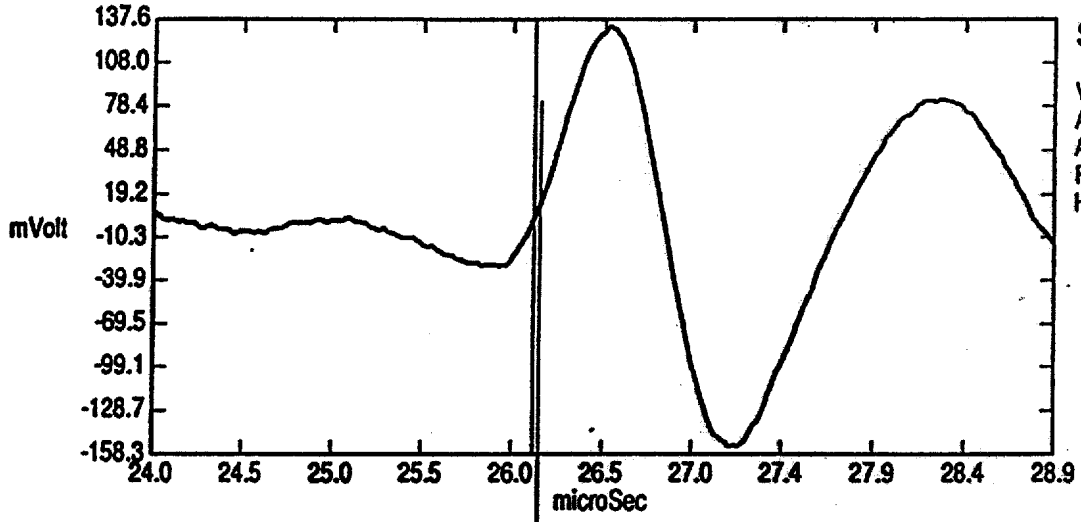
Well : Exxon Antares 1
Sample : 8371
Fluid : Brine
File : 8371.1b
20kppm NaCL Brine

Length : .38 inch
Conf Pr : 1100 psi
Pore Pr : 100 psi
Temp : 21 C



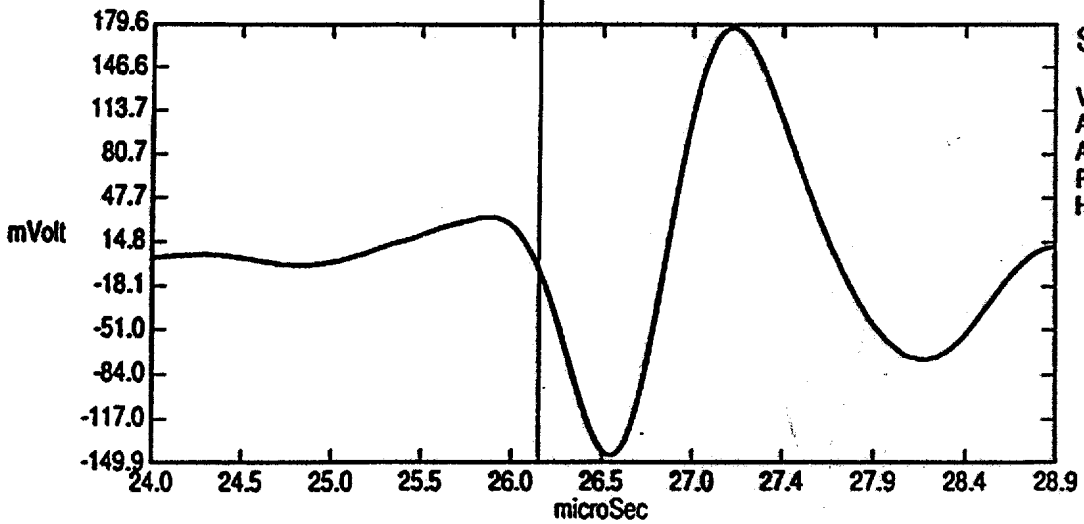
P wave

Velocity	: 13488.7	ft/sec
Arrival Time	: 14.59	microSec
Amplitude	: 105.19	mVolt
Peak to Peak	: 30.24	mVolt
Head to Head	: 12.23	microSec



S1 wave

Velocity	: 7689.2	ft/sec
Arrival Time	: 26.12	microSec
Amplitude	: 87.5	mVolt
Peak to Peak	: 28.55	mVolt
Head to Head	: 21.98	microSec

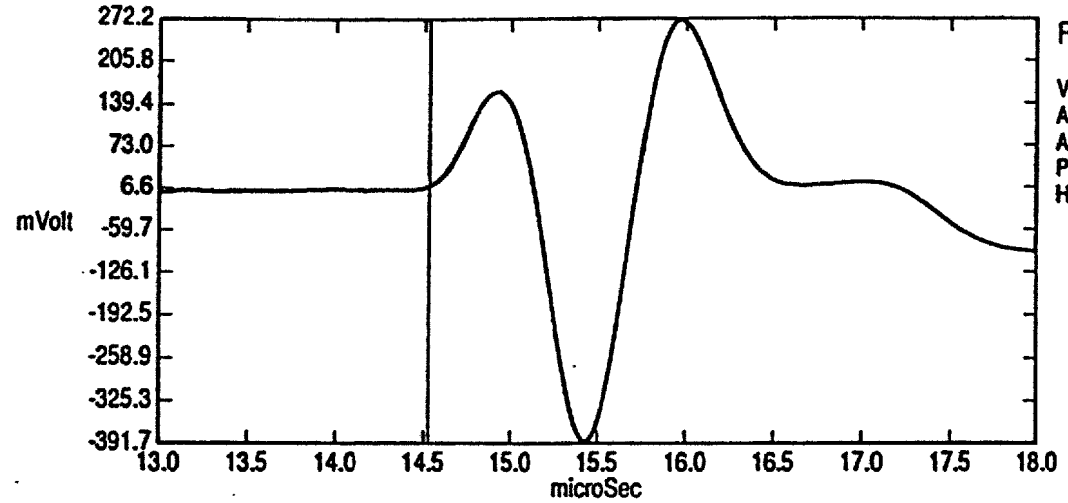


S2 wave

Velocity	: 7707.82	ft/sec
Arrival Time	: 26.15	microSec
Amplitude	: 70.18	mVolt
Peak to Peak	: 32.07	mVolt
Head to Head	: 22.02	microSec

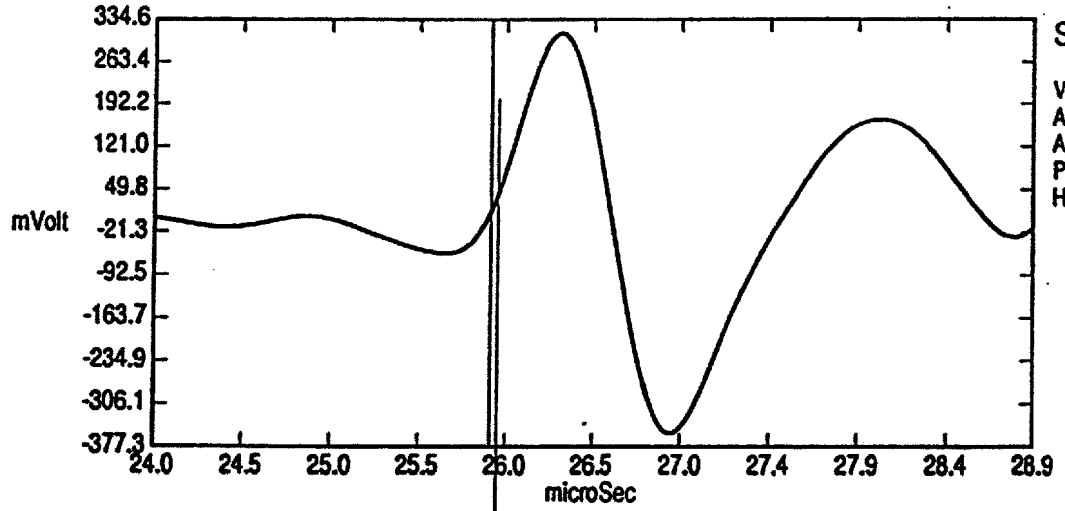
Well : Exxon Antares 1
Sample : 8371
Fluid : Brine
File : 8371.2b
20kppm NaCL Brine

Length : .38 inch
Conf Pr : 41 psi
Pore Pr : 100 psi
Temp : 21 C



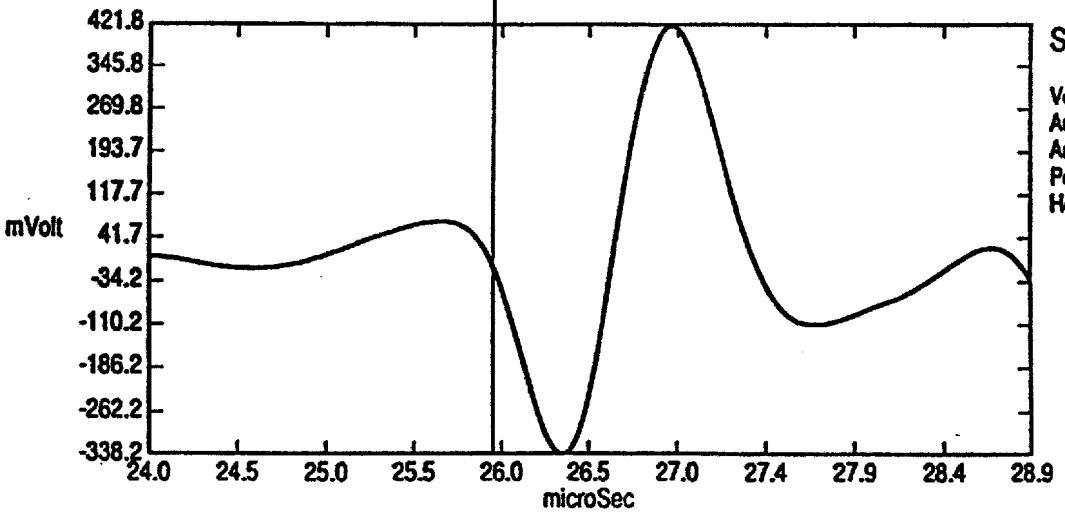
P wave

Velocity	: 13840.6	ft/sec
Arrival Time	: 14.53	microSec
Amplitude	: 96.41	mVolt
Peak to Peak	: 65.64	mVolt
Head to Head	: 12.23	microSec



S1 wave

Velocity	: 8100.08	ft/sec
Arrival Time	: 25.91	microSec
Amplitude	: 87.34	mVolt
Peak to Peak	: 66.43	mVolt
Head to Head	: 21.98	microSec

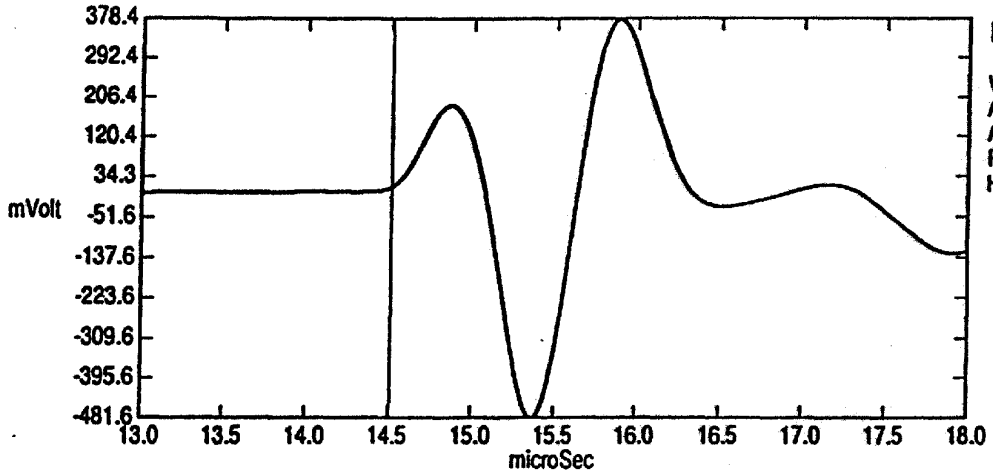


S2 wave

Velocity	: 8100.08	ft/sec
Arrival Time	: 25.95	microSec
Amplitude	: 69.44	mVolt
Peak to Peak	: 75.54	mVolt
Head to Head	: 22.02	microSec

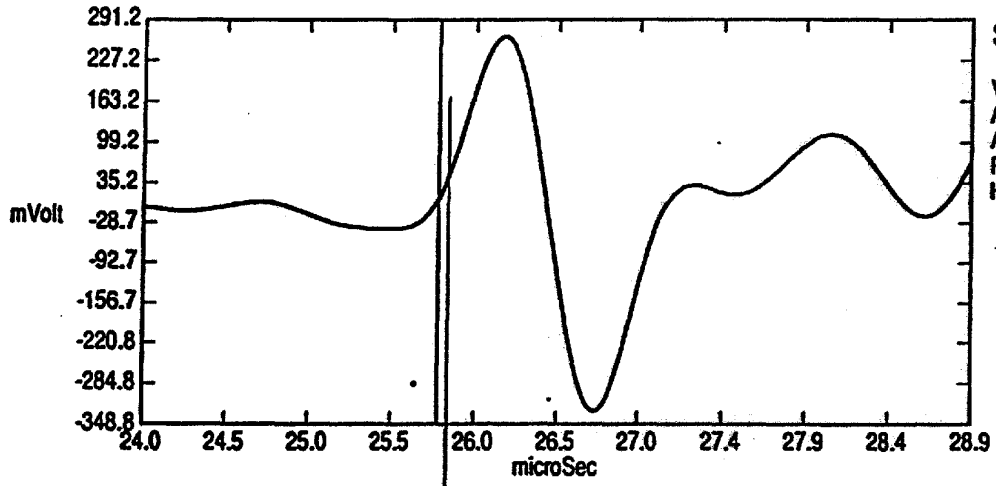
Well : Exxon Antares 1
Sample : 8371
Fluid : Brine
File : 8371.3b
20kppm NaCL Brine

Length : .38 inch
Conf Pr : 7600 psi
Pore Pr : 100 psi
Temp : 21 C



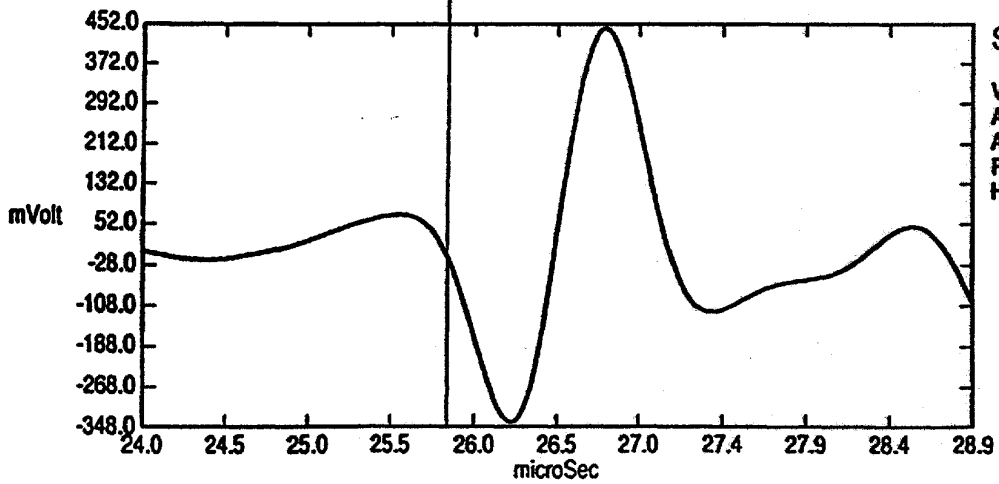
P wave

Velocity	: 13962.0	ft/sec
Arrival Time	: 14.51	microSec
Amplitude	: 91.76	mVolt
Peak to Peak	: 85.52	mVolt
Head to Head	: 12.23	microSec



S1 wave

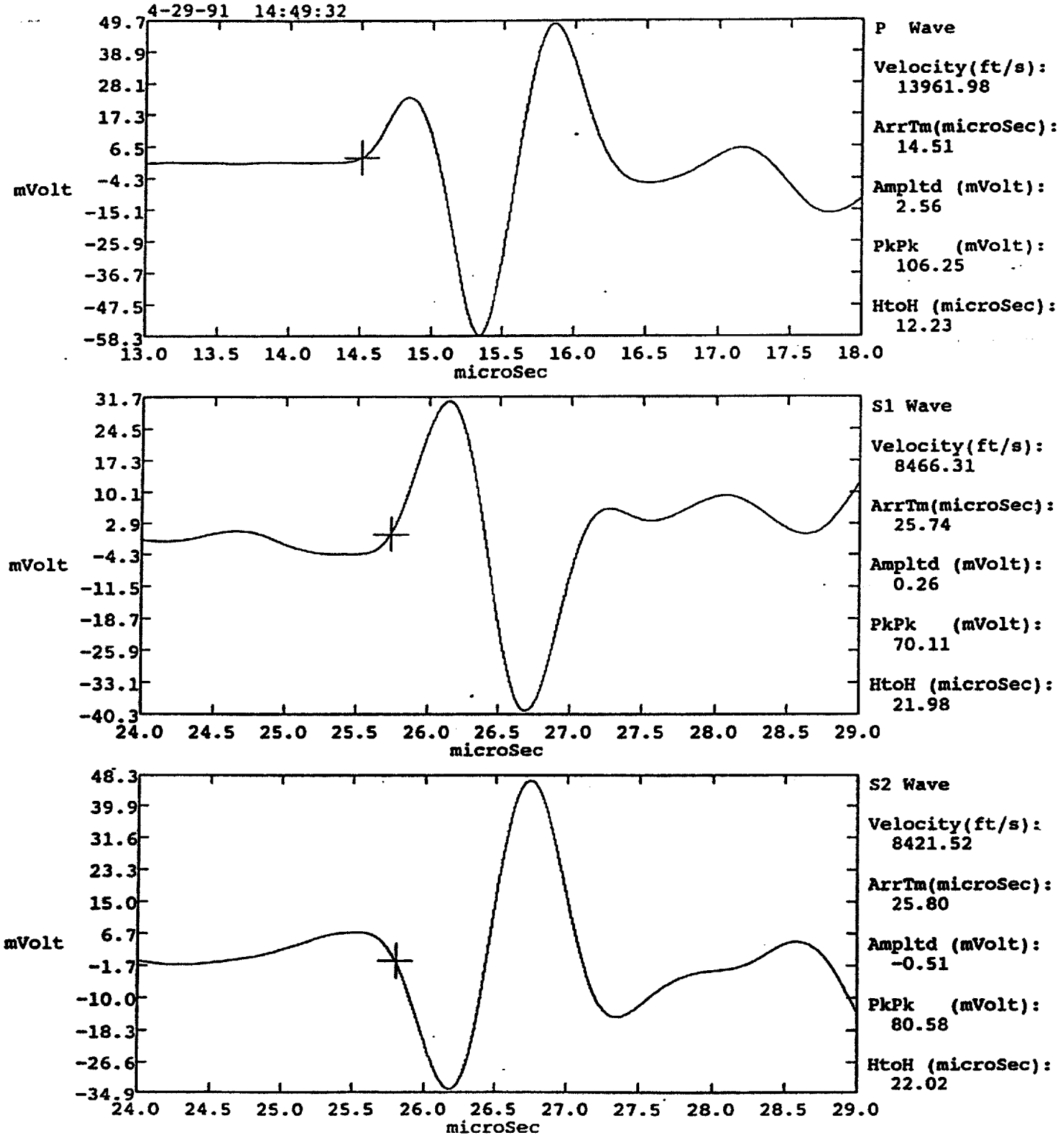
Velocity	: 8377.19	ft/sec
Arrival Time	: 25.78	microSec
Amplitude	: 89.64	mVolt
Peak to Peak	: 59.21	mVolt
Head to Head	: 21.98	microSec



S2 wave

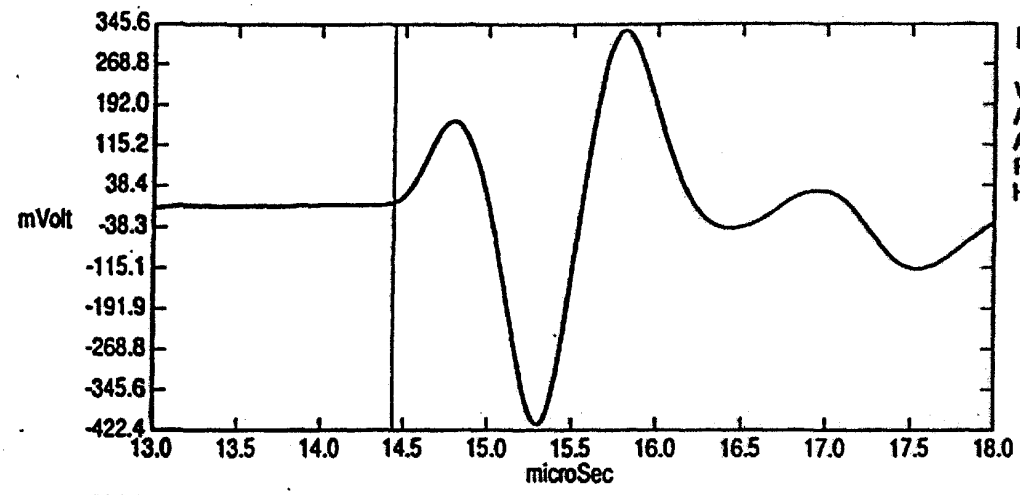
Velocity	: 8333.33	ft/sec
Arrival Time	: 25.84	microSec
Amplitude	: 67.29	mVolt
Peak to Peak	: 77.94	mVolt
Head to Head	: 22.02	microSec

Well: Exxon Antares 1
Sample: 8371 Length:0.382 inch Fluid: Brine
Conf Pr:10100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8371.4B Pick: Manual 4-29-91 14:49:32
20kppm NaCL Brine



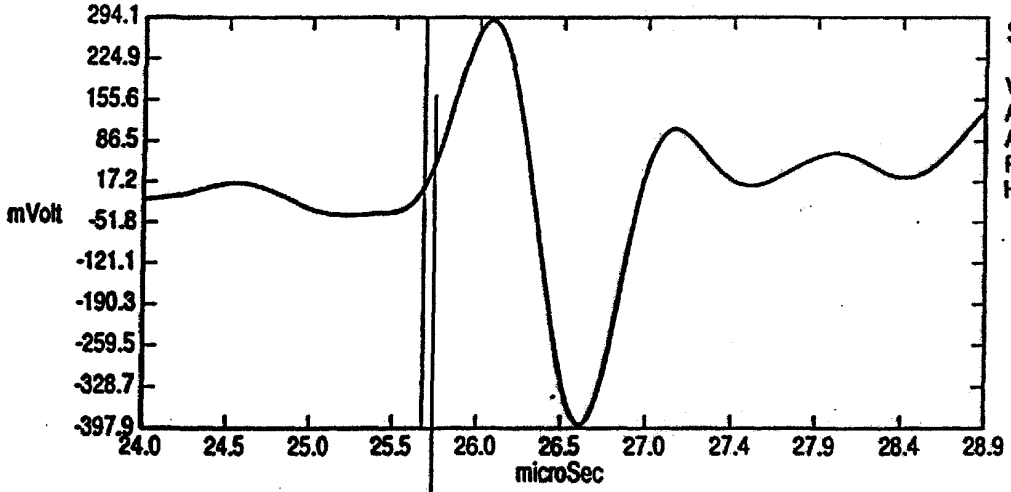
Well : Exxon Antares 1
Sample : 8371
Fluid : Brine
File : 8371.5b
20kppm NaCL Brine

Length : .38 inch
Conf Pr : 15100 psi
Pore Pr : 100 psi
Temp : 21 C



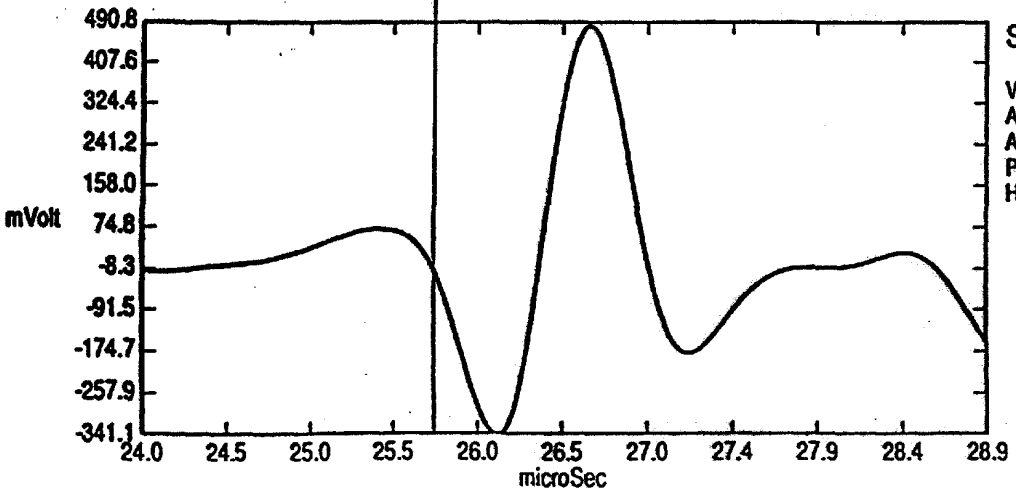
P wave

Velocity	: 14404.2	ft/sec
Arrival Time	: 14.44	microSec
Amplitude	: 89.53	mVolt
Peak to Peak	: 74.41	mVolt
Head to Head	: 12.23	microSec



S1 wave

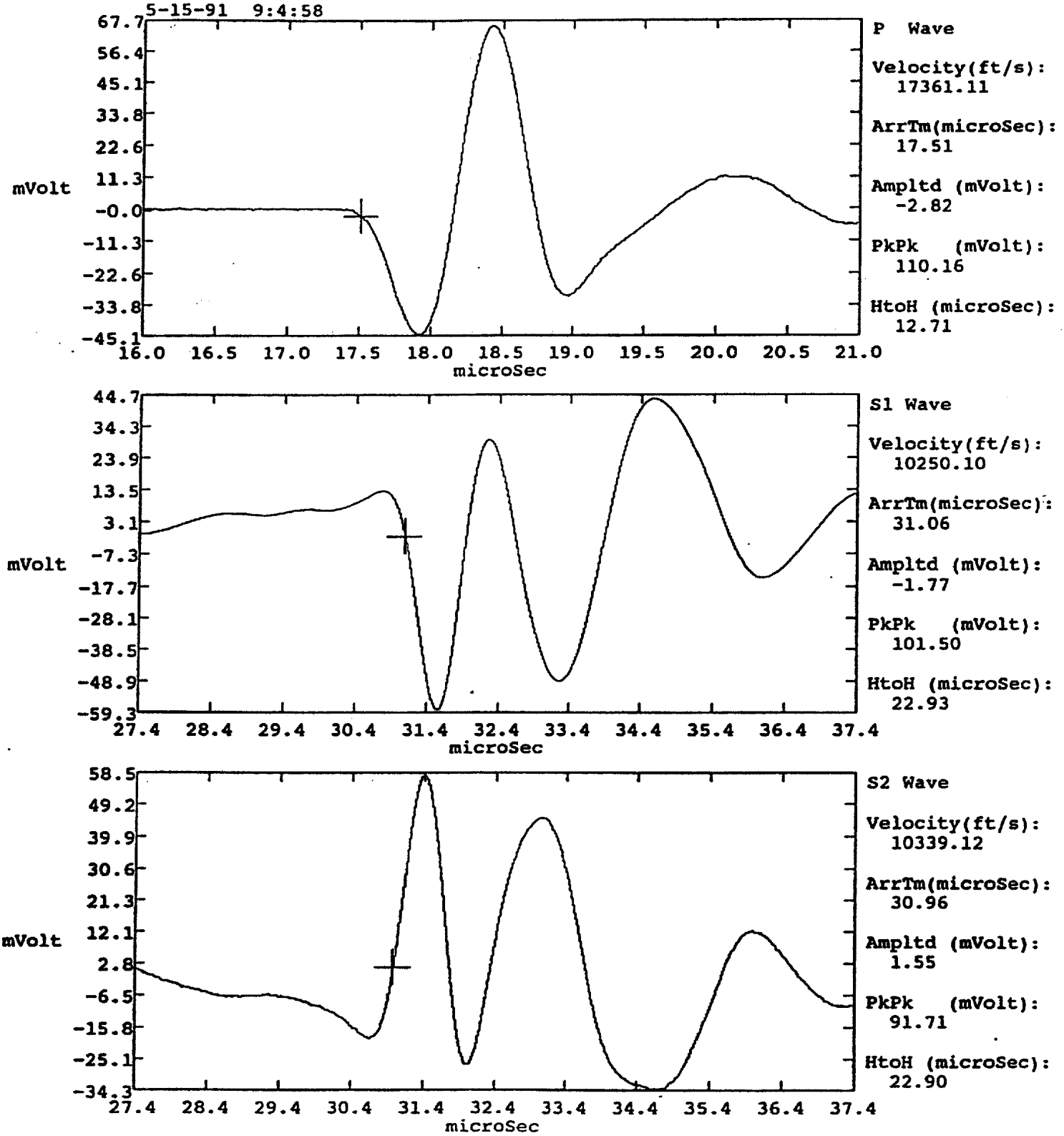
Velocity	: 8603.59	ft/sec
Arrival Time	: 25.68	microSec
Amplitude	: 93.75	mVolt
Peak to Peak	: 67.9	mVolt
Head to Head	: 21.98	microSec



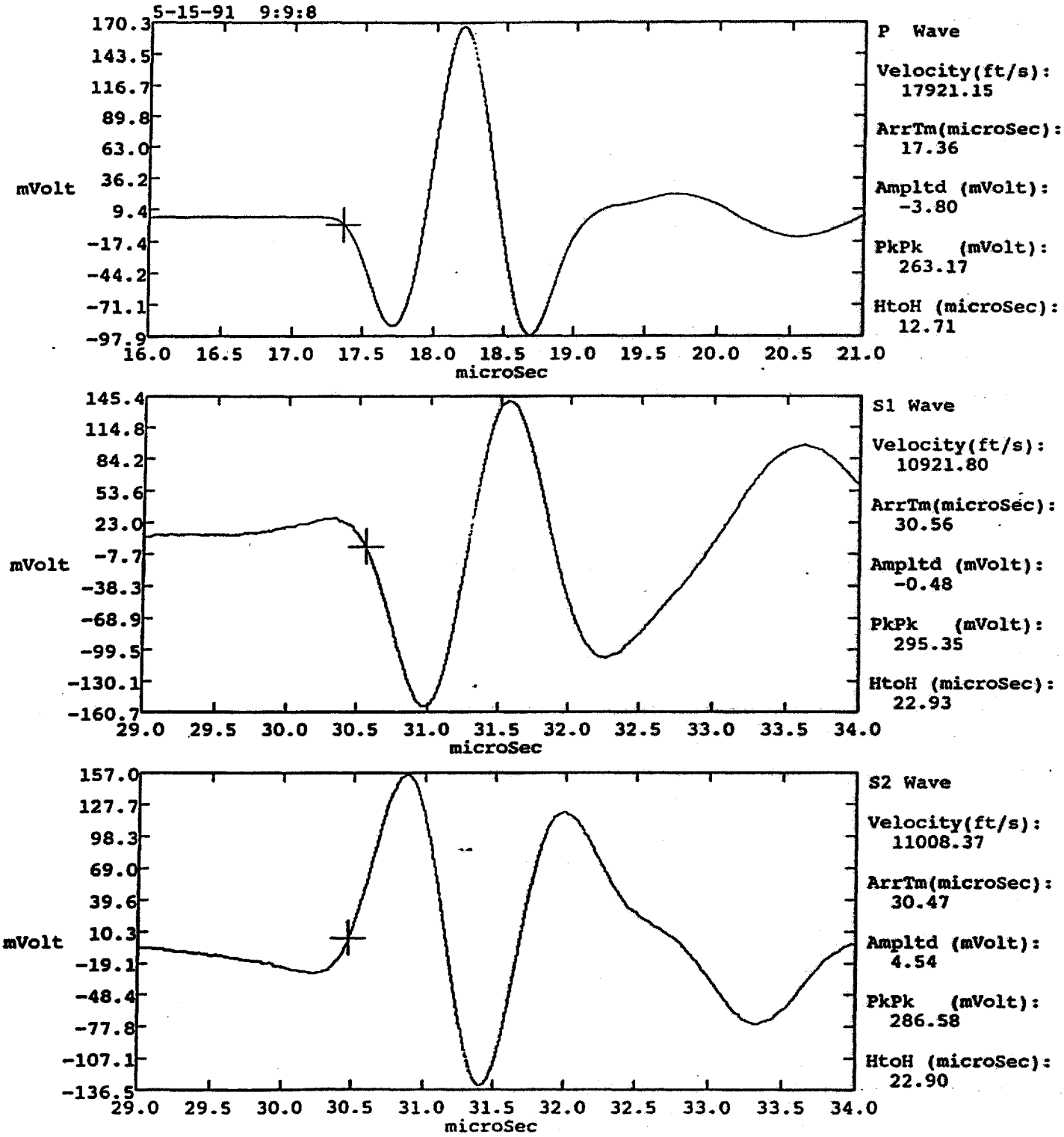
S2 wave

Velocity	: 8557.34	ft/sec
Arrival Time	: 25.74	microSec
Amplitude	: 63.17	mVolt
Peak to Peak	: 82.22	mVolt
Head to Head	: 22.02	microSec

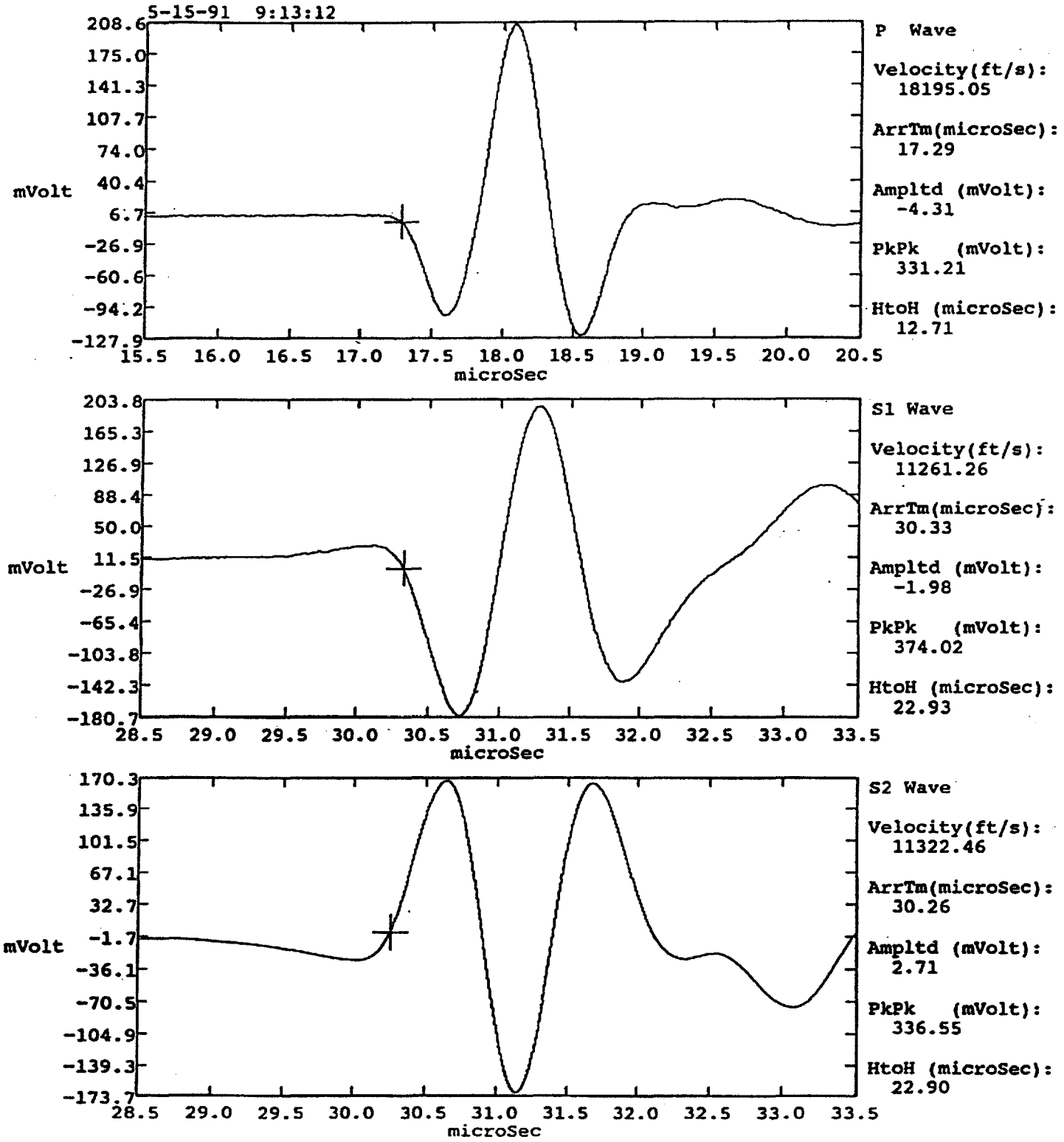
Well: EXXON ANTARES 2
Sample: 10948 Length:1.000 inch Fluid: BRINE
Conf Pr:1100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 10948.1B Pick: Manual 5-15-91 9:4:58
20kppm NaCl Brine



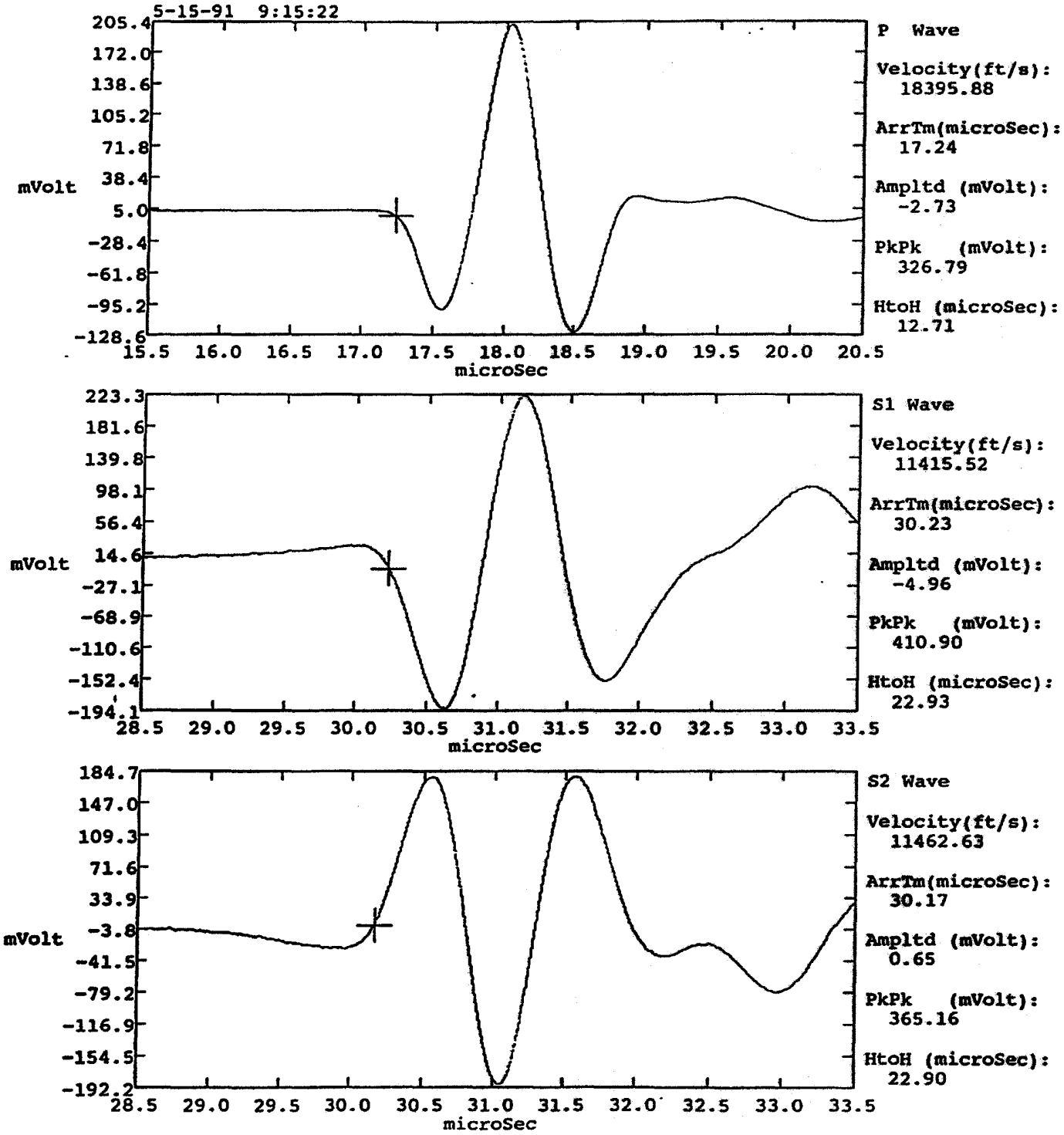
Well: EXXON ANTARES 2
Sample: 10948 Length:1.000 inch Fluid: BRINE
Conf Pr:4100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 10948.2B Pick: Manual 5-15-91 9:9:8
20kppm NaCl Brine



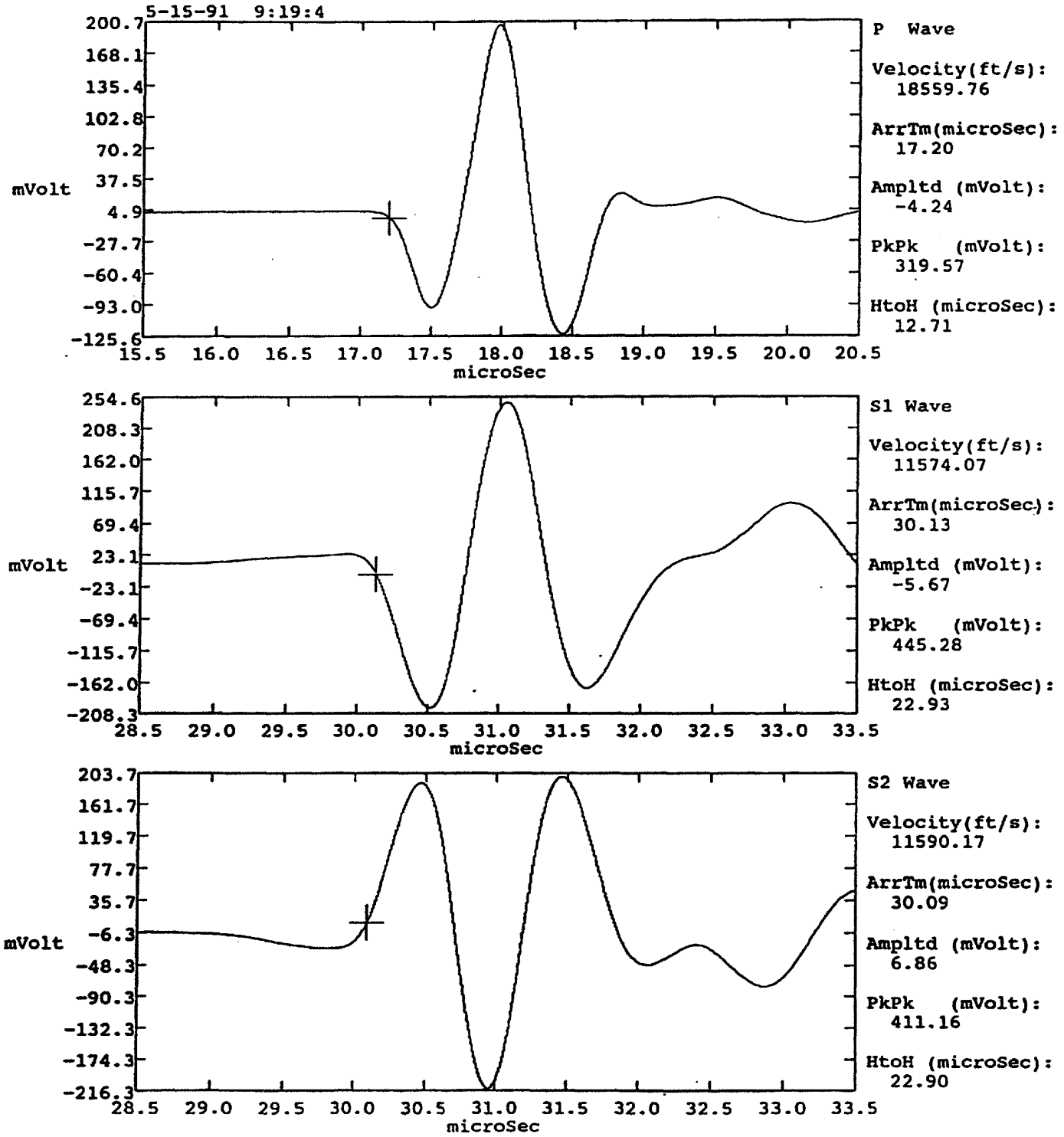
Well: EXXON ANTARES 2
Sample: 10948 Length:1.000 inch Fluid: BRINE
Conf Pr:7600.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 10948.3B Pick: Manual 5-15-91 9:13:12
20kppm NaCl Brine



Well: EXXON ANTARES 2
Sample: 10948 Length:1.000 inch Fluid: BRINE
Conf Pr:10100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 10948.4B Pick: Manual 5-15-91 9:15:24
20kppm NaCl Brine

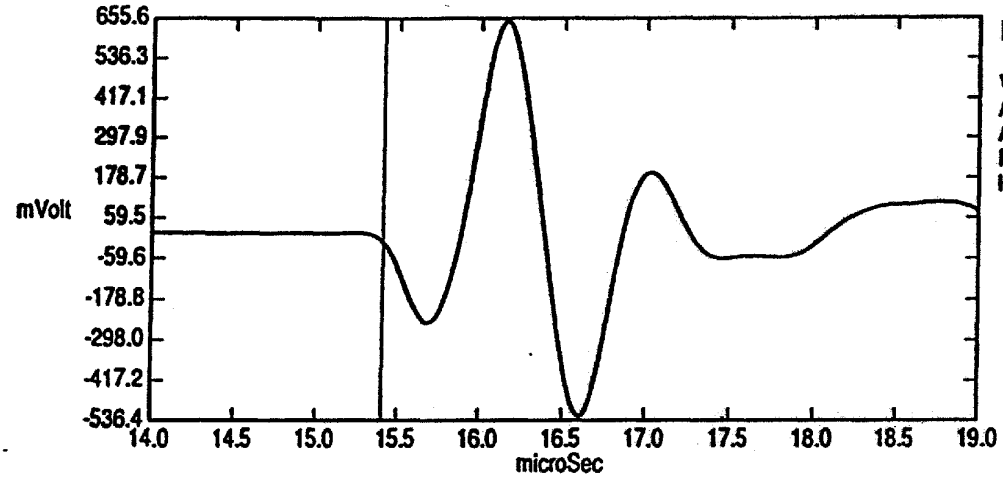


Well: EXXON ANTARES 2
Sample: 10948 Length:1.000 inch Fluid: BRINE
Conf Pr:15100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 10948.5B Pick: Manual 5-15-91 9:19:6
20kppm NaCl Brine



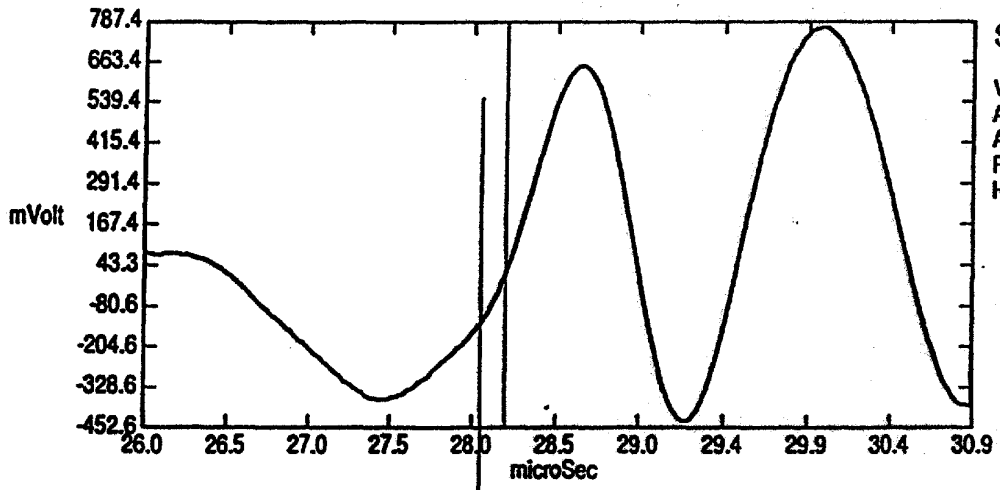
Well : EXXON ANTARES 2
Sample : 10979
Fluid : BRINE
File : 10979.1b
20kppm NaCl Brine

Length : .44 inch
Conf Pr : 1100 psi
Pore Pr : 100 psi
Temp : 21 C



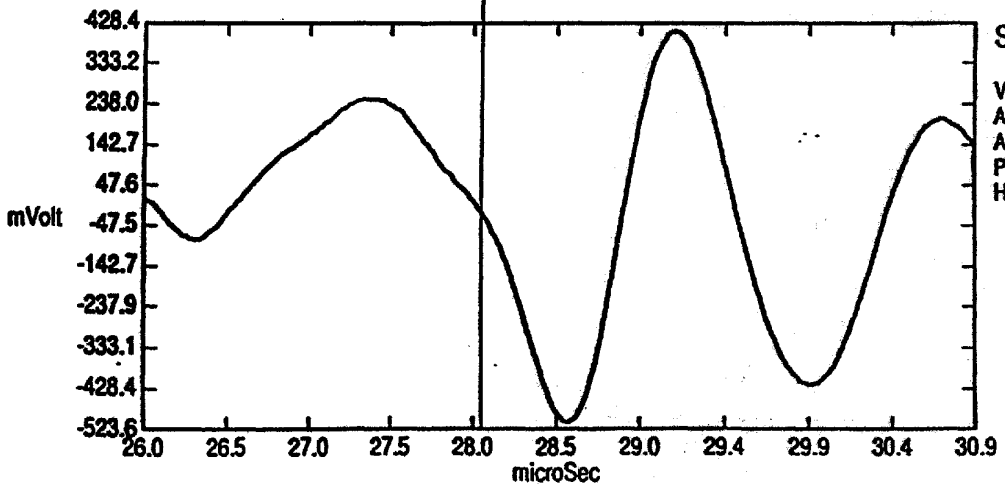
P wave

Velocity	: 11432.3	ft/sec
Arrival Time	: 15.41	microSec
Amplitude	: 69.99	mVolt
Peak to Peak	: 369.08	mVolt
Head to Head	: 12.21	microSec



S1 wave

Velocity	: 5843.98	ft/sec
Arrival Time	: 28.2	microSec
Amplitude	: 61.25	mVolt
Peak to Peak	: 37.98	mVolt
Head to Head	: 21.94	microSec

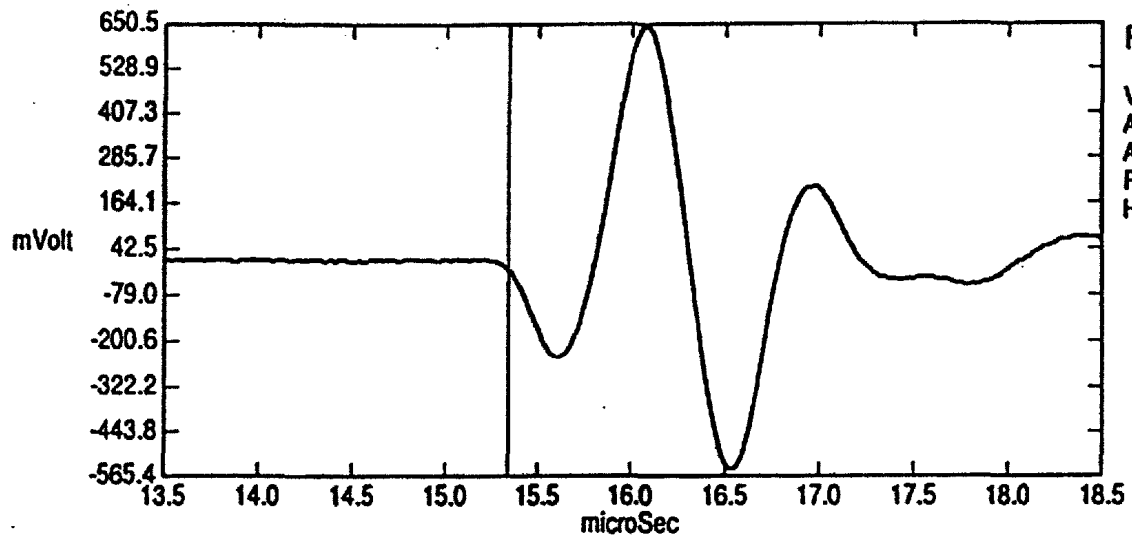


S2 wave

Velocity	: 6046.83	ft/sec
Arrival Time	: 28.05	microSec
Amplitude	: 85.62	mVolt
Peak to Peak	: 29.04	mVolt
Head to Head	: 22.0	microSec

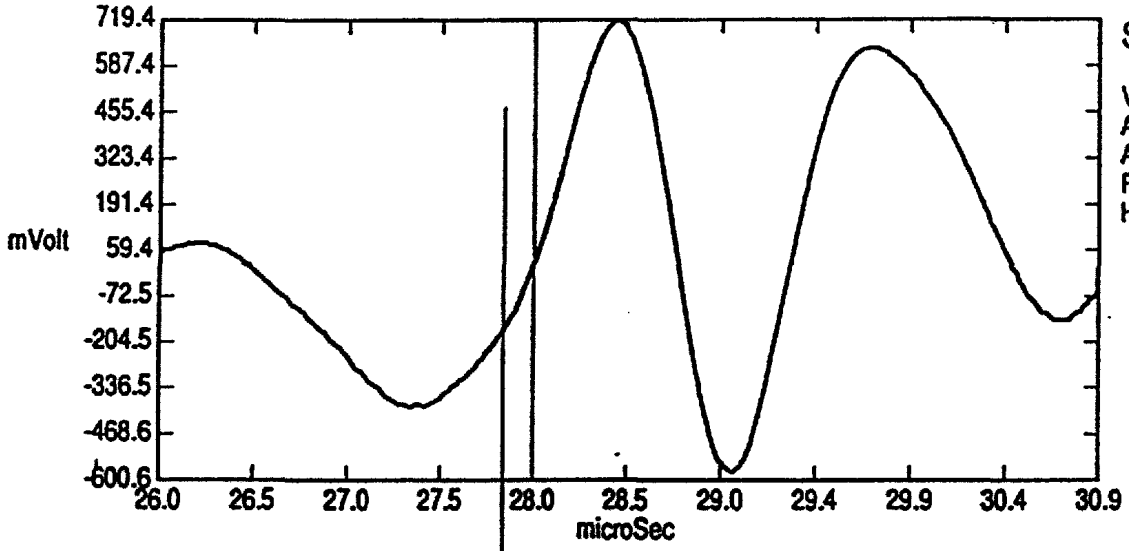
Well : EXXON ANTARES 2
Sample : 10979
Fluid : BRINE
File : 10979.2b
20kppm NaCl Brine

Length : .44 inch
Conf Pr : 4100 psi
Pore Pr : 100 psi
Temp : 21 C



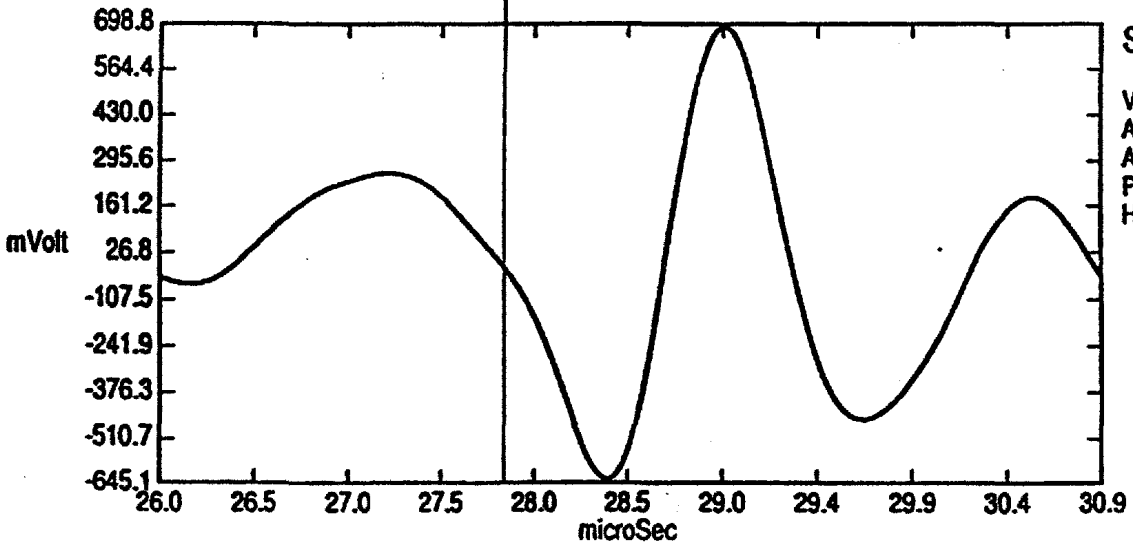
P wave

Velocity	: 11688.0	ft/sec
Arrival Time	: 15.34	microSec
Amplitude	: 72.5	mVolt
Peak to Peak	: 375.52	mVolt
Head to Head	: 12.21	microSec



S1 wave

Velocity	: 6036.85	ft/sec
Arrival Time	: 28.0	microSec
Amplitude	: 75.62	mVolt
Peak to Peak	: 40.76	mVolt
Head to Head	: 21.94	microSec

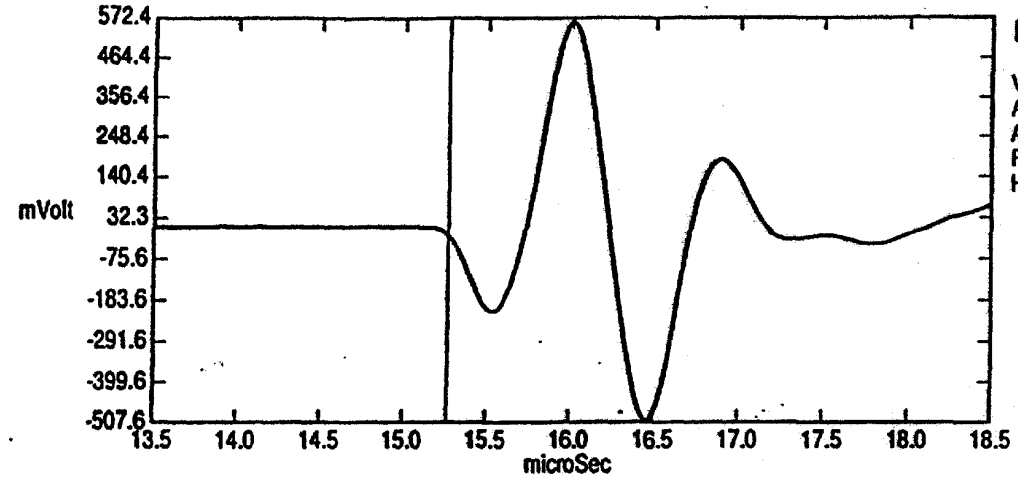


S2 wave

Velocity	: 6264.26	ft/sec
Arrival Time	: 27.84	microSec
Amplitude	: 74.88	mVolt
Peak to Peak	: 41.64	mVolt
Head to Head	: 22.0	microSec

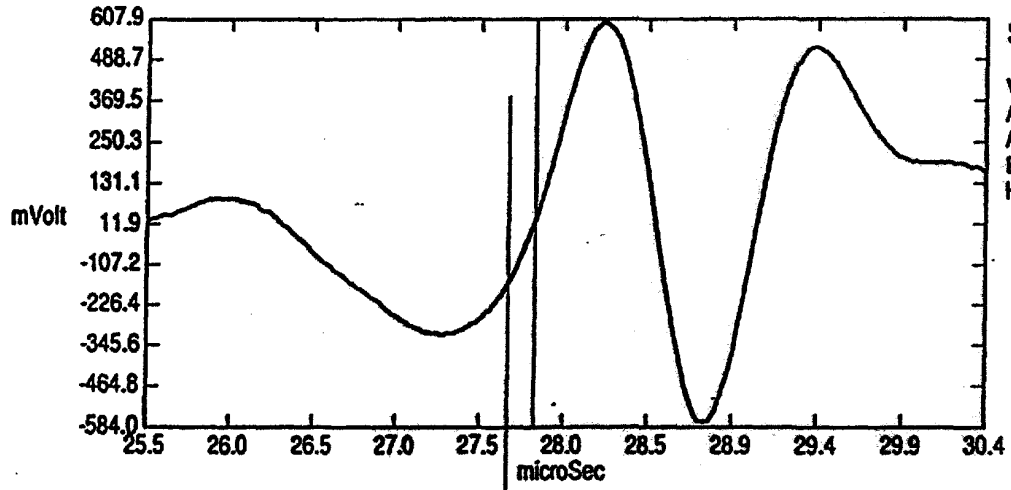
Well : EXXON ANTARES 2
Sample : 10979
Fluid : BRINE
File : 10979.3b
20kppm NaCl Brine

Length : .44 inch
Conf Pr : 7600 psi
Pore Pr : 100 psi
Temp : 21 C



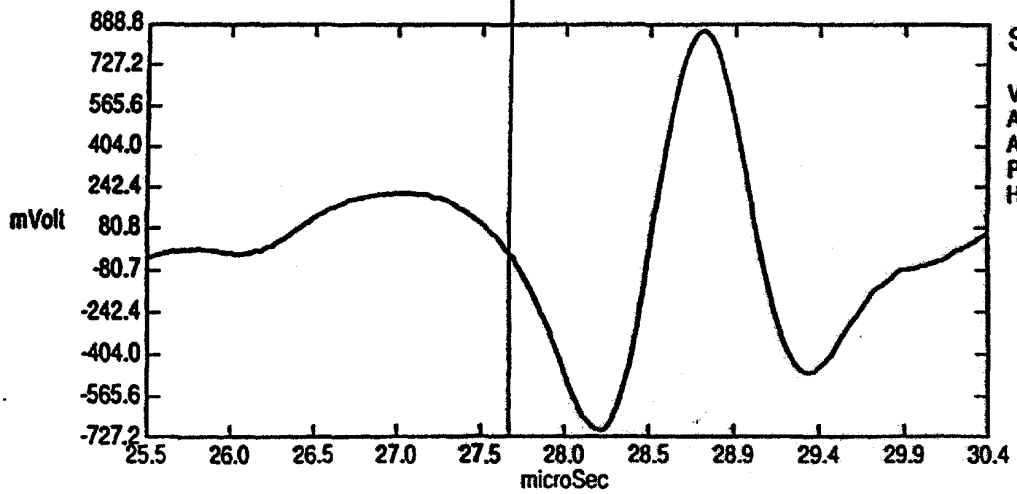
P wave

Velocity	: 11955.3	ft/sec
Arrival Time	: 15.27	microSec
Amplitude	: 73.25	mVolt
Peak to Peak	: 334.93	mVolt
Head to Head	: 12.21	microSec



S1 wave

Velocity	: 6211.09	ft/sec
Arrival Time	: 27.83	microSec
Amplitude	: 81.87	mVolt
Peak to Peak	: 36.81	mVolt
Head to Head	: 21.94	microSec

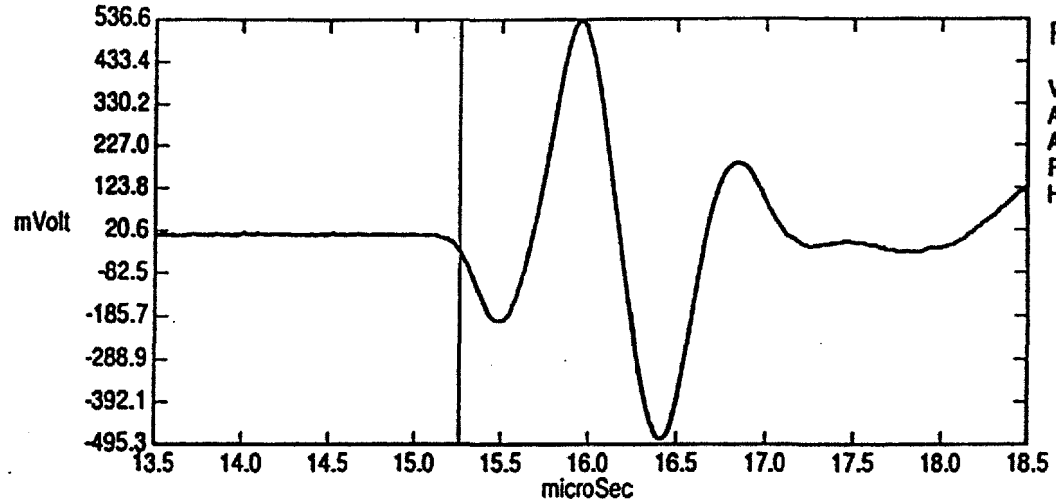


S2 wave

Velocity	: 6452.08	ft/sec
Arrival Time	: 27.67	microSec
Amplitude	: 70.0	mVolt
Peak to Peak	: 49.4	mVolt
Head to Head	: 22.0	microSec

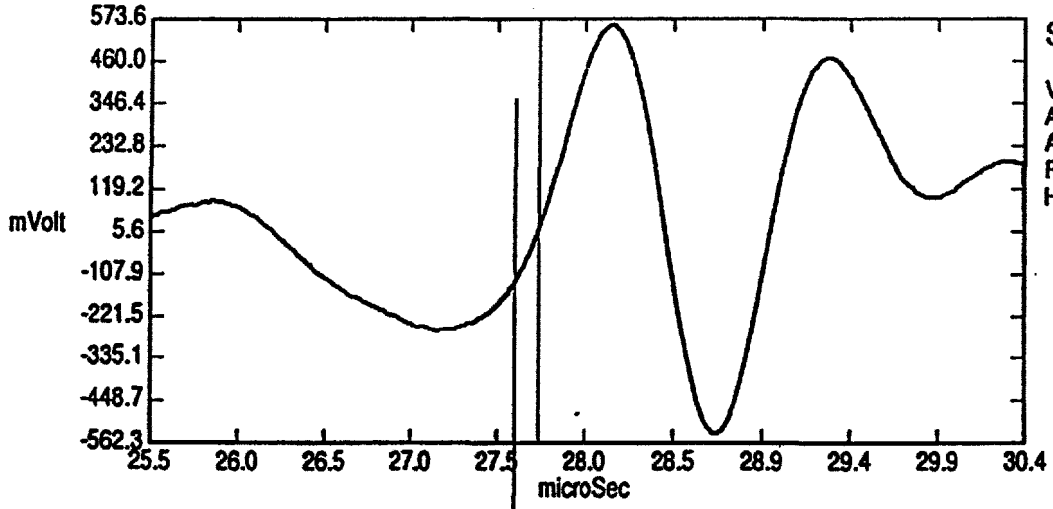
Well : EXXON ANTARES 2
Sample : 10979
Fluid : BRINE
File : 10979.4b
20kppm NaCl Brine

Length : .44 inch
Conf Pr : 10100 psi
Pore Pr : 100 psi
Temp : 21 C



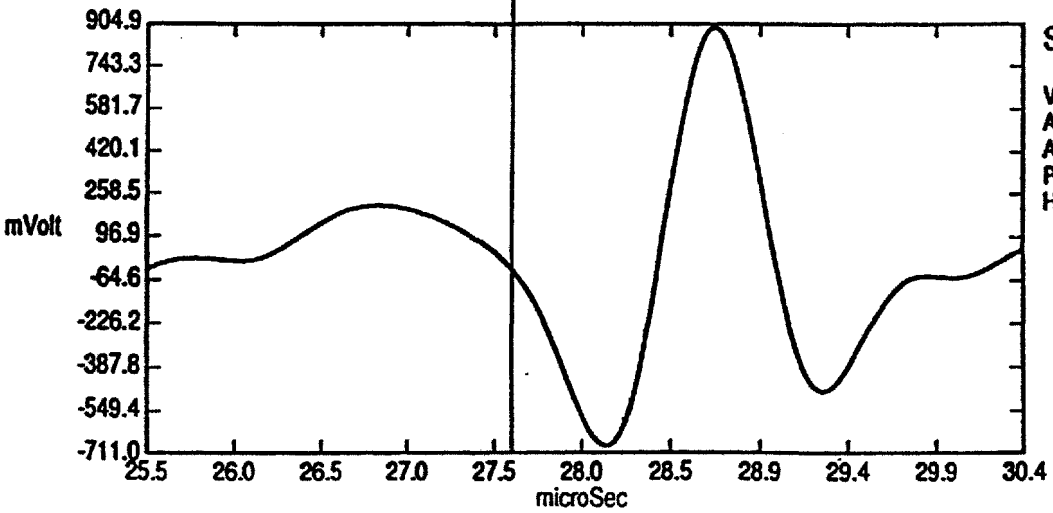
P wave

Velocity	: 11994.5	ft/sec
Arrival Time	: 15.26	microSec
Amplitude	: 72.5	mVolt
Peak to Peak	: 319.97	mVolt
Head to Head	: 12.21	microSec



S1 wave

Velocity	: 6307.47	ft/sec
Arrival Time	: 27.74	microSec
Amplitude	: 81.25	mVolt
Peak to Peak	: 34.52	mVolt
Head to Head	: 21.94	microSec

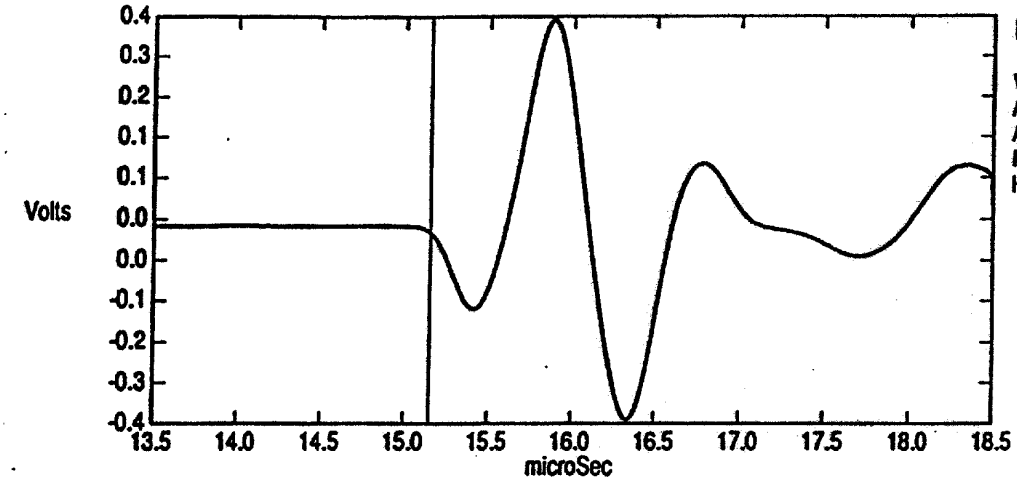


S2 wave

Velocity	: 6532.73	ft/sec
Arrival Time	: 27.6	microSec
Amplitude	: 67.91	mVolt
Peak to Peak	: 49.62	mVolt
Head to Head	: 22.0	microSec

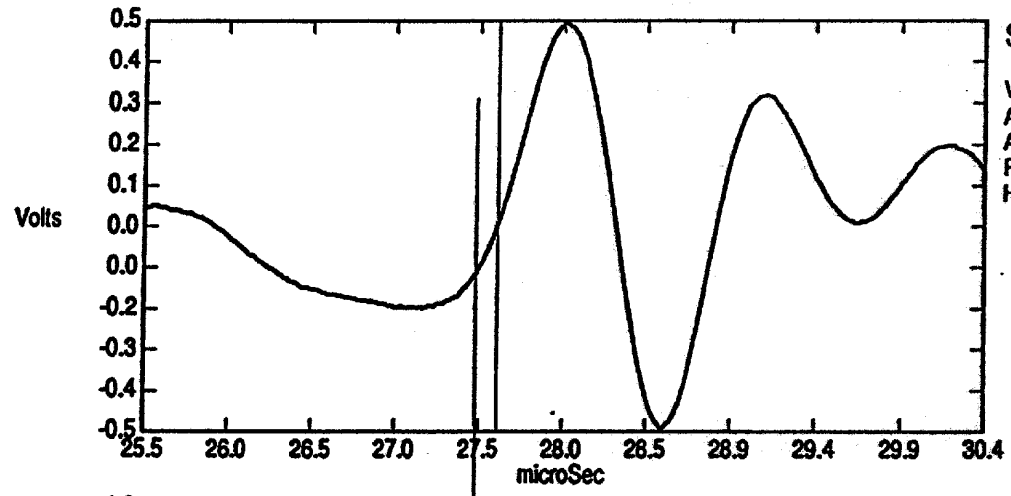
Well : EXXON ANTARES 2
Sample : 10979
Fluid : BRINE
File : 10979.5b
20kppm NaCl Brine

Length : .44 inch
Conf Pr : 15100 psi
Pore Pr : 100 psi
Temp : 21 C



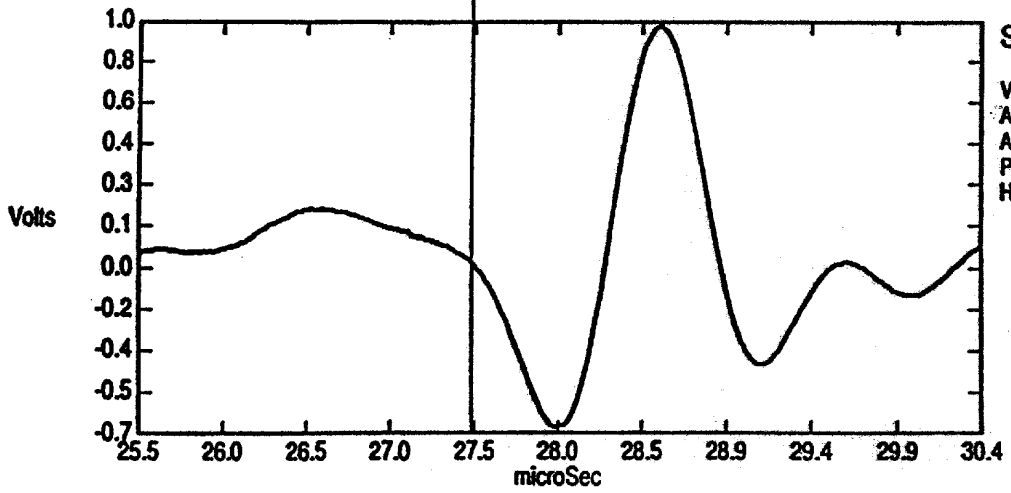
P wave

Velocity	: 12443.3	ft/sec
Arrival Time	: 15.15	microSec
Amplitude	: 74.69	Volts
Peak to Peak	: 0.27	Volts
Head to Head	: 12.21	microSec



S1 wave

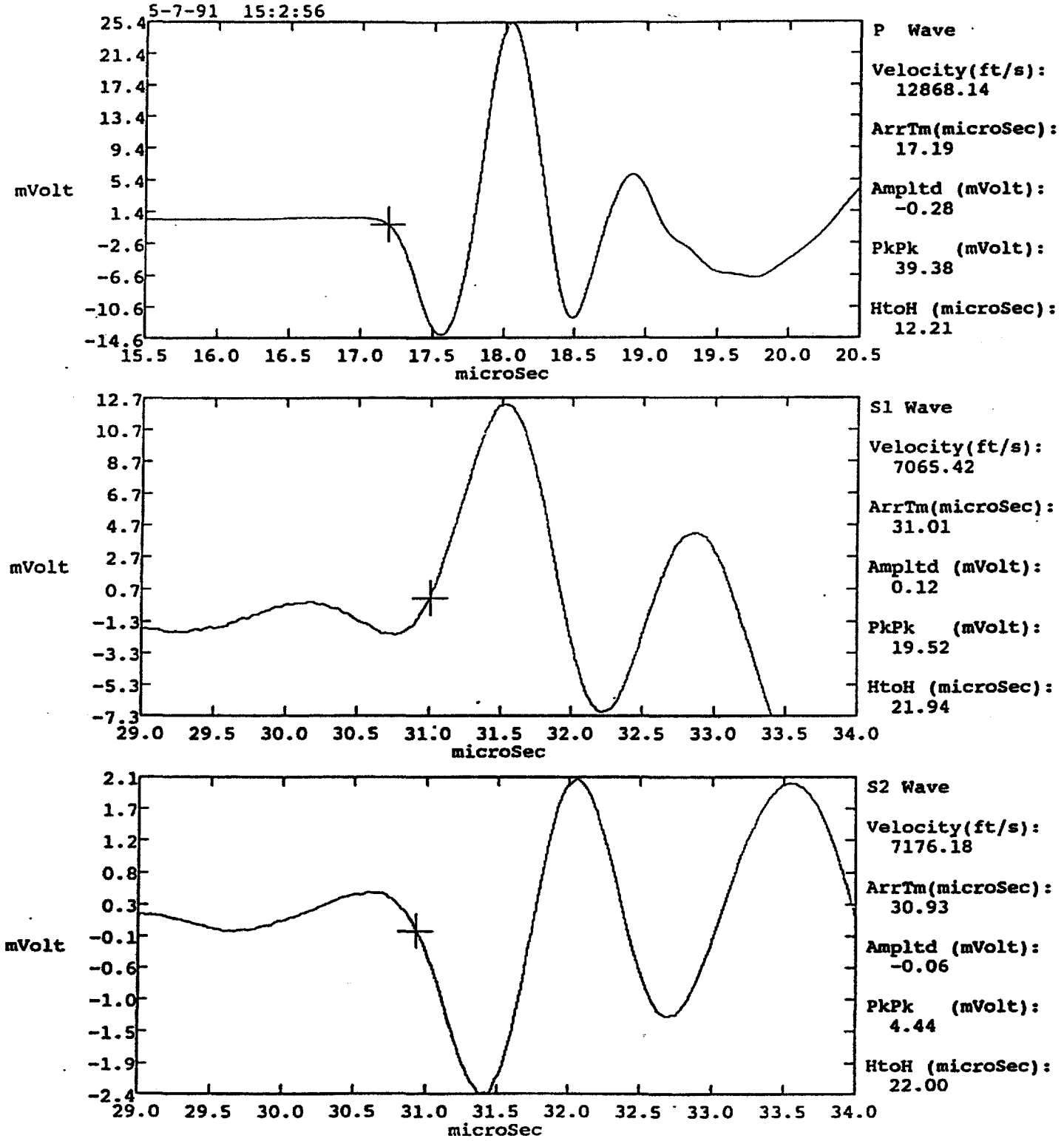
Velocity	: 6452.08	ft/sec
Arrival Time	: 27.61	microSec
Amplitude	: 80.62	Volts
Peak to Peak	: 0.03	Volts
Head to Head	: 21.94	microSec



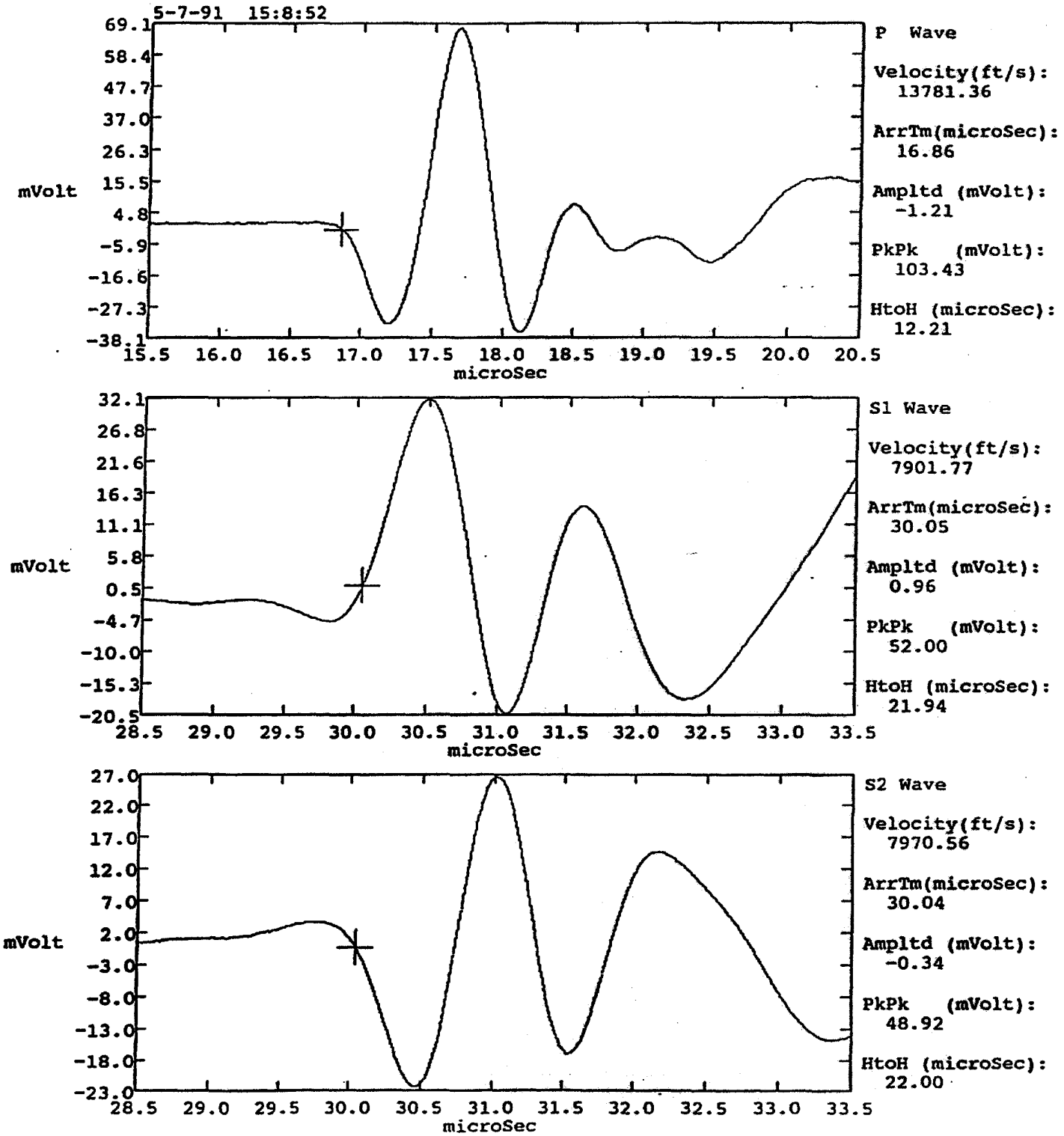
S2 wave

Velocity	: 6675.79	ft/sec
Arrival Time	: 27.48	microSec
Amplitude	: 66.25	Volts
Peak to Peak	: 0.05	Volts
Head to Head	: 22.0	microSec

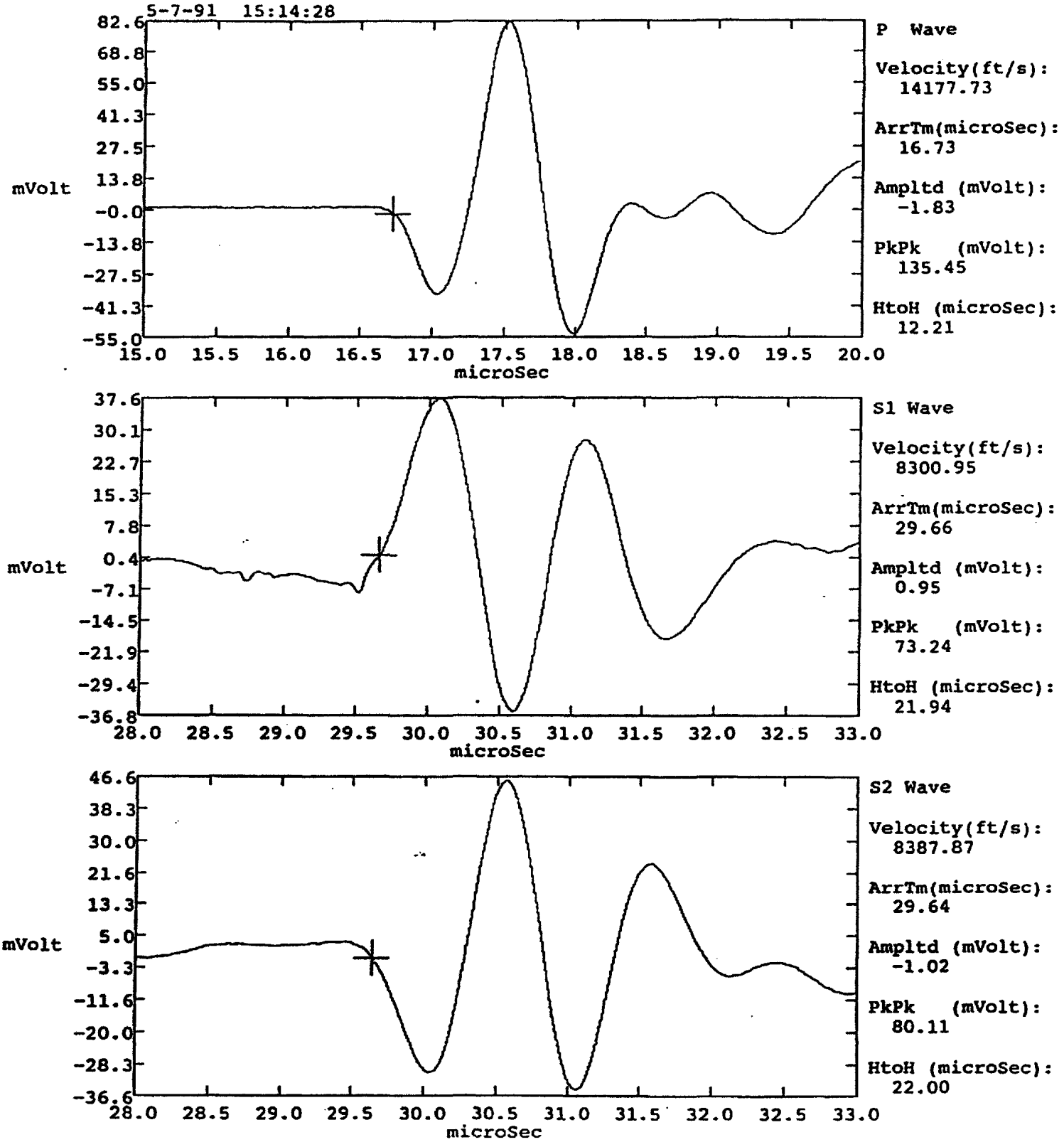
Well: EXXON ANTARES 2
Sample: 11082 Length:0.769 inch Fluid: BRINE
Conf Pr:1100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11082.1B Pick: Manual 5-7-91 15:2:56
20kppm NaCl Brine



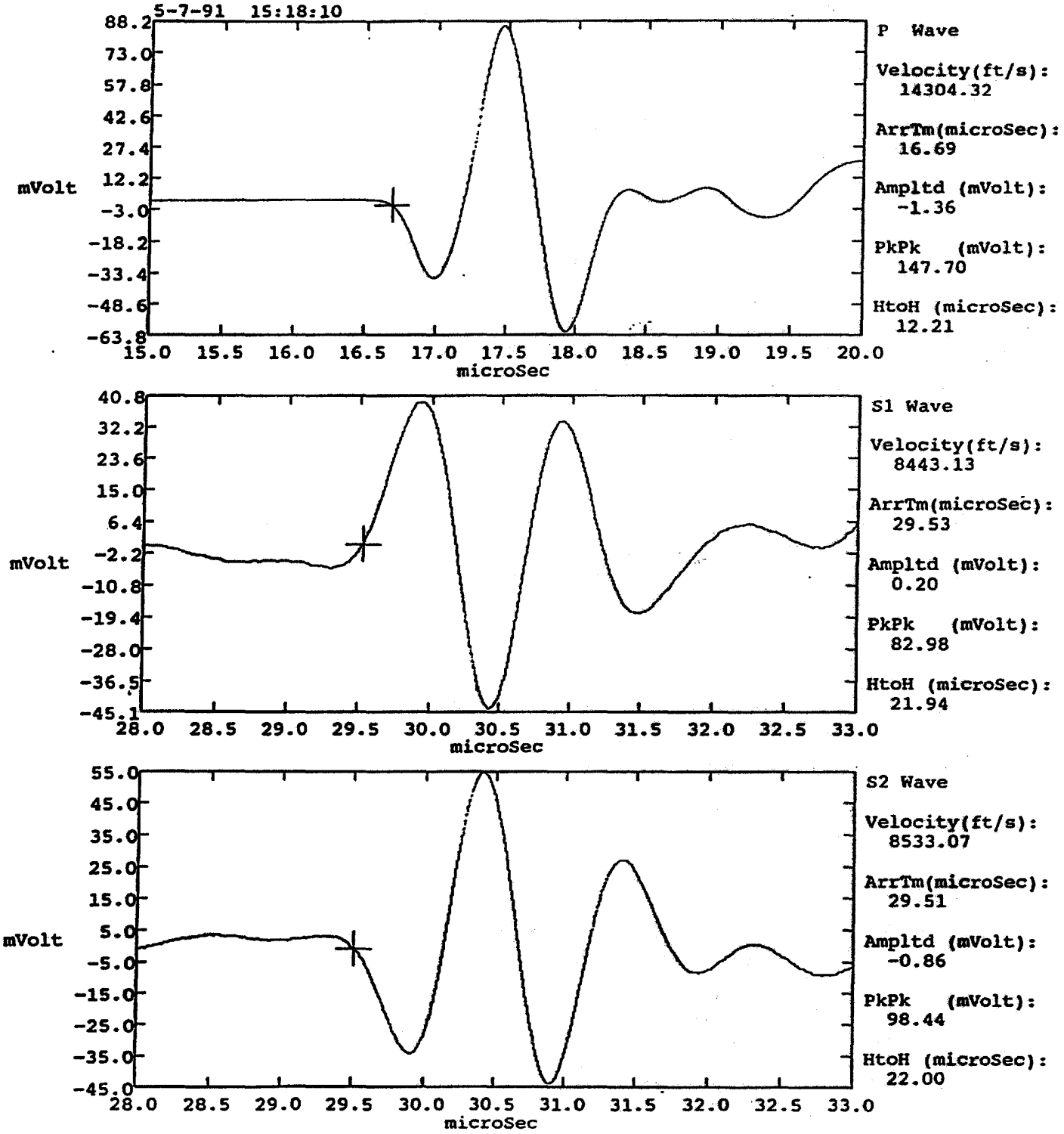
Well: EXXON ANTARES 2
Sample: 11082 Length:0.769 inch Fluid: BRINE
Conf Pr:4100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11082.2B Pick: Manual 5-7-91 15:8:52
20kppm NaCI Brine



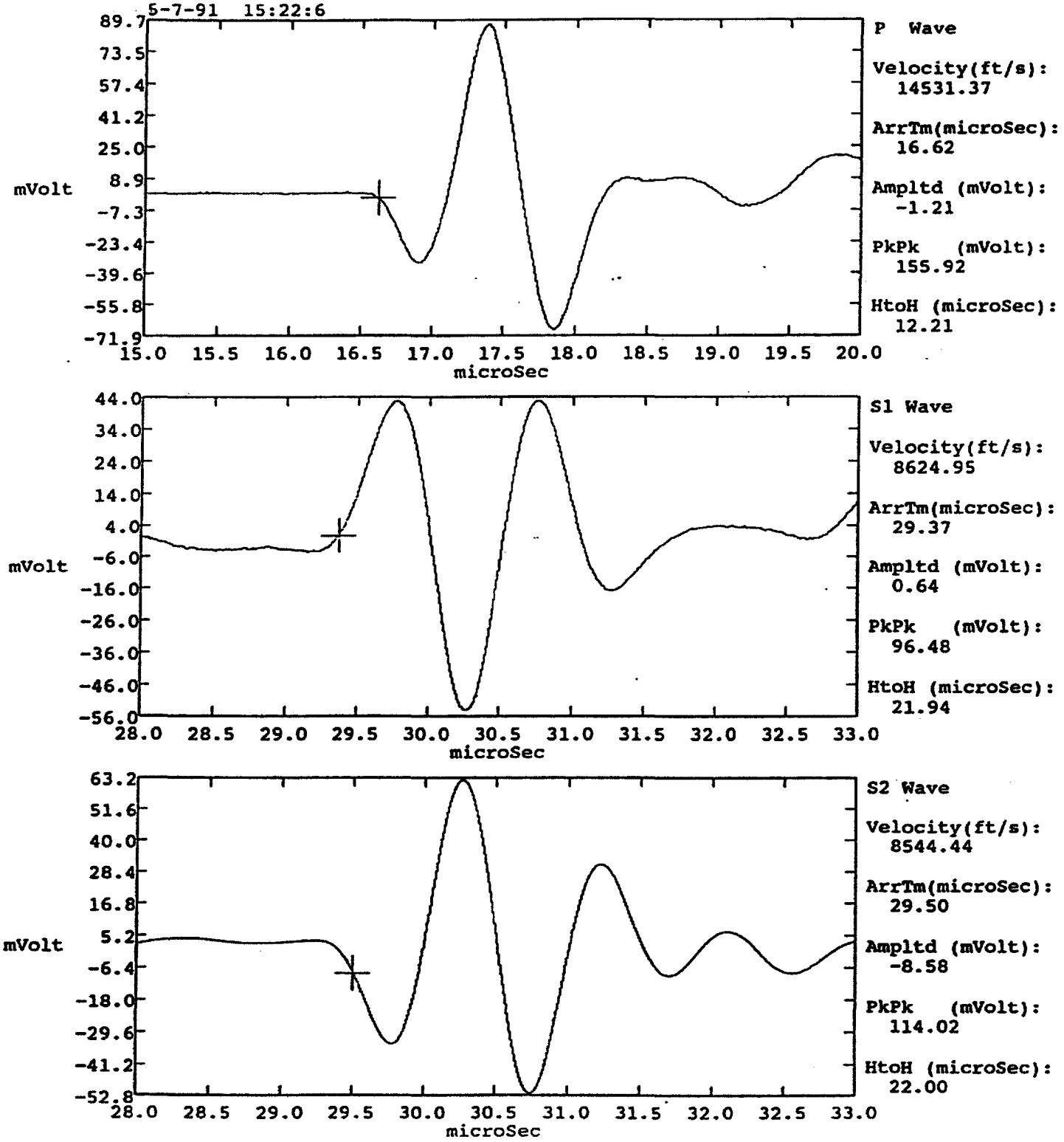
Well: EXXON ANTARES 2
Sample: 11082 Length:0.769 inch Fluid: BRINE
Conf Pr:7600.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11082.3B Pick: Manual 5-7-91 15:14:28
20kppm NaCI Brine



Well: EXXON ANTARES 2
Sample: 11082 Length:0.769 inch Fluid: BRINE
Conf Pr:10100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11082.4B Pick: Manual 5-7-91 15:18:12
20kppm NaCl Brine

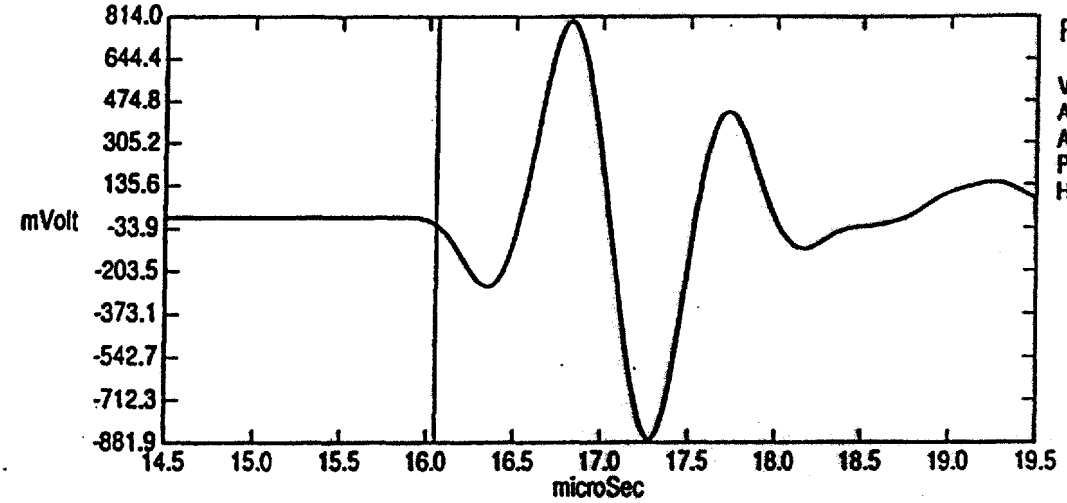


Well: EXXON ANTARES 2
Sample: 11082 Length:0.769 inch Fluid: BRINE
Conf Pr:15100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11082.5B Pick: Manual 5-7-91 15:22:6
20kppm NaCl Brine



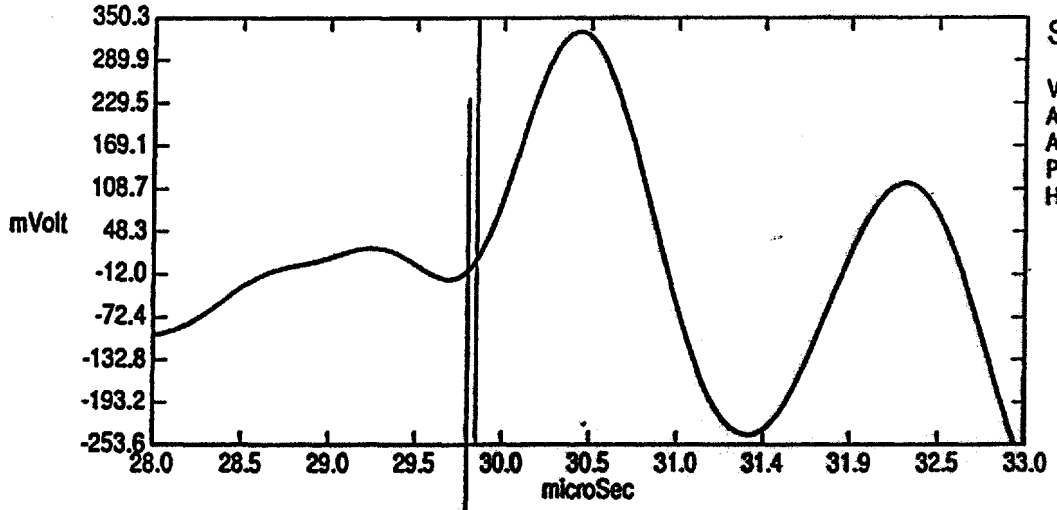
Well : EXXON ANTARES 2
Sample : 11106
Fluid : BRINE
File : 11106.1b
20kppm NaCl Brine

Length : .51 inch
Conf Pr : 1100 psi
Pore Pr : 100 psi
Temp : 21 C



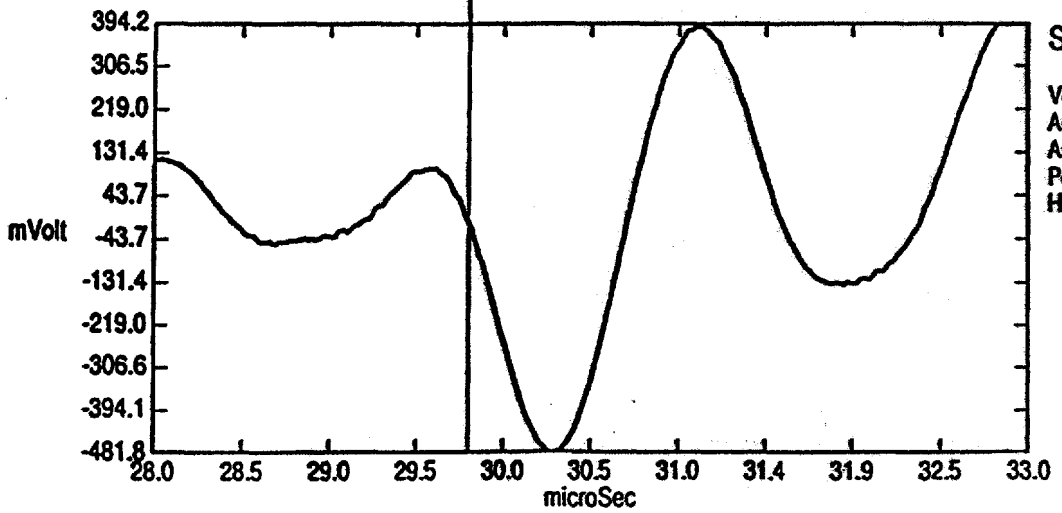
P wave

Velocity	: 11024.3	ft/sec
Arrival Time	: 16.04	microSec
Amplitude	: 81.26	mVolt
Peak to Peak	: 166.0	mVolt
Head to Head	: 12.21	microSec



S1 wave

Velocity	: 5351.87	ft/sec
Arrival Time	: 29.85	microSec
Amplitude	: 69.71	mVolt
Peak to Peak	: 18.45	mVolt
Head to Head	: 21.94	microSec

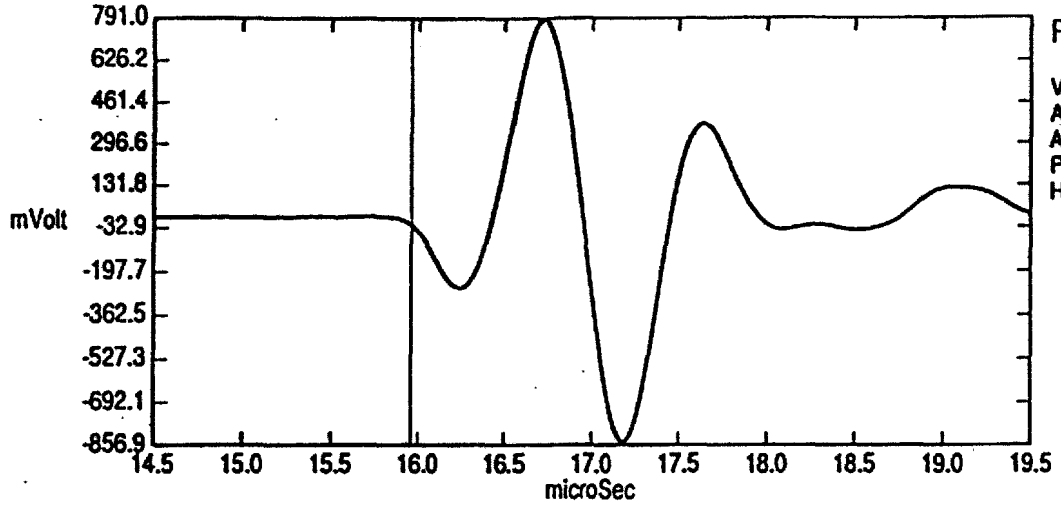


S2 wave

Velocity	: 5427.35	ft/sec
Arrival Time	: 29.8	microSec
Amplitude	: 86.25	mVolt
Peak to Peak	: 8.72	mVolt
Head to Head	: 22.0	microSec

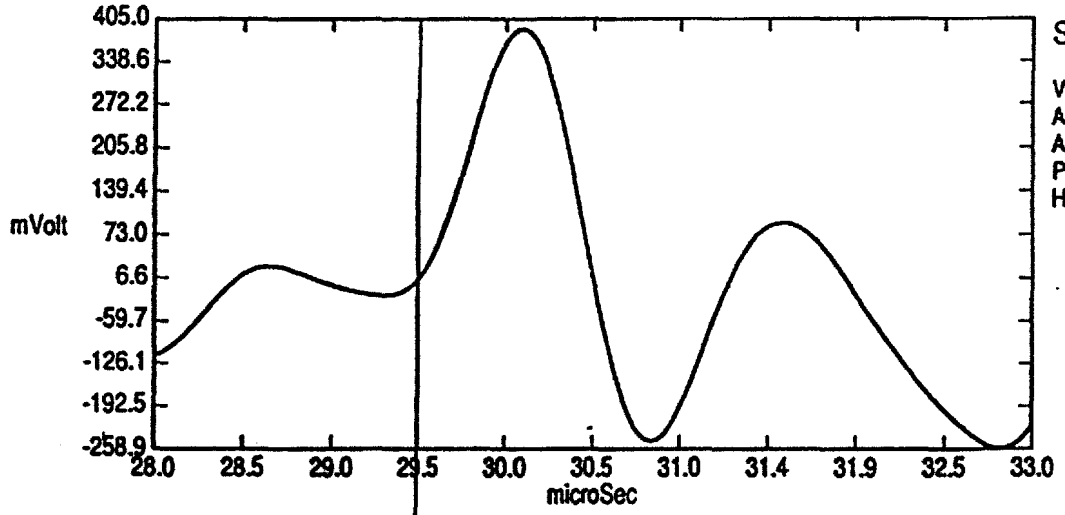
Well : EXXON ANTARES 2
Sample : 11106
Fluid : BRINE
File : 11106.2b
20kppm NaCl Brine

Length : .51 inch
Conf Pr : 4100 psi
Pore Pr : 100 psi
Temp : 21 C



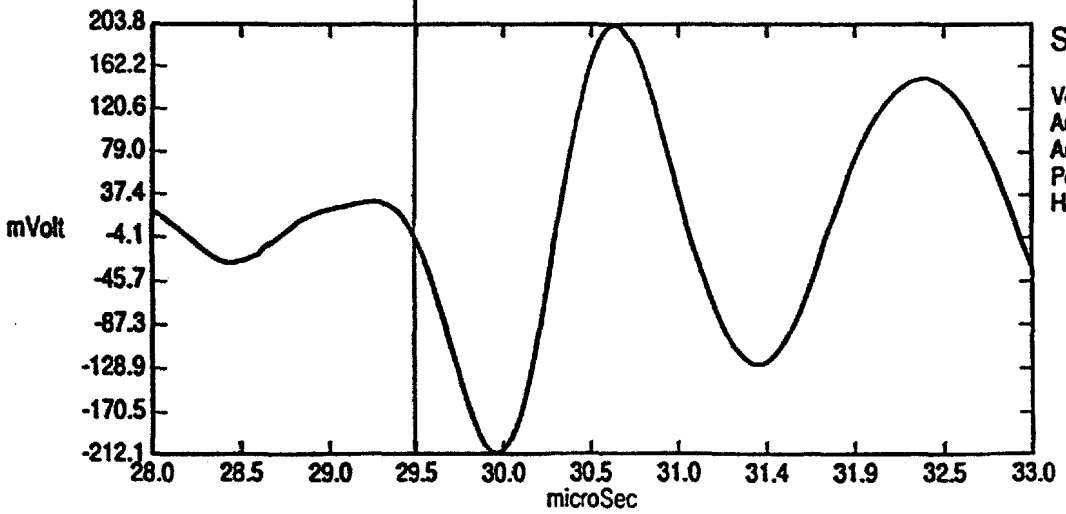
P wave

Velocity	: 11288.9	ft/sec
Arrival Time	: 15.96	microSec
Amplitude	: 80.89	mVolt
Peak to Peak	: 162.55	mVolt
Head to Head	: 12.21	microSec



S1 wave

Velocity	: 5599.64	ft/sec
Arrival Time	: 29.5	microSec
Amplitude	: 63.99	mVolt
Peak to Peak	: 20.37	mVolt
Head to Head	: 21.94	microSec

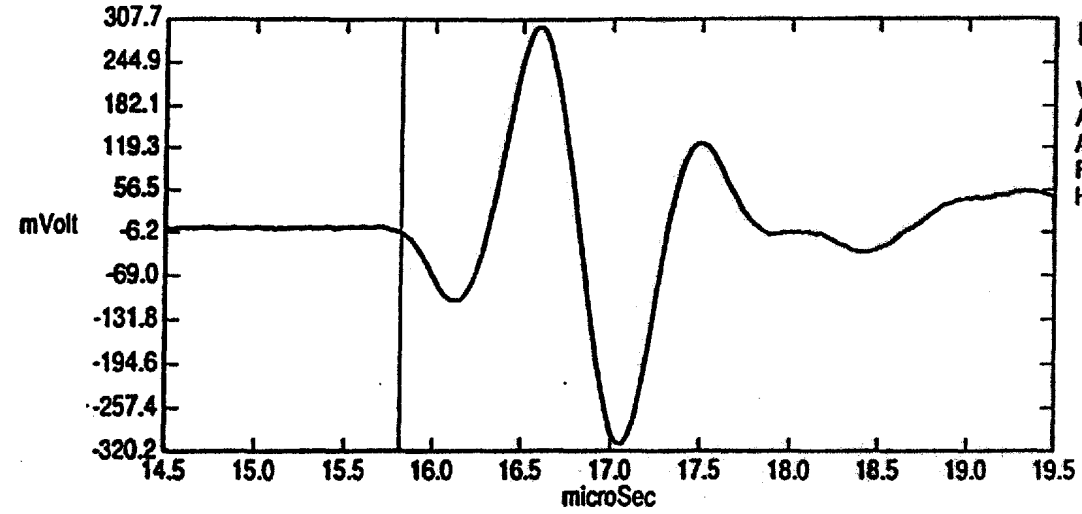


S2 wave

Velocity	: 5651.98	ft/sec
Arrival Time	: 29.49	microSec
Amplitude	: 79.98	mVolt
Peak to Peak	: 13.02	mVolt
Head to Head	: 22.0	microSec

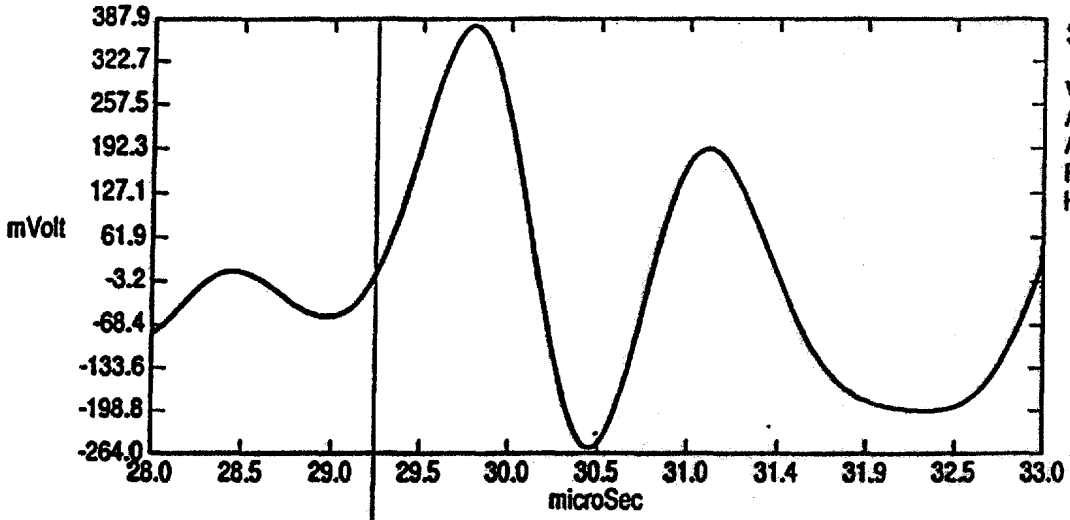
Well : EXXON ANTARES 2
Sample : 11106
Fluid : BRINE
File : 11106.3b
20kppm NaCl Brine

Length : .51 inch
Conf Pr : 7600 psi
Pore Pr : 100 psi
Temp : 21 C



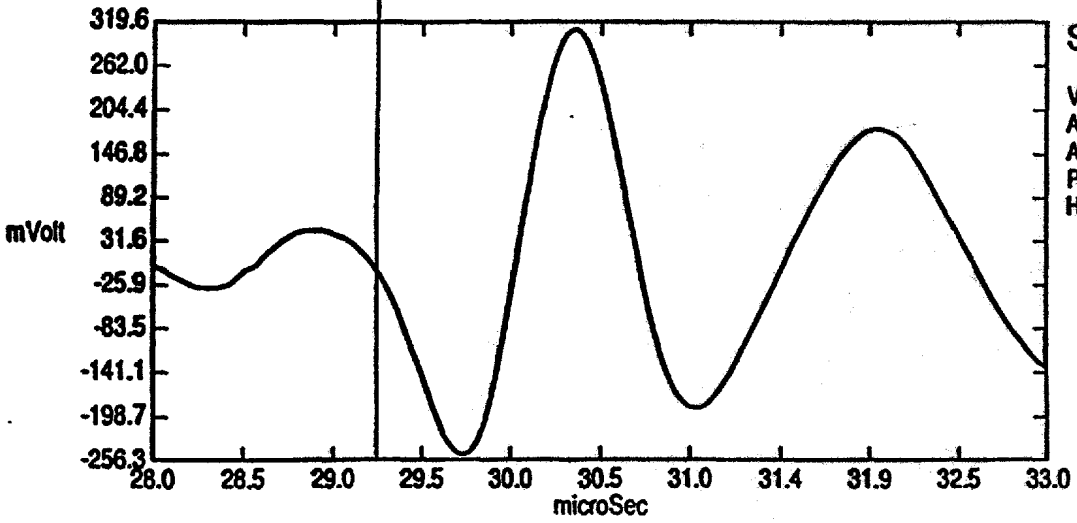
P wave

Velocity	: 11726.7	ft/sec
Arrival Time	: 15.82	microSec
Amplitude	: 79.68	mVolt
Peak to Peak	: 191.6	mVolt
Head to Head	: 12.21	microSec



S1 wave

Velocity	: 5791.15	ft/sec
Arrival Time	: 29.25	microSec
Amplitude	: 66.54	mVolt
Peak to Peak	: 19.96	mVolt
Head to Head	: 21.94	microSec

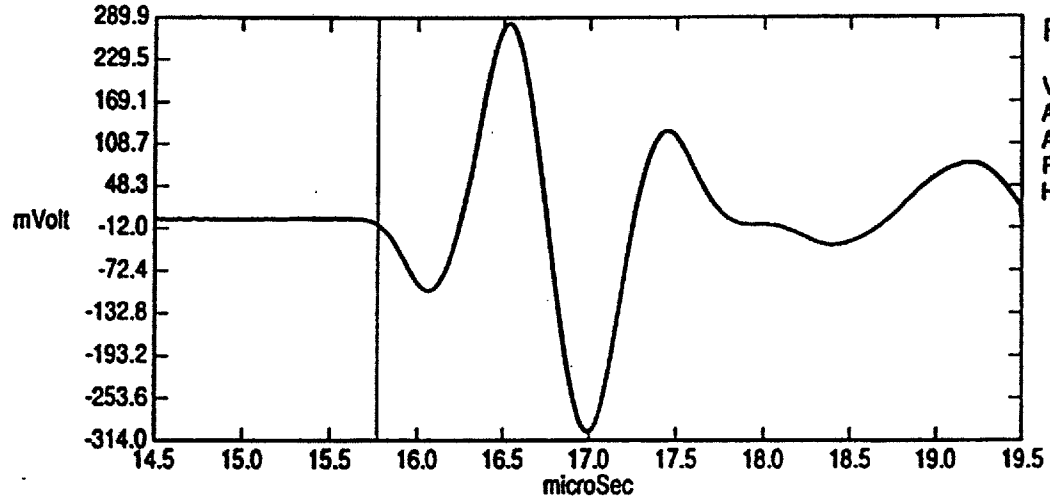


S2 wave

Velocity	: 5839.08	ft/sec
Arrival Time	: 29.25	microSec
Amplitude	: 69.21	mVolt
Peak to Peak	: 17.6	mVolt
Head to Head	: 22.0	microSec

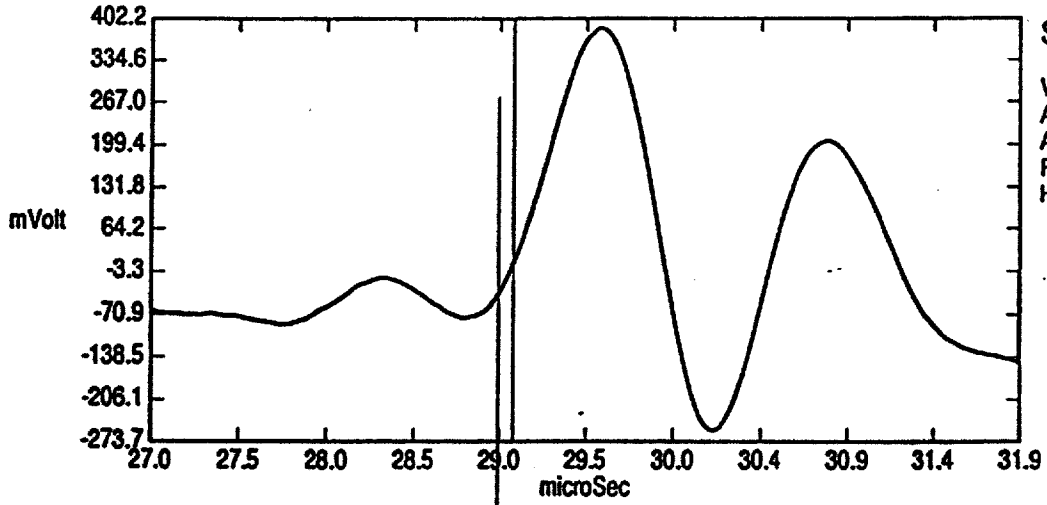
Well : EXXON ANTARES 2
Sample : 11106
Fluid : BRINE
File : 11106.4b
20kppm NaCl Brine

Length : .51 inch
Conf Pr : 10100 psi
Pore Pr : 100 psi
Temp : 21 C



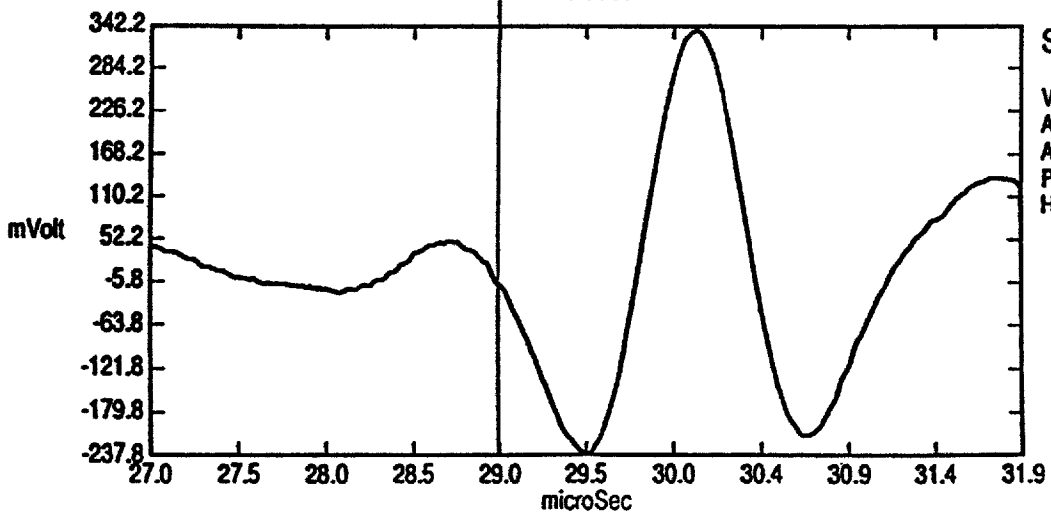
P wave

Velocity	: 11891.4	ft/sec
Arrival Time	: 15.77	microSec
Amplitude	: 81.24	mVolt
Peak to Peak	: 184.12	mVolt
Head to Head	: 12.21	microSec



S1 wave

Velocity	: 5929.03	ft/sec
Arrival Time	: 29.08	microSec
Amplitude	: 67.33	mVolt
Peak to Peak	: 20.25	mVolt
Head to Head	: 21.94	microSec

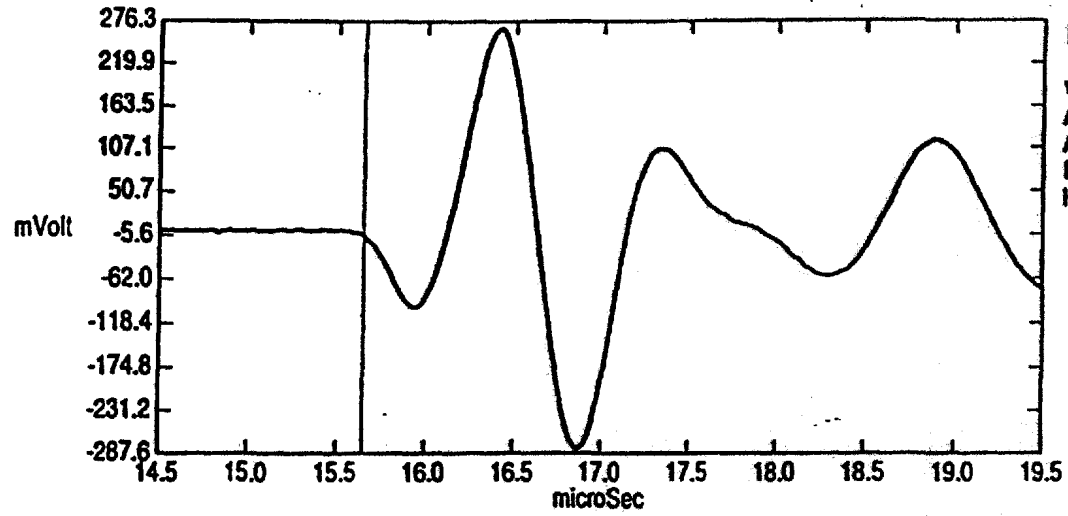


S2 wave

Velocity	: 6056.27	ft/sec
Arrival Time	: 28.99	microSec
Amplitude	: 63.43	mVolt
Peak to Peak	: 18.01	mVolt
Head to Head	: 22.0	microSec

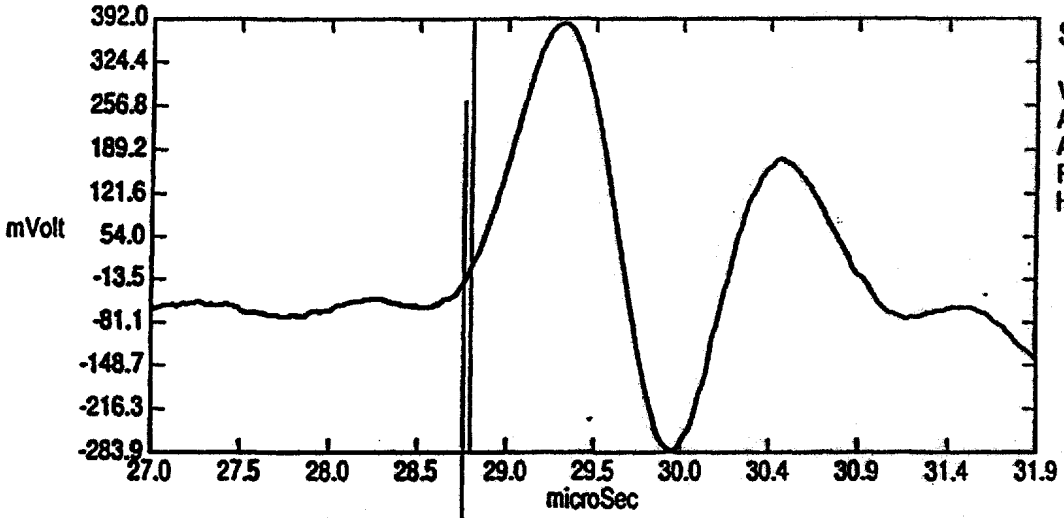
Well : EXXON ANTARES 2
Sample : 11106
Fluid : BRINE
File : 11106.5b
20kppm NaCl Brine

Length : .51 inch
Conf Pr : 15100 psi
Pore Pr : 100 psi
Temp : 21 C



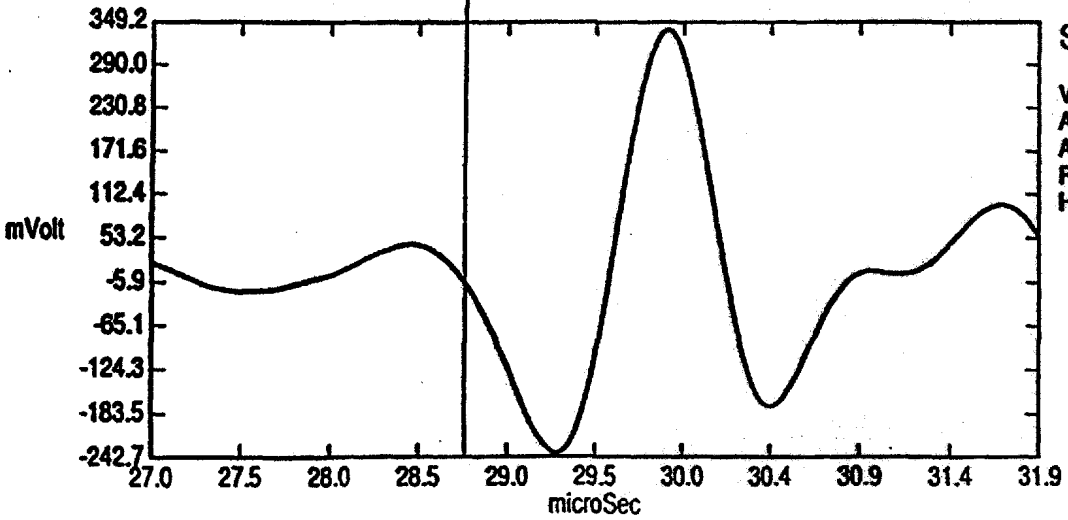
P wave

Velocity	: 12306.2	ft/sec
Arrival Time	: 15.65	microSec
Amplitude	: 79.68	mVolt
Peak to Peak	: 173.12	mVolt
Head to Head	: 12.21	microSec



S1 wave

Velocity	: 6171.04	ft/sec
Arrival Time	: 28.8	microSec
Amplitude	: 68.75	mVolt
Peak to Peak	: 21.04	mVolt
Head to Head	: 21.94	microSec

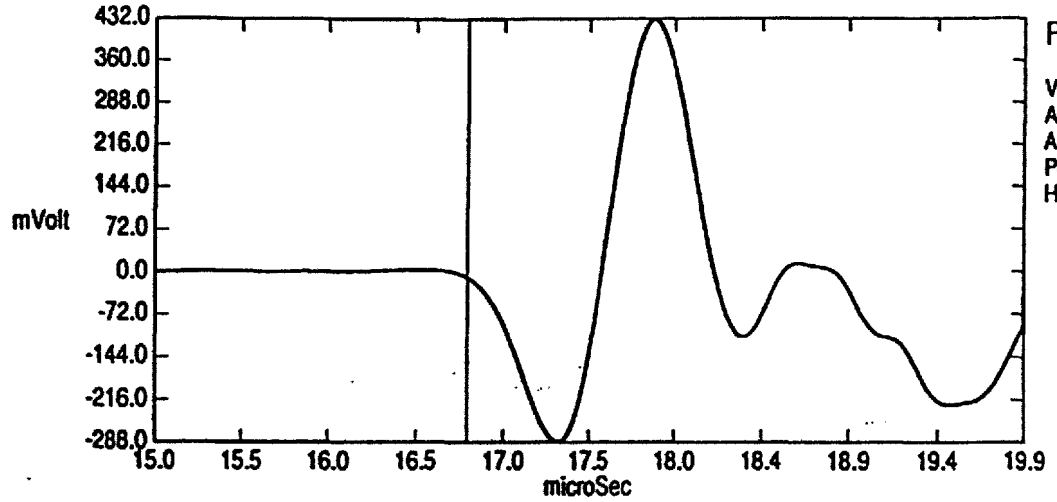


S2 wave

Velocity	: 6262.32	ft/sec
Arrival Time	: 28.76	microSec
Amplitude	: 63.6	mVolt
Peak to Peak	: 18.14	mVolt
Head to Head	: 22.0	microSec

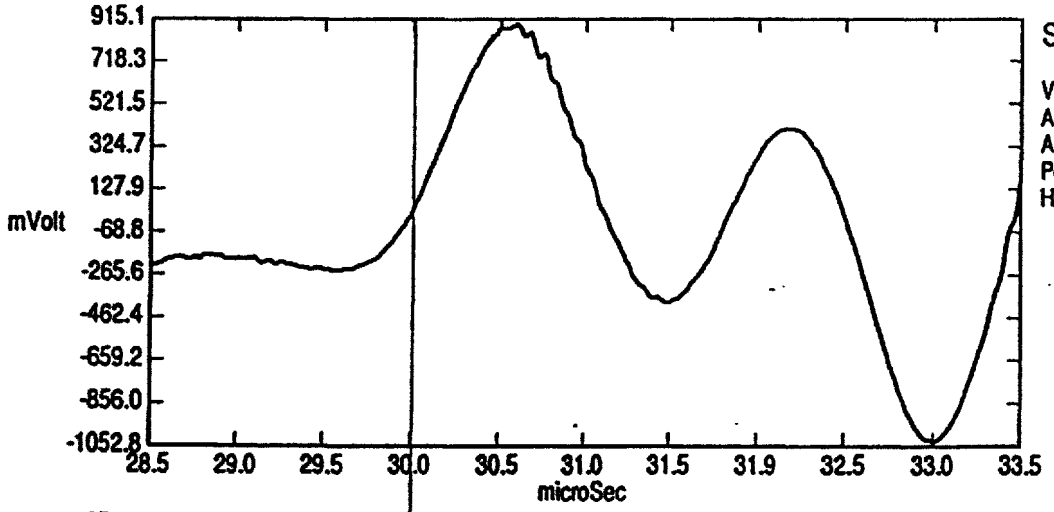
Well : EXXON ANTARES 2
Sample : 11186
Fluid : BRINE
File : 11186.1b
20kppm NaCl Brine

Length : .72 inch
Conf Pr : 1100 psi
Pore Pr : 100 psi
Temp : 21 C



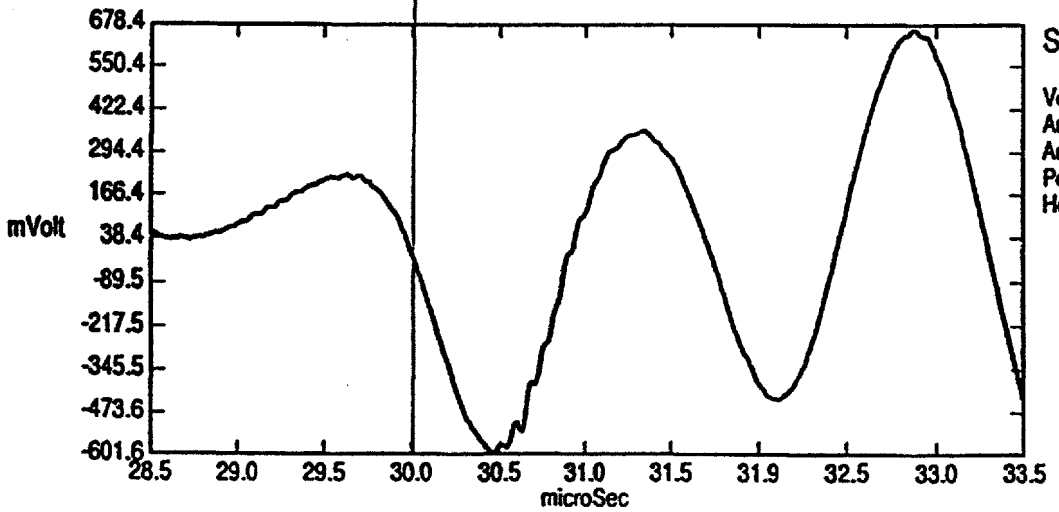
P wave

Velocity	: 13155.0	ft/sec
Arrival Time	: 16.79	microSec
Amplitude	: 61.88	mVolt
Peak to Peak	: 22.6	mVolt
Head to Head	: 12.21	microSec



S1 wave

Velocity	: 7465.92	ft/sec
Arrival Time	: 30.01	microSec
Amplitude	: 88.12	mVolt
Peak to Peak	: 19.21	mVolt
Head to Head	: 21.94	microSec

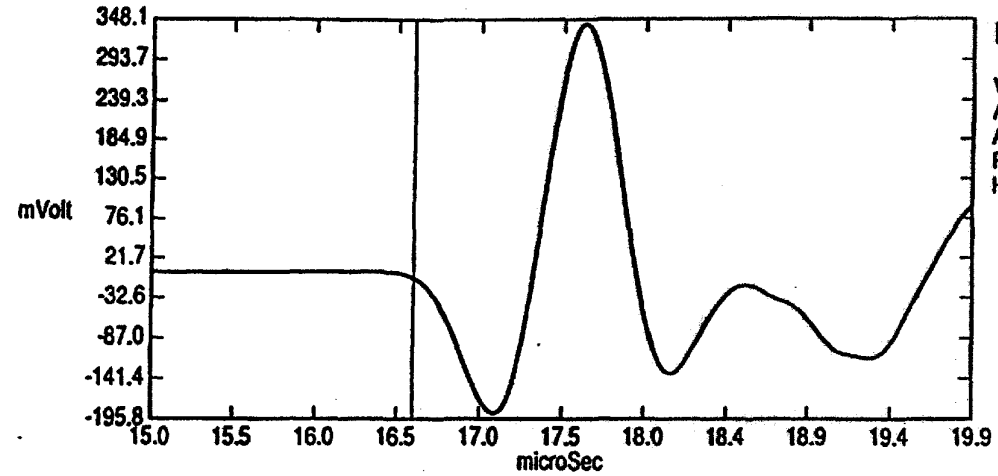


S2 wave

Velocity	: 7521.84	ft/sec
Arrival Time	: 30.01	microSec
Amplitude	: 73.12	mVolt
Peak to Peak	: 12.55	mVolt
Head to Head	: 22.0	microSec

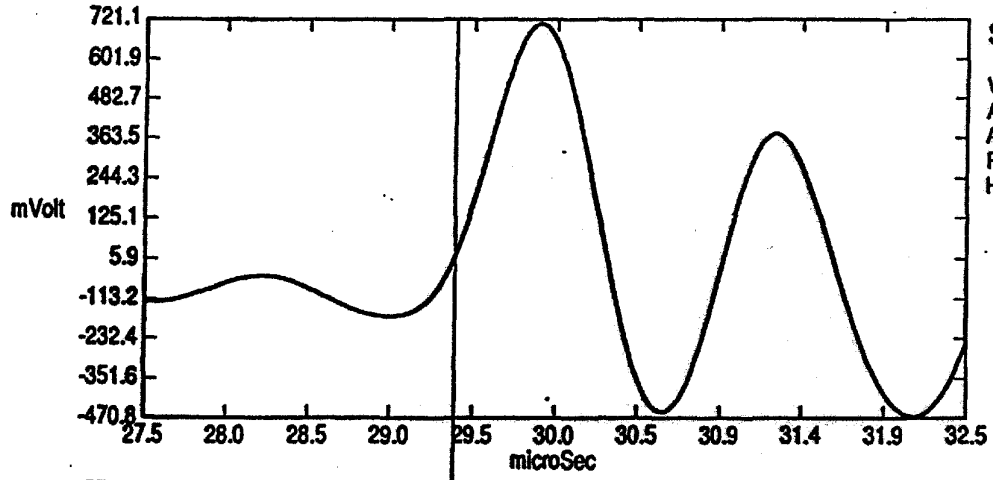
Well : EXXON ANTARES 2
Sample : 11186
Fluid : BRINE
File : 11186.2b
20kppm NaCl Brine

Length : .72 inch
Conf Pr : 4100 psi
Pore Pr : 100 psi
Temp : 21 C



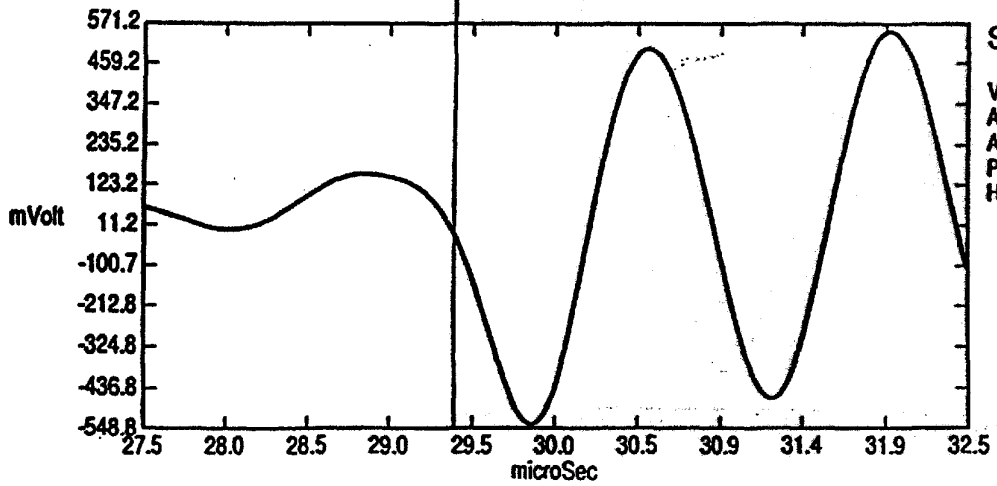
P wave

Velocity	: 13724.4	ft/sec
Arrival Time	: 16.6	microSec
Amplitude	: 55.64	mVolt
Peak to Peak	: 52.91	mVolt
Head to Head	: 12.21	microSec



S1 wave

Velocity	: 8087.25	ft/sec
Arrival Time	: 29.39	microSec
Amplitude	: 65.12	mVolt
Peak to Peak	: 37.07	mVolt
Head to Head	: 21.94	microSec

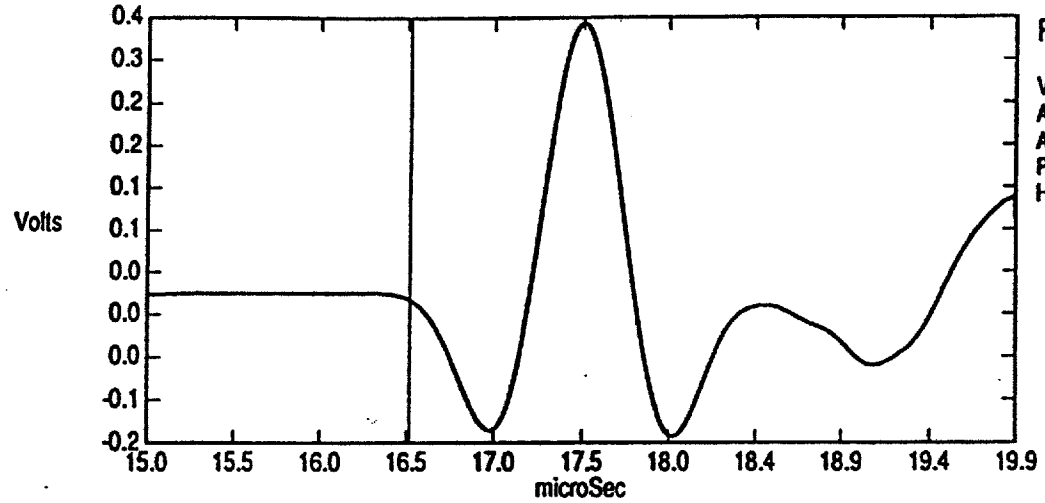


S2 wave

Velocity	: 8152.91	ft/sec
Arrival Time	: 29.39	microSec
Amplitude	: 76.45	mVolt
Peak to Peak	: 34.23	mVolt
Head to Head	: 22.0	microSec

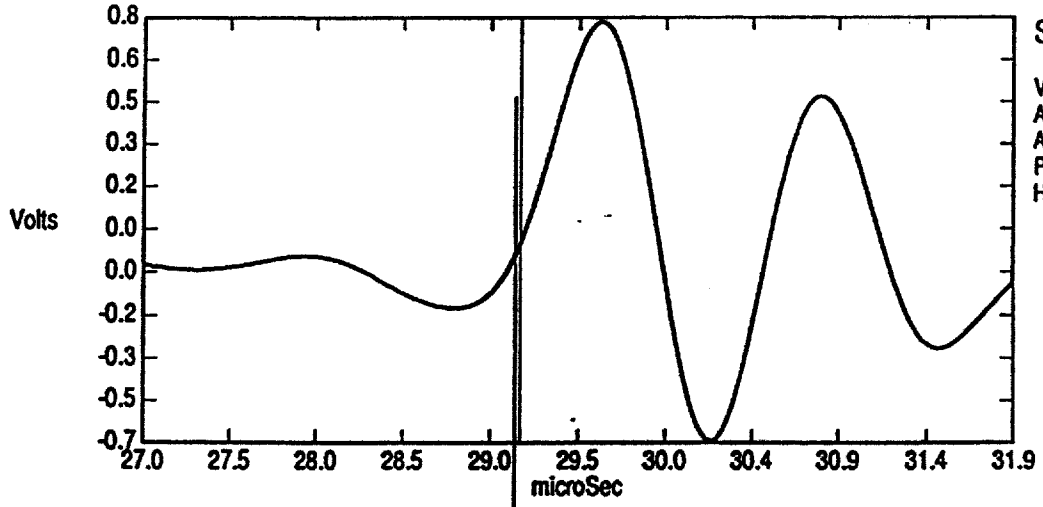
Well : EXXON ANTARES 2
Sample : 11186
Fluid : BRINE
File : 11186.3b
20kppm NaCl Brine

Length : .72 inch
Conf Pr : 7600 psi
Pore Pr : 100 psi
Temp : 21 C



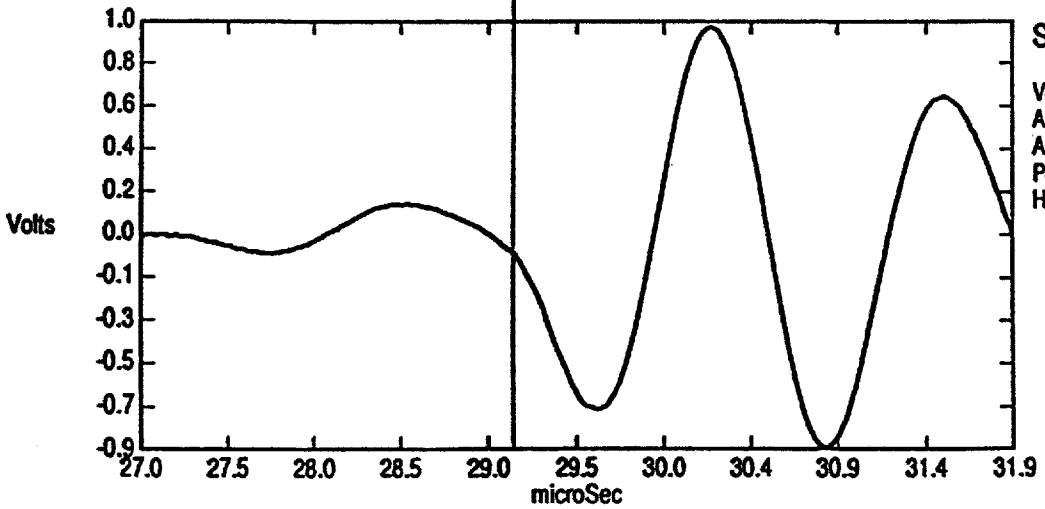
P wave

Velocity	: 13979.1	ft/sec
Arrival Time	: 16.52	microSec
Amplitude	: 53.17	Volts
Peak to Peak	: 0.06	Volts
Head to Head	: 12.21	microSec



S1 wave

Velocity	: 8333.33	ft/sec
Arrival Time	: 29.17	microSec
Amplitude	: 74.52	Volts
Peak to Peak	: 0.04	Volts
Head to Head	: 21.94	microSec

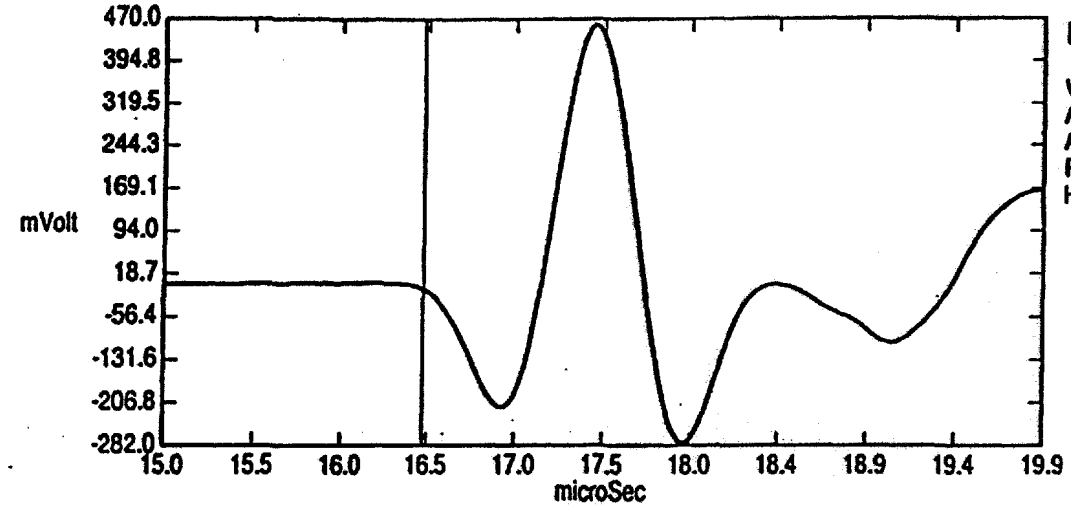


S2 wave

Velocity	: 8438.37	ft/sec
Arrival Time	: 29.14	microSec
Amplitude	: 73.12	Volts
Peak to Peak	: 0.06	Volts
Head to Head	: 22.0	microSec

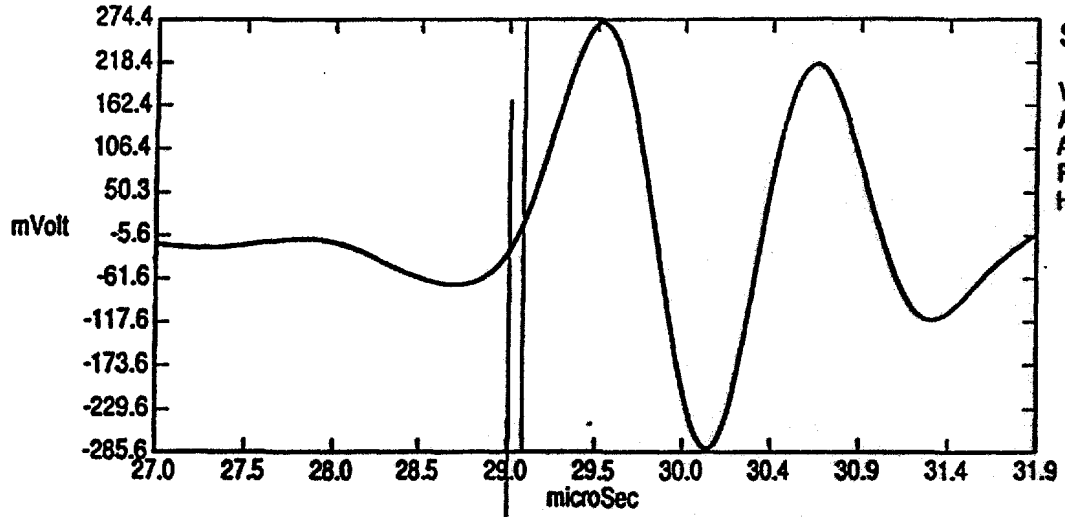
Well : EXXON ANTARES 2
Sample : 11186
Fluid : BRINE
File : 11186.4b
20kppm NaCl Brine

Length : .72 inch
Conf Pr : 10100 psi
Pore Pr : 100 psi
Temp : 21 C



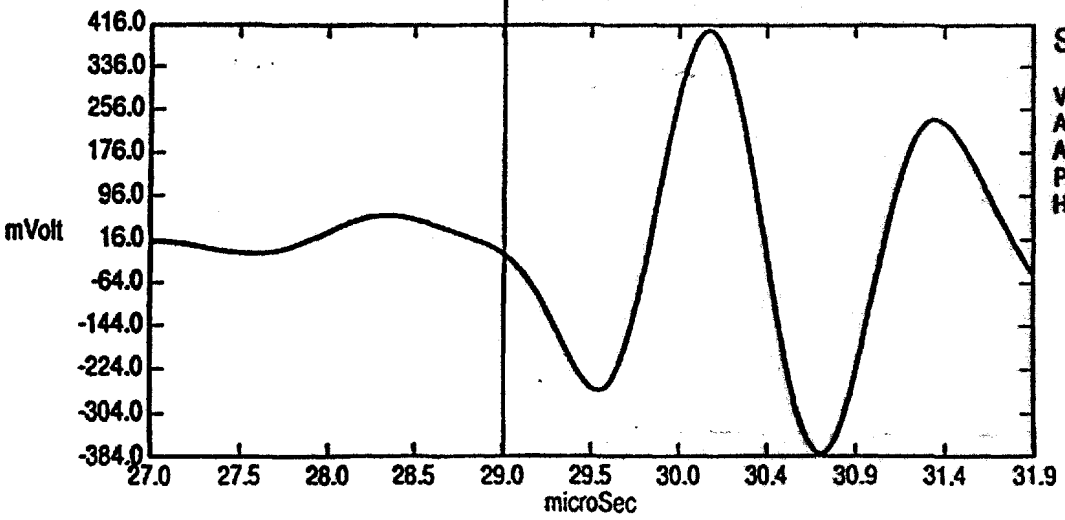
P wave

Velocity	: 14110.1	ft/sec
Arrival Time	: 16.48	microSec
Amplitude	: 58.01	mVolt
Peak to Peak	: 73.39	mVolt
Head to Head	: 12.21	microSec



S1 wave

Velocity	: 8426.57	ft/sec
Arrival Time	: 29.09	microSec
Amplitude	: 84.27	mVolt
Peak to Peak	: 54.94	mVolt
Head to Head	: 21.94	microSec

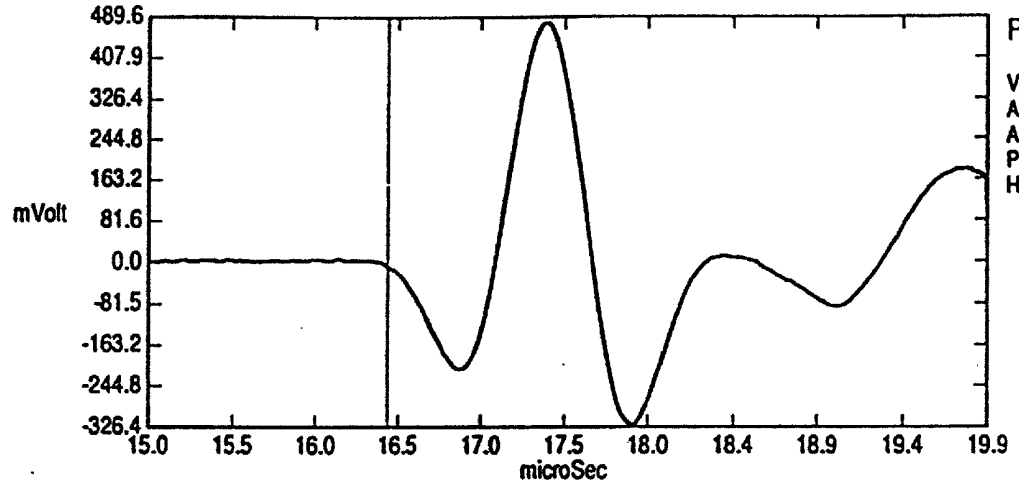


S2 wave

Velocity	: 8594.86	ft/sec
Arrival Time	: 29.01	microSec
Amplitude	: 74.75	mVolt
Peak to Peak	: 78.02	mVolt
Head to Head	: 22.0	microSec

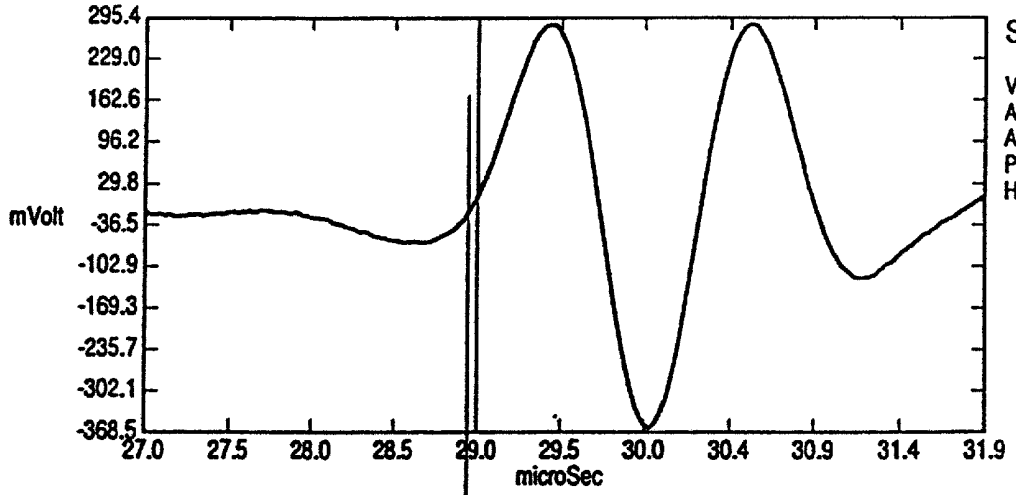
Well : EXXON ANTARES 2
Sample : 11186
Fluid : BRINE
File : 11186.5b
20kppm NaCl Brine

Length : .72 inch
Conf Pr : 15100 psi
Pore Pr : 100 psi
Temp : 21 C



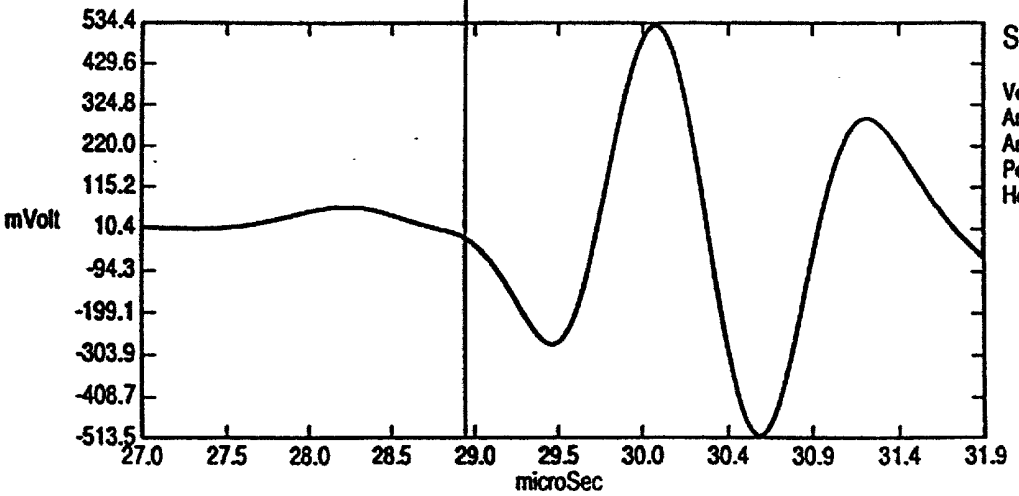
P wave

Velocity	: 14243.5	ft/sec
Arrival Time	: 16.44	microSec
Amplitude	: 62.18	mVolt
Peak to Peak	: 79.68	mVolt
Head to Head	: 12.21	microSec



S1 wave

Velocity	: 8533.99	ft/sec
Arrival Time	: 29.0	microSec
Amplitude	: 90.93	mVolt
Peak to Peak	: 64.45	mVolt
Head to Head	: 21.94	microSec

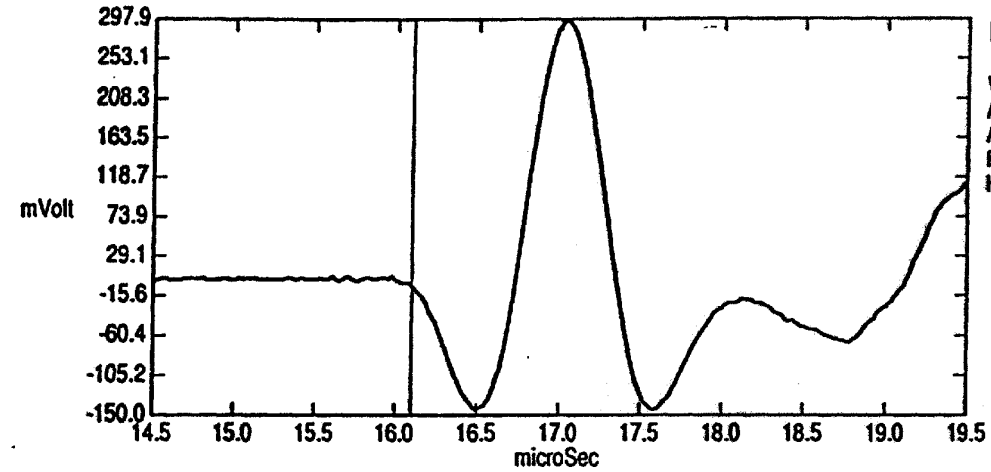


S2 wave

Velocity	: 8681.55	ft/sec
Arrival Time	: 28.94	microSec
Amplitude	: 76.32	mVolt
Peak to Peak	: 103.02	mVolt
Head to Head	: 22.0	microSec

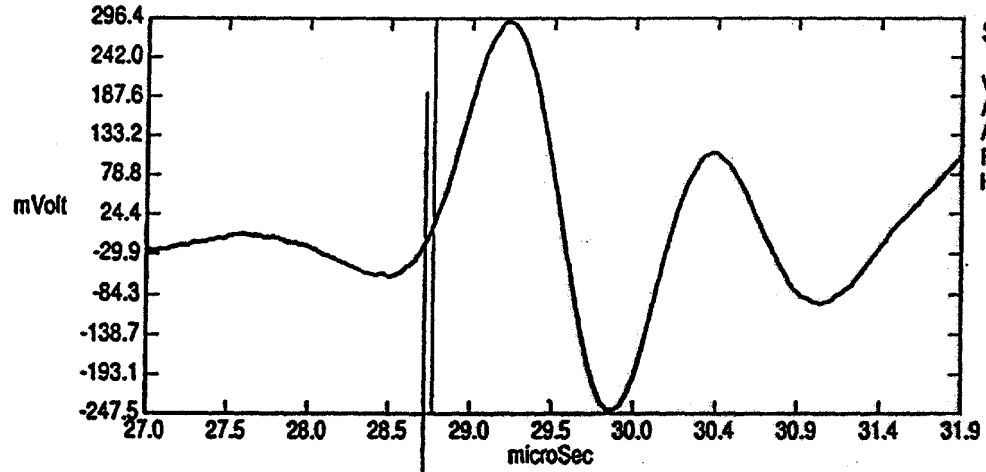
Well : EXXON ANTARES 2
Sample : 11235
Fluid : BRINE
File : 11235.1b
20kppm NaCl Brine

Length : .64 inch
Conf Pr : 1100 psi
Pore Pr : 100 psi
Temp : 21 C



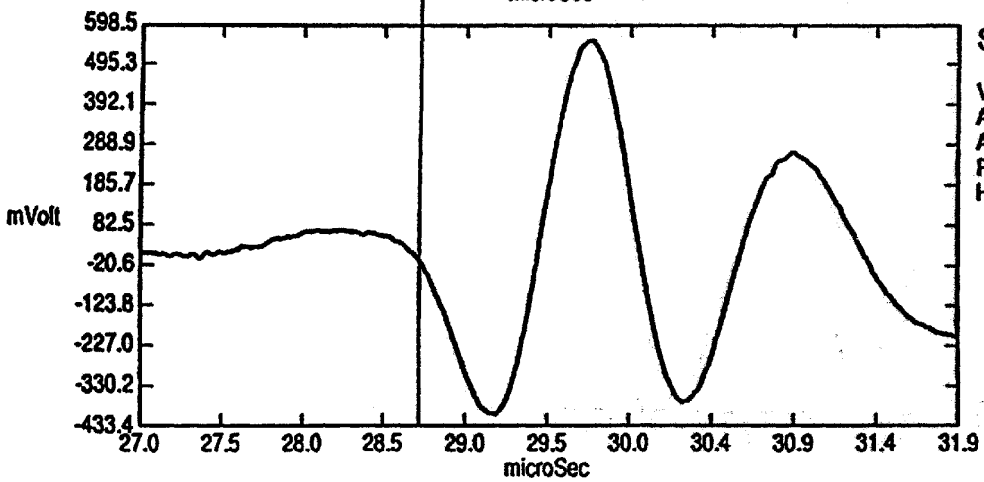
P wave

Velocity	: 13667.5	ft/sec
Arrival Time	: 16.1	microSec
Amplitude	: 51.25	mVolt
Peak to Peak	: 43.75	mVolt
Head to Head	: 12.21	microSec



S1 wave

Velocity	: 7784.28	ft/sec
Arrival Time	: 28.77	microSec
Amplitude	: 75.62	mVolt
Peak to Peak	: 53.12	mVolt
Head to Head	: 21.94	microSec

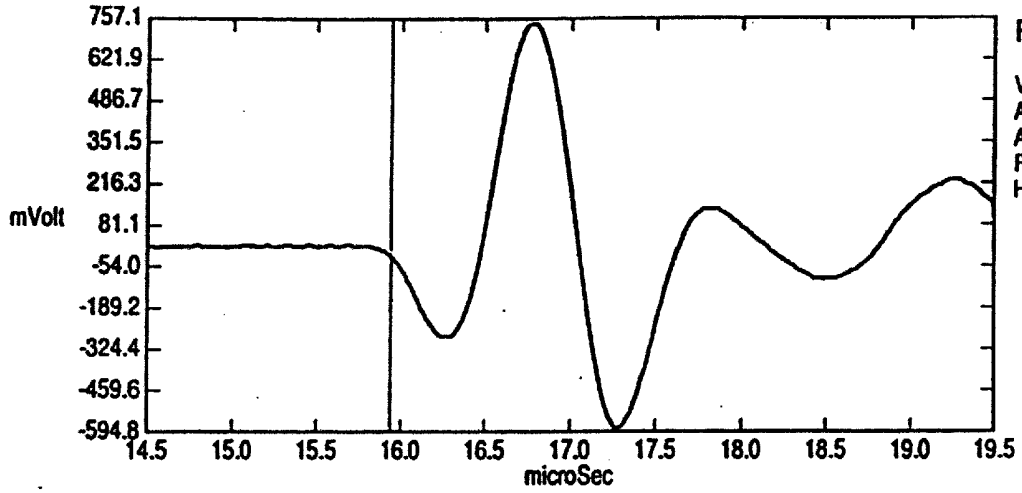


S2 wave

Velocity	: 7911.7	ft/sec
Arrival Time	: 28.72	microSec
Amplitude	: 65.62	mVolt
Peak to Peak	: 30.46	mVolt
Head to Head	: 22.0	microSec

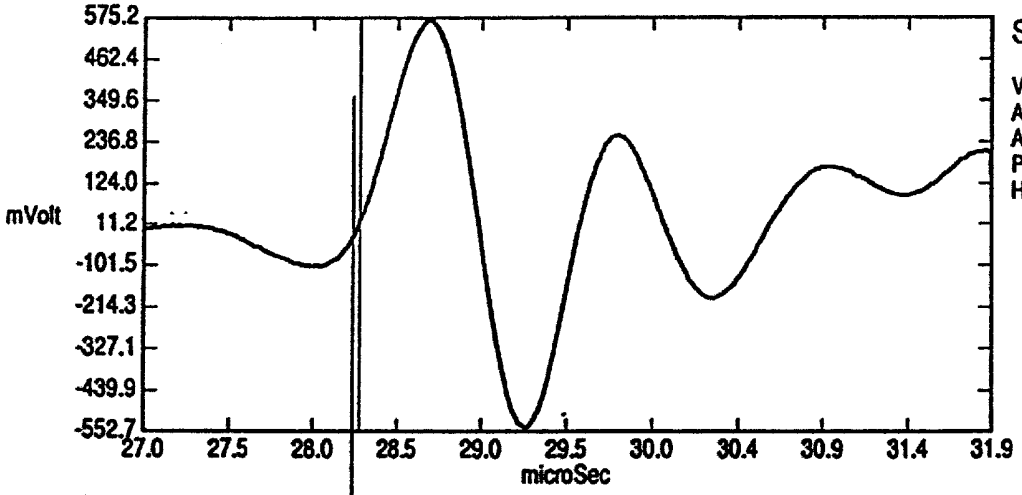
Well	: EXXON ANTARES 2	Length	: .64 inch
Sample	: 11235	Conf Pr	: 4100 psi
Fluid	: BRINE	Pore Pr	: 100 psi
File	: 11235.2b	Temp	: 21 C

20kppm NaCl Brine



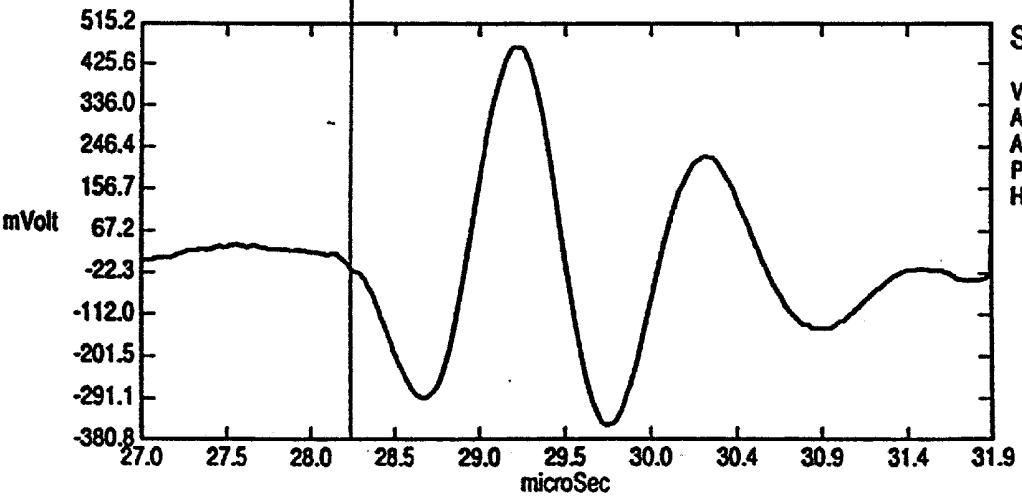
P wave

Velocity	: 14253.8	ft/sec
Arrival Time	: 15.94	microSec
Amplitude	: 67.5	mVolt
Peak to Peak	: 132.55	mVolt
Head to Head	: 12.21	microSec



S1 wave

Velocity	: 8399.15	ft/sec
Arrival Time	: 28.27	microSec
Amplitude	: 81.25	mVolt
Peak to Peak	: 110.59	mVolt
Head to Head	: 21.94	microSec

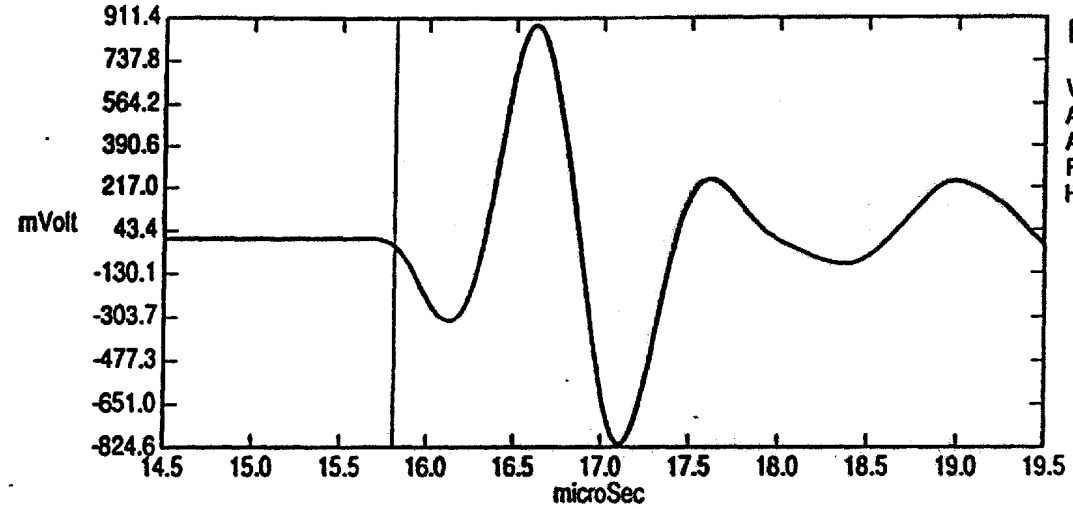


S2 wave

Velocity	: 8533.97	ft/sec
Arrival Time	: 28.23	microSec
Amplitude	: 65.62	mVolt
Peak to Peak	: 81.19	mVolt
Head to Head	: 22.0	microSec

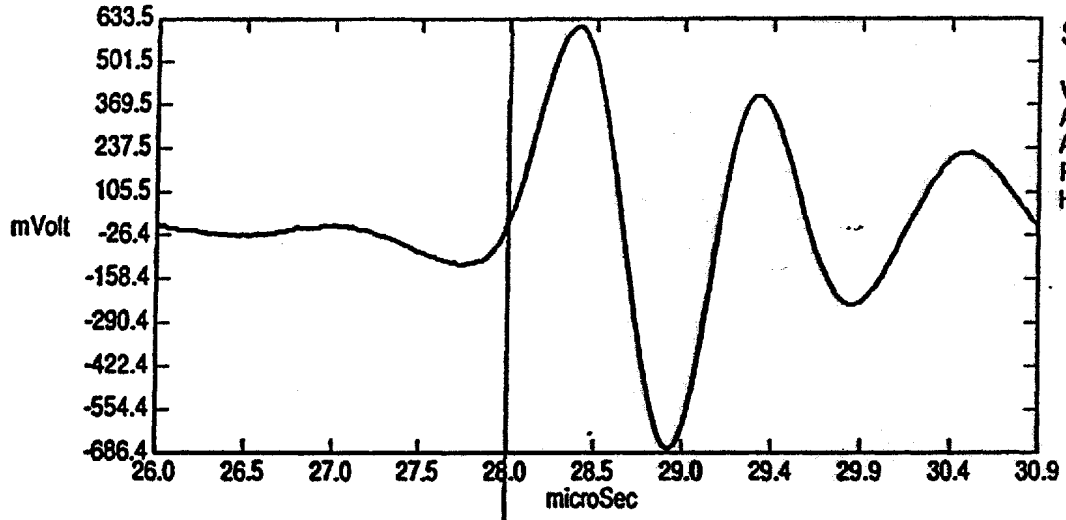
Well : EXXON ANTARES 2
Sample : 11235
Fluid : BRINE
File : 11235.3b
20kppm NaCl Brine

Length : .64 inch
Conf Pr : 7600 psi
Pore Pr : 100 psi
Temp : 21 C



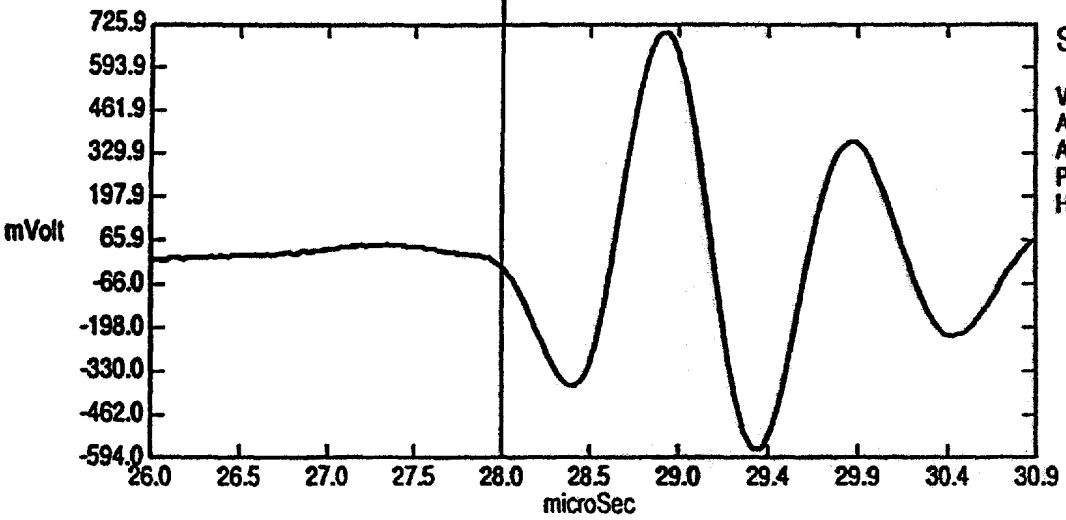
P wave

Velocity	: 14768.5	ft/sec
Arrival Time	: 15.81	microSec
Amplitude	: 74.15	mVolt
Peak to Peak	: 169.22	mVolt
Head to Head	: 12.21	microSec



S1 wave

Velocity	: 8758.92	ft/sec
Arrival Time	: 28.01	microSec
Amplitude	: 85.62	mVolt
Peak to Peak	: 127.87	mVolt
Head to Head	: 21.94	microSec

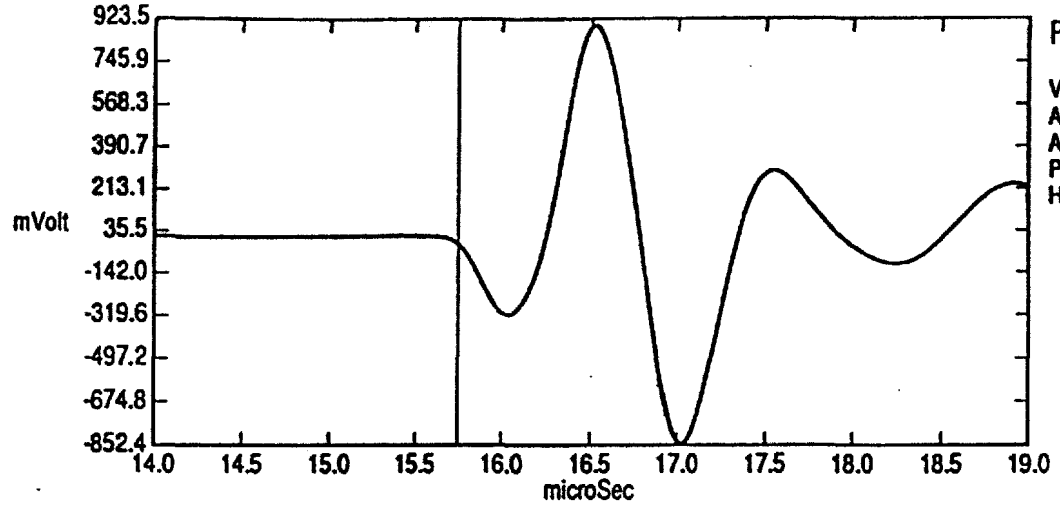


S2 wave

Velocity	: 8861.11	ft/sec
Arrival Time	: 28.0	microSec
Amplitude	: 70.0	mVolt
Peak to Peak	: 126.84	mVolt
Head to Head	: 22.0	microSec

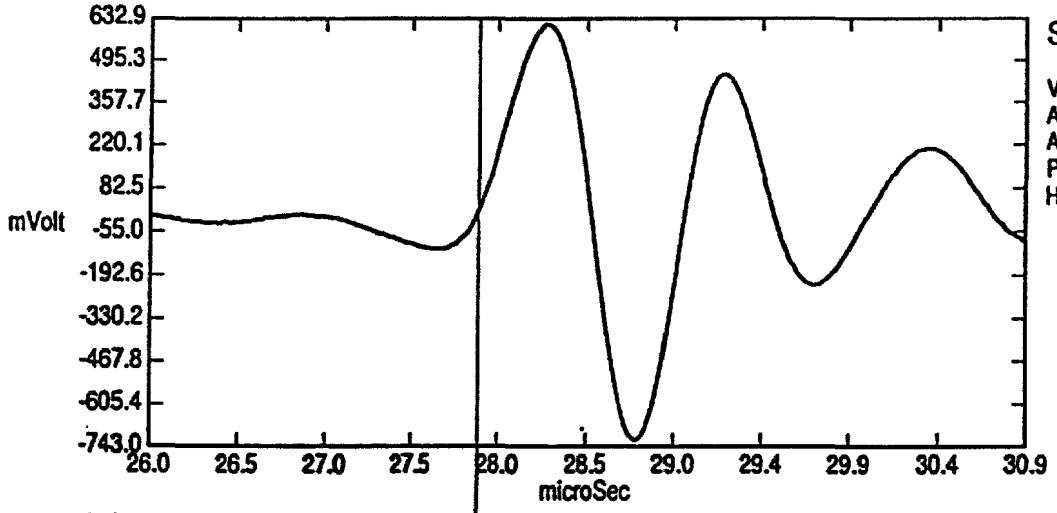
Well : EXXON ANTARES 2
Sample : 11235
Fluid : BRINE
File : 11235.4b
20kppm NaCl Brine

Length : .64 inch
Conf Pr : 10100 psi
Pore Pr : 100 psi
Temp : 21 C



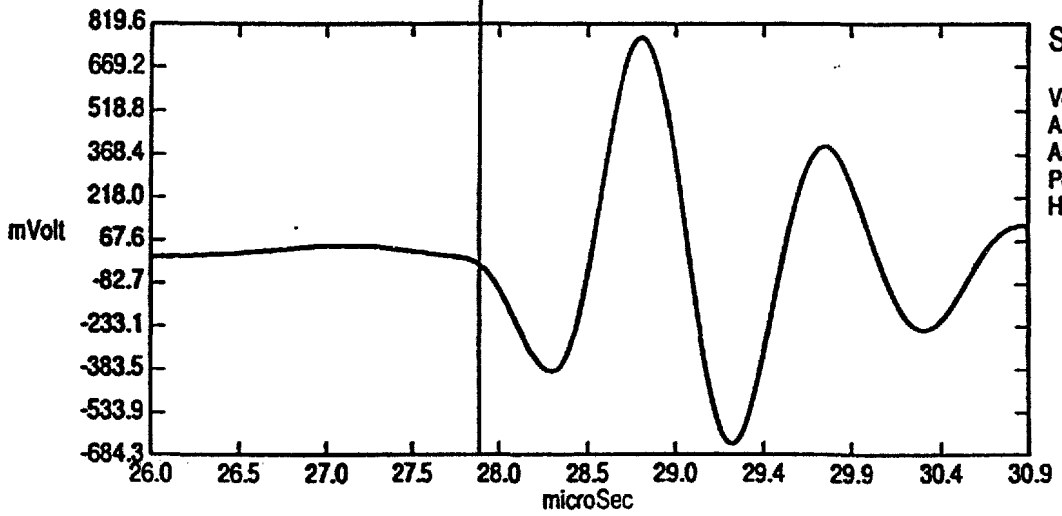
P wave

Velocity	: 15018.8	ft/sec
Arrival Time	: 15.75	microSec
Amplitude	: 74.78	mVolt
Peak to Peak	: 173.97	mVolt
Head to Head	: 12.21	microSec



S1 wave

Velocity	: 8935.57	ft/sec
Arrival Time	: 27.89	microSec
Amplitude	: 87.81	mVolt
Peak to Peak	: 133.3	mVolt
Head to Head	: 21.94	microSec

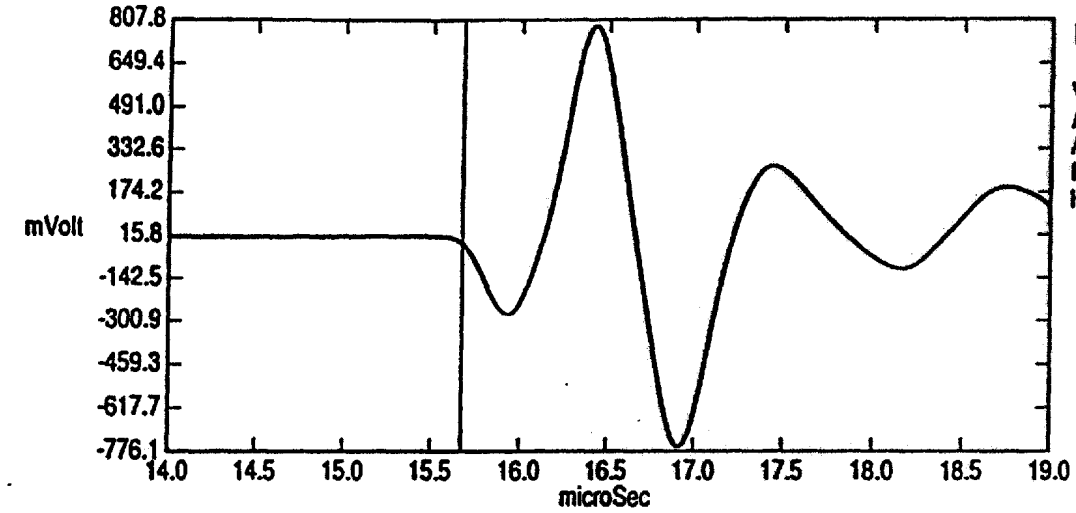


S2 wave

Velocity	: 9026.6	ft/sec
Arrival Time	: 27.89	microSec
Amplitude	: 71.09	mVolt
Peak to Peak	: 141.26	mVolt
Head to Head	: 22.0	microSec

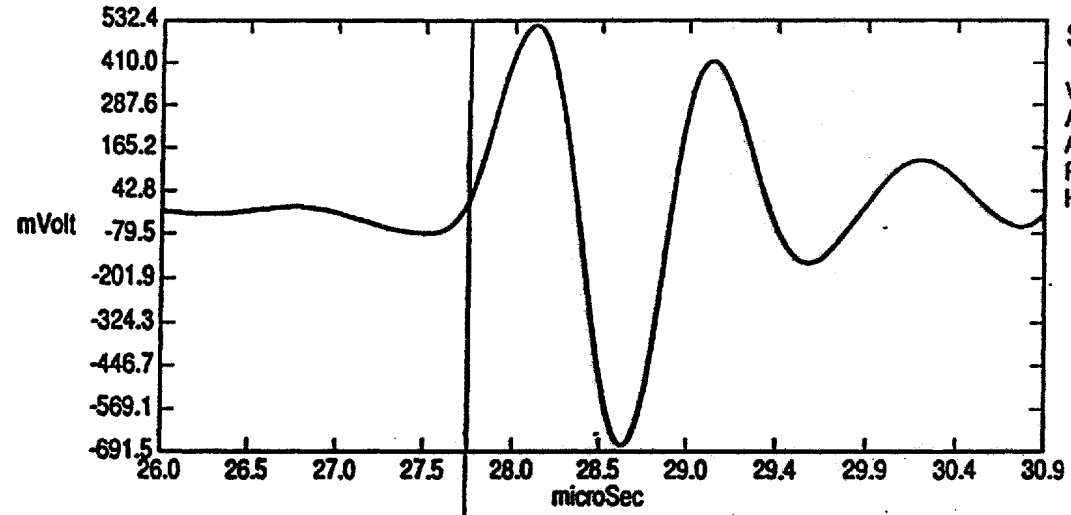
Well : EXXON ANTARES 2
Sample : 11235
Fluid : BRINE
File : 11235.5b
20kppm NaCl Brine

Length : .64 inch
Conf Pr : 15100 psi
Pore Pr : 100 psi
Temp : 21 C



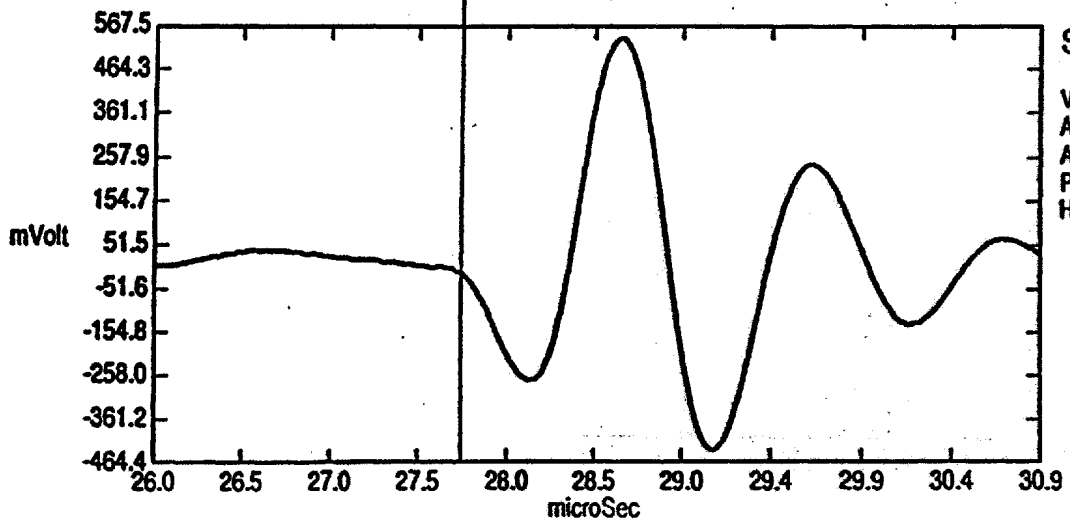
P wave

Velocity	: 15366.1	ft/sec
Arrival Time	: 15.67	microSec
Amplitude	: 76.79	mVolt
Peak to Peak	: 154.11	mVolt
Head to Head	: 12.21	microSec



S1 wave

Velocity	: 9150.88	ft/sec
Arrival Time	: 27.75	microSec
Amplitude	: 92.51	mVolt
Peak to Peak	: 118.9	mVolt
Head to Head	: 21.94	microSec

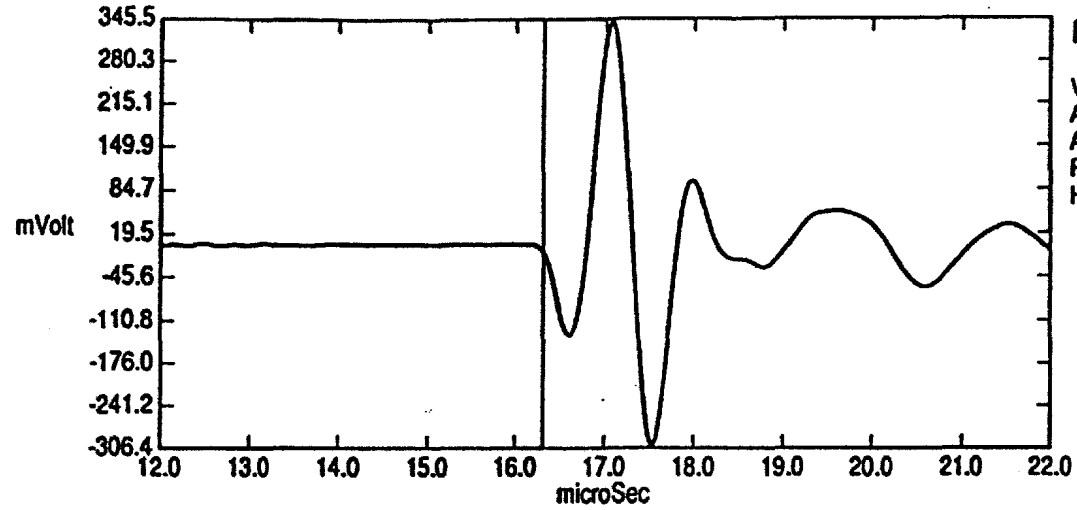


S2 wave

Velocity	: 9262.48	ft/sec
Arrival Time	: 27.74	microSec
Amplitude	: 70.31	mVolt
Peak to Peak	: 97.35	mVolt
Head to Head	: 22.0	microSec

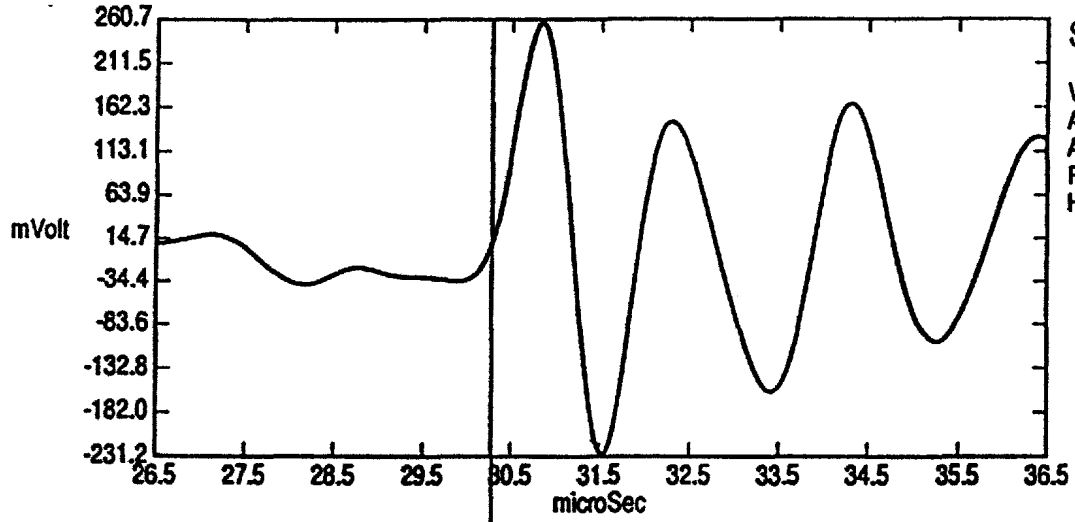
Well : EXXON ANTARES 2
Sample : 11264
Fluid : BRINE
File : 11264.1b
20kppm NaCl Brine

Length : .57 inch
Conf Pr : 1100 psi
Pore Pr : 100 psi
Temp : 21 C



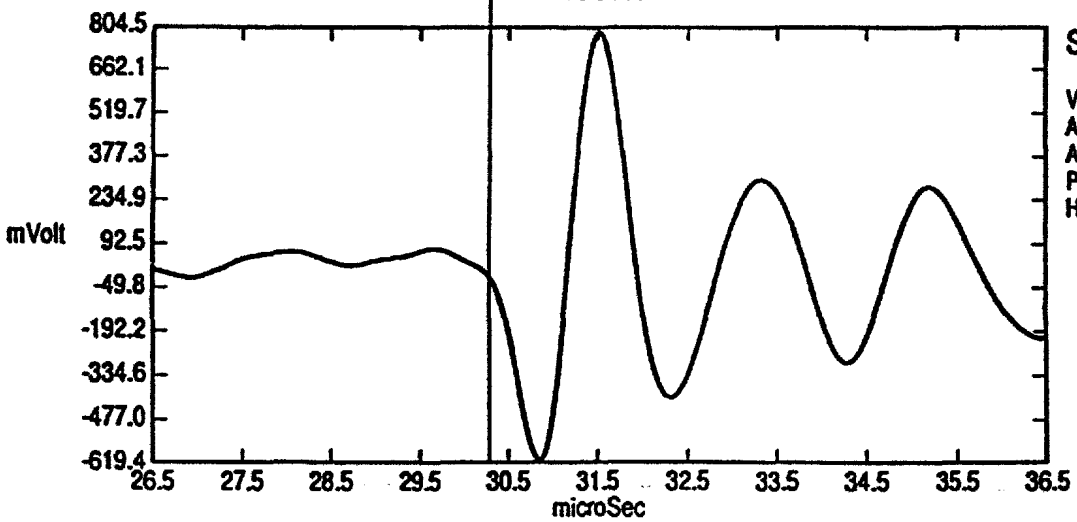
P wave

Velocity	: 11626.0	ft/sec
Arrival Time	: 16.31	microSec
Amplitude	: 72.99	mVolt
Peak to Peak	: 202.74	mVolt
Head to Head	: 12.21	microSec



S1 wave

Velocity	: 5722.29	ft/sec
Arrival Time	: 30.27	microSec
Amplitude	: 77.32	mVolt
Peak to Peak	: 48.41	mVolt
Head to Head	: 21.94	microSec

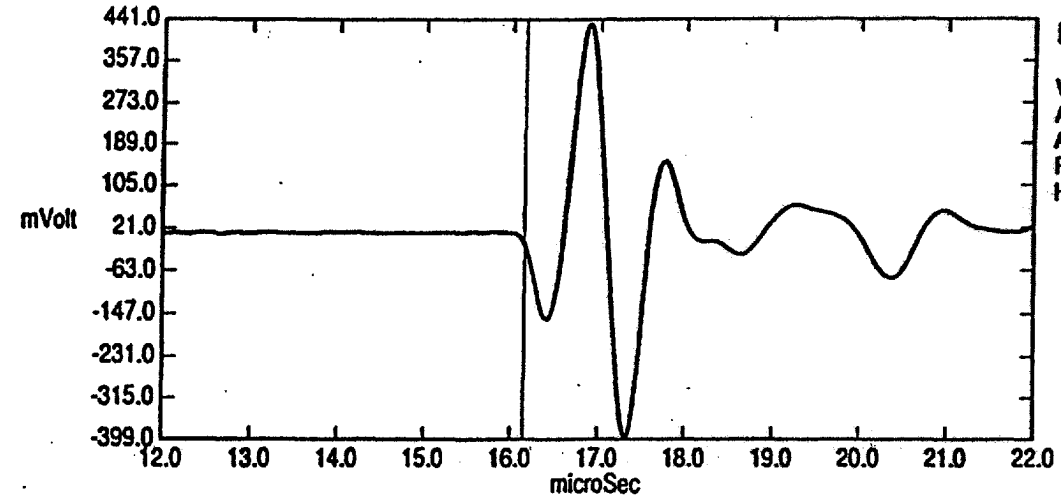


S2 wave

Velocity	: 5749.89	ft/sec
Arrival Time	: 30.29	microSec
Amplitude	: 67.57	mVolt
Peak to Peak	: 43.99	mVolt
Head to Head	: 22.0	microSec

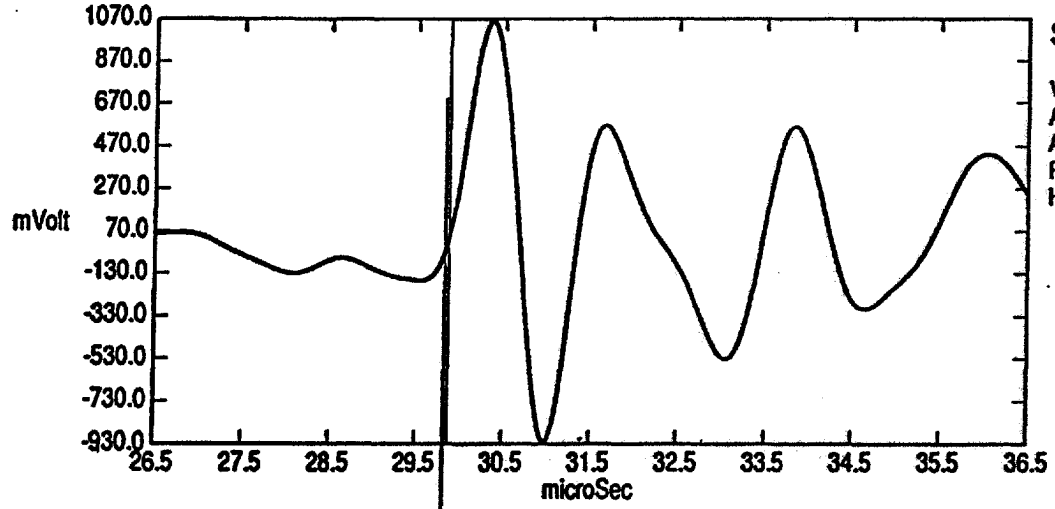
Well : EXXON ANTARES 2
Sample : 11264
Fluid : BRINE
File : 11264.2b
20kppm NaCl Brine

Length : .57 inch
Conf Pr : 4100 psi
Pore Pr : 100 psi
Temp : 21 C



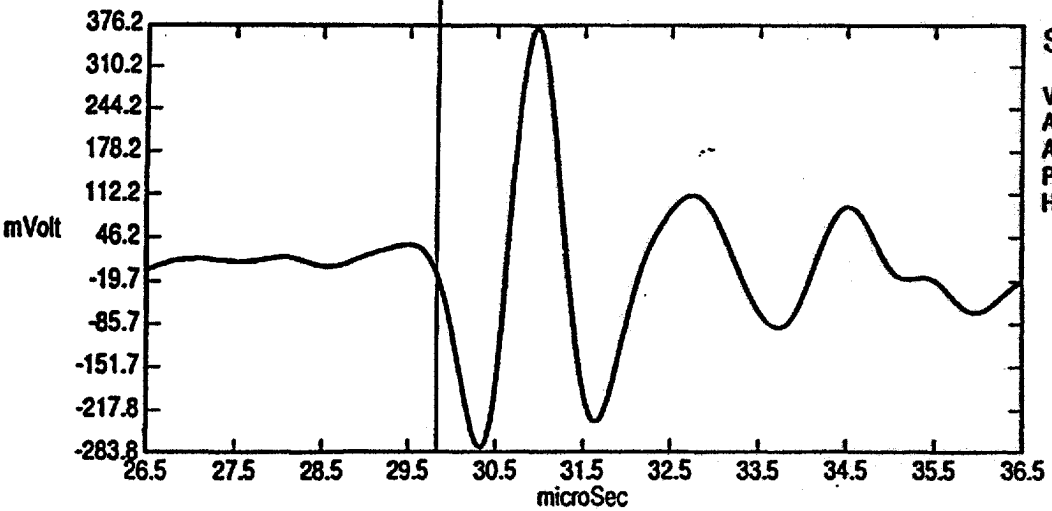
P wave

Velocity	: 12098.1	ft/sec
Arrival Time	: 16.15	microSec
Amplitude	: 73.73	mVolt
Peak to Peak	: 261.0	mVolt
Head to Head	: 12.21	microSec



S1 wave

Velocity	: 6010.93	ft/sec
Arrival Time	: 29.87	microSec
Amplitude	: 77.1	mVolt
Peak to Peak	: 62.33	mVolt
Head to Head	: 21.94	microSec

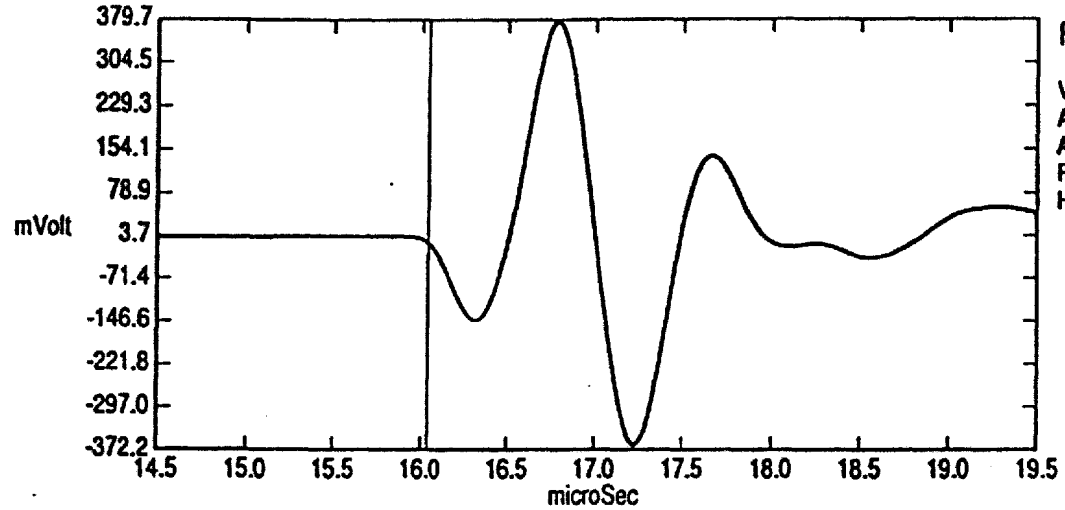


S2 wave

Velocity	: 6087.69	ft/sec
Arrival Time	: 29.83	microSec
Amplitude	: 66.53	mVolt
Peak to Peak	: 20.4	mVolt
Head to Head	: 22.0	microSec

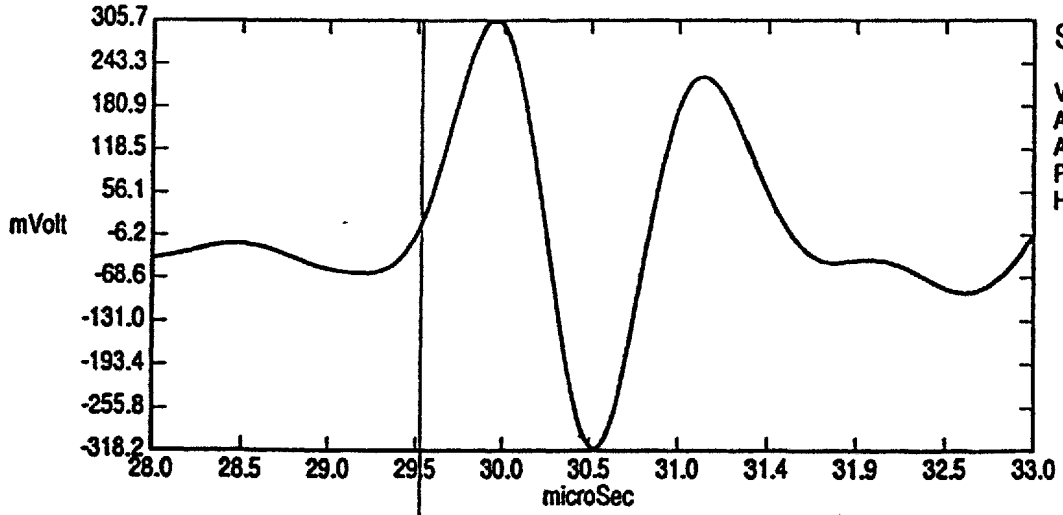
Well : EXXON ANTARES 2
Sample : 11264
Fluid : BRINE
File : 11264.3b
20kppm NaCl Brine

Length : .57 inch
Conf Pr : 7600 psi
Pore Pr : 100 psi
Temp : 21 C



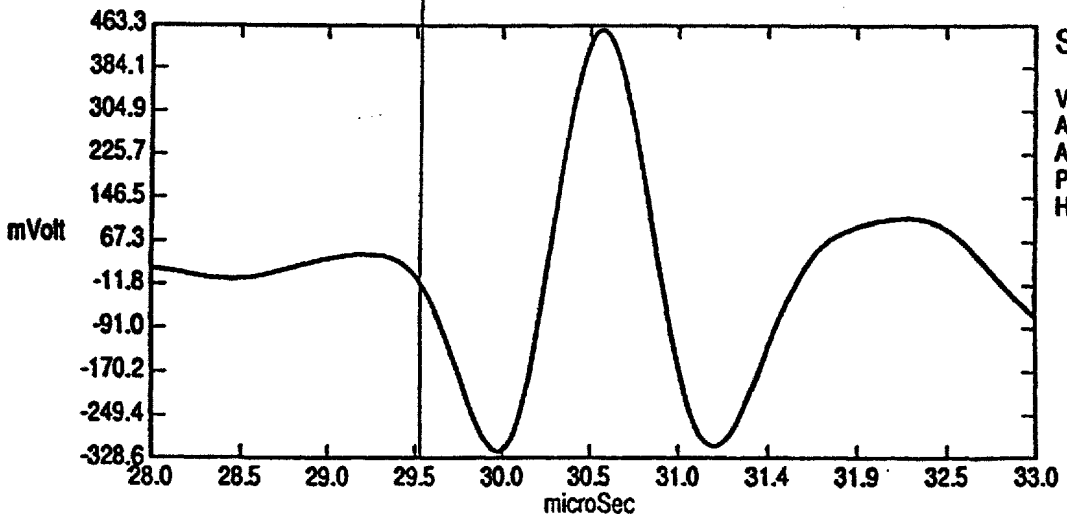
P wave

Velocity	: 12445.6	ft/sec
Arrival Time	: 16.04	microSec
Amplitude	: 77.12	mVolt
Peak to Peak	: 233.32	mVolt
Head to Head	: 12.21	microSec



S1 wave

Velocity	: 6280.19	ft/sec
Arrival Time	: 29.53	microSec
Amplitude	: 84.21	mVolt
Peak to Peak	: 61.74	mVolt
Head to Head	: 21.94	microSec

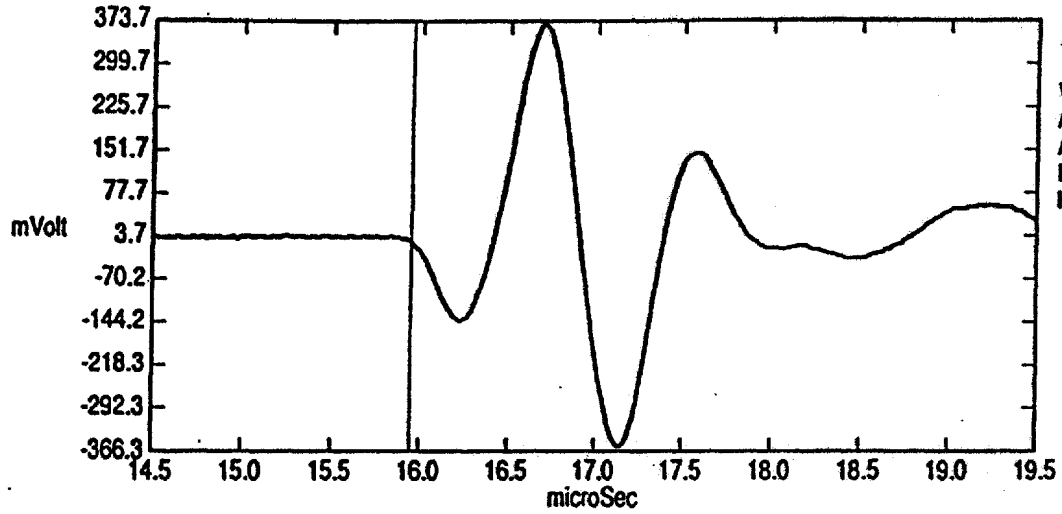


S2 wave

Velocity	: 6330.23	ft/sec
Arrival Time	: 29.53	microSec
Amplitude	: 64.44	mVolt
Peak to Peak	: 76.89	mVolt
Head to Head	: 22.0	microSec

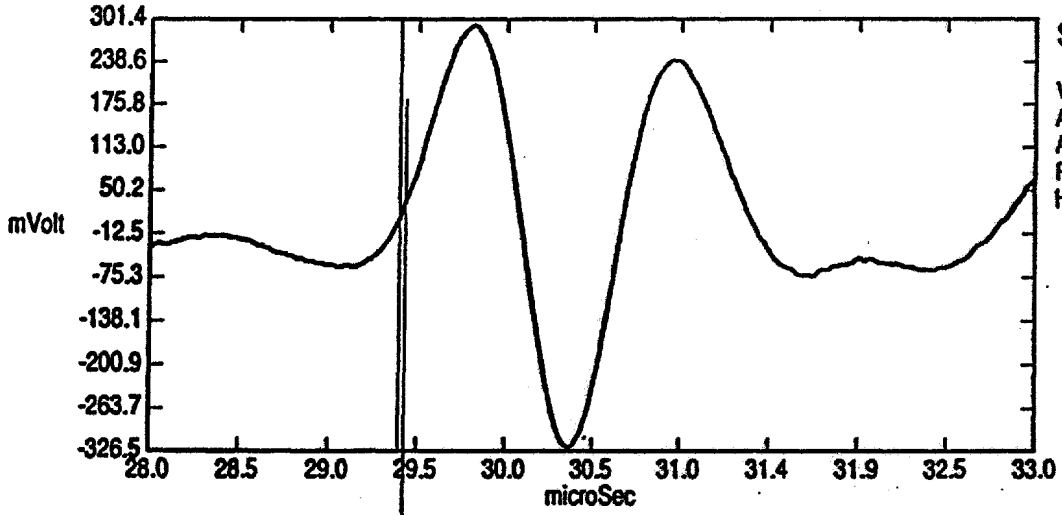
Well : EXXON ANTARES 2
Sample : 11264
Fluid : BRINE
File : 11264.4b
20kppm NaCl Brine

Length : .57 inch
Conf Pr : 10100 psi
Pore Pr : 100 psi
Temp : 21 C



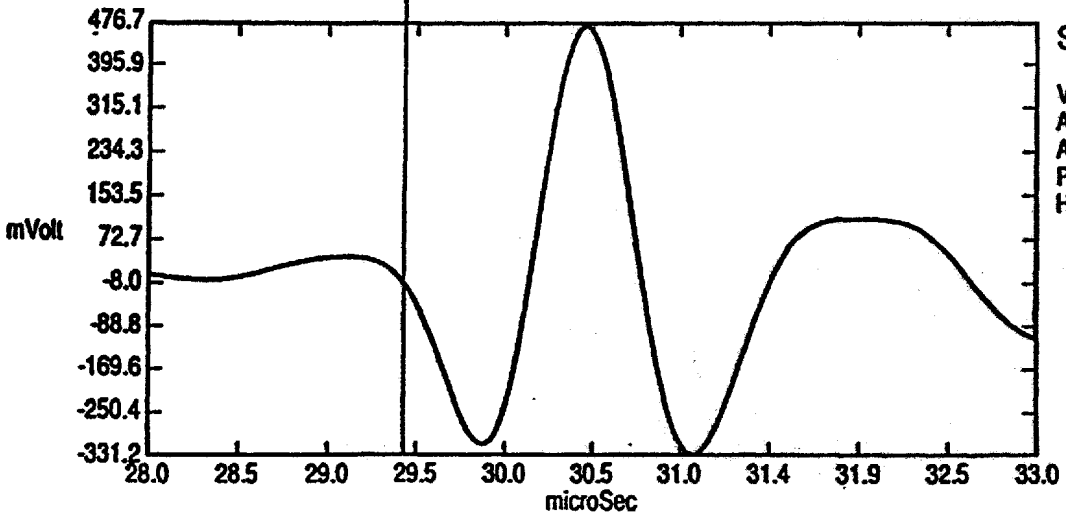
P wave

Velocity	: 12745.1	ft/sec
Arrival Time	: 15.95	microSec
Amplitude	: 77.5	mVolt
Peak to Peak	: 228.52	mVolt
Head to Head	: 12.21	microSec



S1 wave

Velocity	: 6389.63	ft/sec
Arrival Time	: 29.4	microSec
Amplitude	: 85.62	mVolt
Peak to Peak	: 61.08	mVolt
Head to Head	: 21.94	microSec

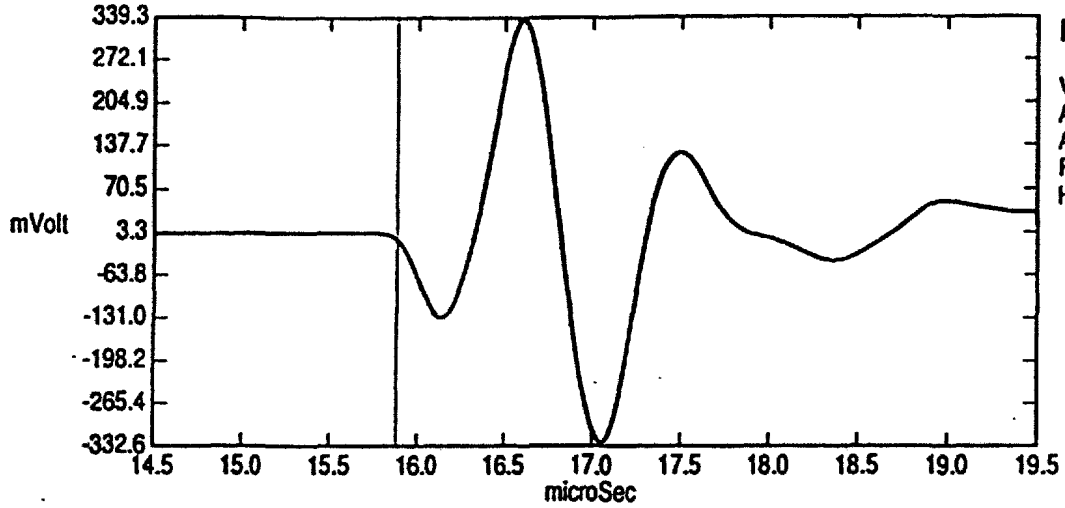


S2 wave

Velocity	: 6415.43	ft/sec
Arrival Time	: 29.43	microSec
Amplitude	: 64.0	mVolt
Peak to Peak	: 79.67	mVolt
Head to Head	: 22.0	microSec

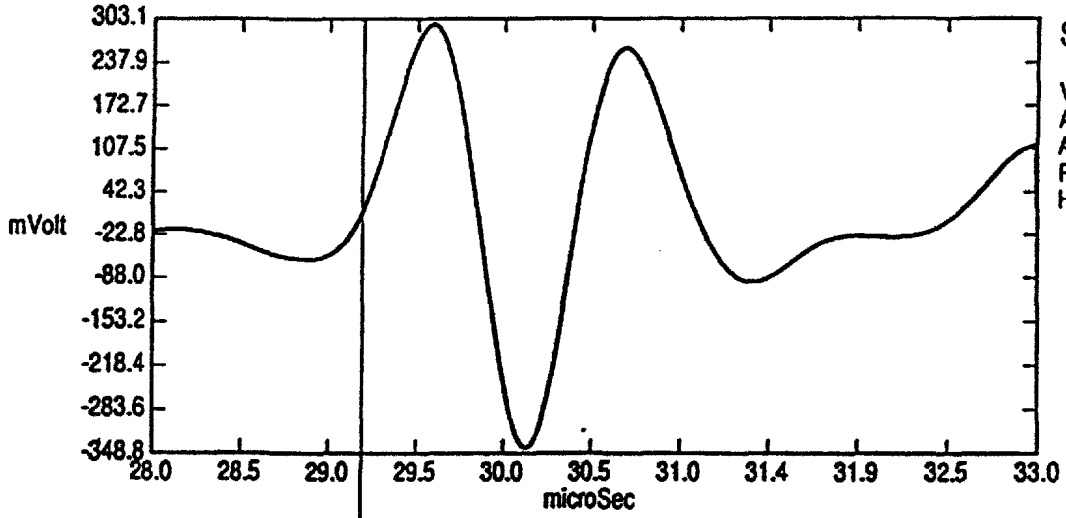
Well : EXXON ANTARES 2
Sample : 11264
Fluid : BRINE
File : 11264.5b
20kppm NaCl Brine

Length : .57 inch
Conf Pr : 15100 psi
Pore Pr : 100 psi
Temp : 21 C



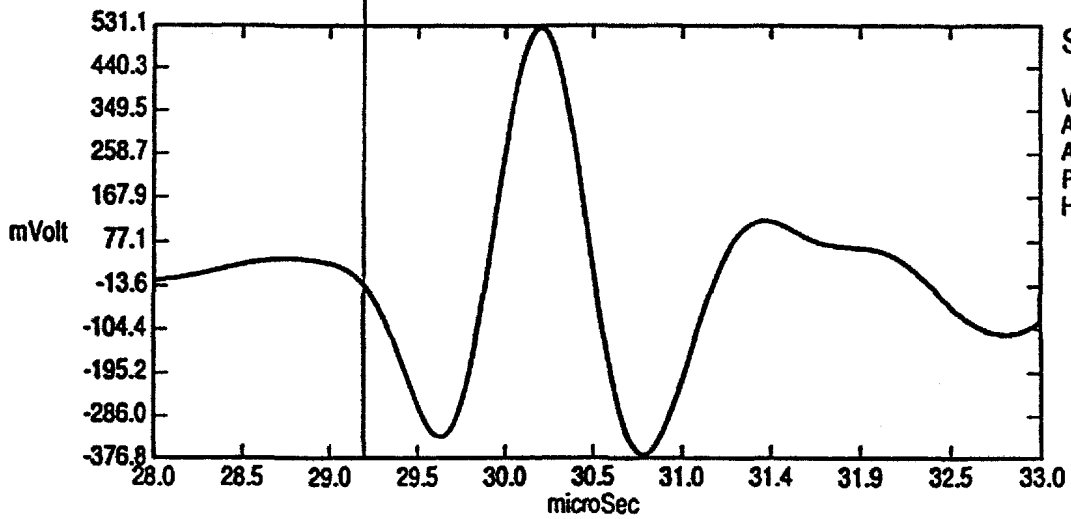
P wave

Velocity	: 12988.2	ft/sec
Arrival Time	: 15.88	microSec
Amplitude	: 77.1	mVolt
Peak to Peak	: 208.8	mVolt
Head to Head	: 12.21	microSec



S1 wave

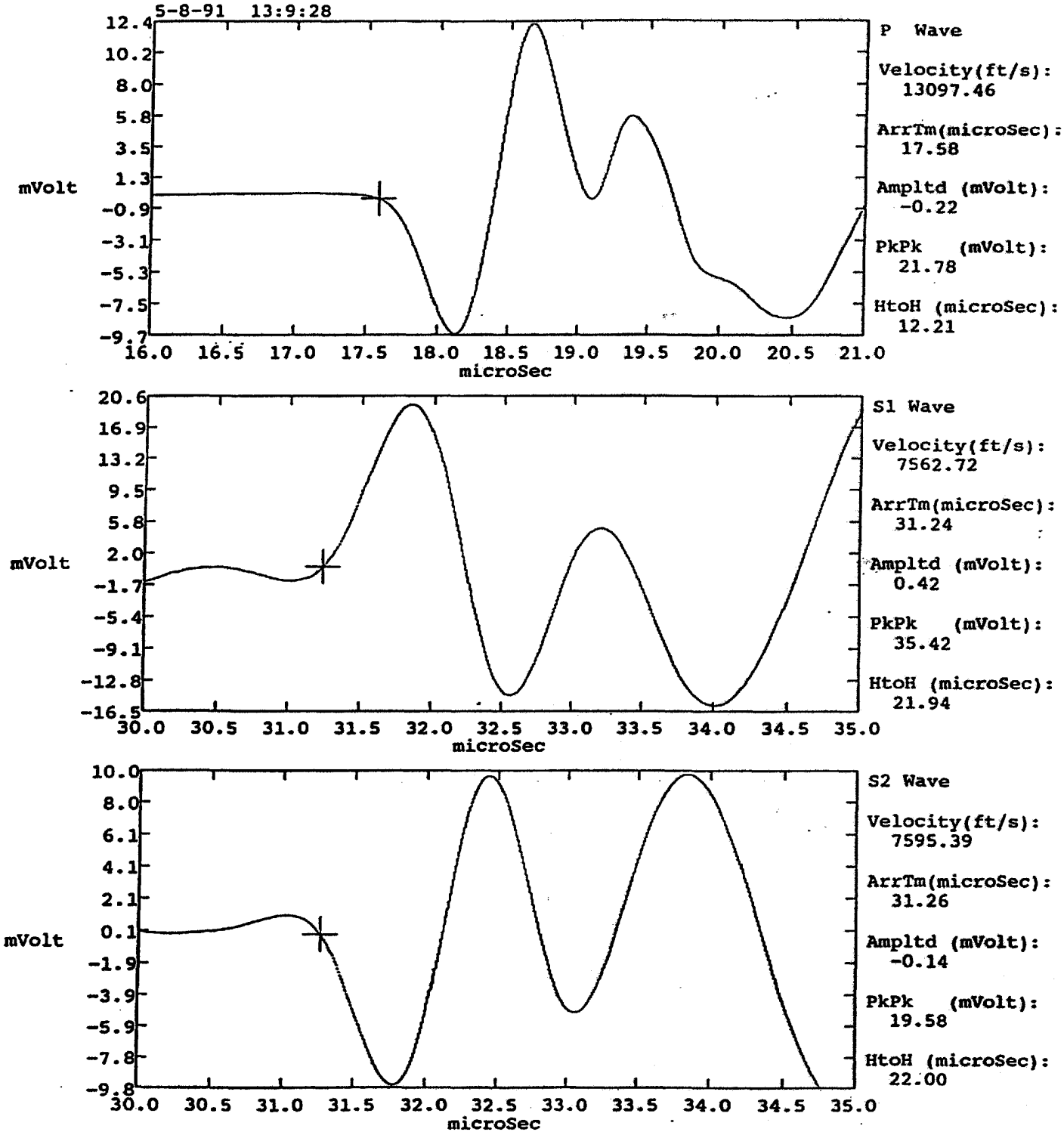
Velocity	: 6574.71	ft/sec
Arrival Time	: 29.19	microSec
Amplitude	: 88.02	mVolt
Peak to Peak	: 63.37	mVolt
Head to Head	: 21.94	microSec



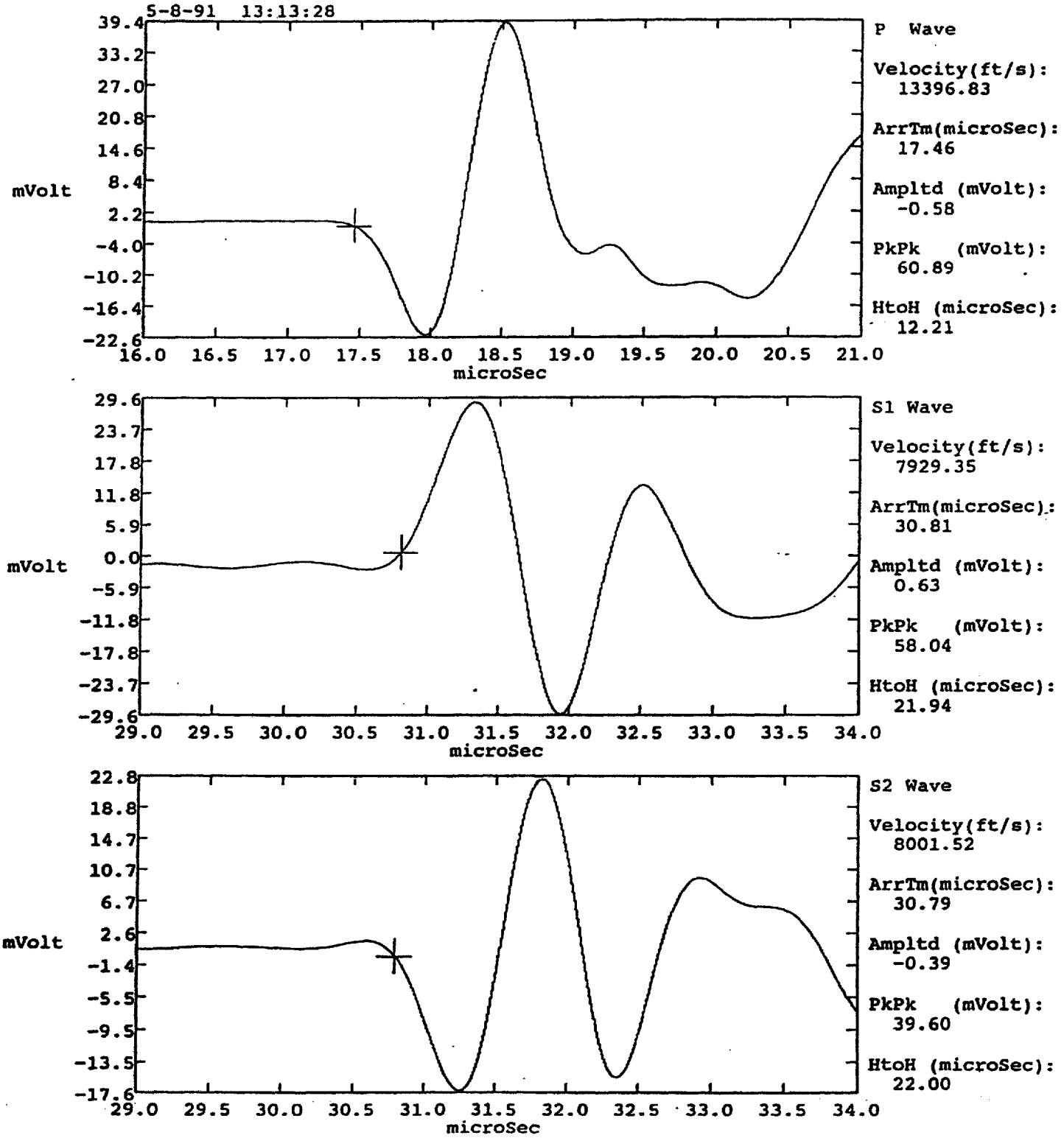
S2 wave

Velocity	: 6629.57	ft/sec
Arrival Time	: 29.19	microSec
Amplitude	: 64.48	mVolt
Peak to Peak	: 89.26	mVolt
Head to Head	: 22.0	microSec

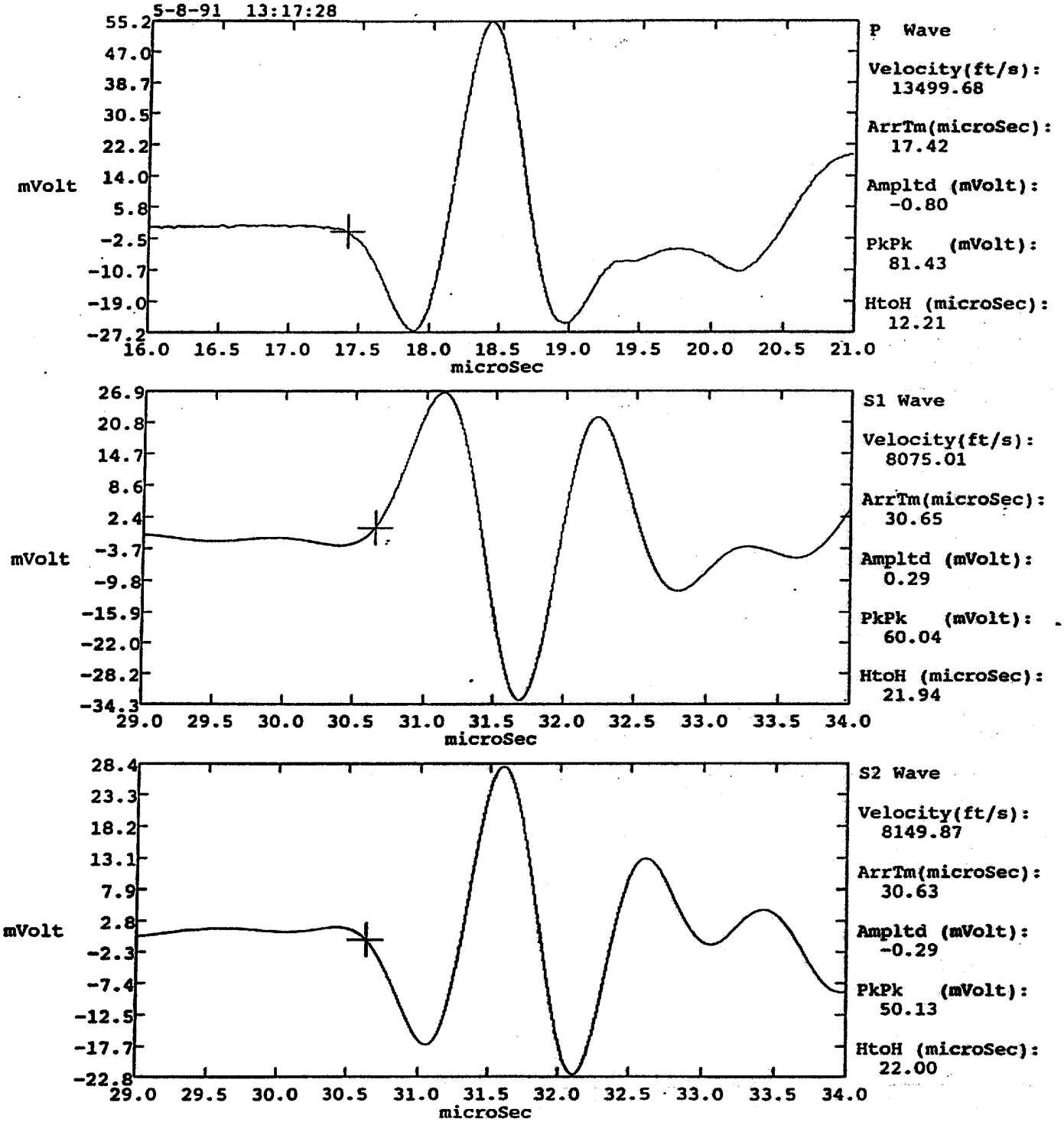
Well: EXXON ANTARES 2
Sample: 11305 Length:0.844 inch Fluid: BRINE
Conf Pr:1100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11305.1B Pick: Manual 5-8-91 13:9:28
20kppm NaCI Brine



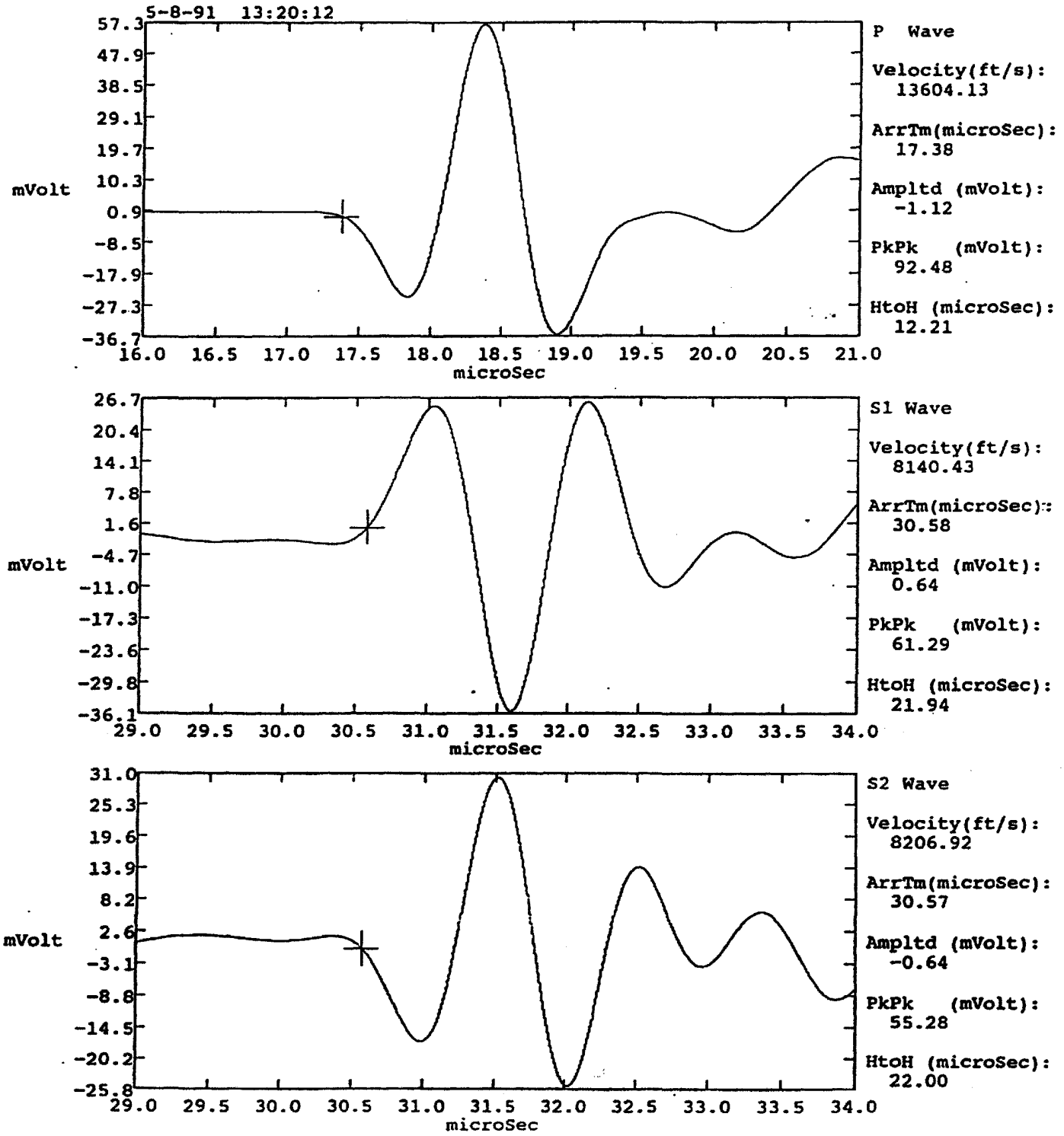
Well: EXXON ANTARES 2
Sample: 11305 Length:0.844 inch Fluid: BRINE
Conf Pr:4100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11305.2B Pick: Manual 5-8-91 13:13:30
20kppm NaCl Brine



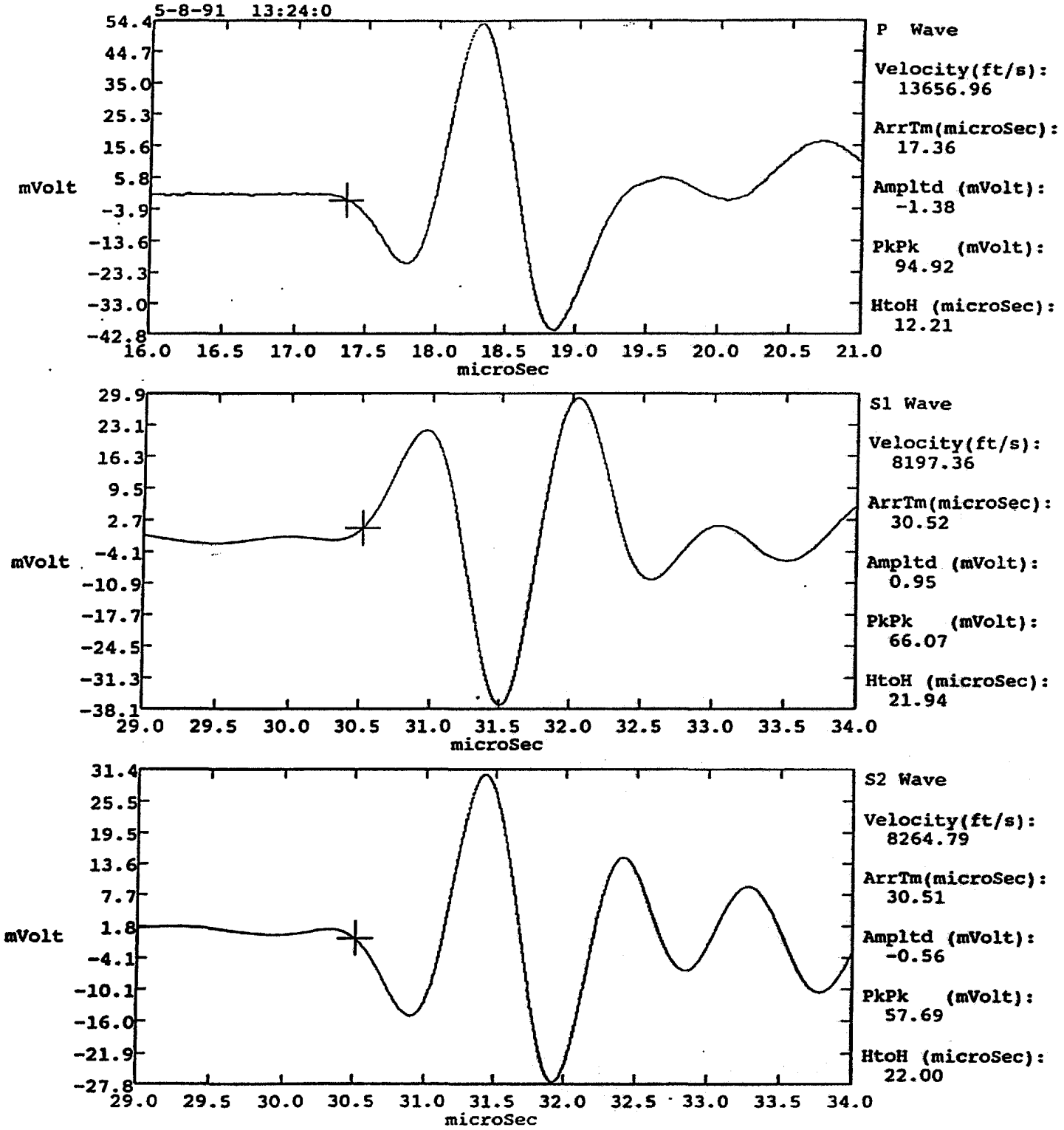
Well: EXXON ANTARES 2
Sample: 11305 Length:0.844 inch Fluid: BRINE
Conf Pr:7600.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11305.3B Pick: Manual 5-8-91 13:17:28
20kppm NaCl Brine



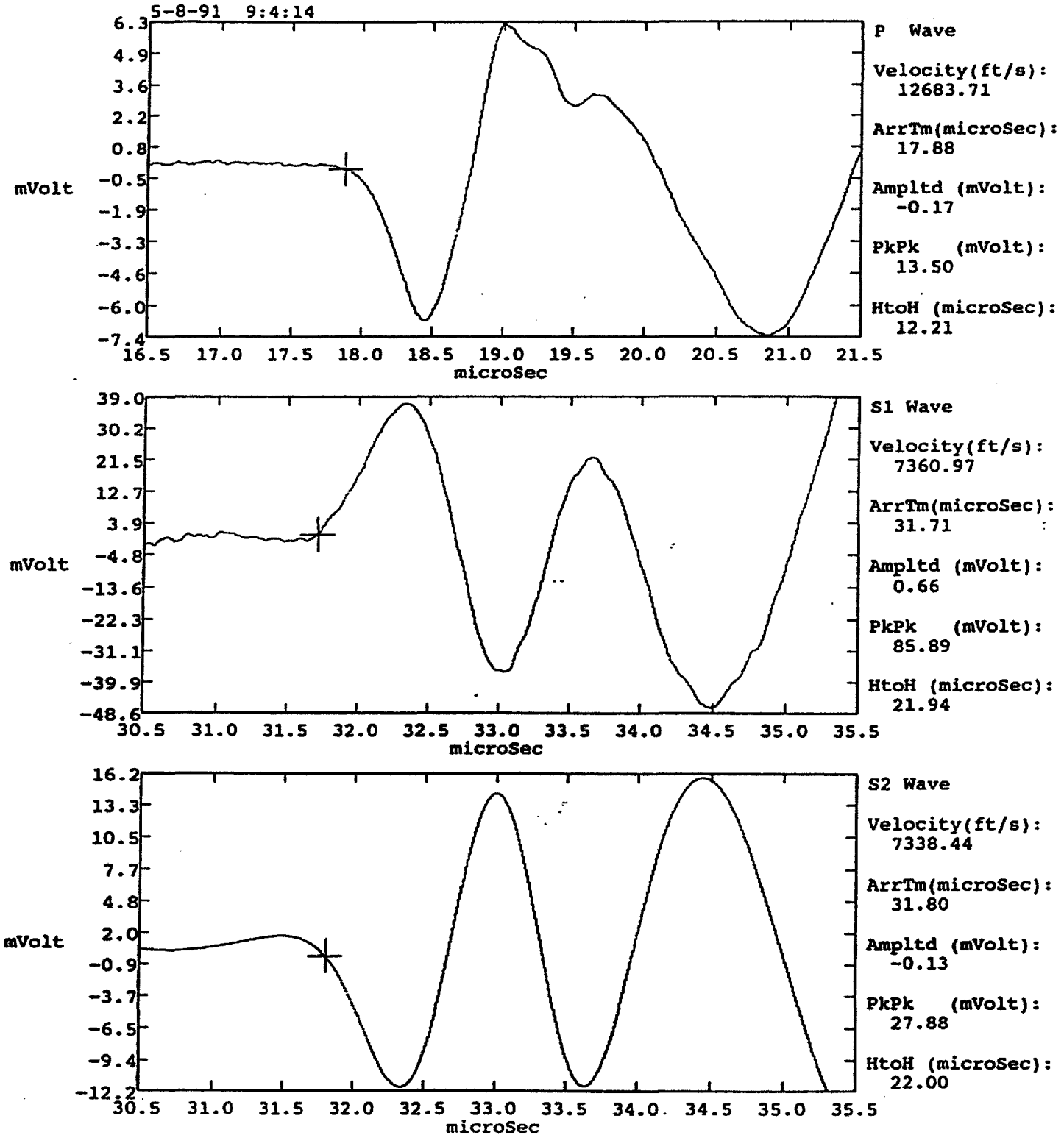
Well: EXXON ANTARES 2
Sample: 11305 Length:0.844 inch Fluid: BRINE
Conf Pr:10100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11305.4B Pick: Manual 5-8-91 13:20:12
20kppm NaCI Brine



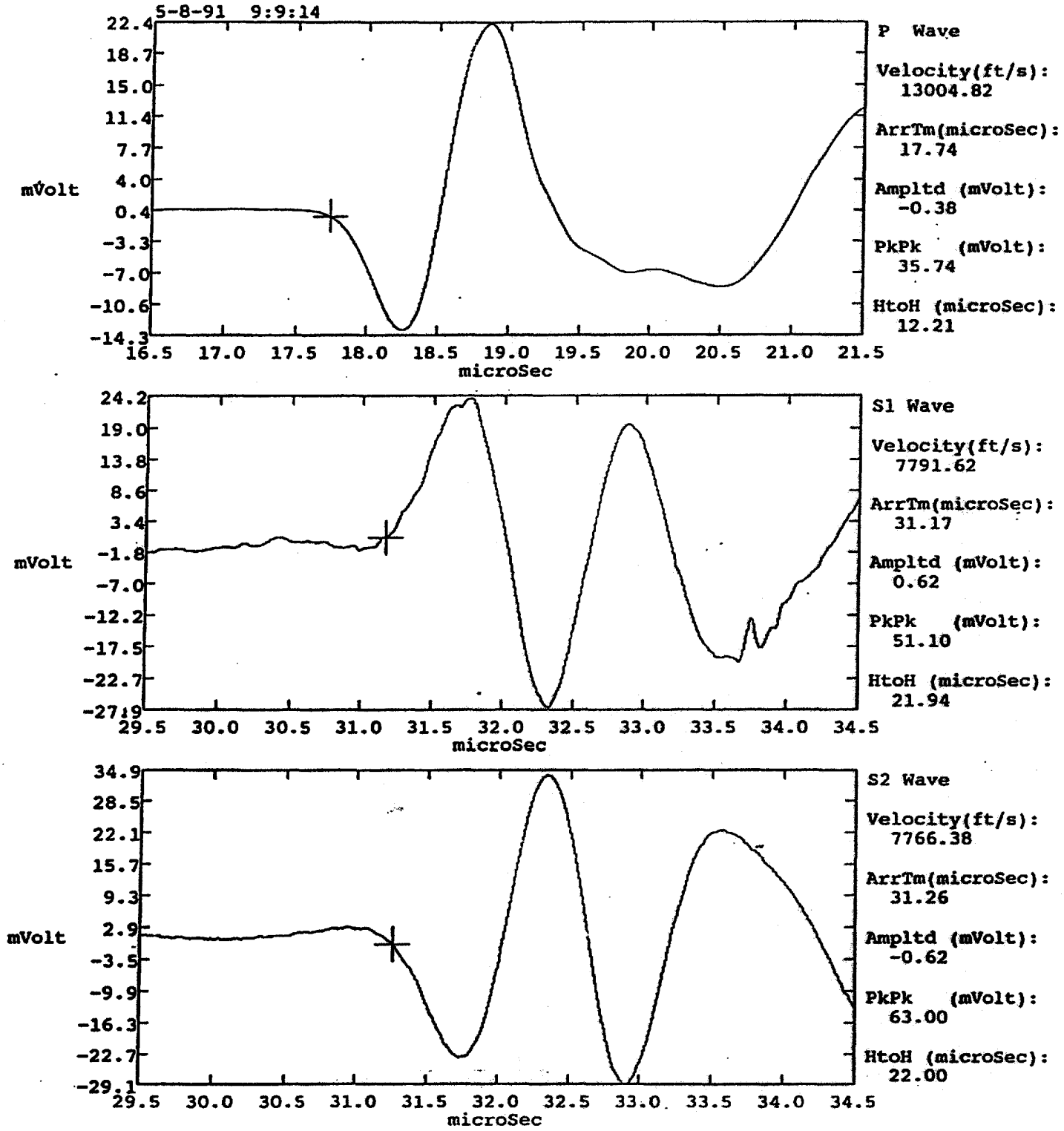
Well: EXXON ANTARES 2
Sample: 11305 Length:0.844 inch Fluid: BRINE
Conf Pr:15100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11305.5B Pick: Manual 5-8-91 13:24:0
20kppm NaCl Brine



Well: EXXON ANTARES 2
Sample: 11330 Length:0.863 inch Fluid: BRINE
Conf Pr:1100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11330.1B Pick: Manual 5-8-91 9:4:14
20kppm NaCI Brine

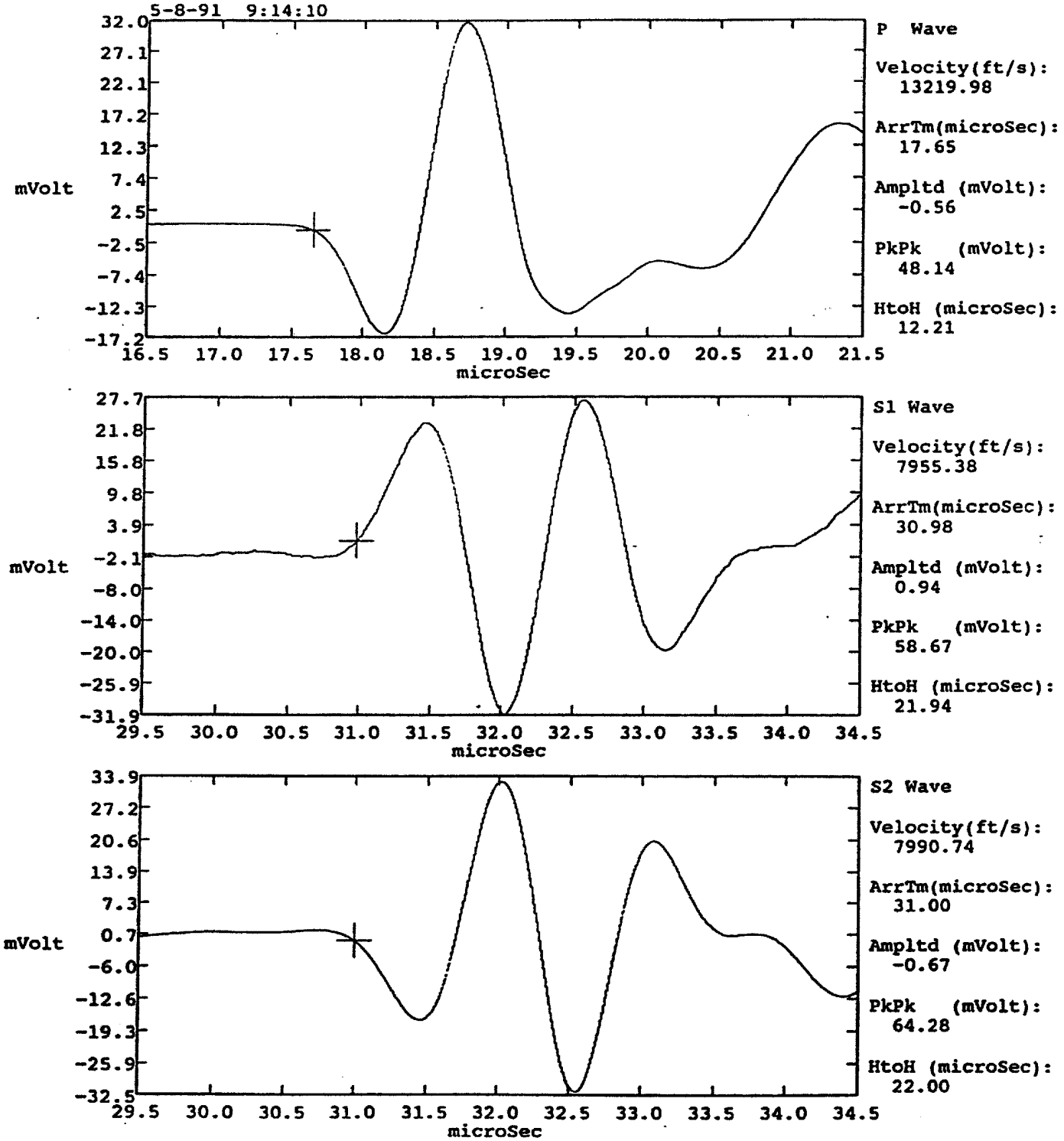


Well: EXXON ANTARES 2
Sample: 11330 Length:0.863 inch Fluid: BRINE
Conf Pr:4100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11330.2B Pick: Manual 5-8-91 9:9:14
20kppm NaCl Brine

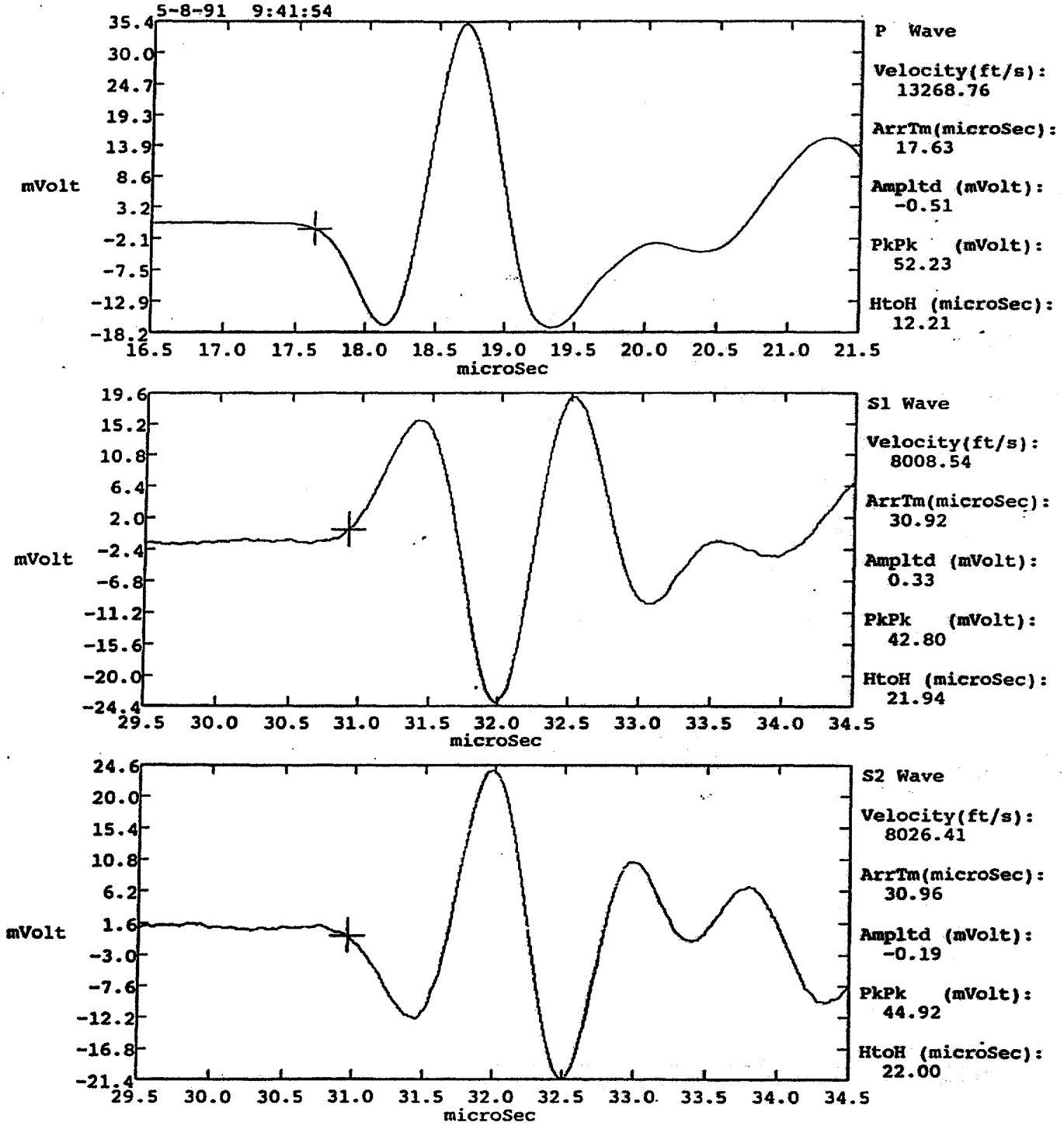


Well: EXXON ANTARES 2
Sample: 11330 Length:0.863 inch Fluid: BRINE
Conf Pr:7600.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11330.3B Pick: Manual 5-8-91 9:38:46
20kppm NaCl Brine

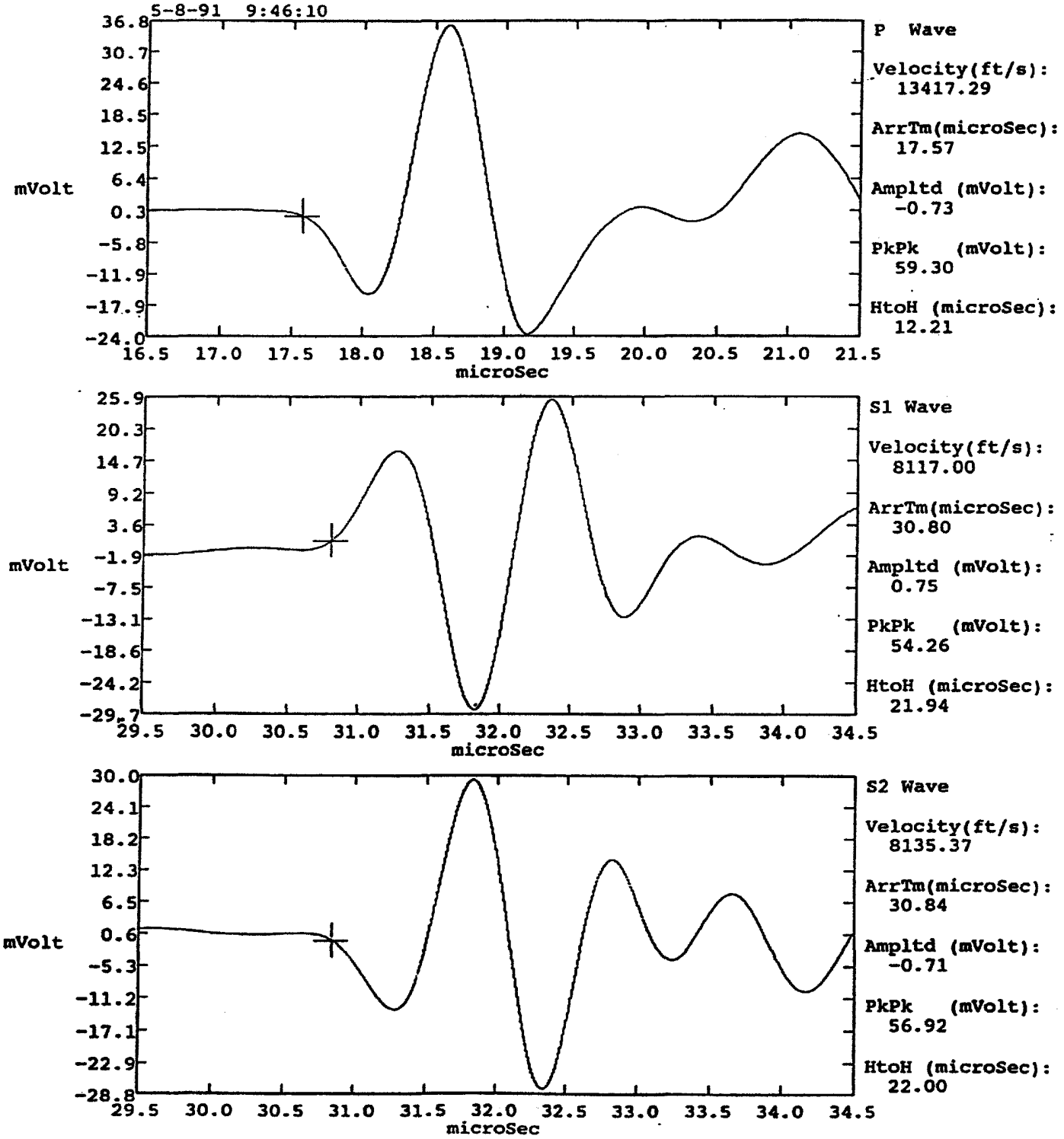
5-8-91 9:14:10



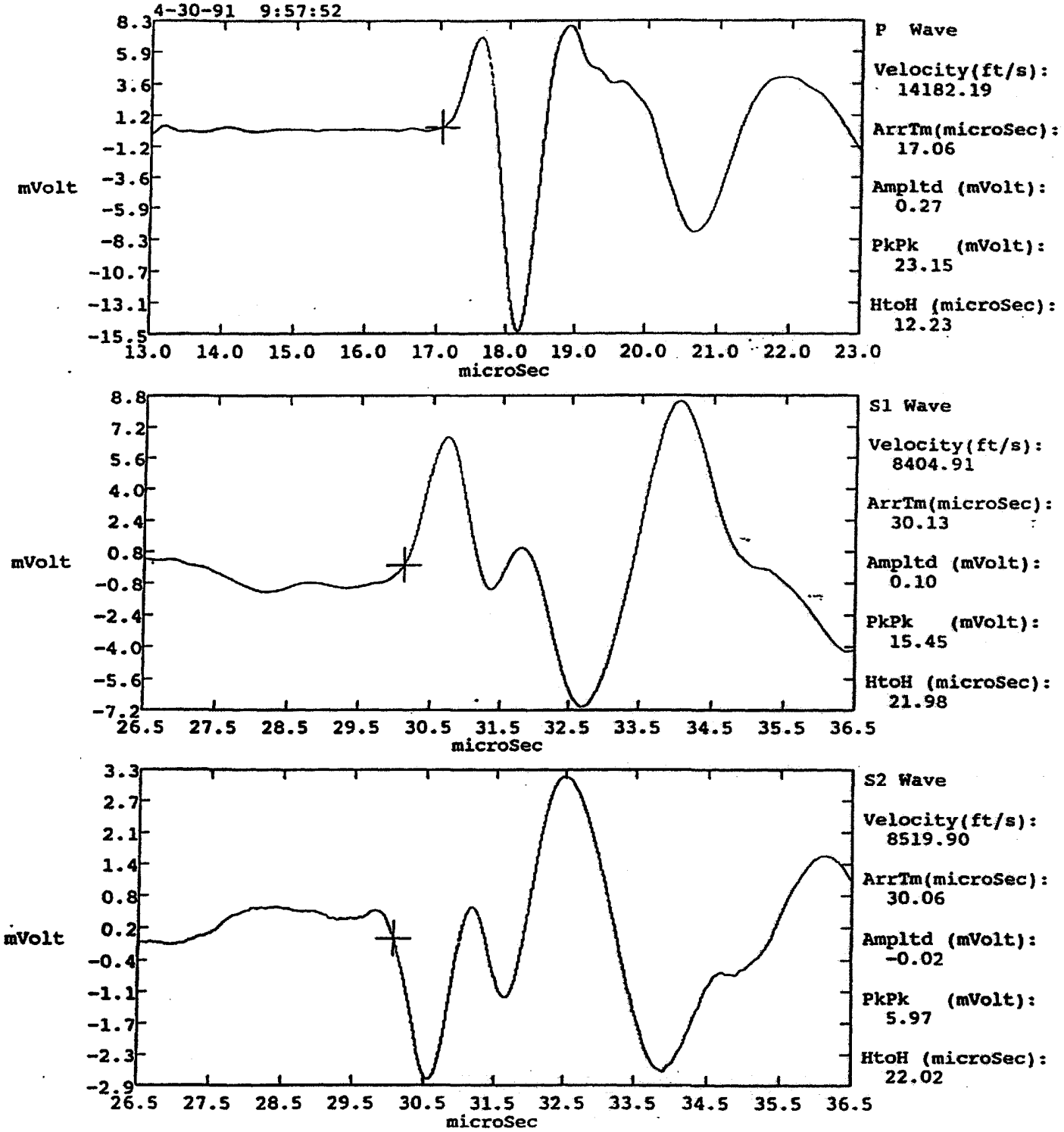
Well: EXXON ANTARES 2
Sample: 11330 Length:0.863 inch Fluid: BRINE
Conf Pr:10100.00 psi Pore Pr :100.00 psi Temp :21.00 c
File: 11330.4B Pick: Manual 5-8-91 9:52:14
20kppm NaCI Brine



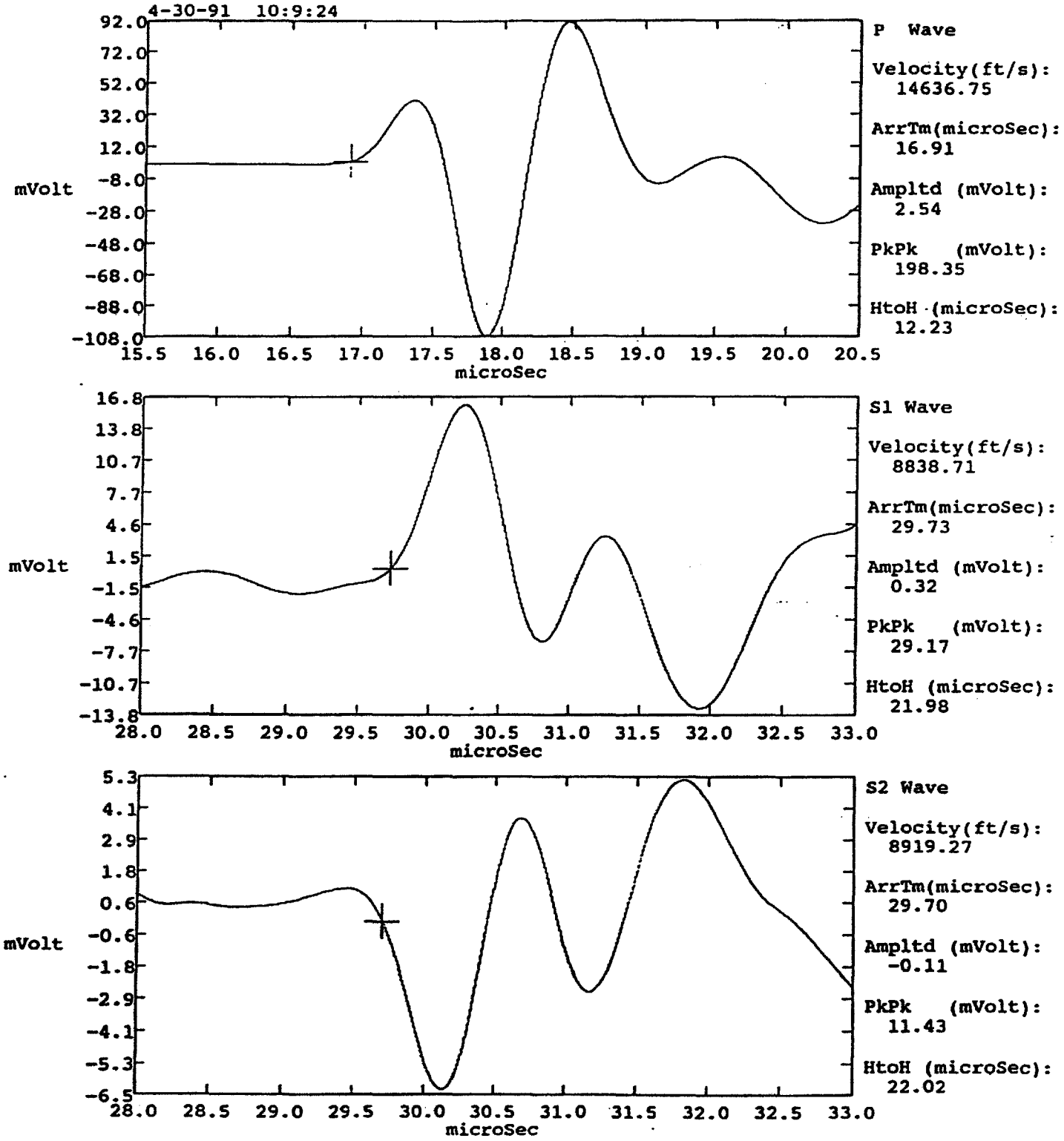
Well: EXXON ANTARES 2
Sample: 11330 Length:0.863 inch Fluid: BRINE
Conf Pr:15100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11330.5B Pick: Manual 5-8-91 9:46:12
20kppm NaCl Brine



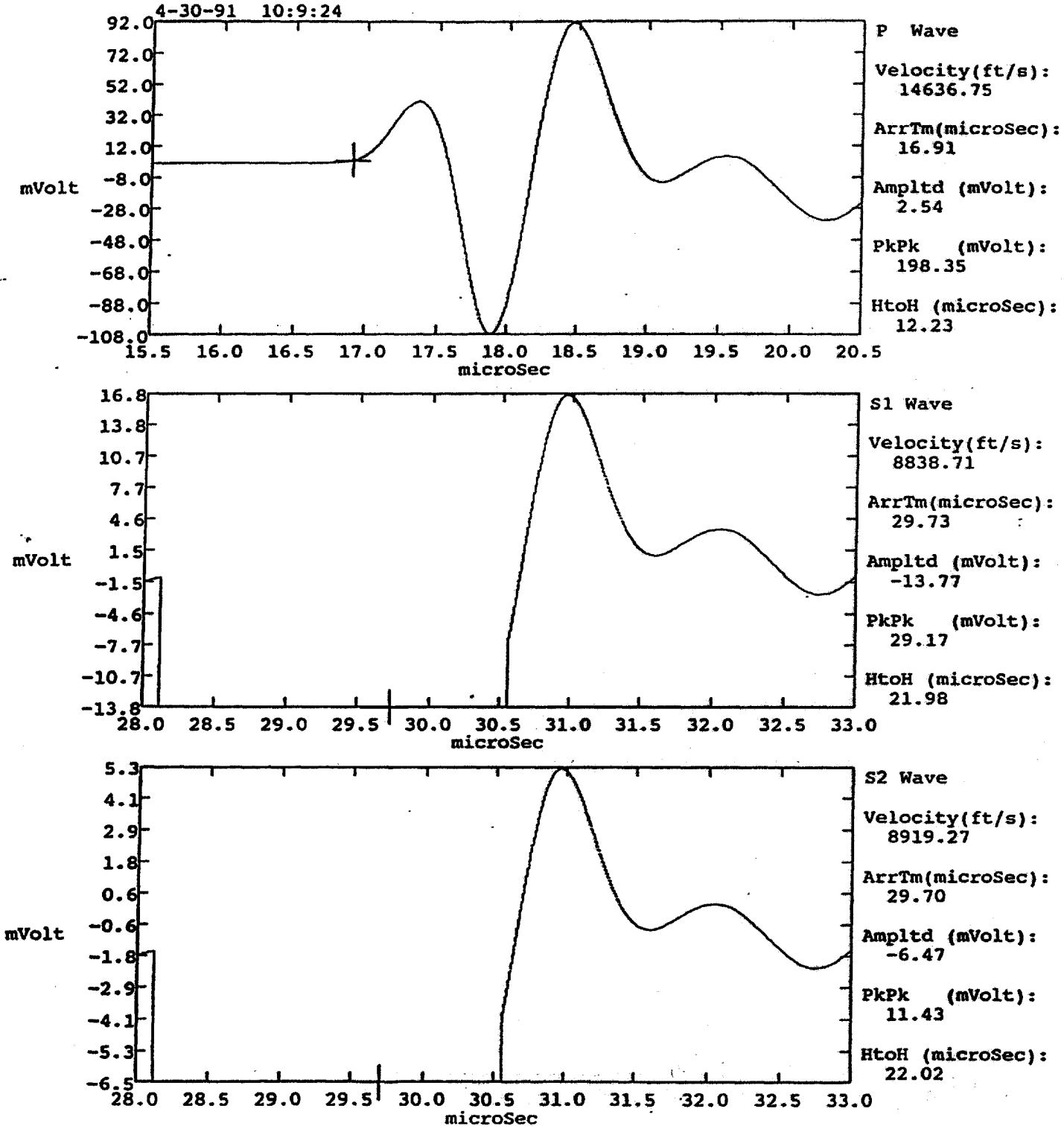
Well: Exxon Antares 2
Sample: 11384 Length:0.822 inch Fluid: Brine
Conf Pr:1100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11384.1B Pick: Manual 5-6-91 15:35:34
20kppm NaCL Brine



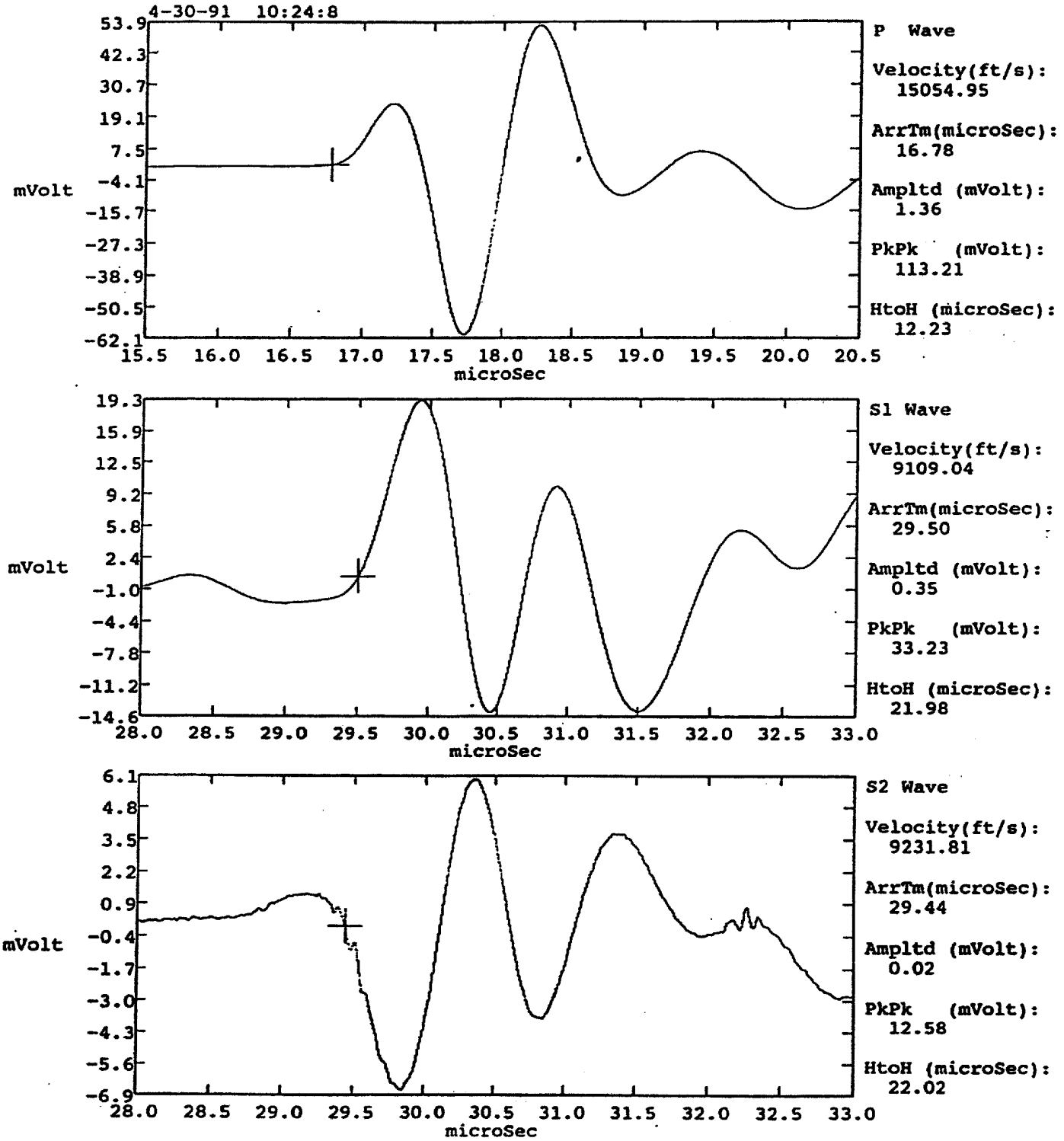
Well: Exxon Antares 2
Sample: 11384 Length:0.822 inch Fluid: Brine
Conf Pr:4100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11384.2B Pick: Manual 5-6-91 15:39:20
20kppm NaCL Brine



Well: Exxon Antares 2
Sample: 11384 Length:0.822 inch Fluid: Brine
Conf Pr:7600.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11384.3B Pick: Manual 5-7-91 8:24:18
20kppm NaCL Brine

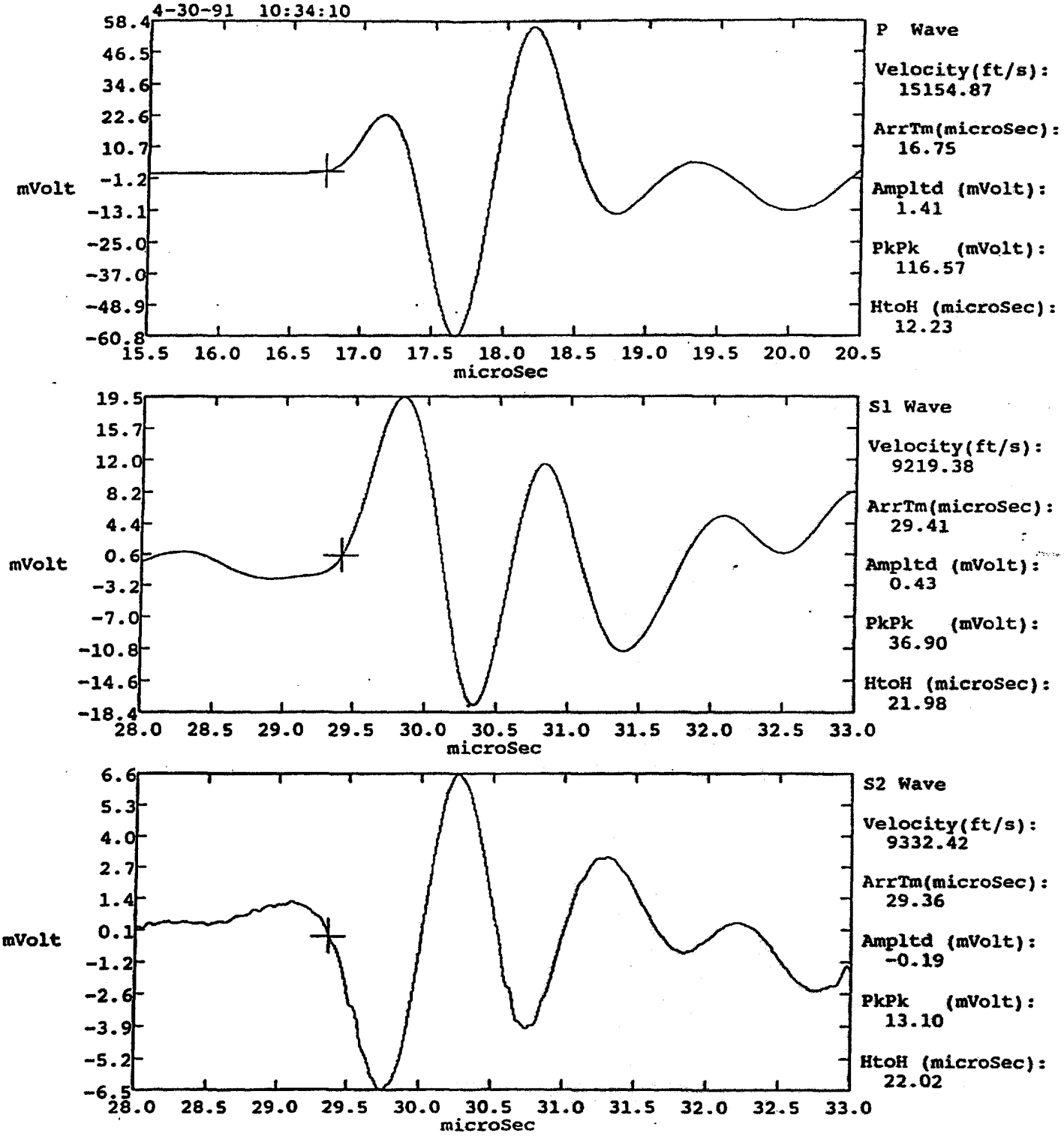


Well: Exxon Antares 2
Sample: 11384 Length:0.822 inch Fluid: Brine
Conf Pr:10100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11384.4B Pick: Manual 5-6-91 15:49:6
20kppm NaCL Brine



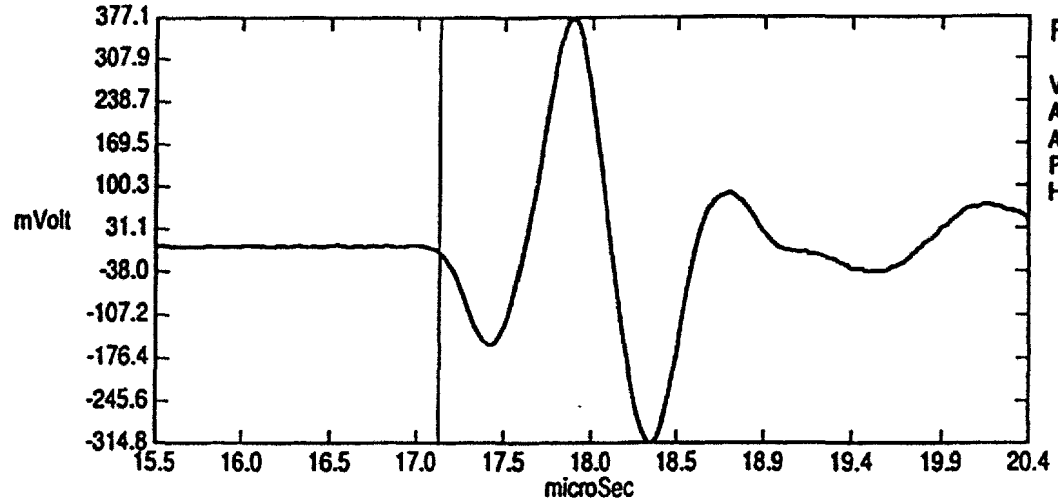
Well: Exxon Antares 2
Sample: 11384 Length:0.822 inch Fluid: Brine
Conf Pr:15100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11384.5B Pick: Manual 5-6-91 15:46:20
20kppm NaCL Brine

4-30-91 10:34:10



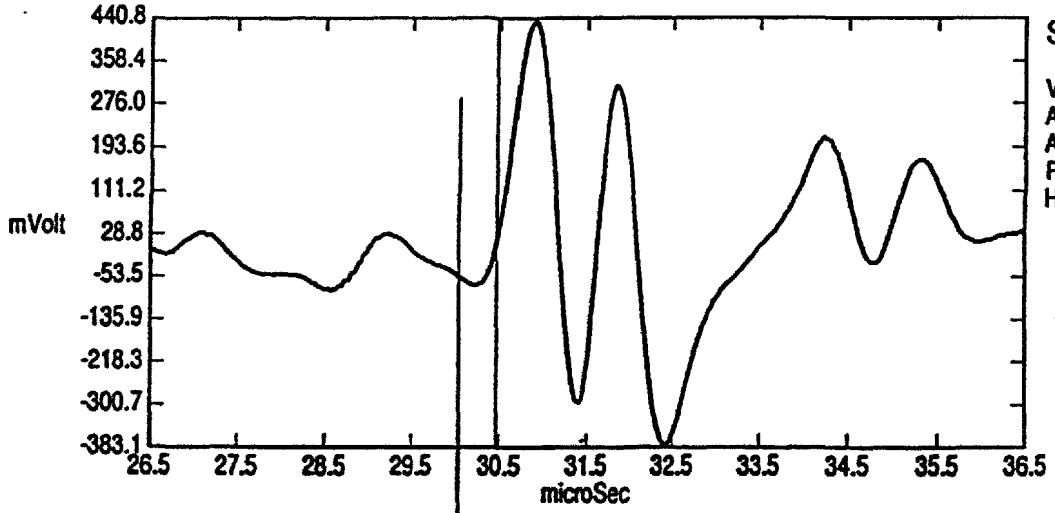
Well : Exxon Antares 2
Sample : 11449
Fluid : Brine
File : 11449.5b
20kppm NaCl Brine

Length : .93 inch
Conf Pr : 15100 psi
Pore Pr : 100 psi
Temp : 21 C



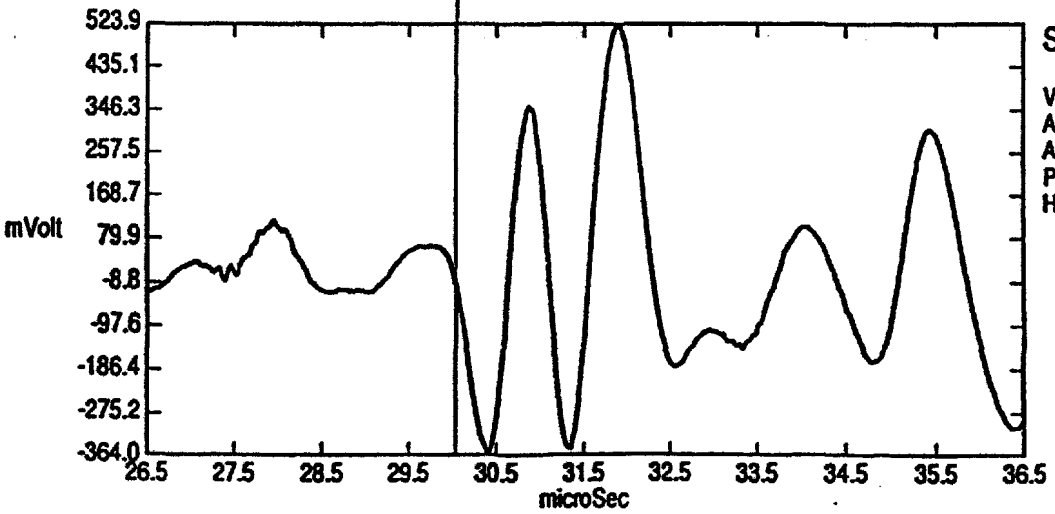
P wave

Velocity	: 15684.3	ft/sec
Arrival Time	: 17.12	microSec
Amplitude	: 71.25	mVolt
Peak to Peak	: 217.97	mVolt
Head to Head	: 12.21	microSec



S1 wave

Velocity	: 9046.5	ft/sec
Arrival Time	: 30.47	microSec
Amplitude	: 77.18	mVolt
Peak to Peak	: 25.59	mVolt
Head to Head	: 21.94	microSec

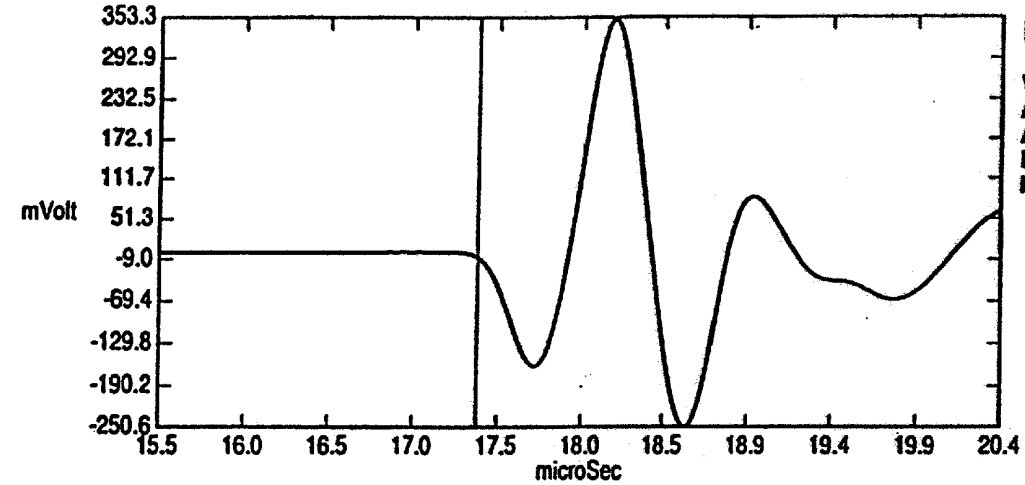


S2 wave

Velocity	: 9597.84	ft/sec
Arrival Time	: 30.04	microSec
Amplitude	: 63.75	mVolt
Peak to Peak	: 27.75	mVolt
Head to Head	: 22.0	microSec

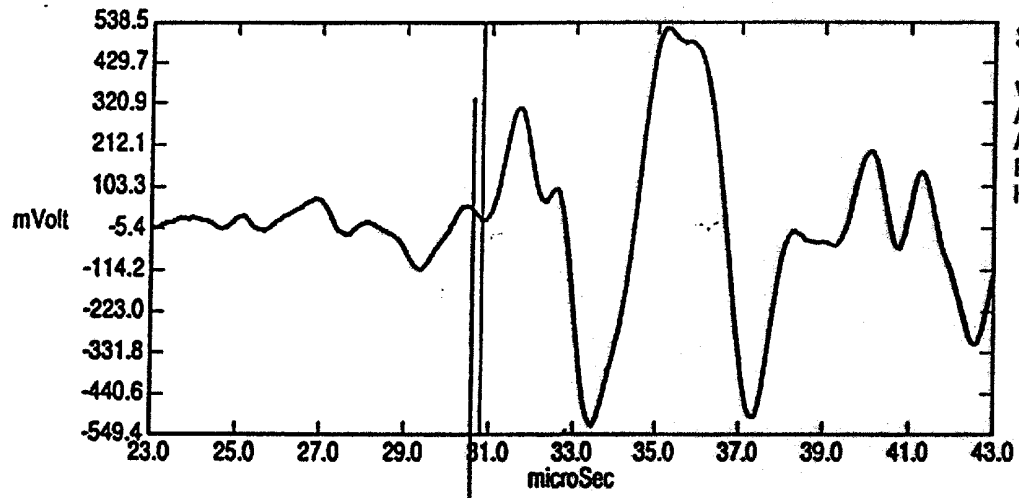
Well : Exxon Antares 2
Sample : 11449
Fluid : Brine
File : 11449.1b
20kppm NaCl Brine

Length : .93 inch
Conf Pr : 1100 psi
Pore Pr : 100 psi
Temp : 21 C



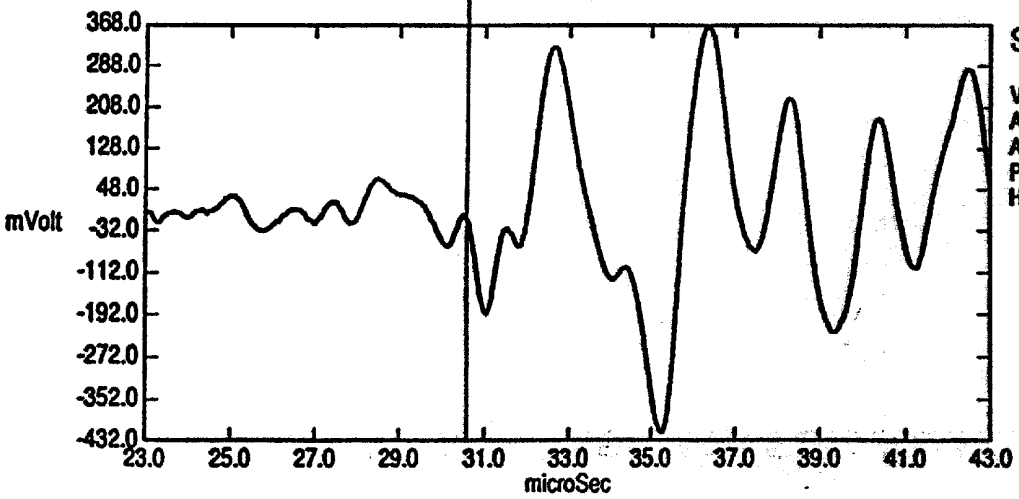
P wave

Velocity	: 14925.8	ft/sec
Arrival Time	: 17.37	microSec
Amplitude	: 64.67	mVolt
Peak to Peak	: 189.53	mVolt
Head to Head	: 12.21	microSec



S1 wave

Velocity	: 8709.55	ft/sec
Arrival Time	: 30.8	microSec
Amplitude	: 83.12	mVolt
Peak to Peak	: 33.19	mVolt
Head to Head	: 21.94	microSec

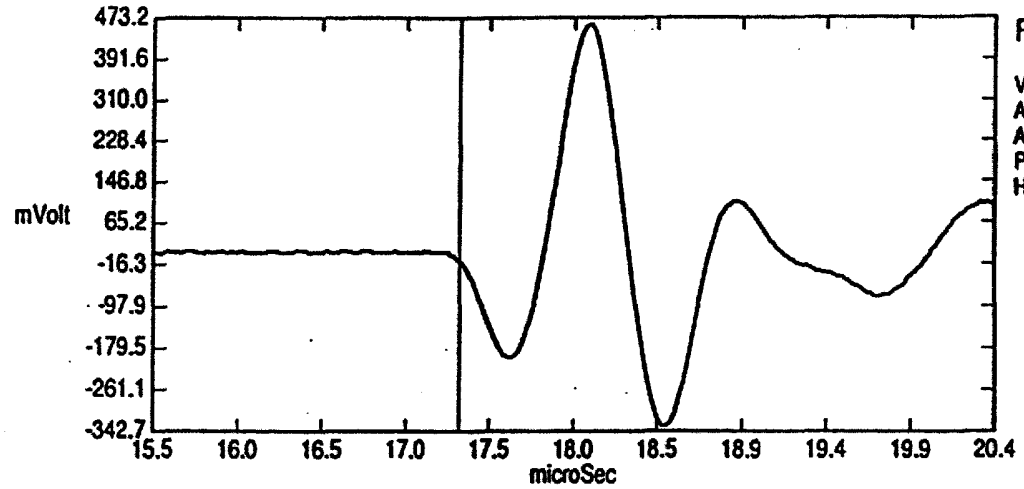


S2 wave

Velocity	: 8983.31	ft/sec
Arrival Time	: 30.59	microSec
Amplitude	: 84.37	mVolt
Peak to Peak	: 24.7	mVolt
Head to Head	: 22.0	microSec

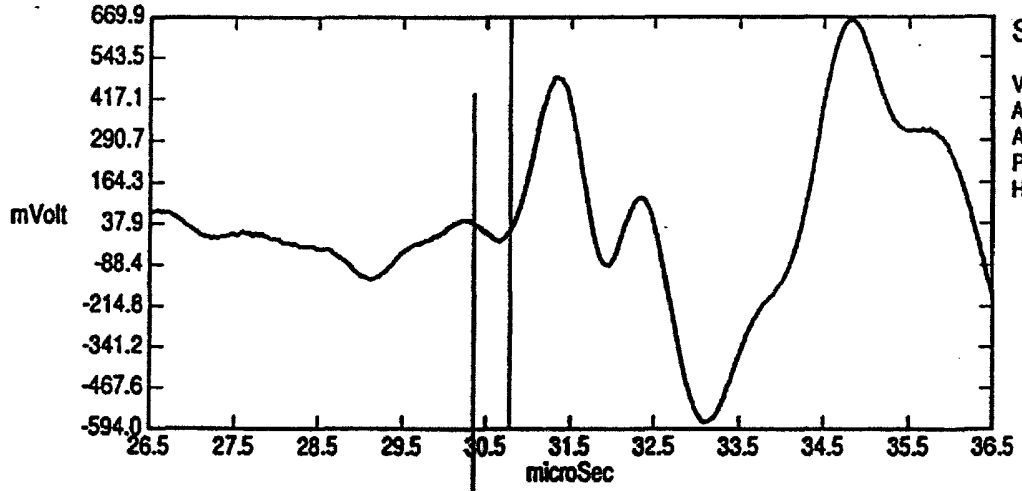
Well : Exxon Antares 2
Sample : 11449
Fluid : Brine
File : 11449.2b
20kppm NaCl Brine

Length : .93 inch
Conf Pr : 4100 psi
Pore Pr : 100 psi
Temp : 21 C



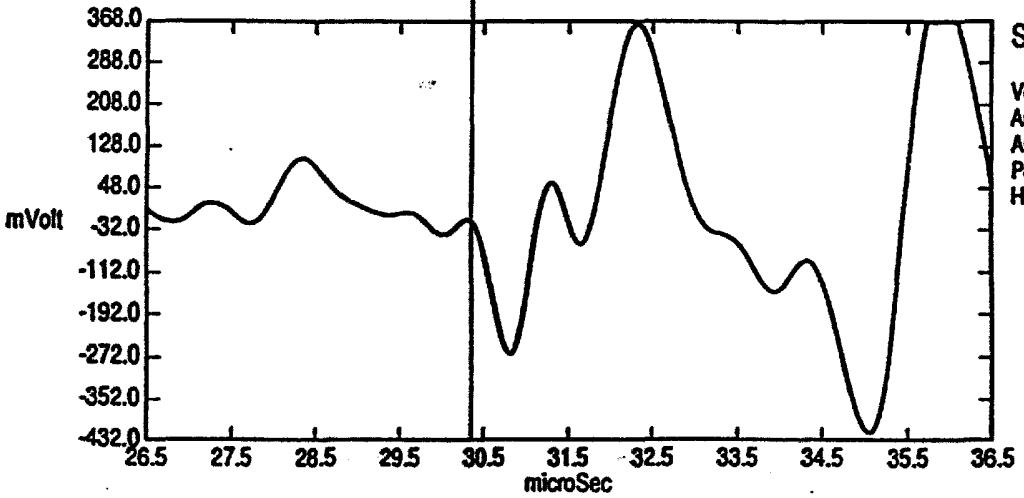
P wave

Velocity	: 15101.1	ft/sec
Arrival Time	: 17.32	microSec
Amplitude	: 65.0	mVolt
Peak to Peak	: 249.97	mVolt
Head to Head	: 12.21	microSec



S1 wave

Velocity	: 8729.26	ft/sec
Arrival Time	: 30.78	microSec
Amplitude	: 76.87	mVolt
Peak to Peak	: 39.03	mVolt
Head to Head	: 21.94	microSec

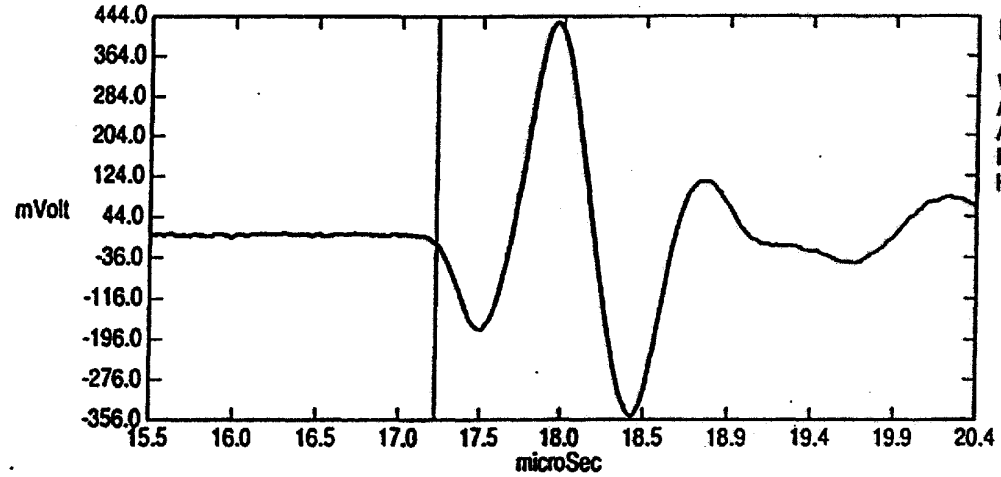


S2 wave

Velocity	: 9241.51	ft/sec
Arrival Time	: 30.35	microSec
Amplitude	: 83.26	mVolt
Peak to Peak	: 24.68	mVolt
Head to Head	: 22.0	microSec

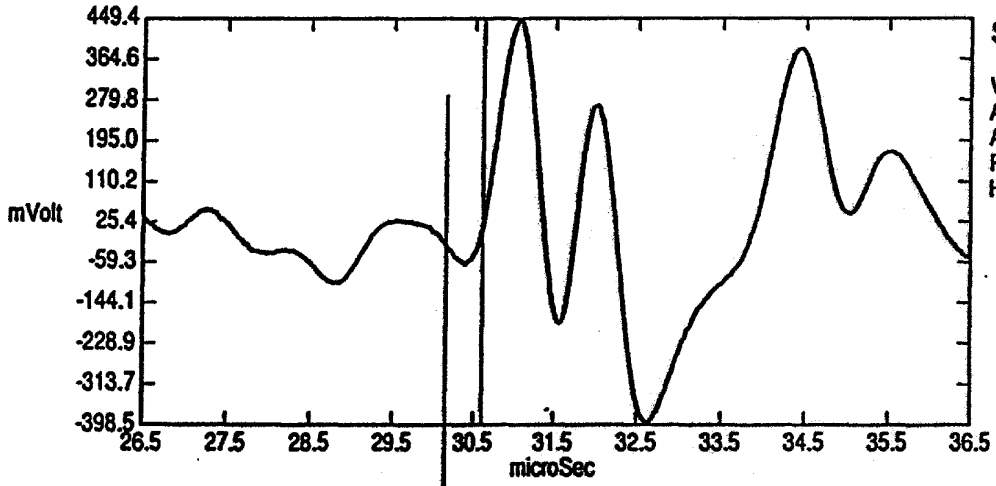
Well : Exxon Antares 2
Sample : 11449
Fluid : Brine
File : 11449.4b
20kppm NaCl Brine

Length : .93 inch
Conf Pr : 10100 psi
Pore Pr : 100 psi
Temp : 21 C



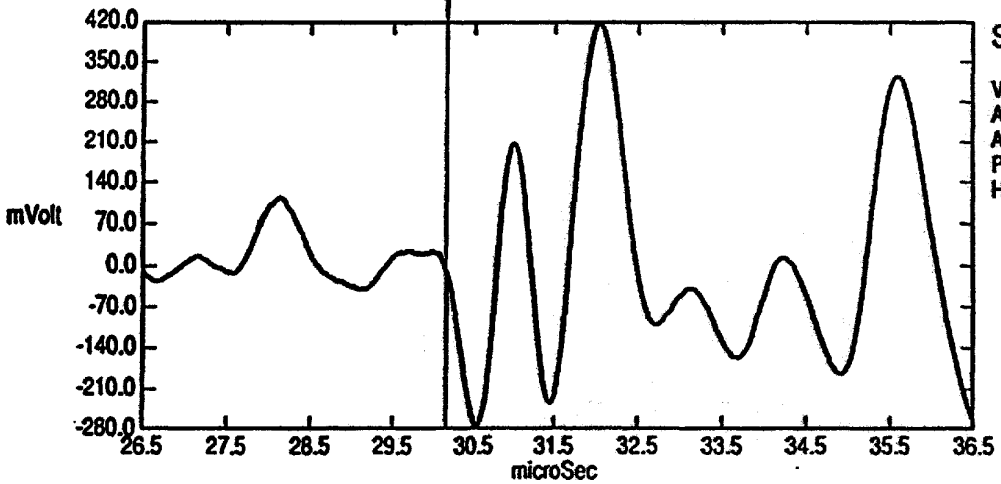
P wave

Velocity	: 15402.5	ft/sec
Arrival Time	: 17.21	microSec
Amplitude	: 69.37	mVolt
Peak to Peak	: 246.06	mVolt
Head to Head	: 12.21	microSec



S1 wave

Velocity	: 8900.42	ft/sec
Arrival Time	: 30.61	microSec
Amplitude	: 78.43	mVolt
Peak to Peak	: 26.55	mVolt
Head to Head	: 21.94	microSec

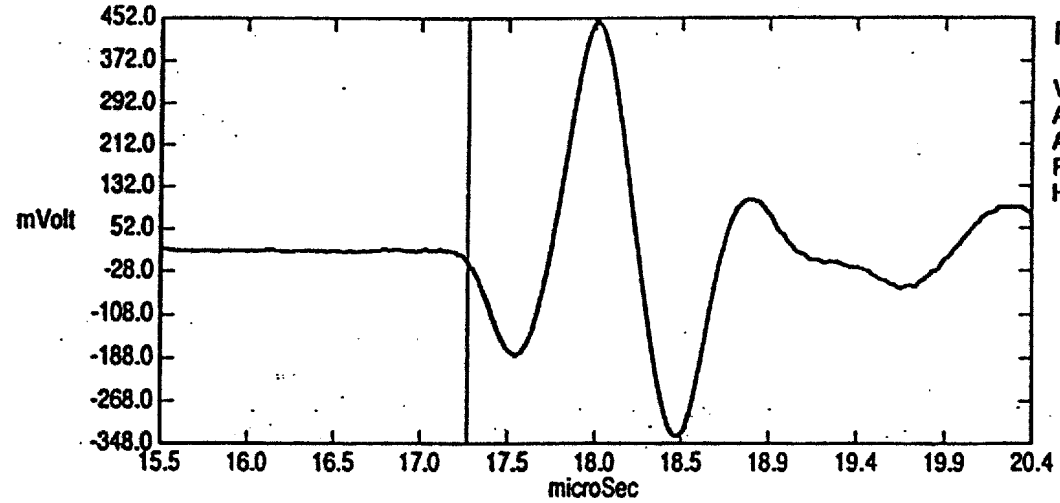


S2 wave

Velocity	: 9468.3	ft/sec
Arrival Time	: 30.15	microSec
Amplitude	: 61.87	mVolt
Peak to Peak	: 21.87	mVolt
Head to Head	: 22.0	microSec

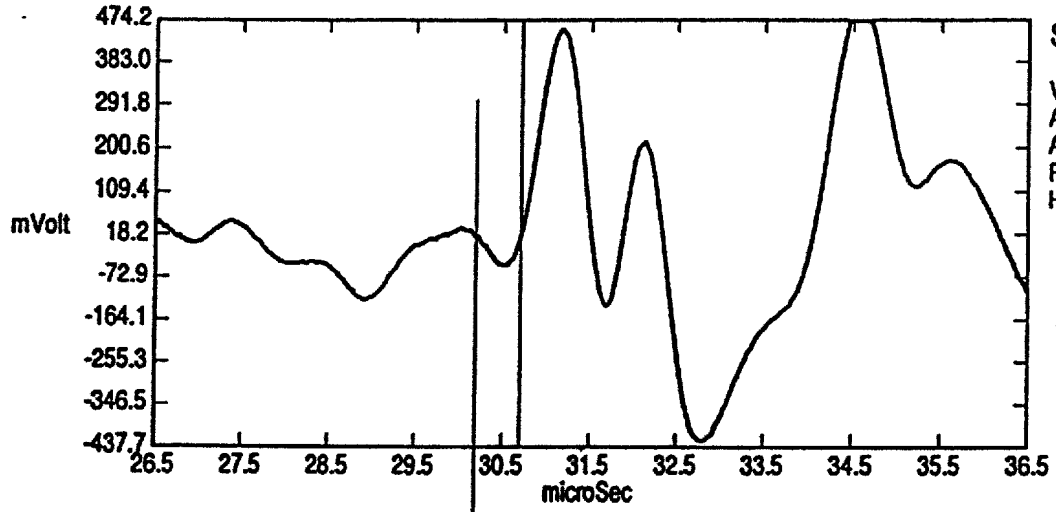
Well : Exxon Antares 2
Sample : 11449
Fluid : Brine
File : 11449.3b
20kppm NaCl Brine

Length : .93 inch
Conf Pr : 7600 psi
Pore Pr : 100 psi
Temp : 21 C



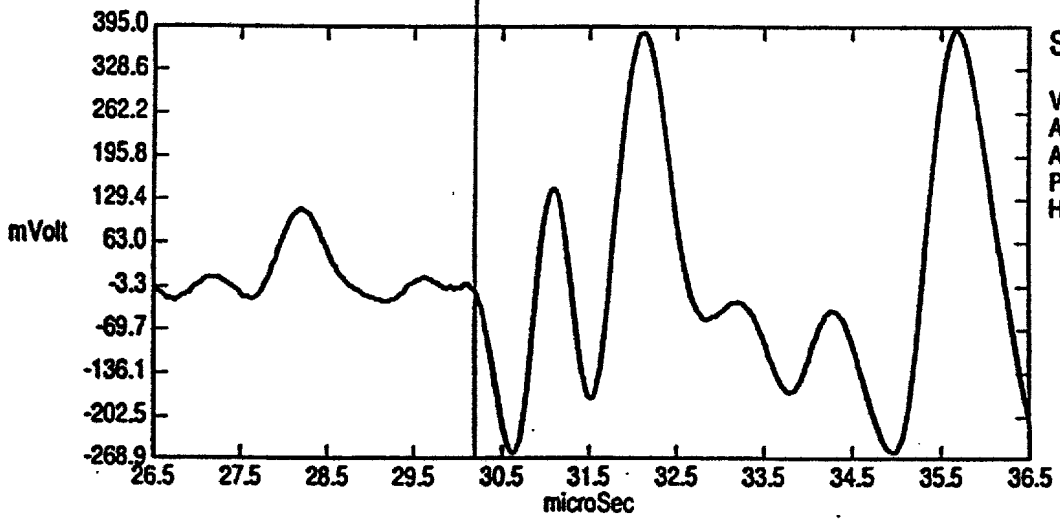
P wave

Velocity	: 15250.3	ft/sec
Arrival Time	: 17.27	microSec
Amplitude	: 67.5	mVolt
Peak to Peak	: 246.06	mVolt
Head to Head	: 12.21	microSec



S1 wave

Velocity	: 8808.97	ft/sec
Arrival Time	: 30.7	microSec
Amplitude	: 79.37	mVolt
Peak to Peak	: 28.27	mVolt
Head to Head	: 21.94	microSec



S2 wave

Velocity	: 9422.05	ft/sec
Arrival Time	: 30.19	microSec
Amplitude	: 62.5	mVolt
Peak to Peak	: 20.58	mVolt
Head to Head	: 22.0	microSec

Compressional and Shear Wave Velocity Measurements

Exxon Antares-1 and -2 wells

Volume 2
Soltrol-saturated Measurements

June 18, 1991

Prepared for

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Prepared by

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76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401
(802) 296-8333 FAX

Compressional and Shear Wave Velocity Measurements

Following the brine saturated velocity measurements, the samples were flushed with distilled water two times then vacuum dried. After the vacuum period magnetic susceptibility measurements were performed on each sample. Following the susceptibility measurements the samples were saturated with Soltrol in preparation for the second phase of ultrasonic velocity measurements.

A single compressional (P) and two shear (S1 and S2) wave velocities were measured with a transducer arrangement that propagated the compressional and two independent and orthogonally polarized shear waves along a core axis. The samples were saturated with Soltrol prior to measurement. Ultrasonic measurements were made at effective confining pressures of 1000, 4000, 7500, 10,000 and 15,000 psi. Pore fluid pressure of 100 psi was applied to the samples during velocity measurement; confining pressure is therefore 100 psi greater than the effective pressures listed above. The measurements were made at ambient laboratory temperature, approximately 22°C.

Sample Descriptions

	Depth	Lithology
Exxon Antares-1 well:		
	7372 ft	shale
	7466 ft	shale
	7525 ft	shale
	7927 ft	shale
	8060 ft	limestone
	8221 ft	shale
	8283 ft	shale
	8371 ft	sandstone
Exxon Antares-2 well:		
	10948 ft	shale
	10979 ft	shale
	11082 ft	fine-grained sandstone
	11106 ft	shale
	11186 ft	sandstone with mud clasts
	11235 ft	sandstone
	11264 ft	red shale
	11305 ft	sandstone
	11330 ft	sandstone
	11384 ft	sandstone
	11449 ft	fine-grained sandstone

Test Procedures

Velocity measurements on the saturated samples were made in the following sequence. The titanium transducer ends were thoroughly cleaned and a 0.001" thick piece of silver foil was placed on the titanium. A thin film of ultrasonic couplant was placed between the titanium and the silver foil. The saturated sample was jacketed with Tygon tubing to produce a nominal one-inch diameter sample. Then the sample was jacketed with Norprene tubing. The jacketed sample was placed between the two titanium end caps and the tubing was clamped to the end caps with wire. The sample was then raised to the first measurement confining pressure of 1100 psi and the pore pressure was raised to 100 psi. Compressional and shear waves were sequentially propagated through the sample, digitized, and displayed. The arrival times were picked and the signals were plotted. After a set of measurements, the confining pressure was raised to the next highest pressure and the process was repeated.

The two ultrasonic shear waves, S1 and S2, were propagated in the same direction as the P wave along the core sample axis, but the sense of shear for each are mutually perpendicular.

The compressional (P) and shear (S1 and S2) wave velocities for the sample at any pressure was obtained by measuring the one-way travel time of a P or S wave along the rock core axis and then dividing it into the sample length. A source and receiver pair of like crystals (P, S1, or S2) were selected through switches. The source crystal was excited by a fast risetime electrical pulse generated with a Panametrics 5055PR pulser-receiver. The crystal produced a broadband (600 kHz to 1.2 MHz) ultrasonic pulse that propagates through the adjacent titanium end piece, through the rock sample along the core axis, through the titanium end piece at the opposite end of the core, and into the receiver crystal. The electrical signal produced by the receiver crystal is amplified and filtered by the receiving section of the Panametrics 5055PR, then fed into a LeCroy 9400 digital oscilloscope. The oscilloscope digitized the ultrasonic waveform at a frequency of 100 MHz and displayed the digitized signal for analysis.

The travel time was read directly from the oscilloscope display by reading the first break in the P and S wave signal. The break was defined by a threshold voltage that was 1.25% of the overall peak-to-peak amplitudes of the first three half-cycles of the signal. The arrival time was picked at the point where this threshold voltage was exceeded relative to the baseline voltage. The resolution of the pick was ± 0.01 microsecond. The P and S wave velocities are precise to within approximately ±0.5% and 1% respectively.

The transit times of the P and S waves through the titanium end pieces were subtracted from the total travel time measured on the oscilloscope to arrive at transit times through the sample. Travel times through the titanium end pieces were obtained by placing the transducers face to face and measuring as a function of confining pressure. Velocities were calculated by dividing sample length by sample transit time.

Results

The experimental results for each sample are tabulated on a summary page followed by the five time series plots for inspection and further analysis. The summary page identifies the sample, the date completed, and gives the sample dimensions, dry and immersed weights, bulk density, grain density, porosity and velocities.

The time series plots for the compressional and shear wave measurements follow the summary page. At each pressure the compressional and two shear waves are presented on one page. At the top of the page are listed the well, sample identification, sample length, pore fluid, confining pressure, pore pressure and temperature. To the right of each trace are listed velocity, the picked arrival time, amplitude at the pick, and the peak-to-peak amplitude. The picks are identified with a vertical marker on each signal trace. The markers for the S1 and S2 waves overlap to show visually the amount of anisotropy in the sample.

MAGNETIC SUSCEPTIBILITY MEASUREMENTS

Magnetic susceptibility measurements were carried out on seventeen (17) rock cores supplied by Texaco. The tests were performed in a bridge apparatus modified after the design of Christie and Symons (1969). Figure 1 is a schematic diagram of the susceptibility bridge. The bridge was a transformer balance in which the internal oscillator of a Princeton Applied Research lock-in amplifier (Model 124A with model 116 differential preamplifier) was used to excite the primary coils of the measuring transformer and the reference transformer. The net in-phase signal picked up by the two secondary coils, connected in series opposition, was returned to the amplifier input where it passes through a transformer, a linear amplifier, a narrow-band filter, a phase-sensitive detector for comparison with the output phase and finally to a d.c. voltmeter. Each primary coil consisted of two Helmholtz coils, with 1,000 turns of No. 32 enameled wire wound on a nylon form 10.0 cm in diameter, separated by 5.0 cm and driven at a frequency of 1,000 Hz with the PAR output adjusted to generate a field of 0.5 Oe. The secondary coil, positioned in the center of the coaxial Helmholtz coils had 1,000 turns of No. 32 enameled wire wound on a diameter of 5.00 cm.

The susceptibility is determined by first balancing the output of the secondary coils and then inserting the sample into the axial cavity of one nylon coil form. The sample generated an imbalance in the output of the secondary coils which is proportional to the susceptibility of the sample. The bridge was calibrated with a series of powders containing various percentages of titanomagnetite grains. The low field susceptibility of these powders was determined by the National Bureau of Standards, Boulder, Colorado.

The magnetic susceptibility is determined by first measuring the bridge imbalance per gram of the sample and then multiplying that number by a scale factor, obtained in the calibration procedure, to obtain a final value. The equation relating the amplified bridge output to the susceptibility at a sensitivity of 200 microvolts full scale and a driving

voltage of 1.641 volts RMS is

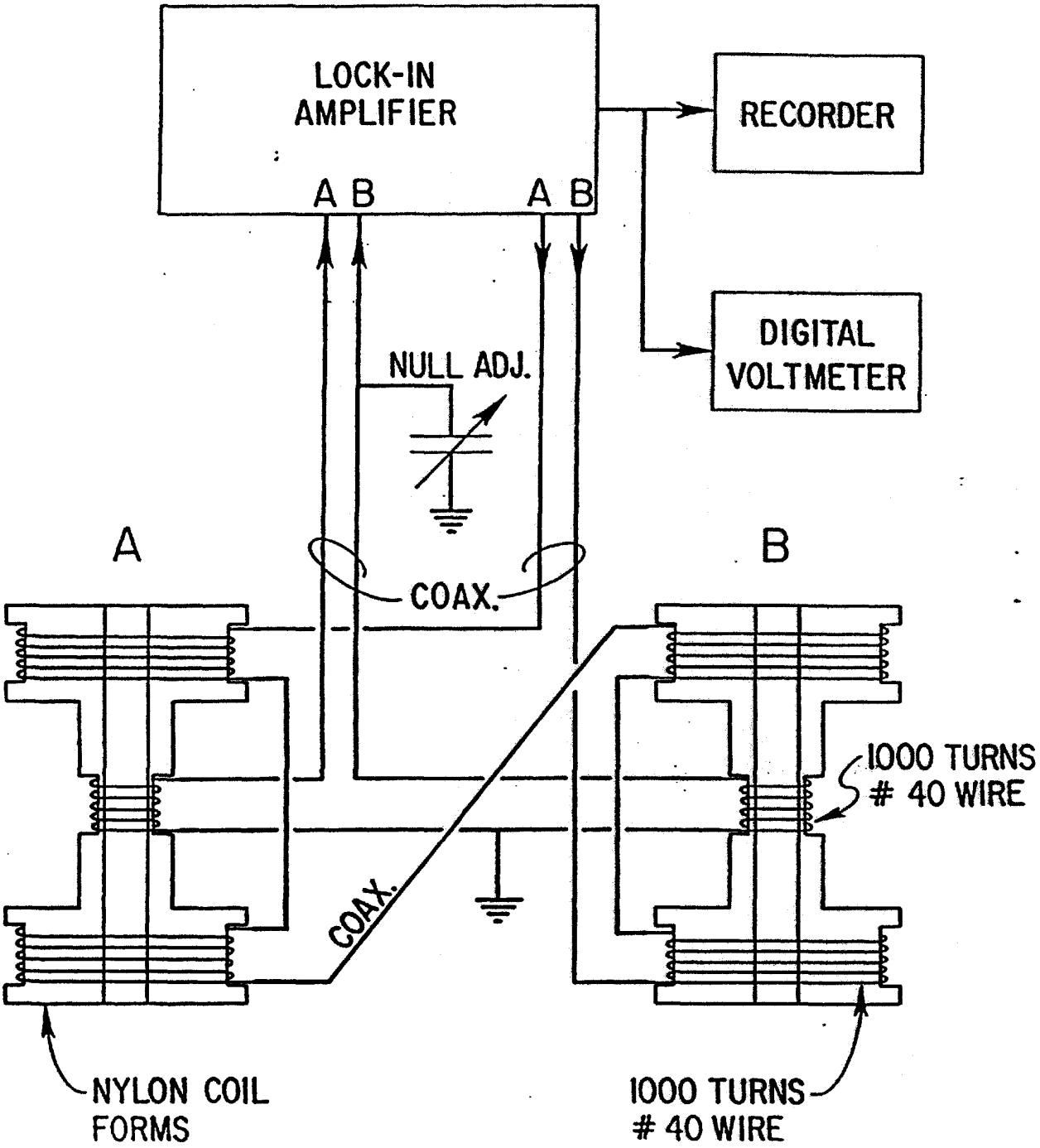
$$K = 0.00294\ V^{0.945}$$

where K is magnetic susceptibility in emu/g/Oe and V is the amplified bridge output per gram of sample.

The bridge imbalance due to each sample was measured twice to ensure reproducibility. Then the mass of the sample was measured and the susceptibility per gram is calculated. The accuracy of the susceptibility is ±6% for samples with susceptibilities of 10^{-5} emu/g/Oe and greater. For lower values, the accuracy decreases because the excitation of the secondary coil is exceedingly small, on the order of 0.2 microvolts, and the signal just rises above the background noise of the system. Therefore, the accuracy for samples with susceptibilities between 5×10^{-6} and 10^{-5} emu/g/Oe is ±10% and the accuracy for those below 5×10^{-6} emu/g/Oe is ±20%.

Reference

Christie, K.W. and D.T.A. Symons, Apparatus for measuring magnetic susceptibility and its anisotropy, *Geol. Survey of Canada Paper*, 69-41. 1969.


LOCK-IN
AMPLIFIER
A B
A B
RECORDER
DIGITAL
VOLTMETER
NULL ADJ.
A
B
COAX.
COAX.
1000 TURNS
40 WIRE
NYLON COIL
FORMS
1000 TURNS
40 WIRE

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 1
Depth(ft):	7466
Orientation:	VERTICAL
Rock Type:	Shale
Pore Fluid:	Soltrol
Date:	6/12/91
Sample Length (in)	0.453
Sample Diameter (in)	0.478
Sample Weight: Vacuum Dry (g)	3.295
Dry Bulk Density (g/cm3)	2.47
Grain Density (g/cm3)	2.78
Porosity (%)	11.1
Magnetic Susceptibility (emu/gm/Oe)	2.7 E -5

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisot
1100	100	1000	12541	7580	7565	1.66	0.2
4100	100	4000	13107	7980	7947	1.65	0.4
7600	100	7500	13482	8188	8242	1.64	0.7
10100	100	10000	13727	8370	8388	1.64	0.2
15100	100	15000	14033	8540	8560	1.64	0.2

COMMENTS:

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 1
Depth(ft):	7525
Orientation:	VERTICAL
Rock Type:	Shale
Pore Fluid:	Soltrol
Date:	5/10/91
Sample Length (in)	0.577
Sample Diameter (in)	0.478
Sample Weight: Vacuum Dry (g)	4.019
Dry Bulk Density (g/cm3)	2.37
Grain Density (g/cm3)	2.80
Porosity (%)	15.5
Magnetic Susceptibility (emu/gm/Oe)	

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisot
1100	100	1000					
4100	100	4000					
7600	100	7500					
10100	100	10000					
15100	100	15000					

COMMENTS:

Sample fragmented upon resaturation

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 1
Depth(ft):	7927
Orientation:	VERTICAL
Rock Type:	Shale
Pore Fluid:	Soltrol
Date:	6/13/91
Sample Length (in)	0.454
Sample Diameter (in)	0.479
Sample Weight: Vacuum Dry (g)	3.350
Dry Bulk Density (g/cm3)	2.50
Grain Density (g/cm3)	2.77
Porosity (%)	9.8
Magnetic Susceptibility (emu/gm/Oe)	4.1 E -6

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisot
1100	100	1000	12975	7572	6976	1.78	7.9
4100	100	4000	13233	7764	7100	1.78	8.6
7600	100	7500	13457	7903	7998	1.69	1.2
10100	100	10000	13688	7998	8079	1.70	1.0
15100	100	15000	14025	8129	8196	1.72	0.8

COMMENTS:

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 1
Depth (ft):	8060
Orientation:	VERTICAL
Rock Type:	Limestone
Pore Fluid:	Soltrol
Date:	6/5/91
Sample Length (in)	0.984
Sample Diameter (in)	0.484
Sample Weight: Vacuum Dry (g)	7.804
Dry Bulk Density (g/cm3)	2.63
Grain Density (g/cm3)	2.67
Porosity (%)	1.6
Magnetic Susceptibility (emu/gm/Oe)	1.0 E -6

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisot
1100	100	1000	18764	10110	10073	1.86	0.4
4100	100	4000	19114	10392	10406	1.84	0.1
7600	100	7500	19385	10594	10567	1.83	0.3
10100	100	10000	19477	10718	10635	1.82	0.8
15100	100	15000	19664	10832	10761	1.82	0.7

COMMENTS:

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 1
Depth(ft):	8221
Orientation:	VERTICAL
Rock Type:	Shale
Pore Fluid:	20k ppm NaCl
Date:	6/17/91
Sample Length (in)	0.541
Sample Diameter (in)	0.483
Sample Weight: Vacuum Dry (g)	4.233
Dry Bulk Density (g/cm3)	2.61
Grain Density (g/cm3)	2.78
Porosity (%)	6.1
Magnetic Susceptibility (emu/gm/Oe)	3.6 E -6

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisot
1100	100	1000	12118	5164	5211	2.34	0.9
4100	100	4000	12283	6108	6059	2.02	0.8
7600	100	7500	12522	5438	5558	2.28	2.2
10100	100	10000	12699	5531	5649	2.27	2.1
15100	100	15000	12917	5706	5772	2.25	1.1

COMMENTS:

Questionable S signal; Very low amplitude

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 1
Depth(ft):	8221
Orientation:	VERTICAL
Rock Type:	Shale
Pore Fluid:	Soltrol
Date:	6/13/91
Sample Length (in)	0.541
Sample Diameter (in)	0.483
Sample Weight: Vacuum Dry (g)	4.233
Dry Bulk Density (g/cm3)	2.61
Grain Density (g/cm3)	2.78
Porosity (%)	6.1
Magnetic Susceptibility (emu/gm/Oe)	3.6 E -6

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisot
1100	100	1000	13776	8193	8209	1.68	0.2
4100	100	4000	14266	8461	8493	1.68	0.4
7600	100	7500	14793	8694	8712	1.70	0.2
10100	100	10000	15045	8834	8852	1.70	0.2
15100	100	15000	15360	9015	8996	1.71	0.2

COMMENTS:

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 1
Depth(ft):	8283
Orientation:	VERTICAL
Rock Type:	Shale
Pore Fluid:	Soltrol
Date:	6/13/91
Sample Length (in)	0.526
Sample Diameter (in)	0.481
Sample Weight: Vacuum Dry (g)	4.012
Dry Bulk Density (g/cm3)	2.56
Grain Density (g/cm3)	2.82
Porosity (%)	9.1
Magnetic Susceptibility (emu/gm/Oe)	6.7 E -6

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisot
1100	100	1000	12841	7517	7455	1.72	0.8
4100	100	4000	13073	7693	7612	1.71	1.1
7600	100	7500	13364	7844	7776	1.71	0.9
10100	100	10000	13514	7947	7861	1.71	1.1
15100	100	15000	13878	8072	8018	1.73	0.7

COMMENTS:

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 1
Depth(ft):	8371
Orientation:	VERTICAL
Rock Type:	Sandstone
Pore Fluid:	Soltrol
Date:	6/12/91
Sample Length (in)	0.382
Sample Diameter (in)	0.482
Sample Weight: Vacuum Dry (g)	2.584
Dry Bulk Density (g/cm3)	2.26
Grain Density (g/cm3)	2.73
Porosity (%)	17.2
Magnetic Susceptibility (emu/gm/Oe)	3.7 E -6

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisot
1100	100	1000	13046	8018	7918	1.64	1.2
4100	100	4000	13431	8466	8399	1.59	0.8
7600	100	7500	13721	8721	8626	1.58	1.1
10100	100	10000	13840	8842	8745	1.57	1.1
15100	100	15000	14085	9147	8967	1.56	2.0

COMMENTS:

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 2
Depth(ft):	10948
Orientation:	VERTICAL
Rock Type:	Shale
Pore Fluid:	Soltrol
Date:	6/14/91
Sample Length (in)	0.861
Sample Diameter (in)	1.010
Sample Weight: Vacuum Dry (g)	26.052
Dry Bulk Density (g/cm3)	2.30
Grain Density (g/cm3)	2.65
Porosity (%)	13.0
Magnetic Susceptibility (emu/gm/Oe)	2.8 E -6

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisot
1100	100	1000	17498	10416	10640	1.66	2.1
4100	100	4000	18217	11207	11358	1.61	1.3
7600	100	7500	18538	11609	11738	1.59	1.1
10100	100	10000	18745	11738	11871	1.59	1.1
15100	100	15000	18913	11938	12023	1.58	0.7

COMMENTS:

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 2
Depth(ft):	10979
Orientation:	VERTICAL
Rock Type:	Shale
Pore Fluid:	Soltrol
Date:	6/12/91
Sample Length (in)	0.439
Sample Diameter (in)	0.479
Sample Weight: Vacuum Dry (g)	3.260
Dry Bulk Density (g/cm3)	2.51
Grain Density (g/cm3)	2.74
Porosity (%)	8.4
Magnetic Susceptibility (emu/gm/Oe)	5.8 E -6

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisot
1100	100	1000	12359	7511	7511	1.65	0.0
4100	100	4000	12836	7816	7783	1.65	0.4
7600	100	7500	13206	7987	8005	1.65	0.2
10100	100	10000	13449	8058	8075	1.67	0.2
15100	100	15000	13753	8202	8258	1.67	0.7

COMMENTS:

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 2
Depth(ft):	11082
Orientation:	VERTICAL
Rock Type:	Fine-grained sandstone
Pore Fluid:	Soltrol
Date:	6/6/91
Sample Length (in)	0.769
Sample Diameter (in)	0.482
Sample Weight: Vacuum Dry (g)	5.491
Dry Bulk Density (g/cm3)	2.39
Grain Density (g/cm3)	2.79
Porosity (%)	14.3
Magnetic Susceptibility (emu/gm/Oe)	6.6 E -6

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisot
1100	100	1000	12491	7539	7583	1.65	0.6
4100	100	4000	13519	8398	8398	1.61	0.0
7600	100	7500	14022	8766	8790	1.60	0.3
10100	100	10000	14240	8851	8875	1.61	0.3
15100	100	15000	14433	9013	9038	1.60	0.3

COMMENTS:

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 2
Depth(ft):	11106
Orientation:	VERTICAL
Rock Type:	Shale
Pore Fluid:	Soltrol
Date:	6/13/91
Sample Length (in)	0.508
Sample Diameter (in)	0.480
Sample Weight: Vacuum Dry (g)	3.770
Dry Bulk Density (g/cm3)	2.50
Grain Density (g/cm3)	2.78
Porosity (%)	10.0
Magnetic Susceptibility (emu/gm/Oe)	7.8 E -6

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisot
1100	100	1000	12976	7387	7546	1.74	2.1
4100	100	4000	13371	7884	7956	1.69	0.9
7600	100	7500	13790	8197	8255	1.68	0.7
10100	100	10000	13955	8294	8373	1.67	0.9
15100	100	15000	14353	8535	8598	1.68	0.7

COMMENTS:

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 2
Depth(ft):	11186
Orientation:	VERTICAL
Rock Type:	Sandstone with mud clasts
Pore Fluid:	Soltrol
Date:	6/12/91
Sample Length (in)	0.723
Sample Diameter (in)	0.486
Sample Weight: Vacuum Dry (g)	4.613
Dry Bulk Density (g/cm3)	2.10
Grain Density (g/cm3)	2.68
Porosity (%)	21.7
Magnetic Susceptibility (emu/gm/Oe)	3.3 E -6

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisot
1100	100	1000	12604	7655	7845	1.63	2.4
4100	100	4000	13418	8426	8485	1.59	0.7
7600	100	7500	13693	8744	8731	1.57	0.1
10100	100	10000	13882	8899	8847	1.56	0.6
15100	100	15000	14044	8992	8925	1.57	0.7

COMMENTS:

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 2
Depth(ft):	11235
Orientation:	VERTICAL
Rock Type:	Sandstone
Pore Fluid:	Soltrol
Date:	6/11/91
Sample Length (in)	0.638
Sample Diameter (in)	0.483
Sample Weight: Vacuum Dry (g)	4.820
Dry Bulk Density (g/cm3)	2.52
Grain Density (g/cm3)	2.81
Porosity (%)	10.5
Magnetic Susceptibility (emu/gm/Oe)	6.9 E -6

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisot
1100	100	1000	12688	8154	8129	1.56	0.3
4100	100	4000	12967	9011	9057	1.44	0.5
7600	100	7500	14892	9311	9376	1.59	0.7
10100	100	10000	15104	9460	9494	1.59	0.4
15100	100	15000	15366	9596	9649	1.60	0.5

COMMENTS:

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 2
Depth(ft):	11264
Orientation:	VERTICAL
Rock Type:	Red Shale
Pore Fluid:	Soltrol
Date:	6/13/91
Sample Length (in)	0.572
Sample Diameter (in)	0.480
Sample Weight: Vacuum Dry (g)	4.376
Dry Bulk Density (g/cm3)	2.58
Grain Density (g/cm3)	2.91
Porosity (%)	11.4
Magnetic Susceptibility (emu/gm/Oe)	8.5 E -5

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisot
1100	100	1000	12456	7423	7411	1.68	0.2
4100	100	4000	12860	7576	7576	1.70	0.0
7600	100	7500	13114	7737	7775	1.69	0.5
10100	100	10000	13328	7865	7865	1.69	0.0
15100	100	15000	13634	7997	8010	1.70	0.2

COMMENTS:

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 2
Depth(ft):	11305
Orientation:	VERTICAL
Rock Type:	Sandstone
Pore Fluid:	Soltrol
Date:	6/12/91
Sample Length (in)	0.844
Sample Diameter (in)	0.483
Sample Weight: Vacuum Dry (g)	5.431
Dry Bulk Density (g/cm3)	2.14
Grain Density (g/cm3)	2.70
Porosity (%)	20.7
Magnetic Susceptibility (emu/gm/Oe)	2.4 E -5

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisot
1100	100	1000	12811	7797	7763	1.65	0.4
4100	100	4000	13345	8226	8235	1.62	0.1
7600	100	7500	13499	8403	8423	1.60	0.2
10100	100	10000	13604	8433	8494	1.61	0.7
15100	100	15000	13736	8484	8566	1.61	1.0

COMMENTS:

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 2
Depth(ft):	11330
Orientation:	VERTICAL
Rock Type:	Sandstone
Pore Fluid:	Soltrol
Date:	6/5/91
Sample Length (in)	0.863
Sample Diameter (in)	0.481
Sample Weight: Vacuum Dry (g)	5.259
Dry Bulk Density (g/cm3)	2.05
Grain Density (g/cm3)	2.67
Porosity (%)	23.4
Magnetic Susceptibility (emu/gm/Oe)	7.6 E -6

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisot
1100	100	1000	12485	7475	7491	1.67	0.2
4100	100	4000	13004	7973	7973	1.63	0.0
7600	100	7500	13244	8153	8200	1.62	0.6
10100	100	10000	13342	8256	8247	1.62	0.1
15100	100	15000	13492	8314	8352	1.62	0.5

COMMENTS:

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 2
Depth(ft):	11384
Orientation:	VERTICAL
Rock Type:	Sandstone
Pore Fluid:	20k ppm NaCl
Date:	6/17/91
Sample Length (in)	0.822
Sample Diameter (in)	0.480
Sample Weight: Vacuum Dry (g)	5.810
Dry Bulk Density (g/cm3)	2.38
Grain Density (g/cm3)	2.72
Porosity (%)	12.5
Magnetic Susceptibility (emu/gm/Oe)	3.6 E -6

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisot
1100	100	1000	13894	8164	8203	1.70	0.5
4100	100	4000	14451	8737	8793	1.65	0.6
7600	100	7500	14731	8954	9036	1.64	0.9
10100	100	10000	14826	9060	9194	1.62	1.5
15100	100	15000	14956	9157	9244	1.63	0.9

COMMENTS:

Questionable S signal; Very low amplitude

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 2
Depth(ft):	11384
Orientation:	VERTICAL
Rock Type:	Sandstone
Pore Fluid:	Soltrol
Date:	6/6/91
Sample Length (in)	0.822
Sample Diameter (in)	0.480
Sample Weight: Vacuum Dry (g)	5.810
Dry Bulk Density (g/cm3)	2.38
Grain Density (g/cm3)	2.72
Porosity (%)	12.5
Magnetic Susceptibility (emu/gm/Oe)	3.6 E -6

Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisot
1100	100	1000	13951	8583	8541	1.63	0.5
4100	100	4000	14482	9170	9121	1.58	0.5
7600	100	7500	14826	9357	9370	1.58	0.1
10100	100	10000	14923	9422	9448	1.58	0.3
15100	100	15000	15121	9567	9567	1.58	0.0

COMMENTS:

COMPRESSIONAL AND SHEAR WAVE VELOCITIES

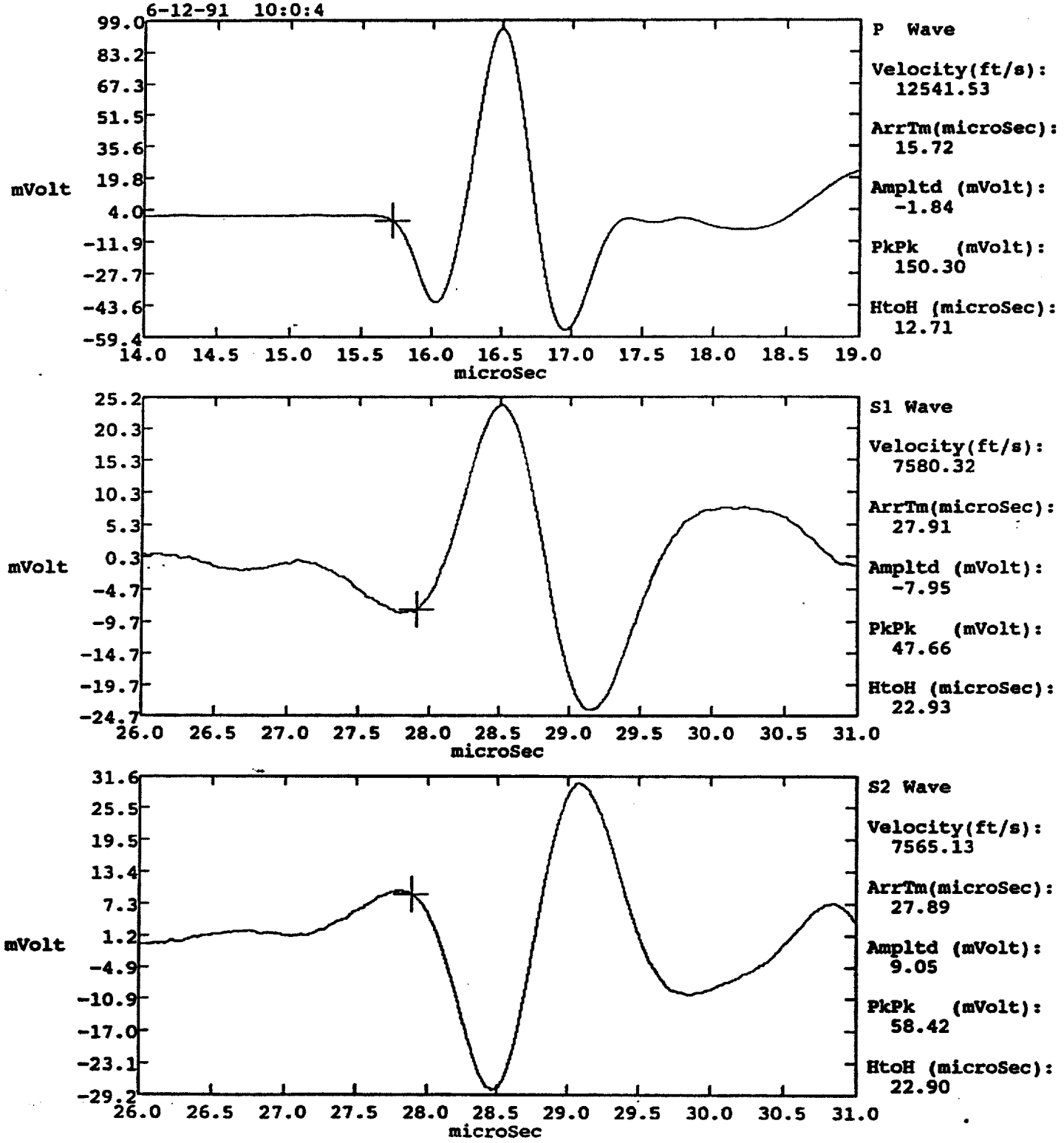
New England Research, Inc.
76 Olcott Drive
White River Junction, Vermont 05001
(802) 296-2401

Well:	Exxon Antares 2
Depth (ft):	11449
Orientation:	VERTICAL
Rock Type:	Fine-grained sandstone
Pore Fluid:	Soltrol
Date:	6/4/91
Sample Length (in)	0.926
Sample Diameter (in)	0.484
Sample Weight: Vacuum Dry (g)	6.896
Dry Bulk Density (g/cm3)	2.47
Grain Density (g/cm3)	2.73
Porosity (%)	9.6
Magnetic Susceptibility (emu/gm/Oe)	1.2 E -5

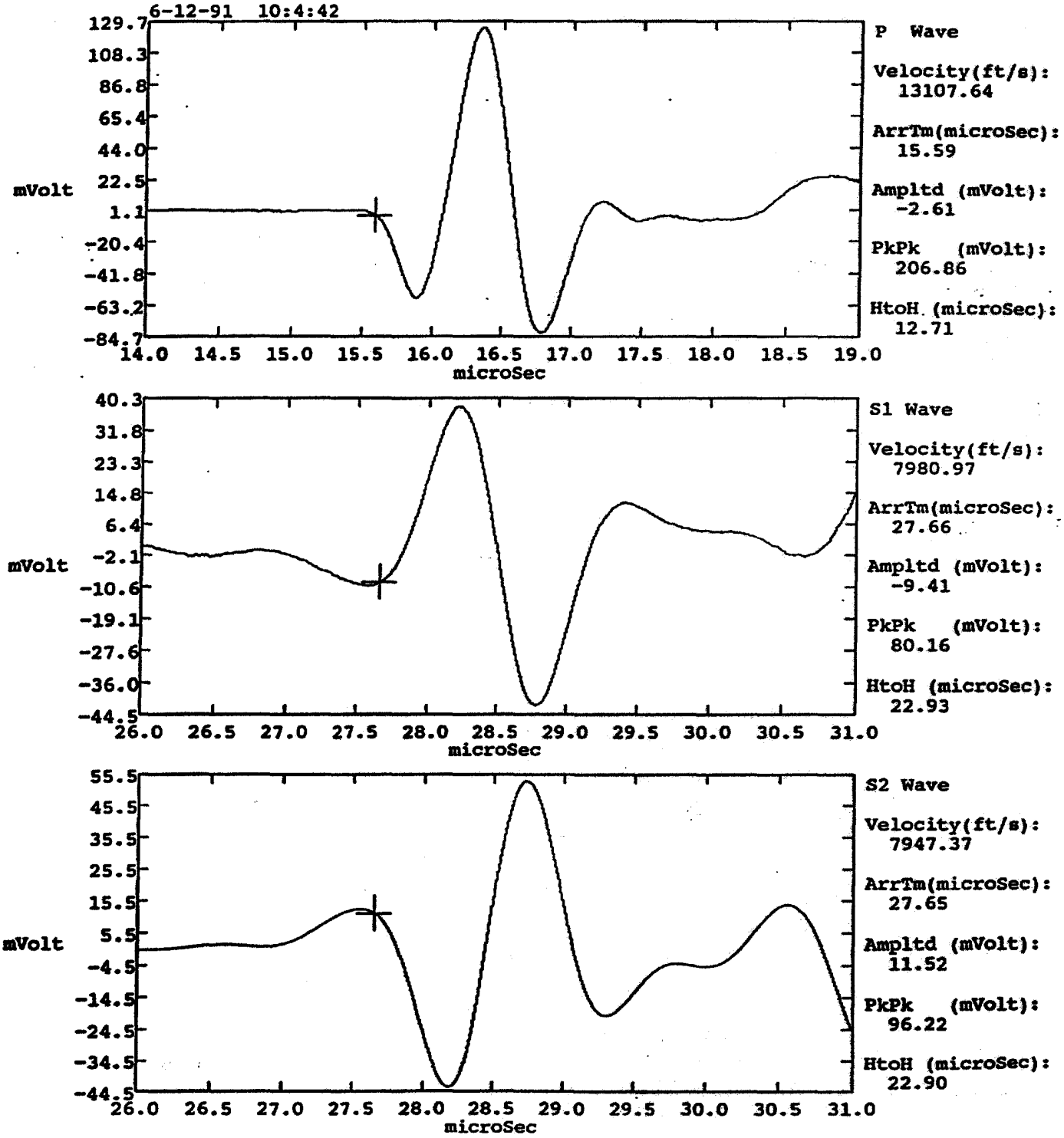
Pressures (psi)			Velocities (ft/sec)				
Confining	Pore	Effective	P-Wave	S1-Wave	S2-Wave	Vp/Vs	%Anisotropy
1100	100	1000	15160	9792	9067	1.61	7.4
4100	100	4000	15464	10034	9399	1.59	6.3
7600	100	7500	15812	10180	9645	1.60	5.3
10100	100	10000	15943	10275	9755	1.59	5.1
15100	100	15000	16177	10399	9867	1.60	5.1

COMMENTS:

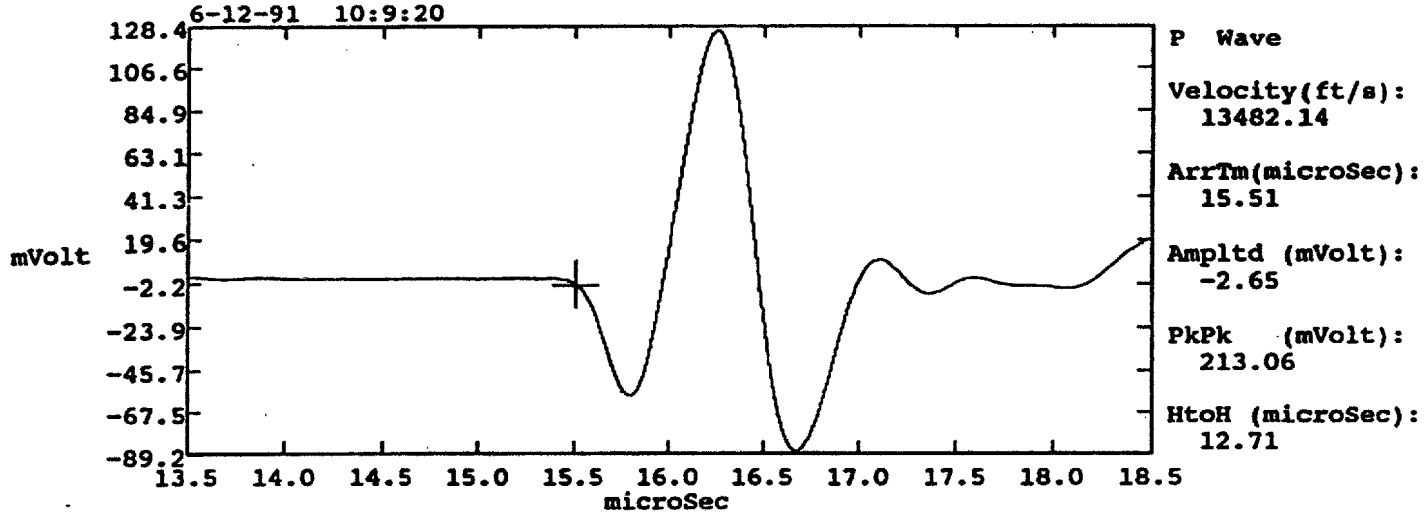
Well: EXXON ANTARES 1
Sample: 7466 Length:0.453 inch Fluid: SOLTROL
Conf Pr:1100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 7466.1S Pick: Manual 6-12-91 10:0:4

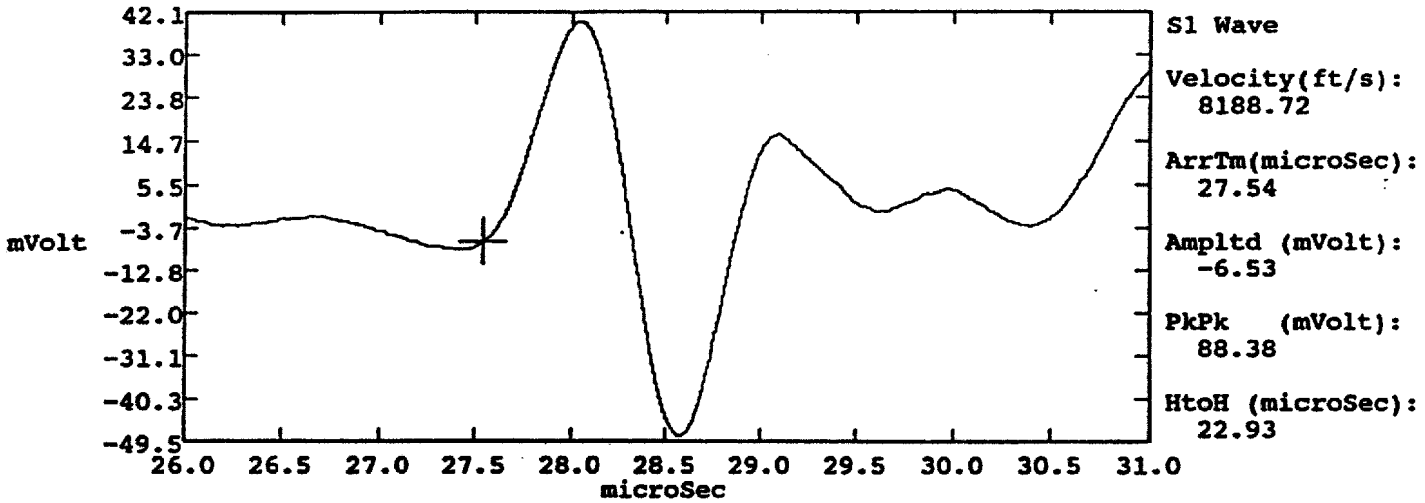


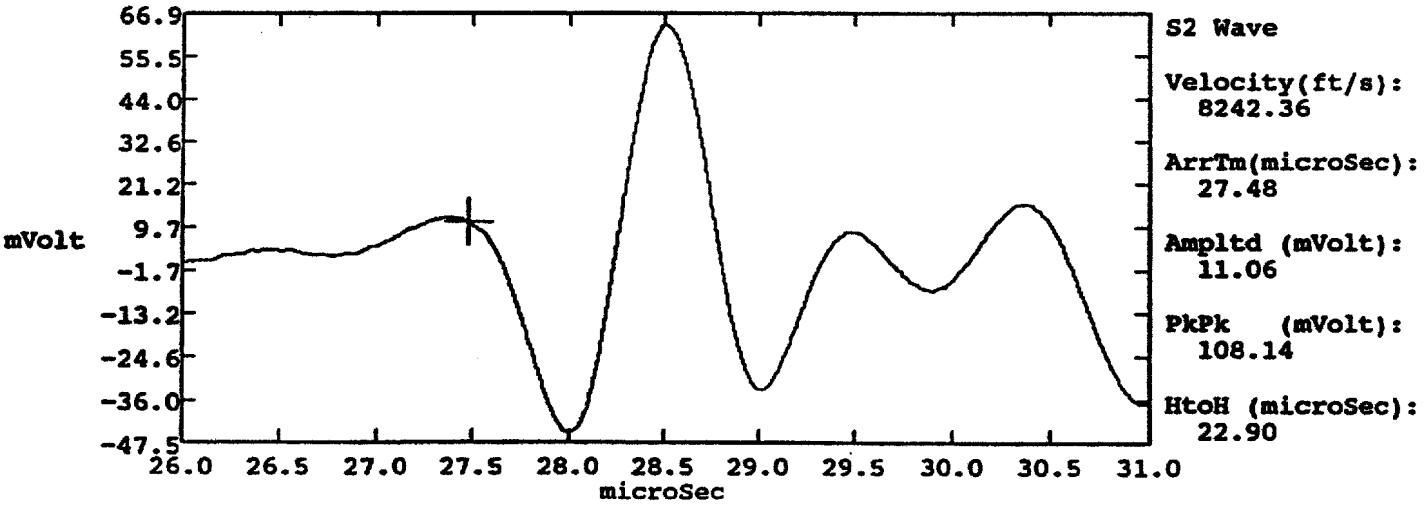
Well: EXXON ANTARES 1
Sample: 7466 Length:0.453 inch Fluid: SOLTROL
Conf Pr:4100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 7466.2S Pick: Manual 6-12-91 10:4:42



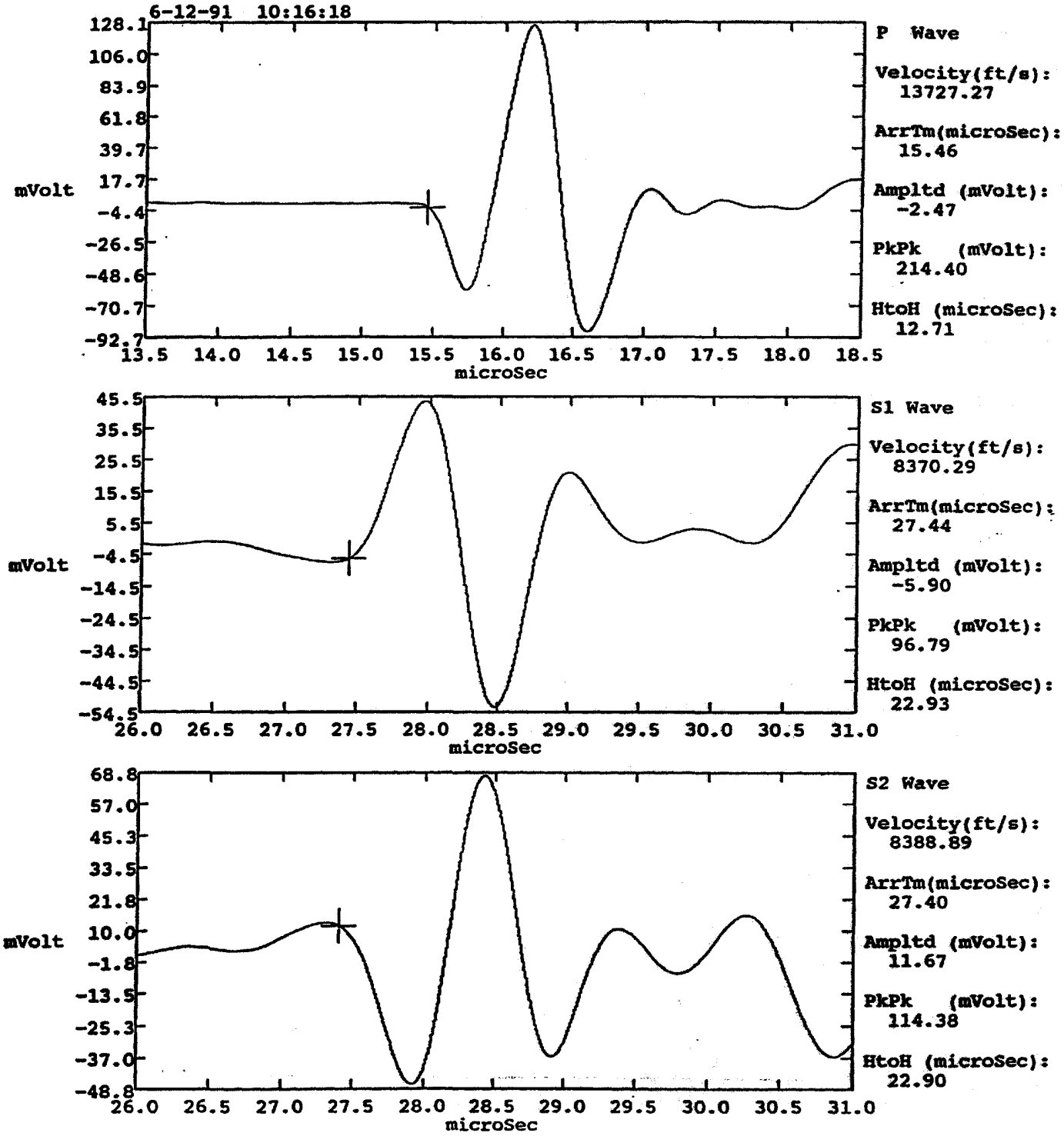
Well: EXXON ANTARES 1
Sample: 7466 Length:0.453 inch Fluid: SOLTROL
Conf Pr:7600.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 7466.3S Pick: Manual 6-12-91 10:9:20



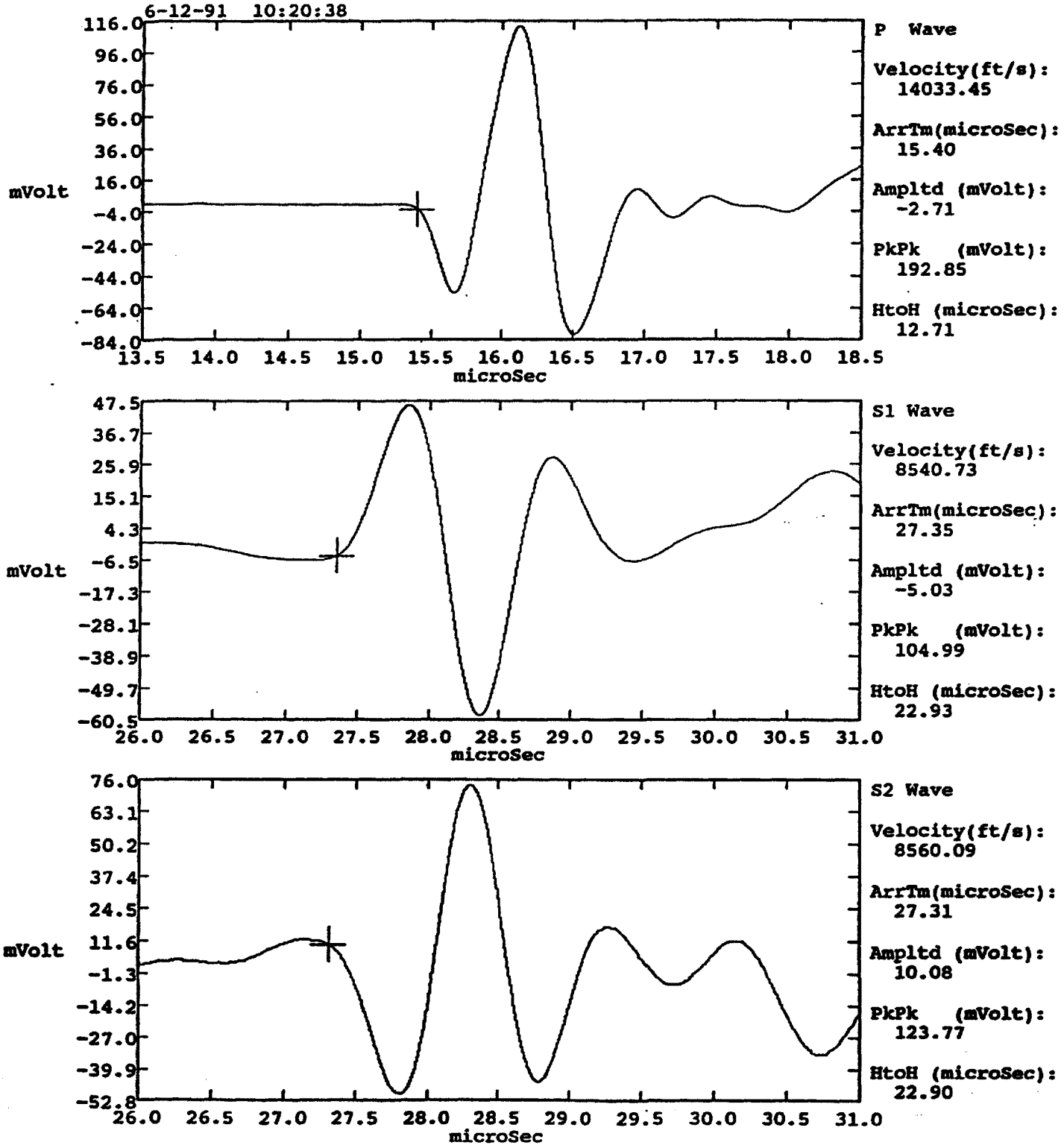




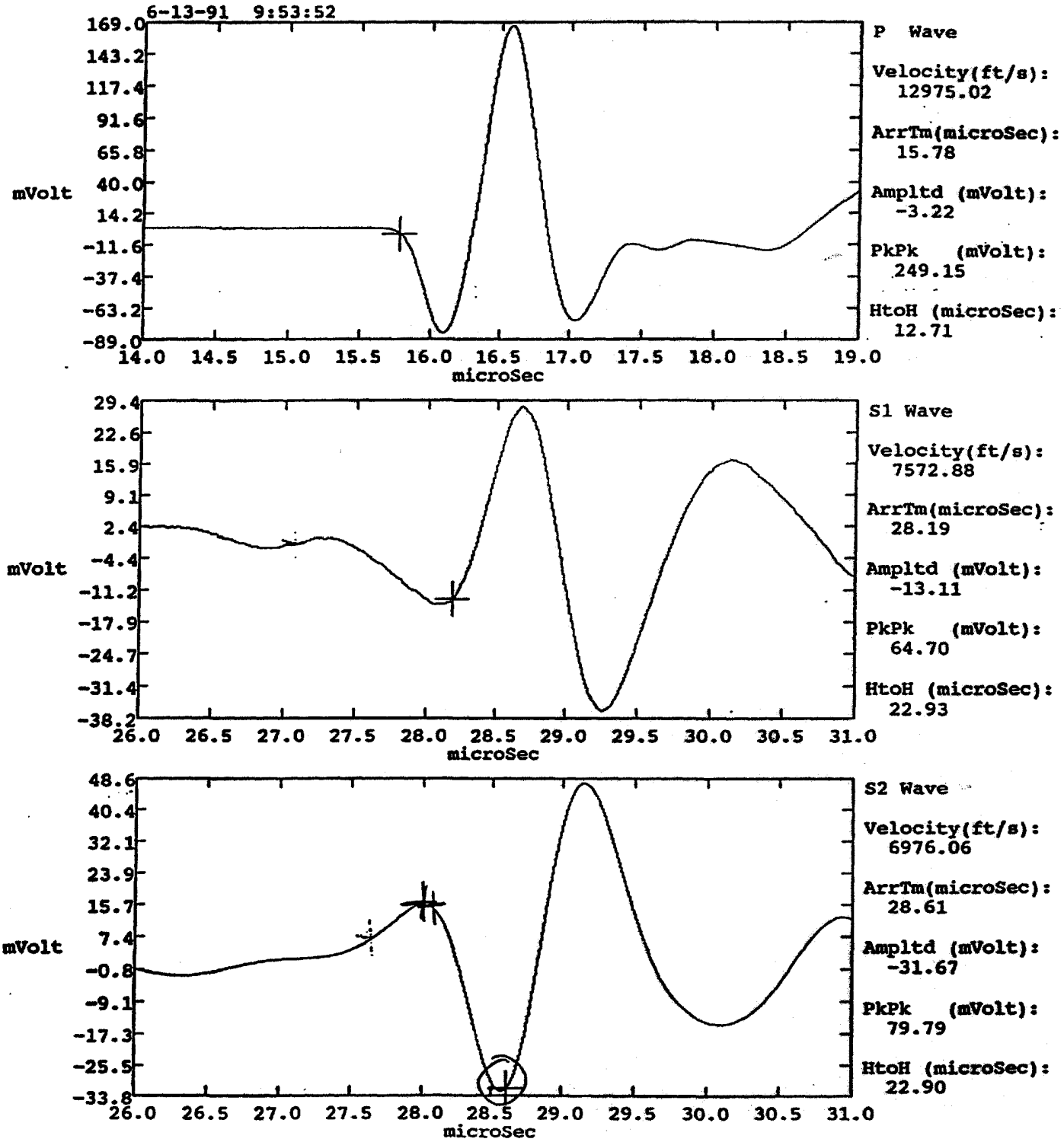
Well: EXXON ANTARES 1
Sample: 7466 Length:0.453 inch Fluid: SOLTROL
Conf. Pr:10100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 7466.4S Pick: Manual 6-12-91 10:16:18



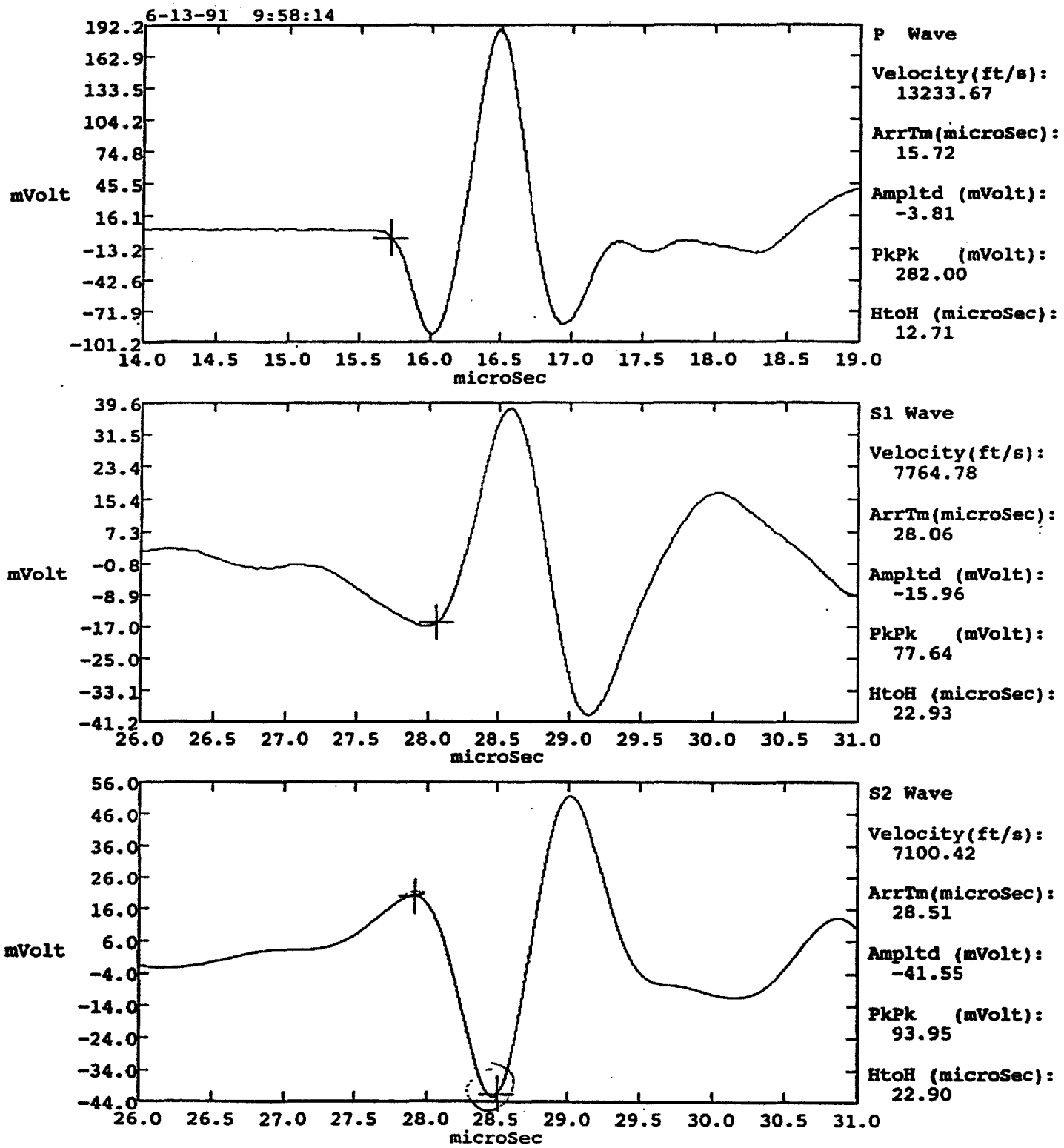
Well: EXXON ANTARES 1
Sample: 7466 Length:0.453 inch Fluid: SOLTROL
Conf Pr:15100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 7466.5S Pick: Manual 6-12-91 10:20:38



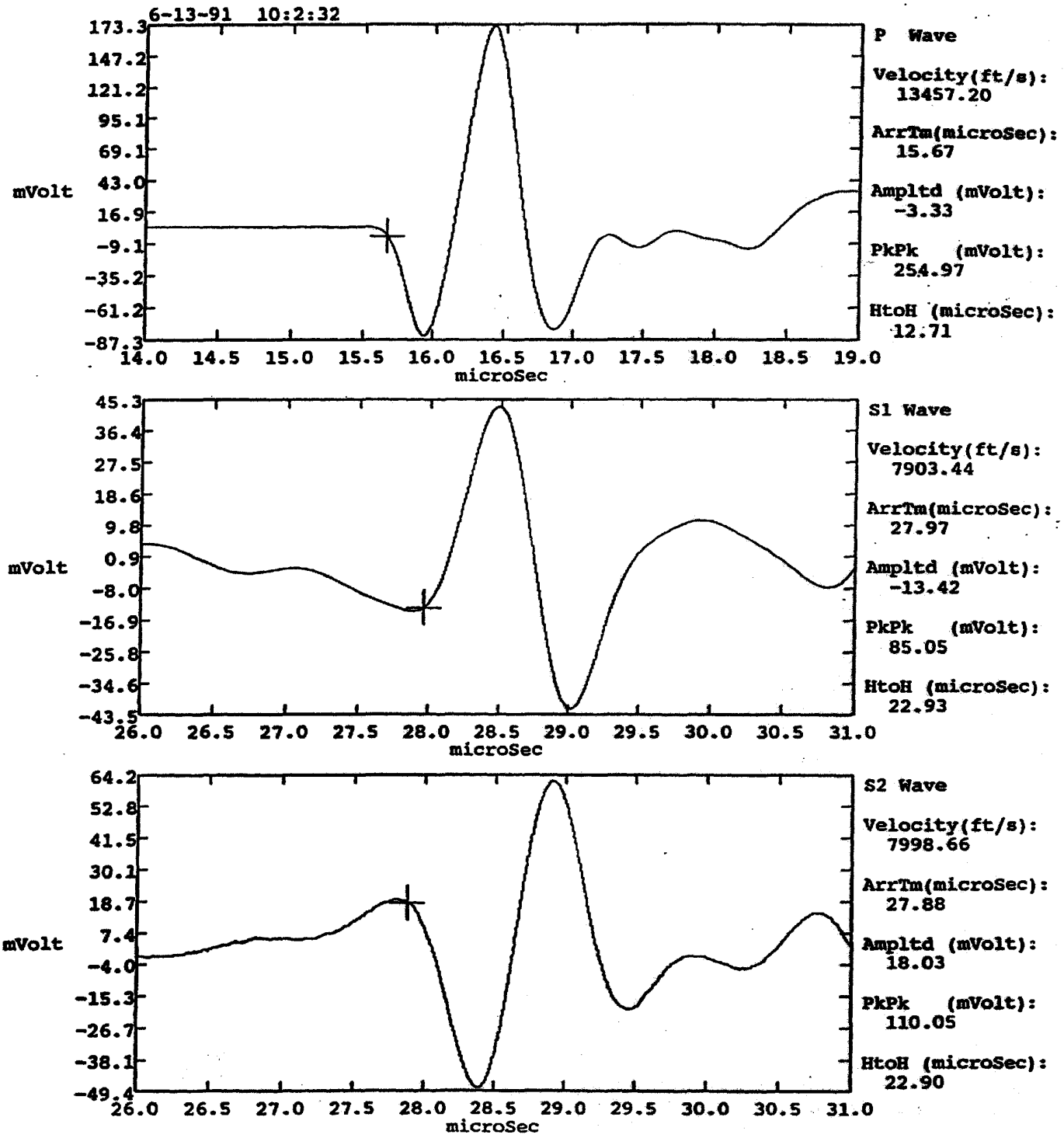
Well: EXXON ANTARES 1
Sample: 7927 Length:0.478 inch Fluid: SOLTROL
Conf Pr:1100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 7927.1S Pick: Manual 6-13-91 9:53:52



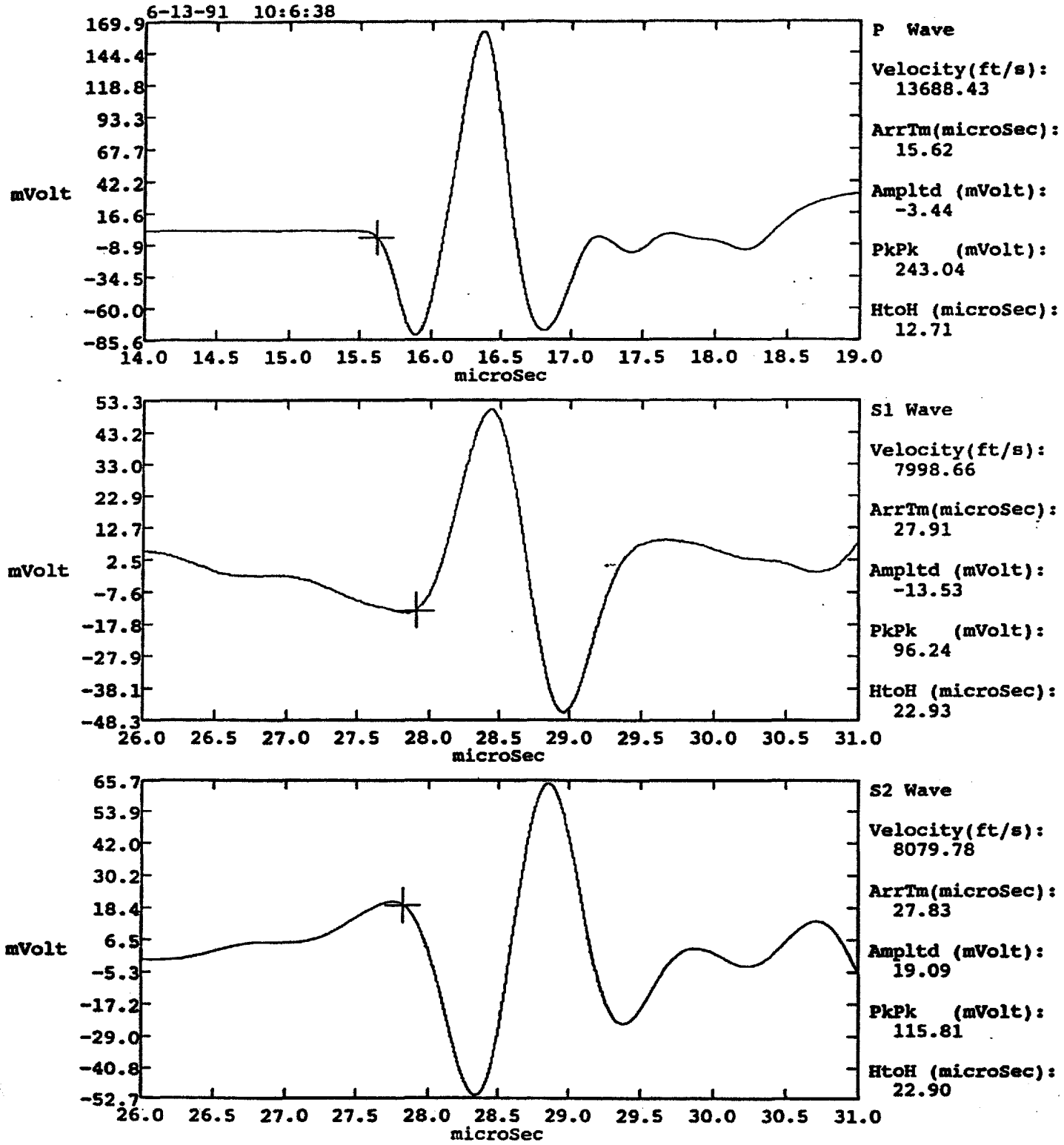
Well: EXXON ANTARES 1
Sample: 7927 Length:0.478 inch Fluid: SOLTROL
Conf Pr:4100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 7927.2S Pick: Manual 6-13-91 9:58:14



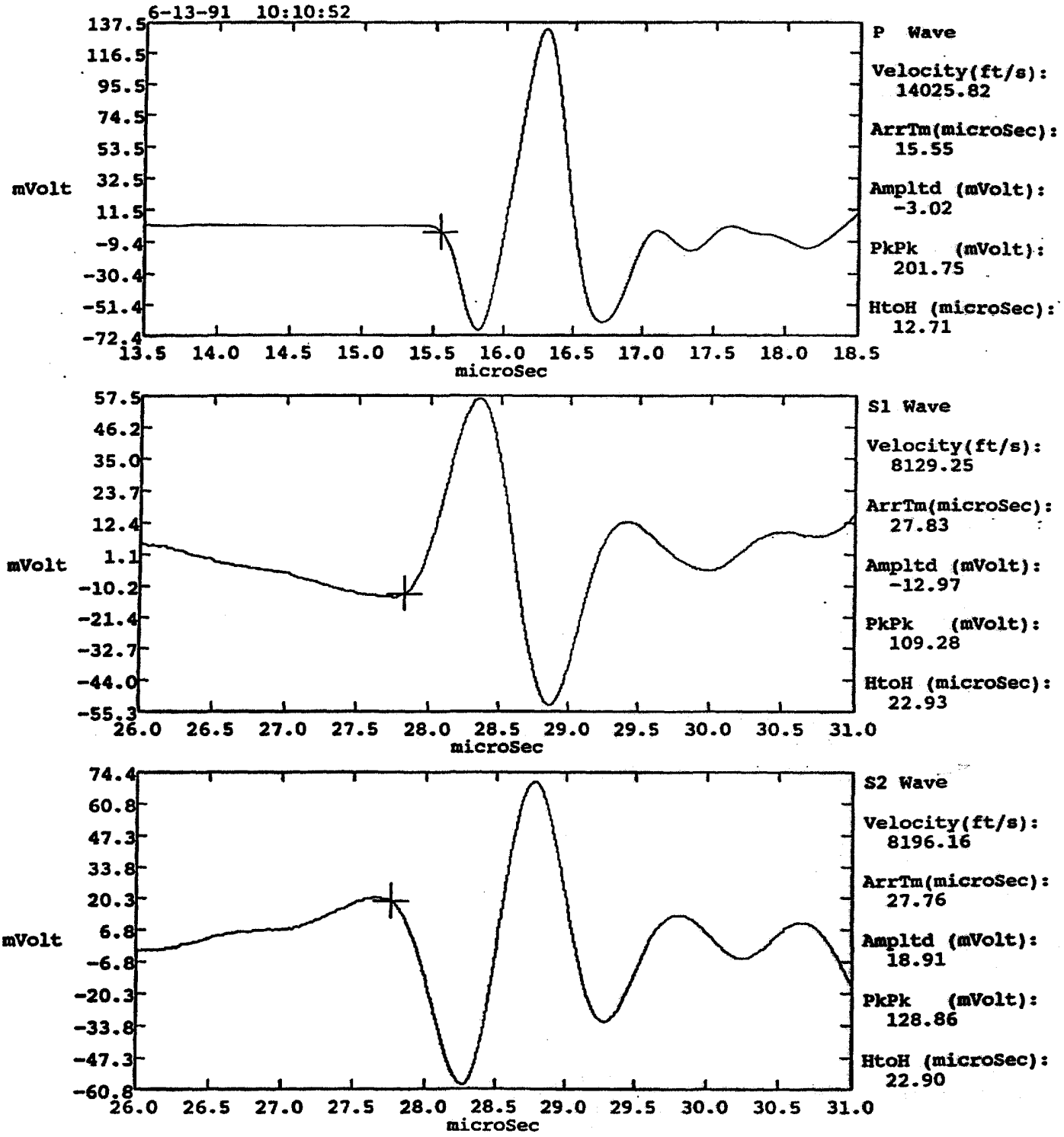
Well: EXXON ANTARES 1
Sample: 7927 Length:0.478 inch Fluid: SOLTROL
Conf Pr:7600.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 7927.3S Pick: Manual 6-13-91 10:2:32



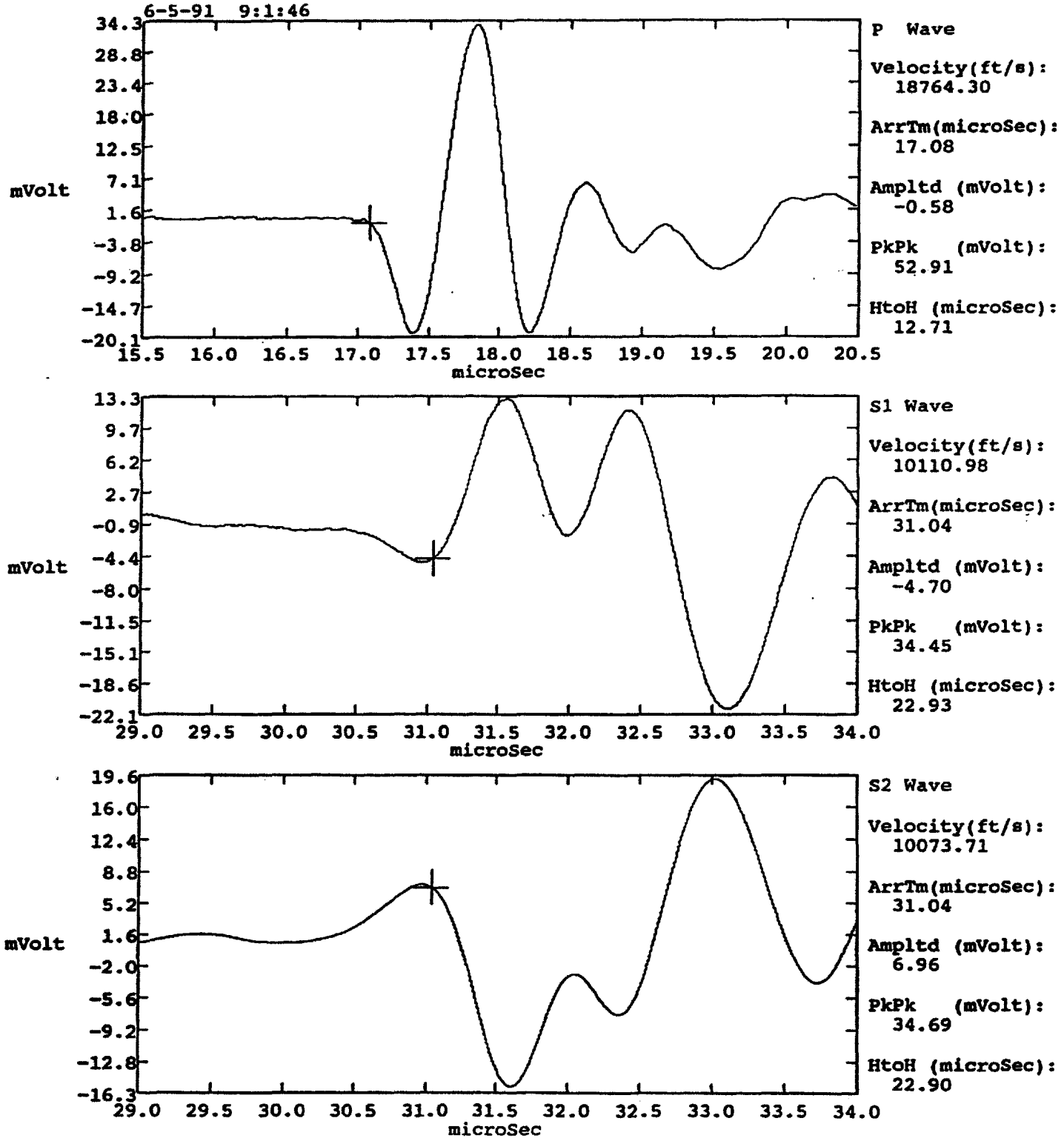
Well: EXXON ANTARES 1
Sample: 7927 Length:0.478 inch Fluid: SOLTROL
Conf Pr:10100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 7927.4S Pick: Manual 6-13-91 10:6:38



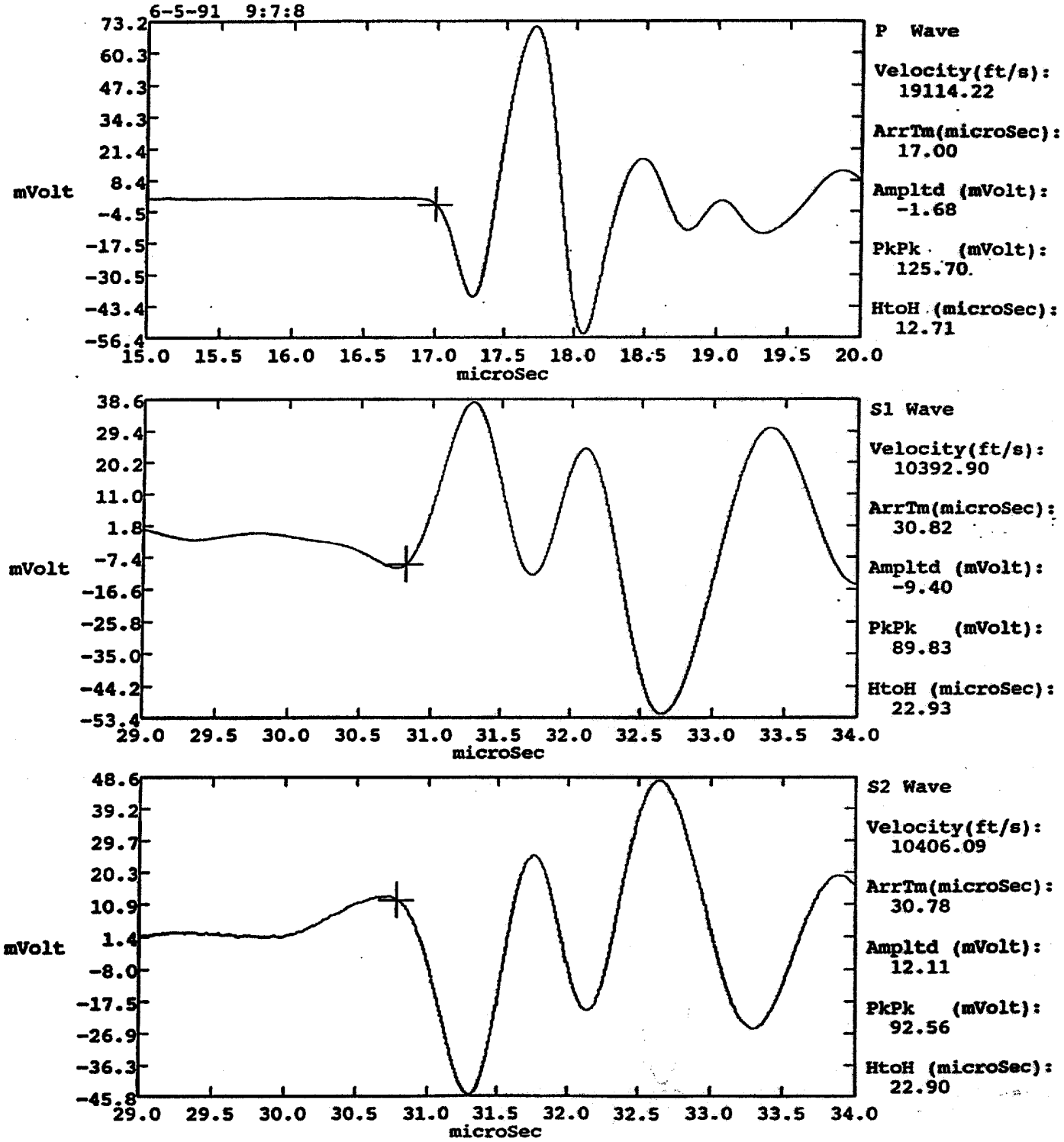
Well: EXXON ANTARES 1
Sample: 7927 Length:0.478 inch Fluid: SOLTROL
Conf Pr:15100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 7927.5S Pick: Manual 6-13-91 10:10:52



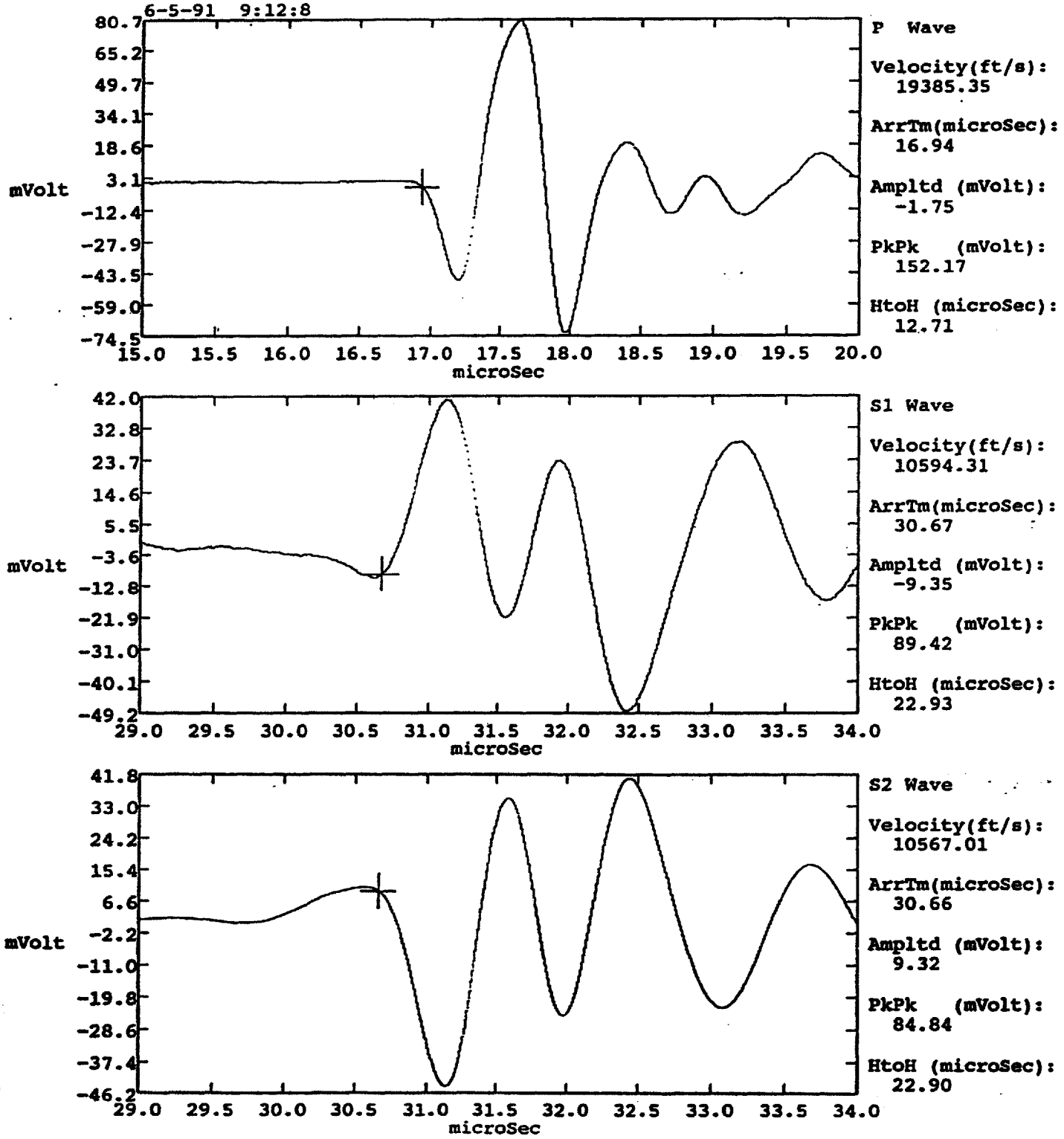
Well: EXXON ANTARES 1
Sample: 8060 Length:0.984 inch Fluid: Soltrol
Conf Pr:1100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8060.1S Pick: Manual 6-5-91 9:1:46



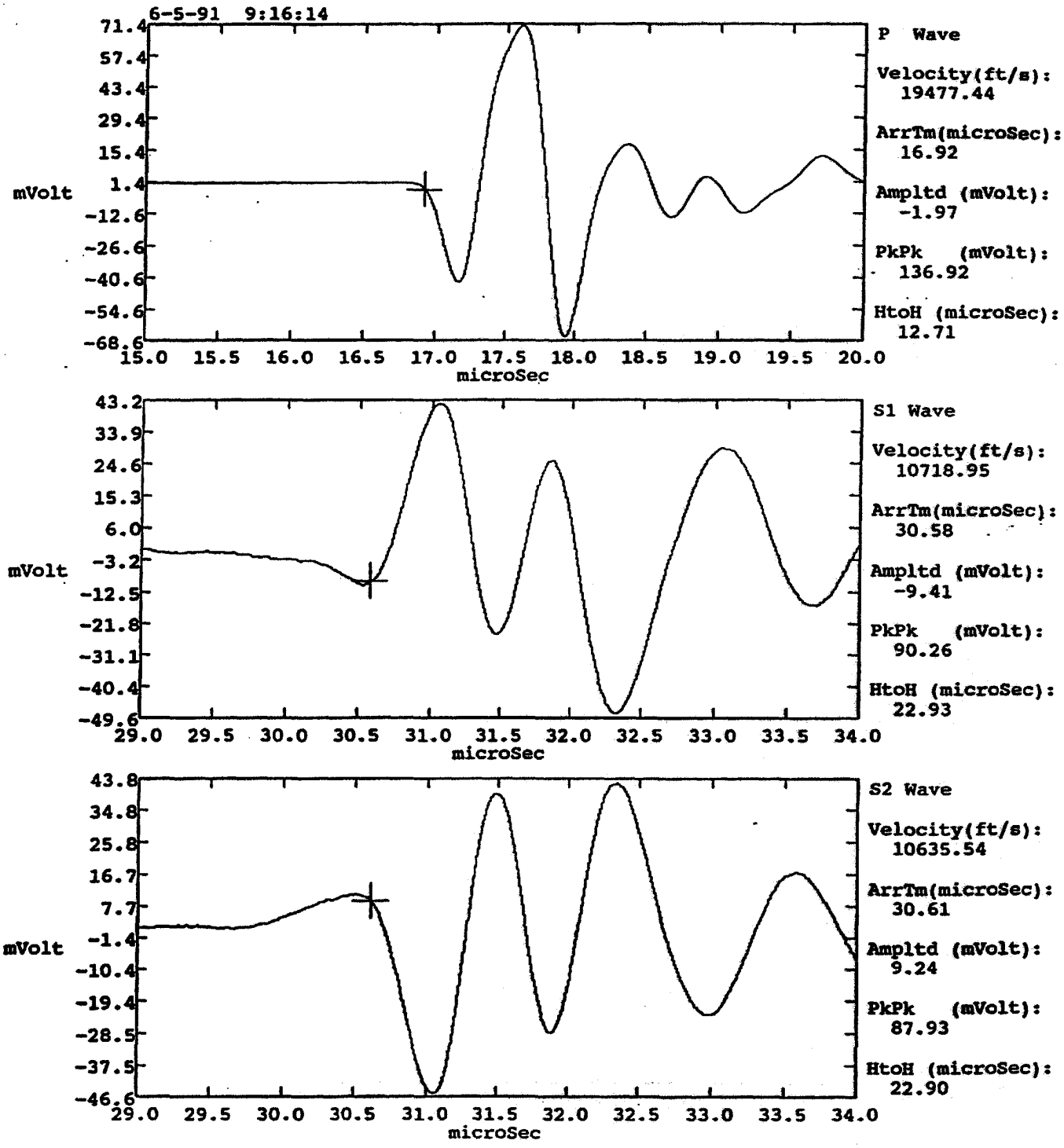
Well: EXXON ANTARES 1
Sample: 8060 Length:0.984 inch Fluid: Soltrol
Conf Pr:4100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8060.2S Pick: Manual 6-5-91 9:7:8



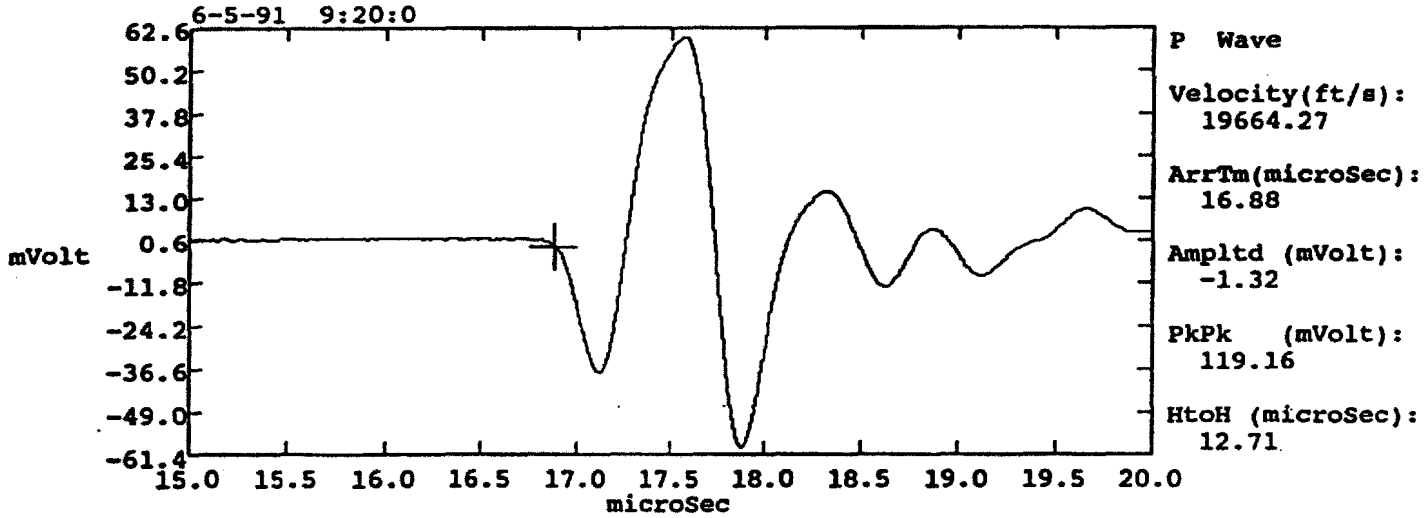
Well: EXXON ANTARES 1
Sample: 8060 Length:0.984 inch Fluid: Soltrol
Conf Pr:7600.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8060.3S Pick: Manual 6-5-91 9:12:8

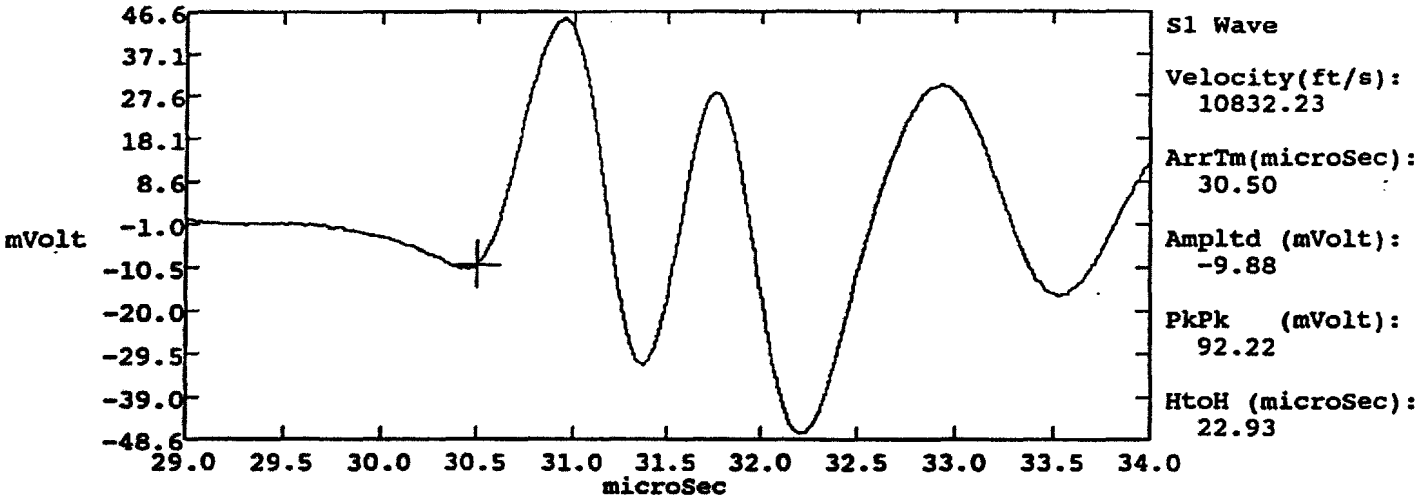


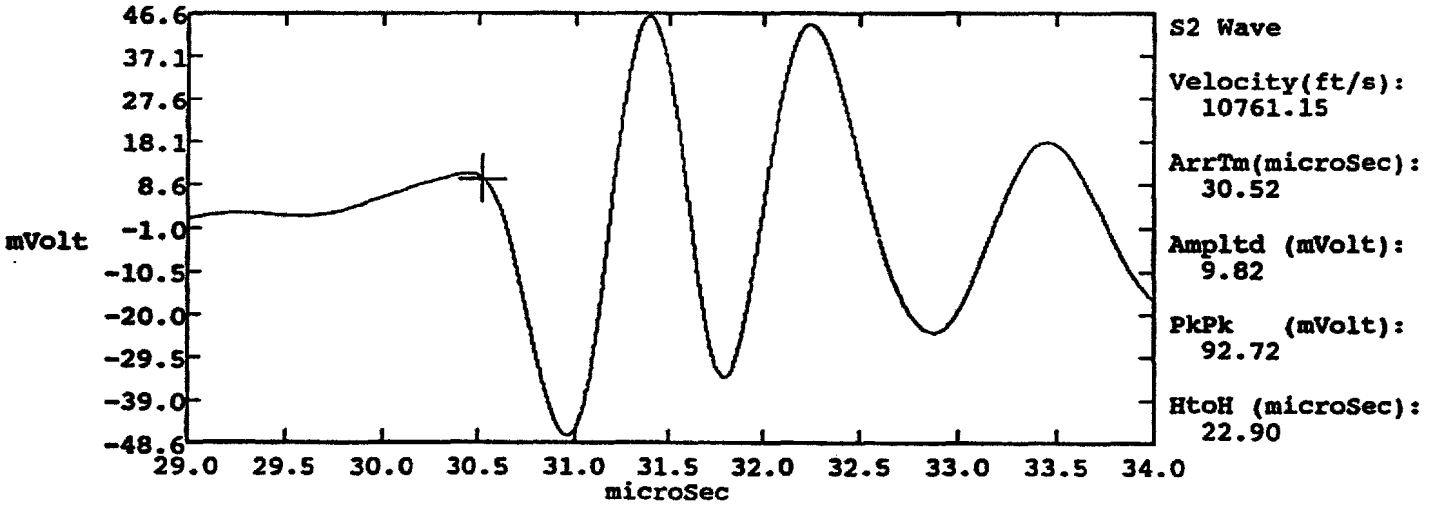
Well: EXXON ANTARES 1
Sample: 8060 Length:0.984 inch Fluid: Soltrol
Conf Pr:10100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8060.4S Pick: Manual 6-5-91 9:16:14



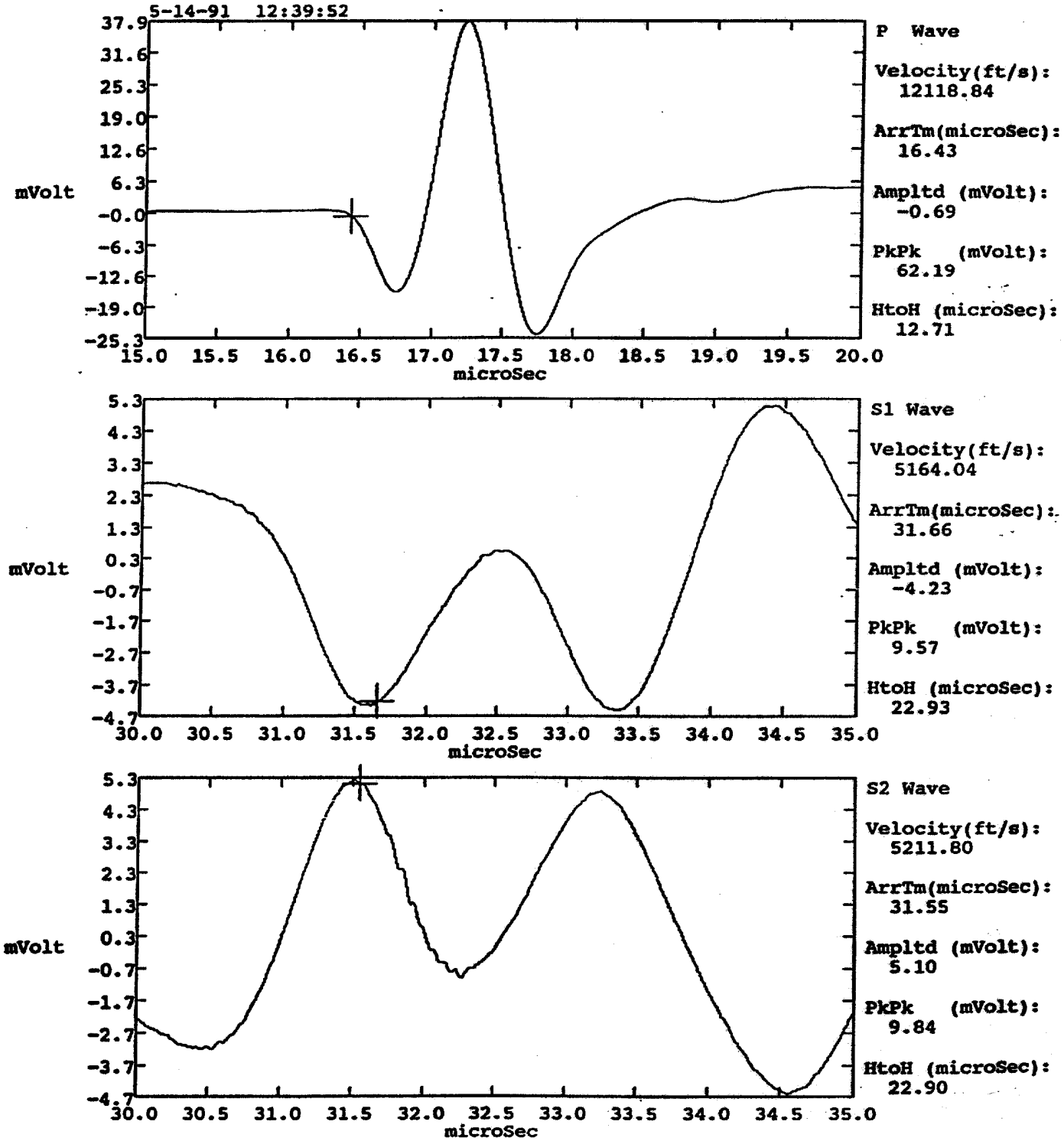
Well: EXXON ANTARES 1
Sample: 8060 Length:0.984 inch Fluid: Soltrol
Conf Pr:15100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8060.5S Pick: Manual 6-5-91 9:20:0





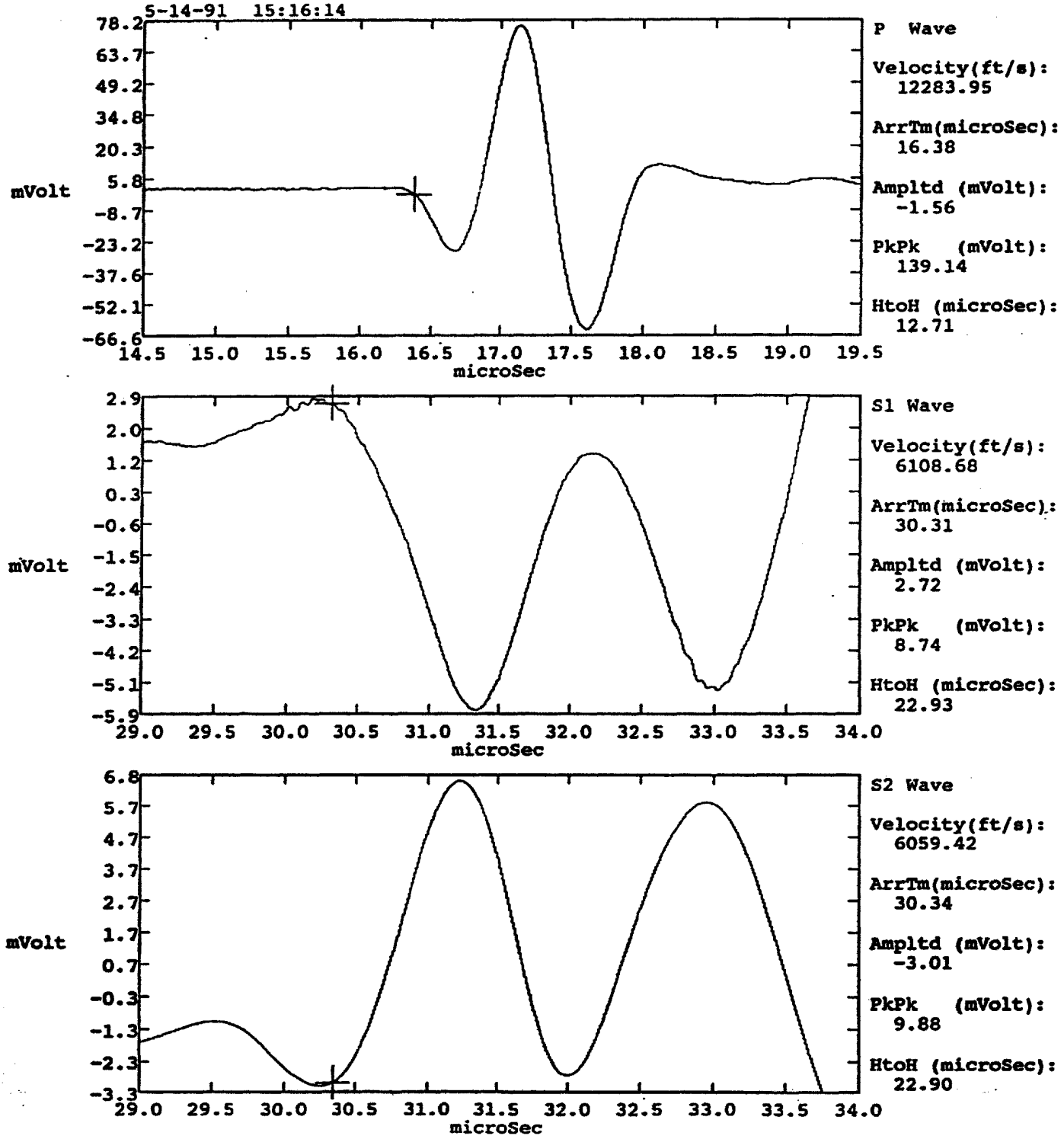


Well: Exxon antares 1
Sample: 8221 Length:0.541 inch Fluid: Brine
Conf Pr:1100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8221.1B Pick: Manual 5-14-91 15:11:42
20kppm NaCl Brine

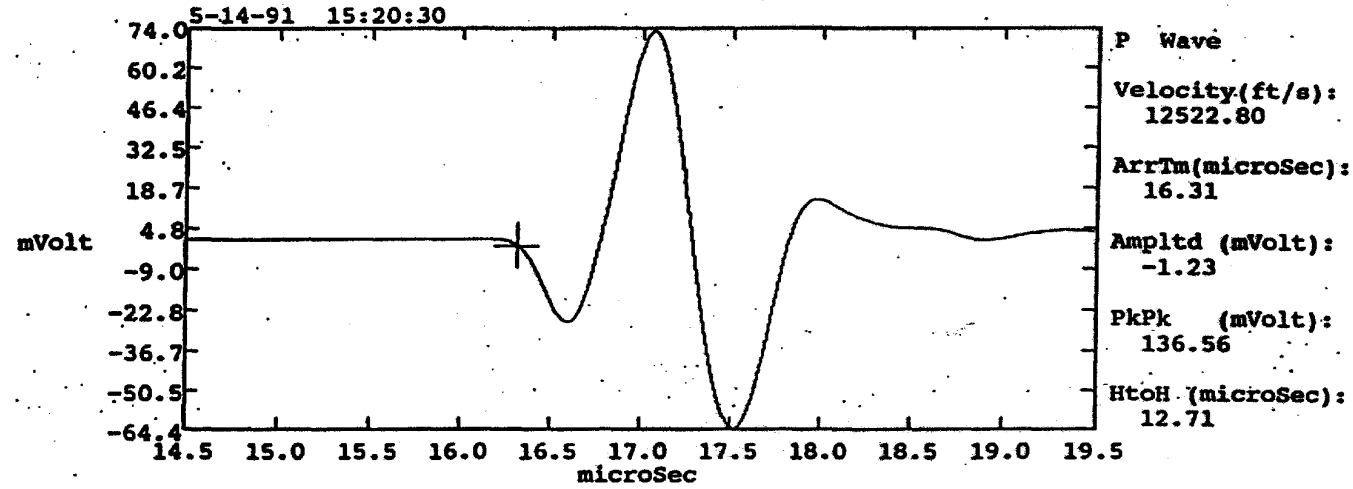


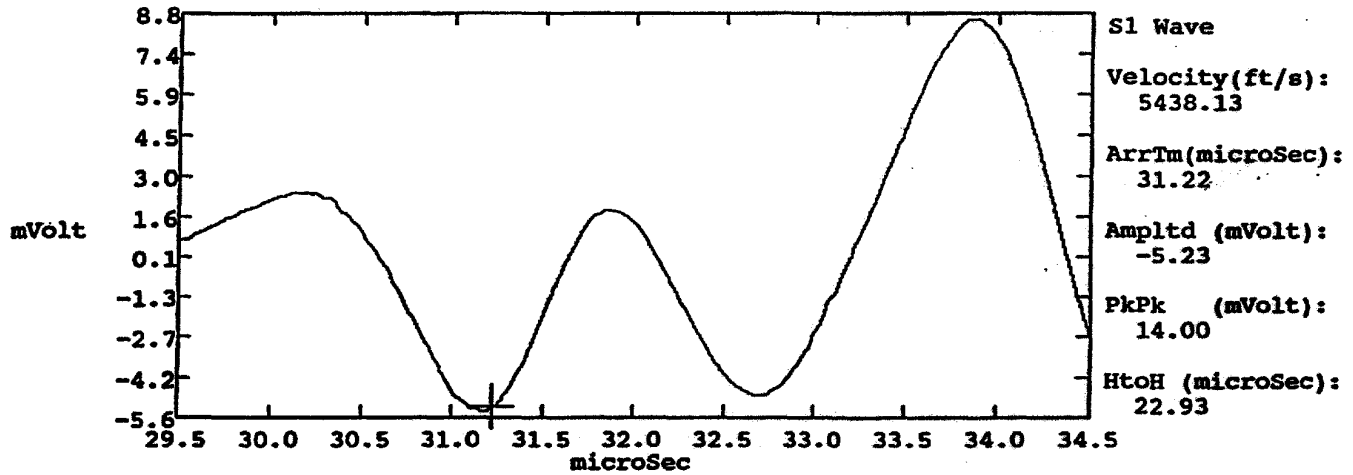
Well: Exxon antares 1
Sample: 8221 Length:0.541 inch Fluid: Brine
Conf Pr:4100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8221.2B Pick: Manual 5-14-91 15:16:16
20kppm NaCI Brine

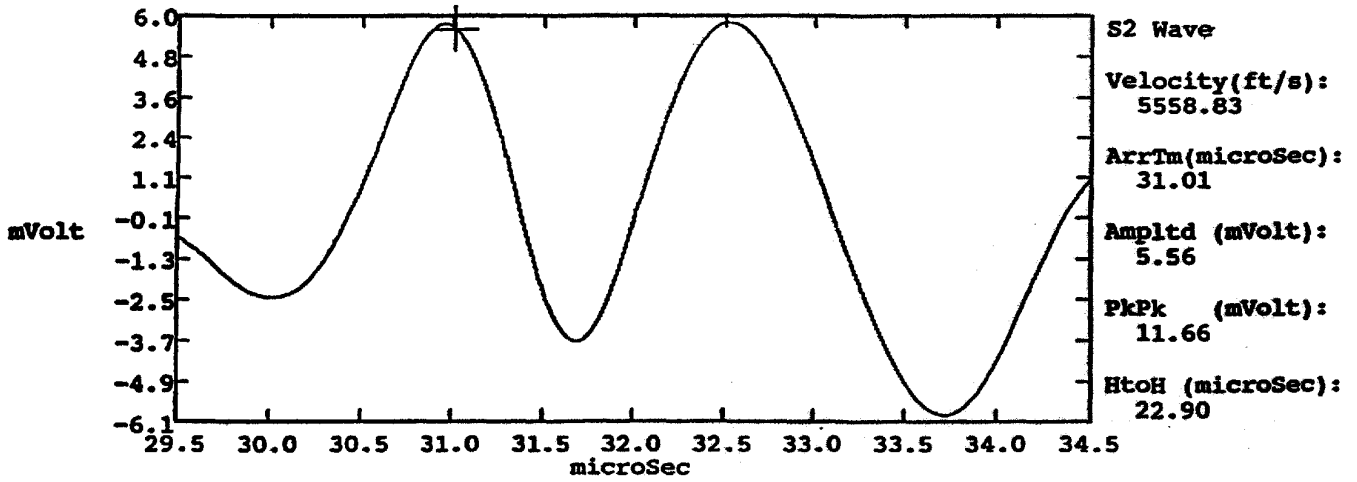
5-14-91 15:16:14



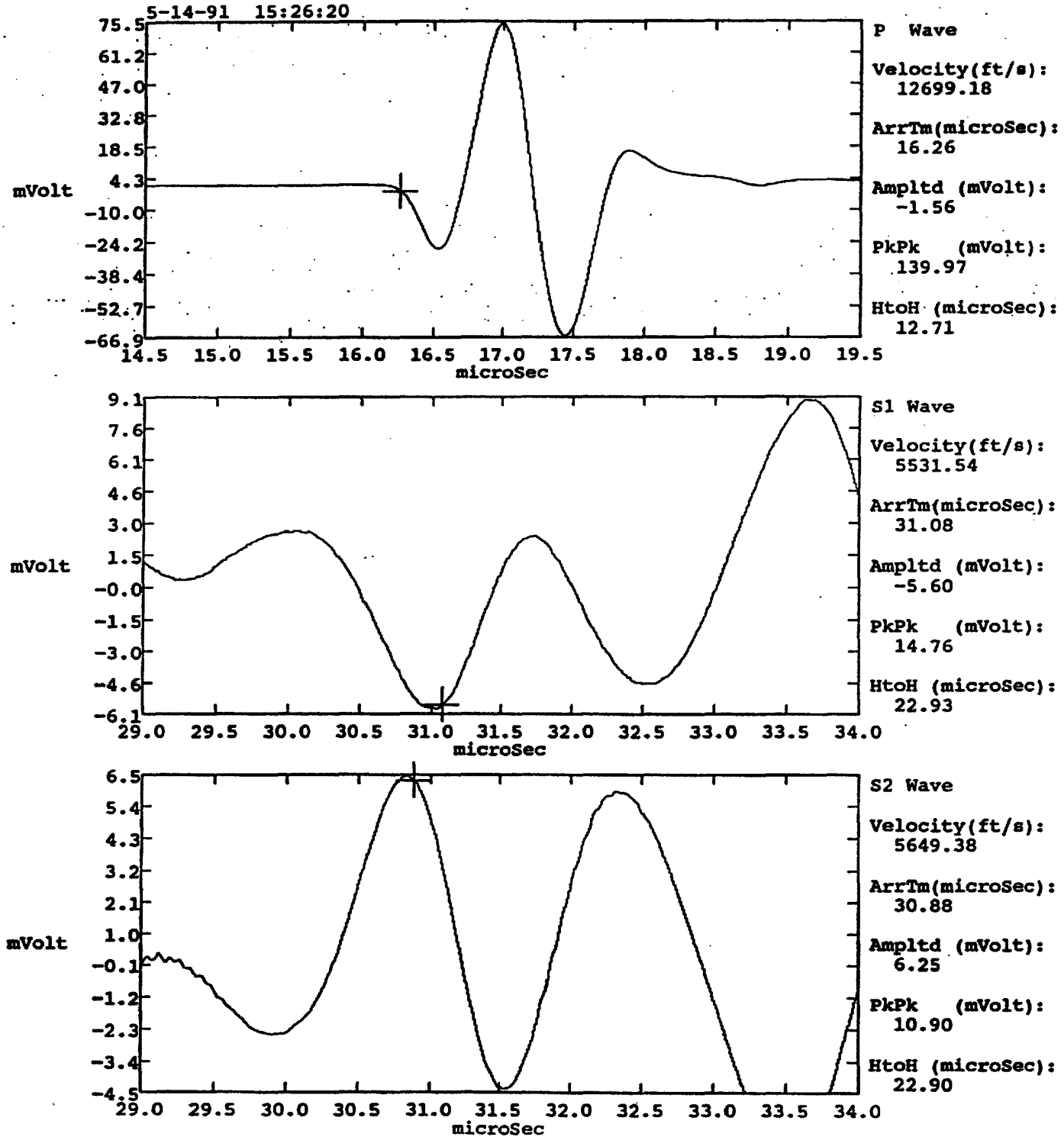
Well: Exxon antares 1
Sample: 8221 Length:0.541 inch Fluid: Brine
Conf Pr:7600.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8221.3B Pick: Manual 5-14-91 15:20:30
20kppm NaCl Brine



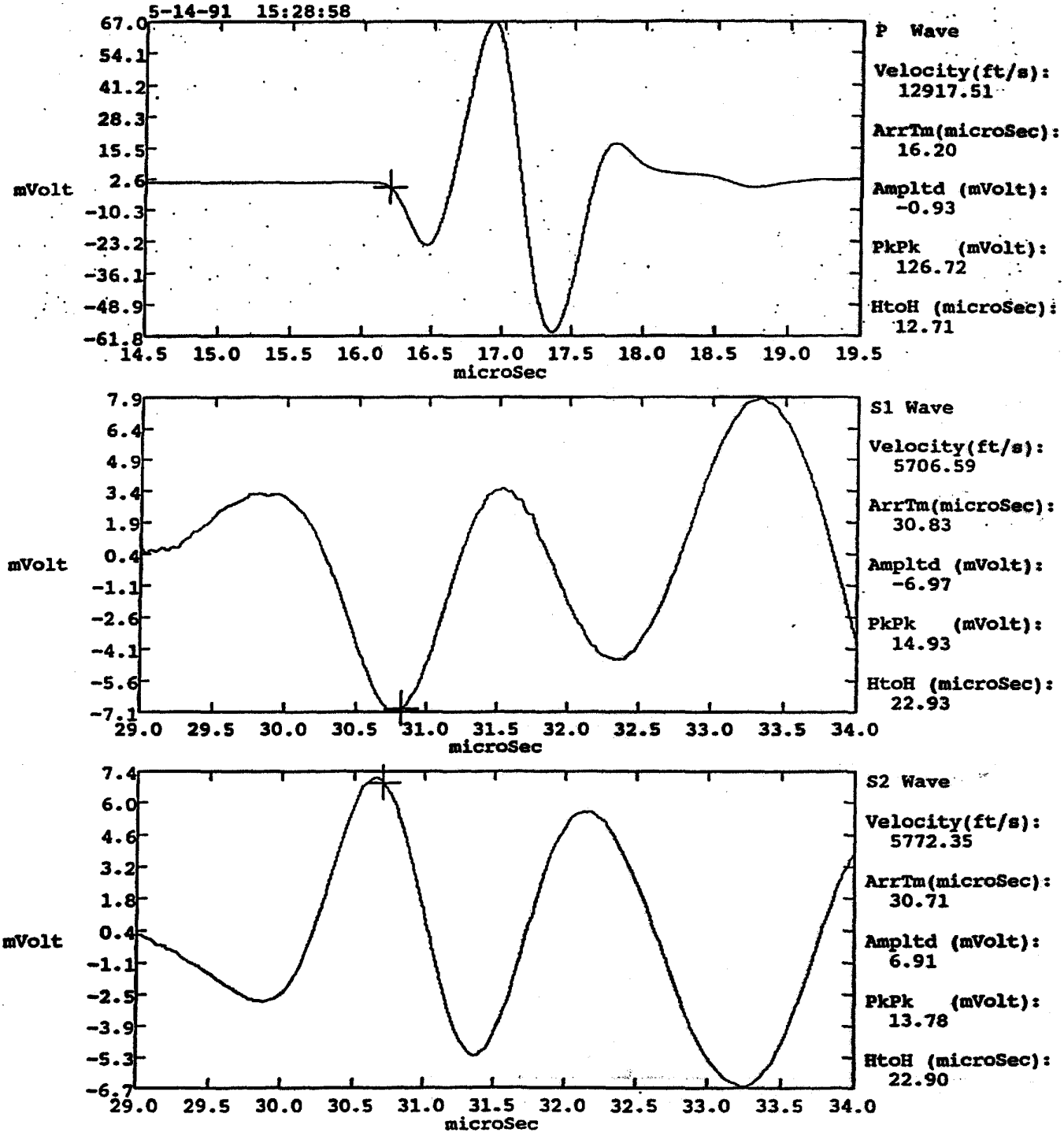




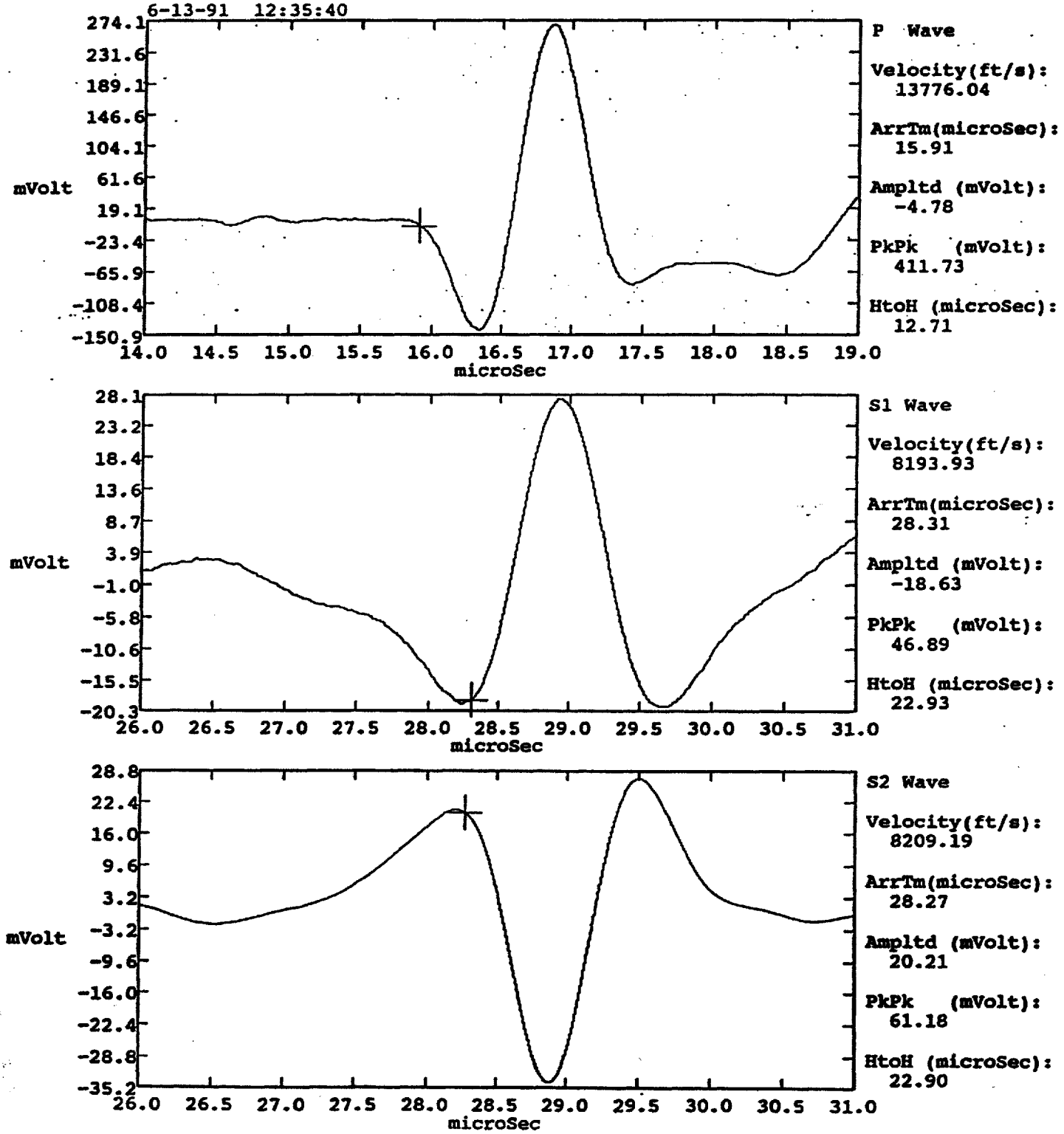
Well: Exxon antares 1
Sample: 8221 Length:0.541 inch Fluid: Brine
Conf Pr:10100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8221.4B Pick: Manual 5-14-91 15:26:22
20kppm NaCl Brine



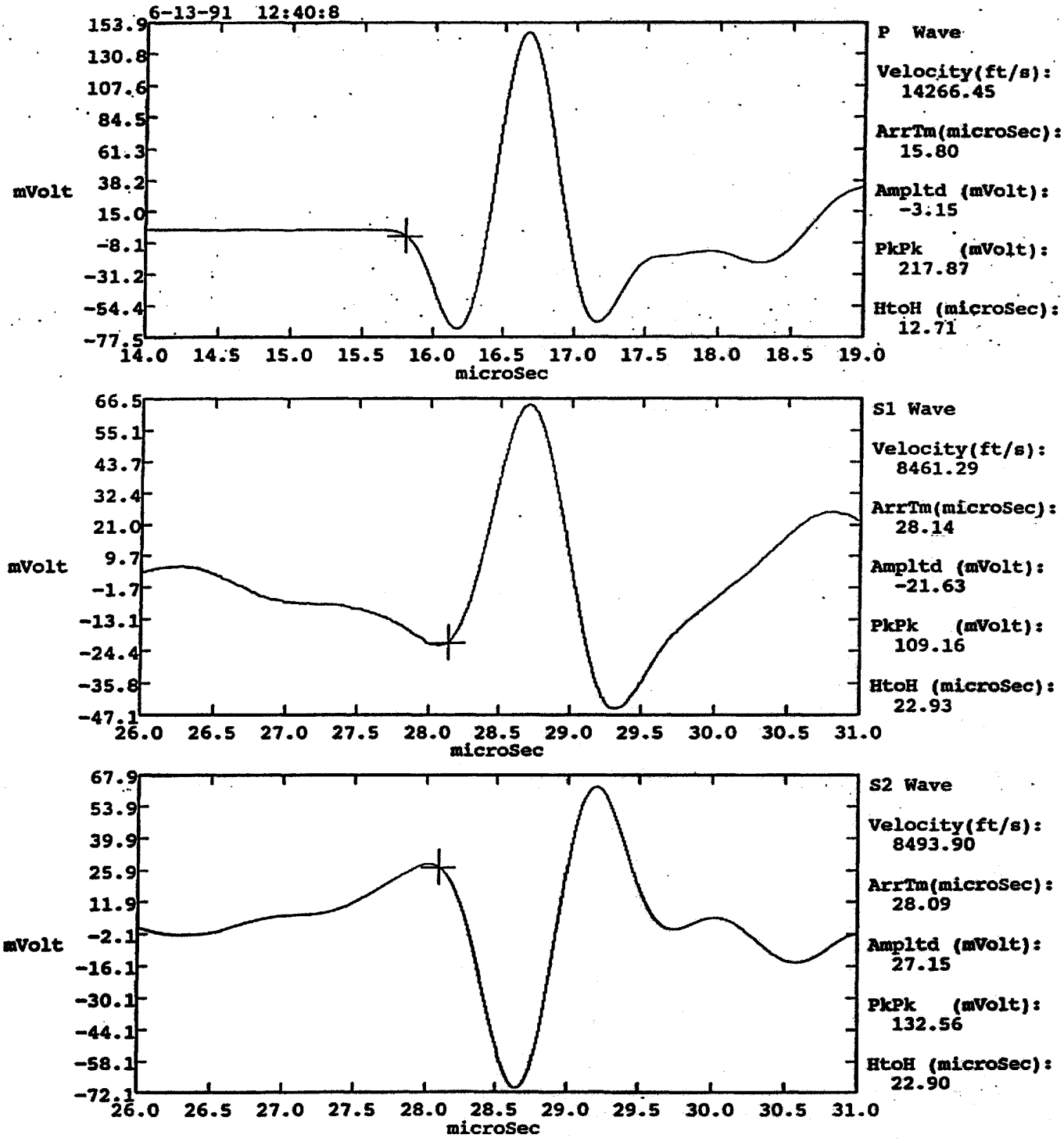
Well: Exxon antares 1
Sample: 8221 Length:0.541 inch Fluid: Brine
Conf Pr:15100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8221.5B Pick: Manual 5-14-91 15:28:58
20kppm NaCl Brine



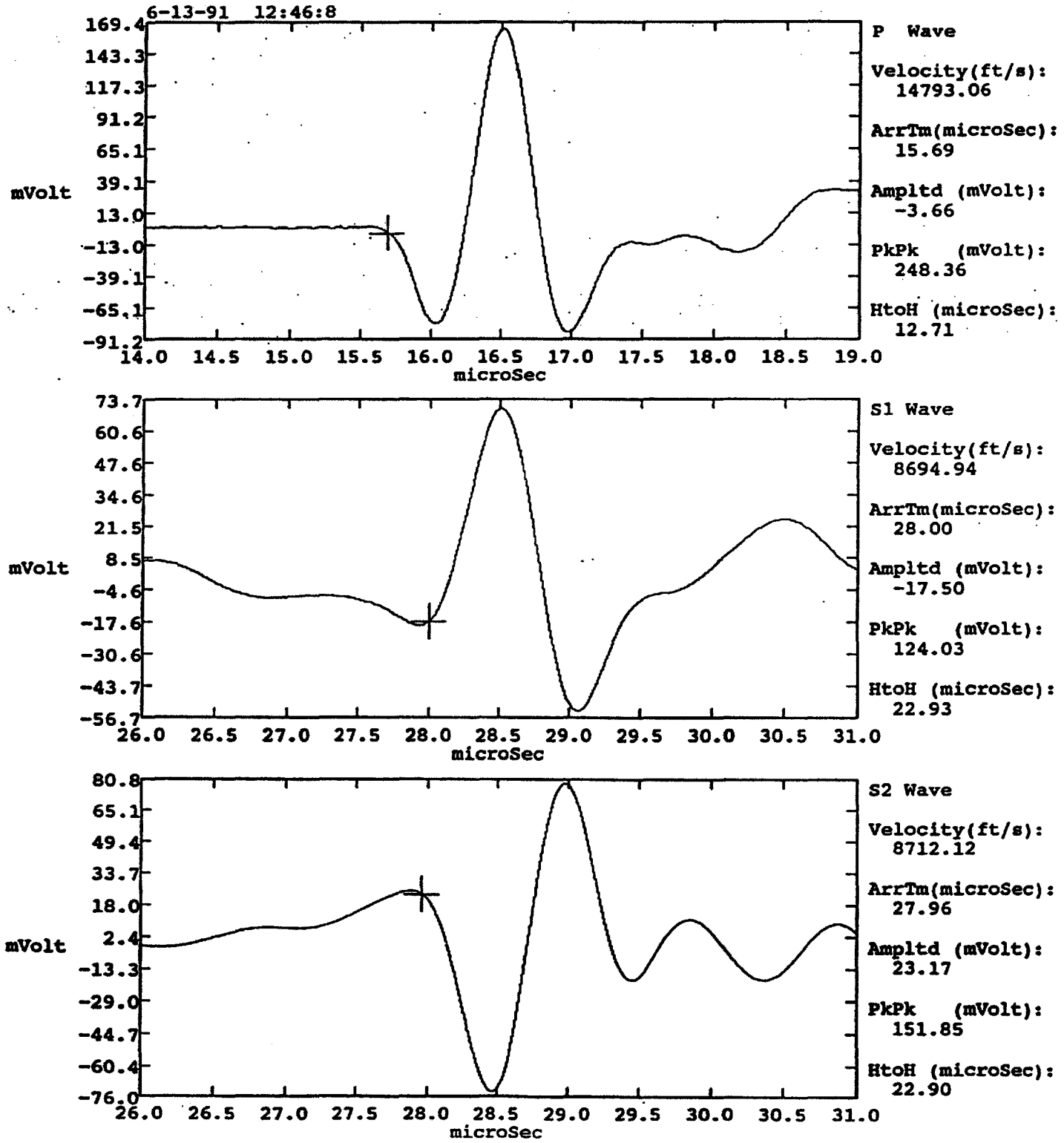
Well: EXXON ANTARES 1
Sample: 8221 Length:0.529 inch Fluid: SOLTROL
Conf Pr:1100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8221.1S Pick: Manual 6-13-91 12:35:40



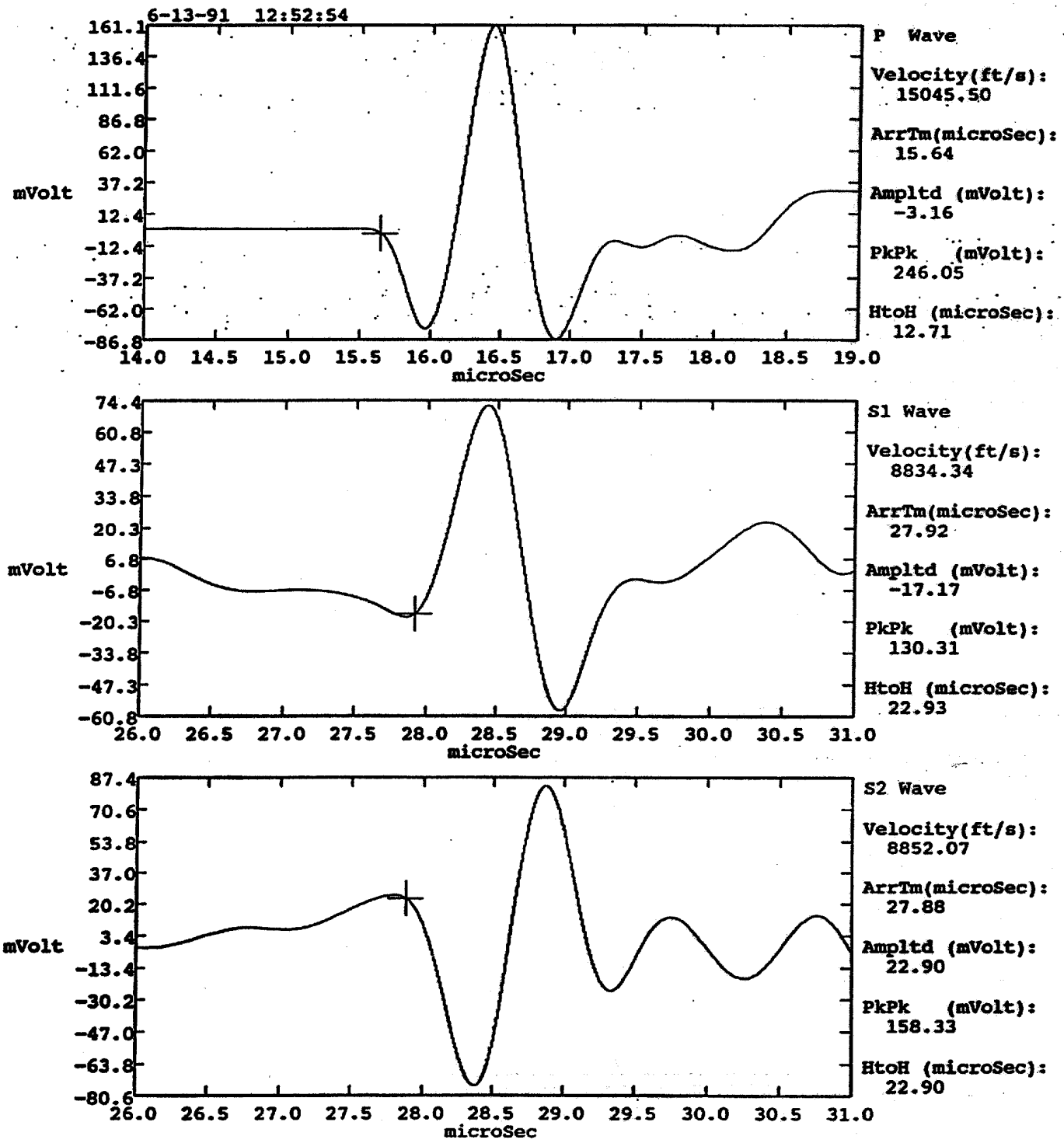
Well: EXXON ANTARES 1
Sample: 8221 Length:0.529 inch Fluid: SOLTROL
Conf Pr:4100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8221.2S Pick: Manual 6-13-91 12:40:8



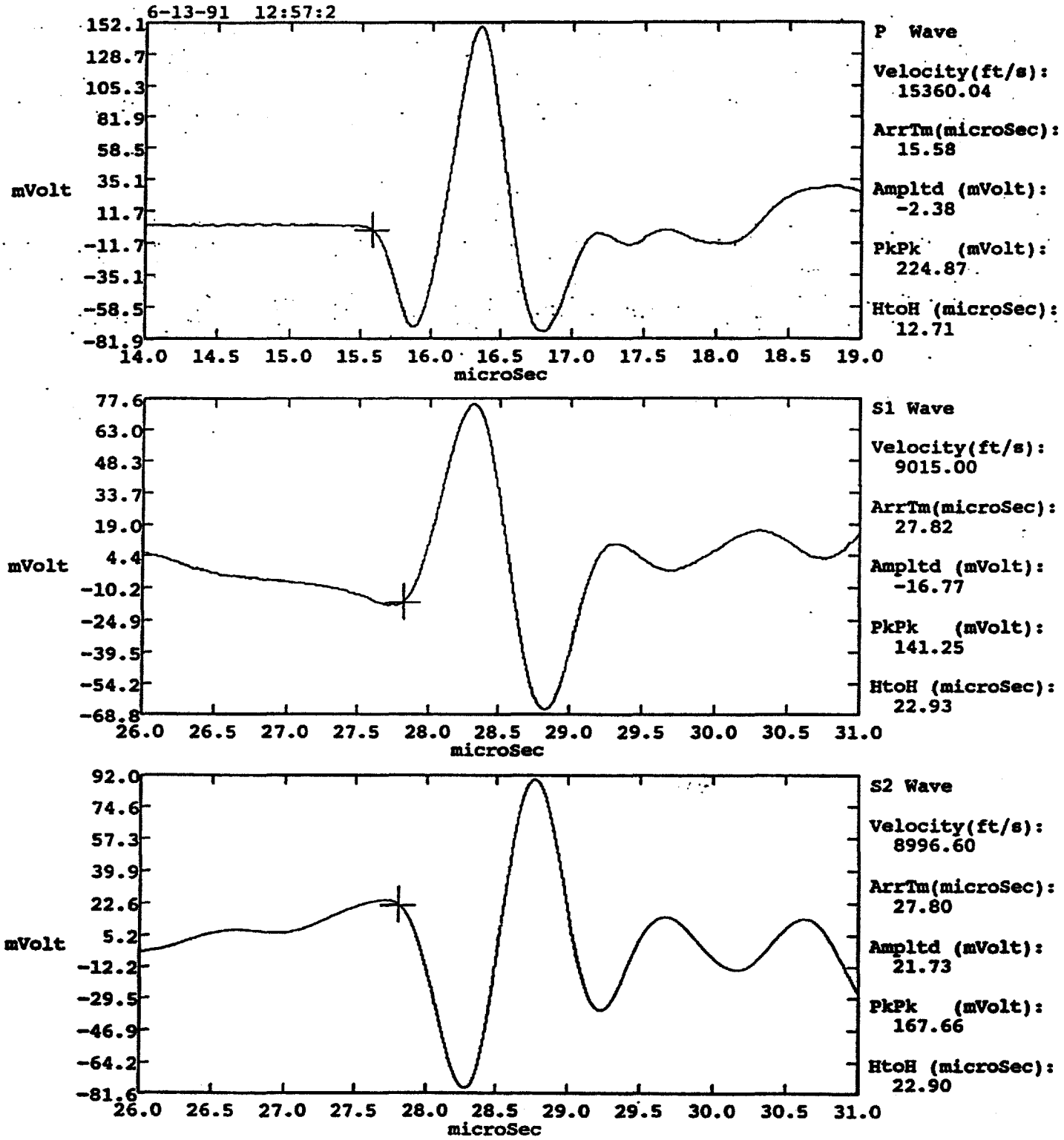
Well: EXXON ANTARES 1
Sample: 8221 Length:0.529 inch Fluid: SOLTROL
Conf Pr:7600.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8221.3S Pick: Manual 6-13-91 12:46:8



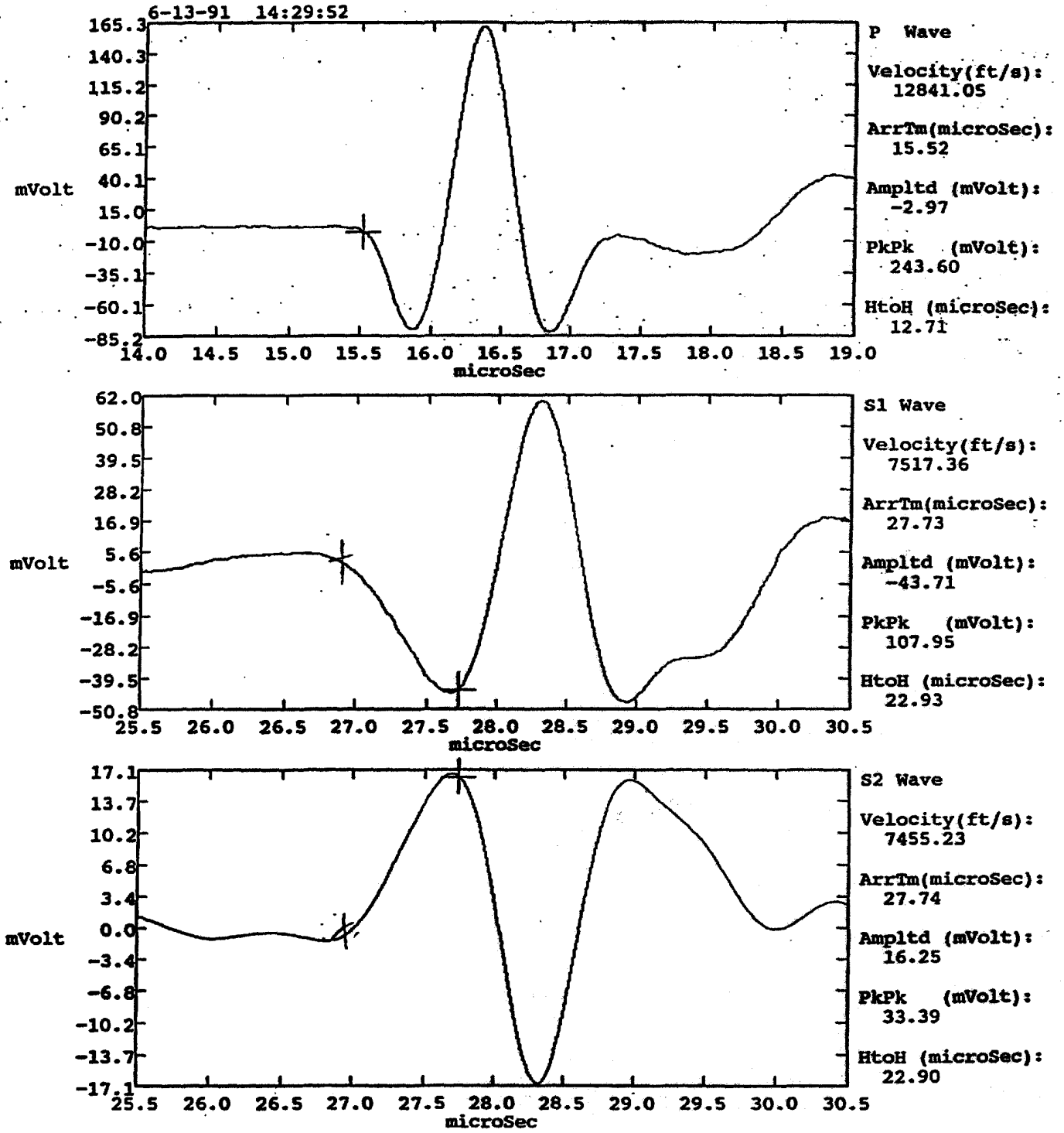
Well: EXXON ANTARES 1
Sample: 8221 Length:0.529 inch Fluid: SOLTROL
Conf Pr:10100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8221.4S Pick: Manual 6-13-91 12:52:54



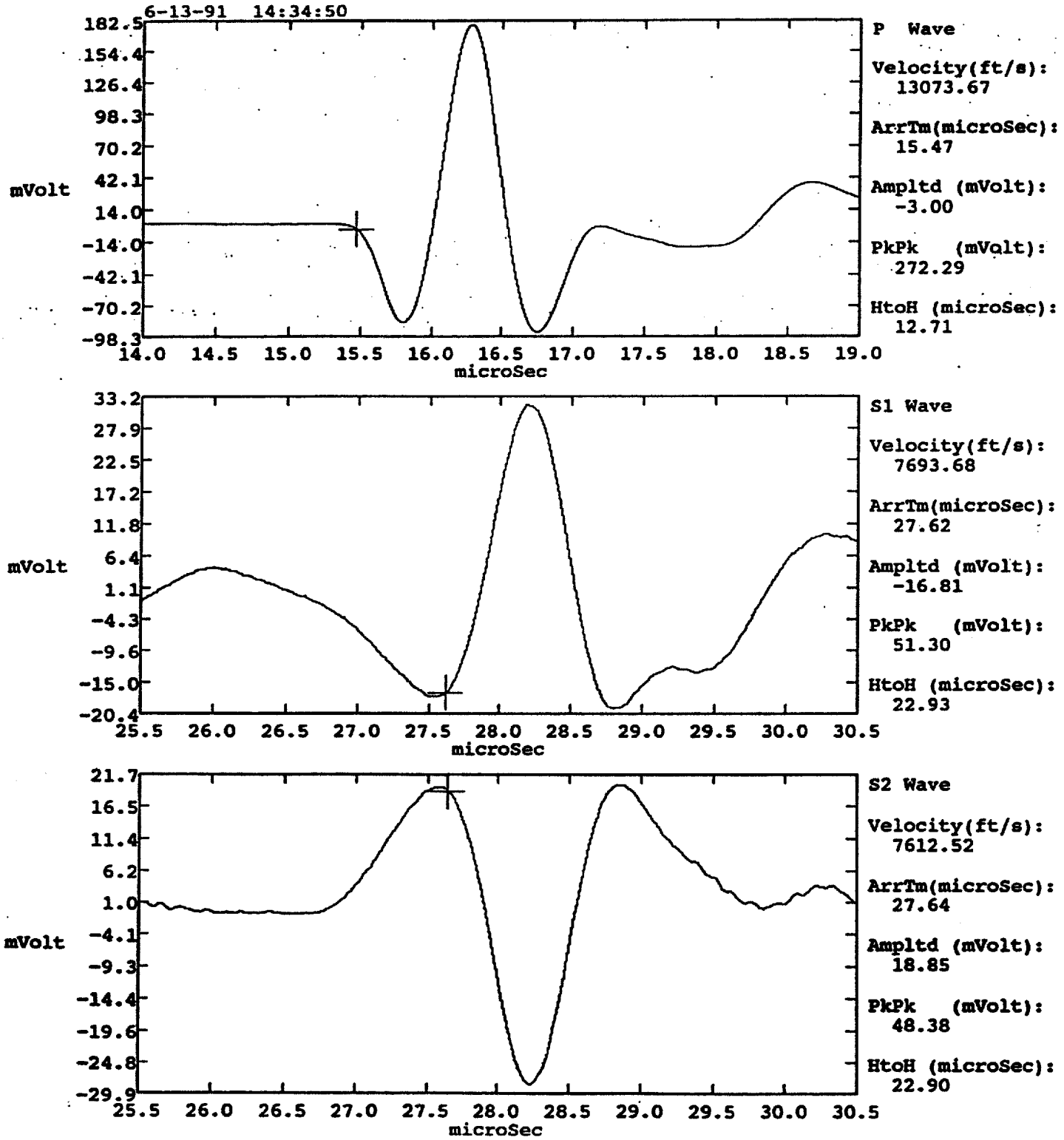
Well: EXXON ANTARES 1
Sample: 8221 Length:0.529 inch Fluid: SOLTROL
Conf Pr:15100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8221.5S Pick: Manual 6-13-91 12:57:2



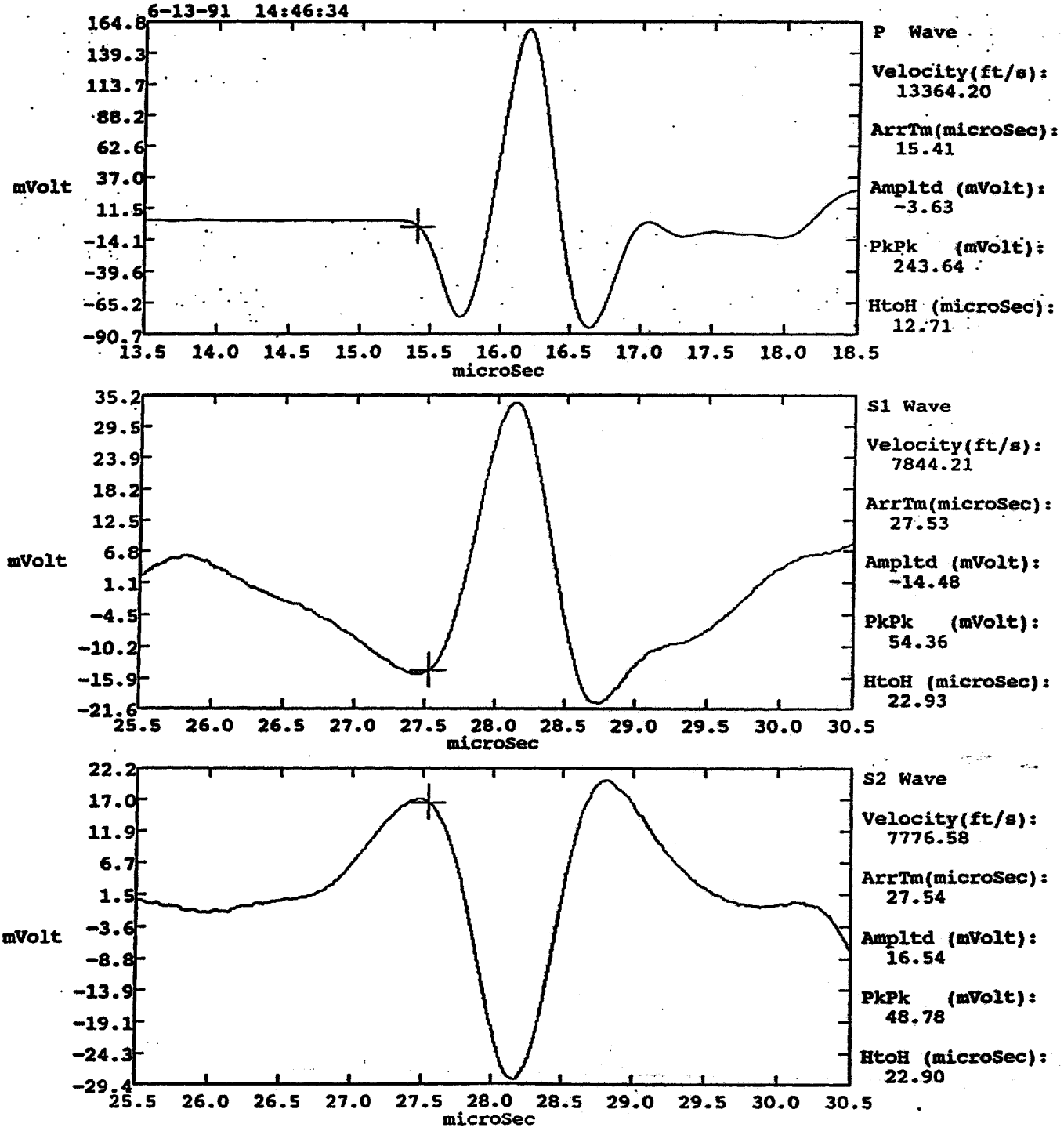
Well: EXXON ANTARES 1
Sample: 8283 Length:0.433 inch Fluid: SOLTROL
Conf Pr:1100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8283.1S Pick: Manual 6-13-91 14:29:52



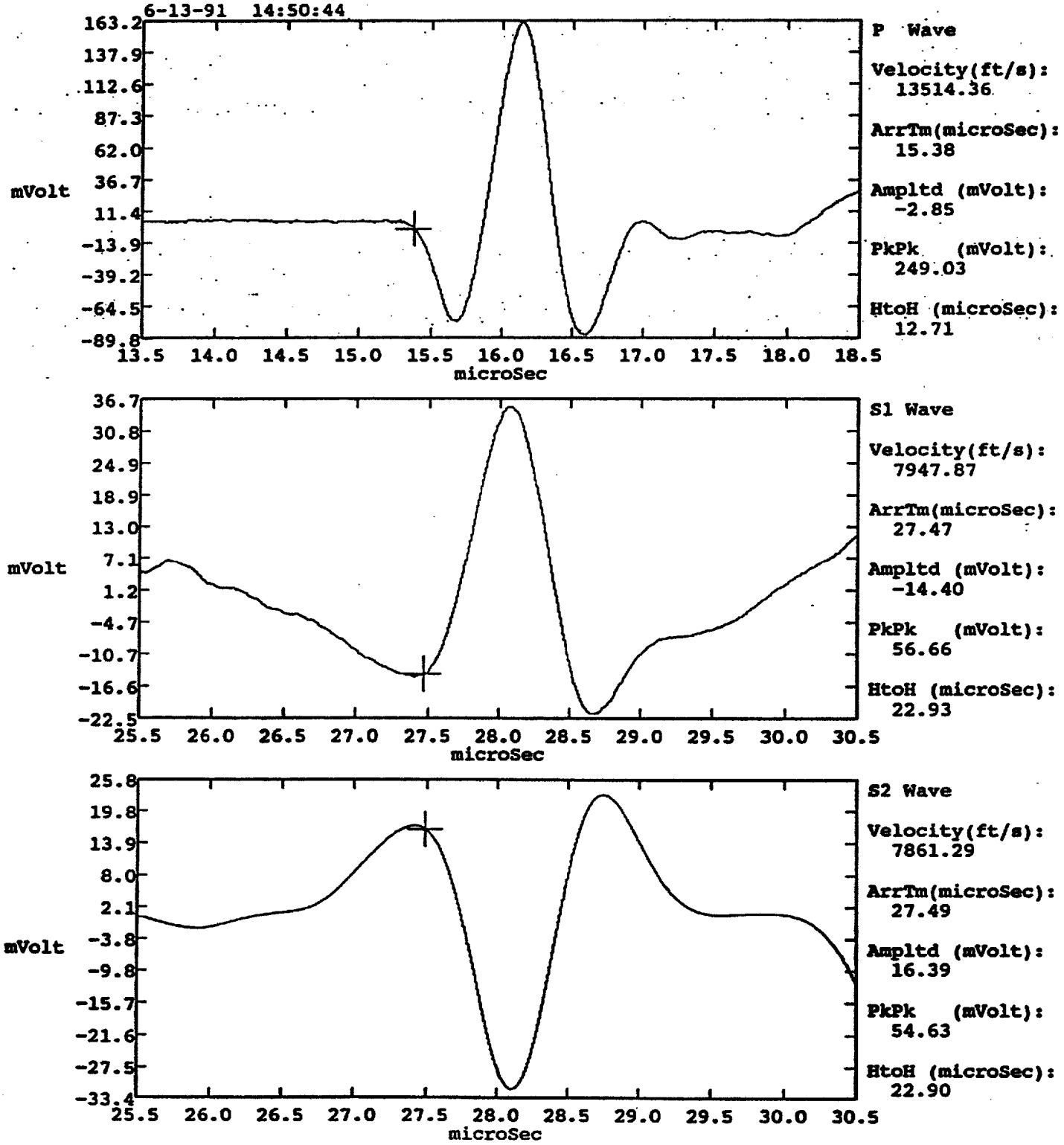
Well: EXXON ANTARES 1
Sample: 8283 Length:0.433 inch Fluid: SOLTROL
Conf Pr:4100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8283.2S Pick: Manual 6-13-91 14:34:50



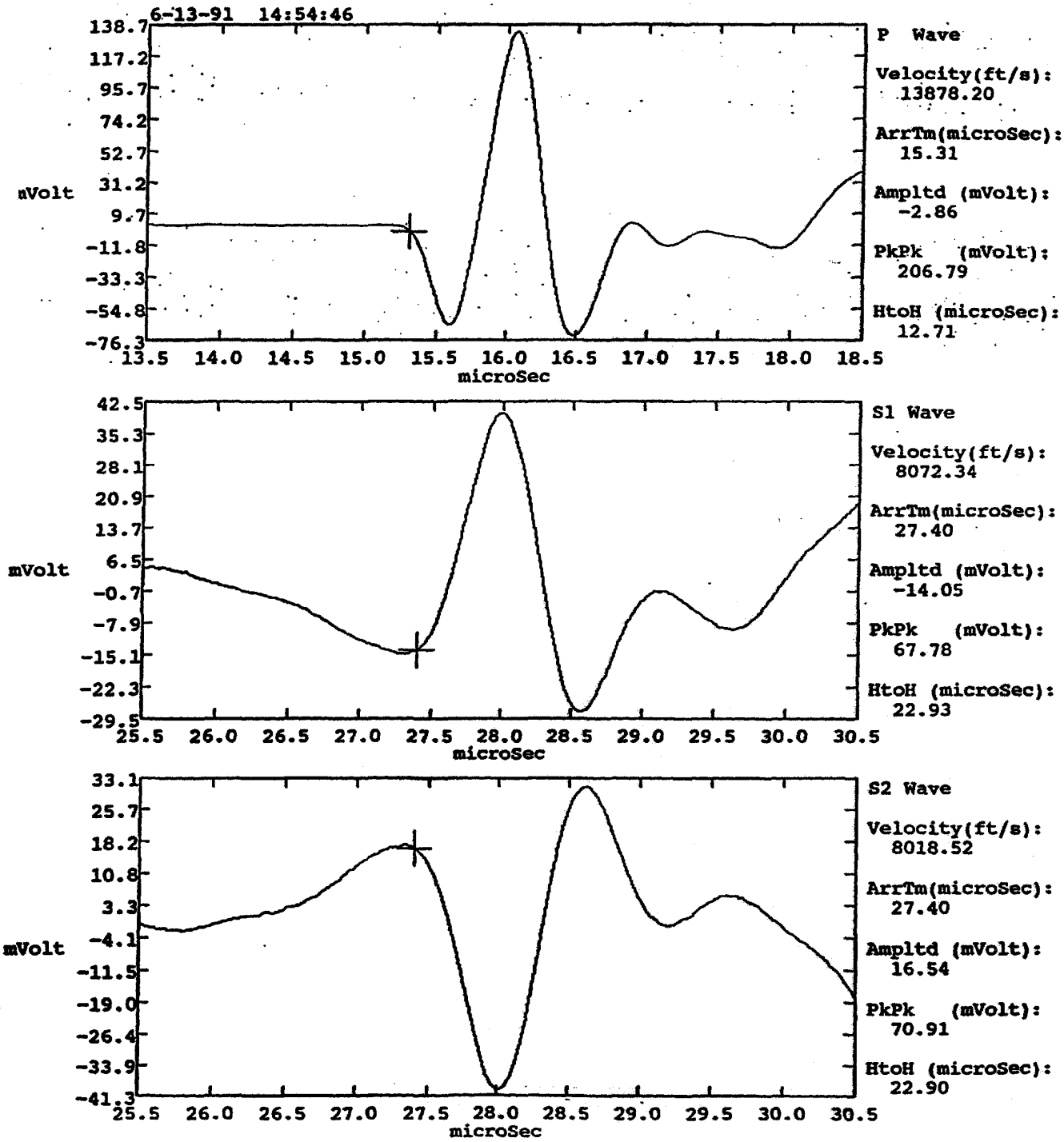
Well: EXXON ANTARES 1
Sample: 8283 Length:0.433 inch Fluid: SOLTROL
Conf Pr:7600.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8283.3S Pick: Manual 6-13-91 14:46:34



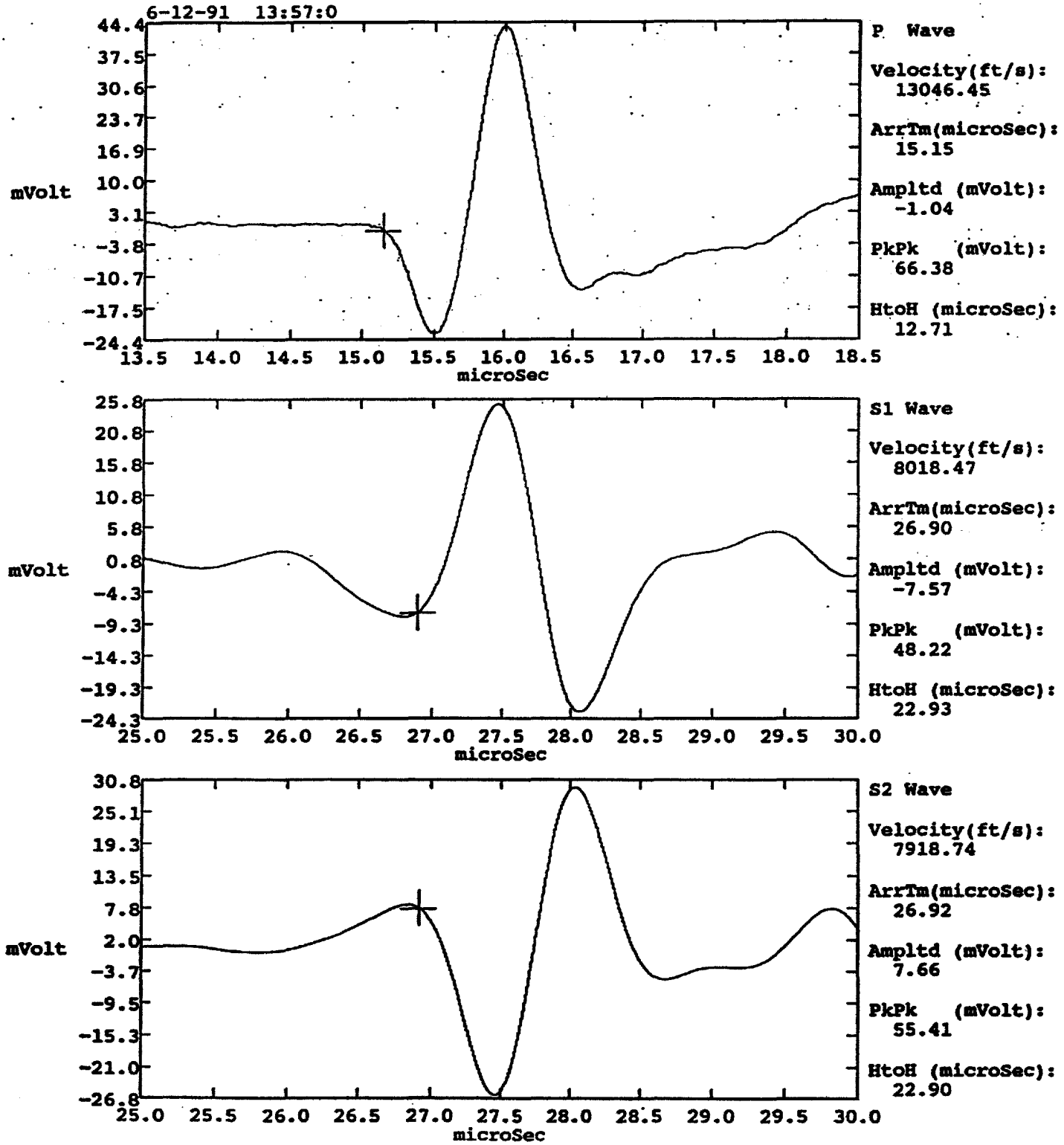
Well: EXXON ANTARES 1
Sample: 8283 Length:0.433 inch Fluid: SOLTROL
Conf Pr:10100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8283.4S Pick: Manual 6-13-91 14:50:44



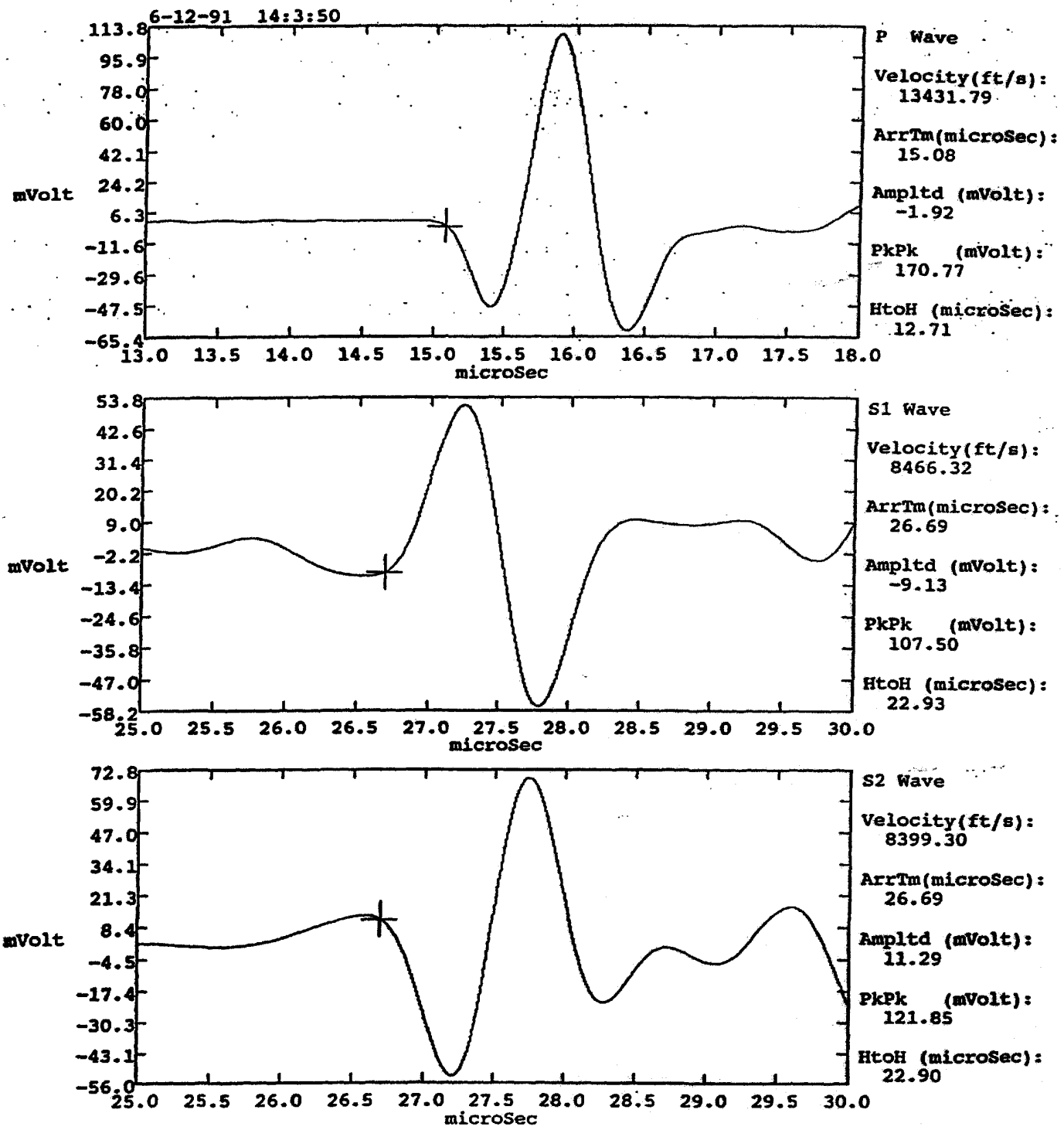
Well: EXXON ANTARES 1
Sample: 8283 Length:0.433 inch Fluid: SOLTROL
Conf Pr:15100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8283.5S Pick: Manual 6-13-91 14:54:46



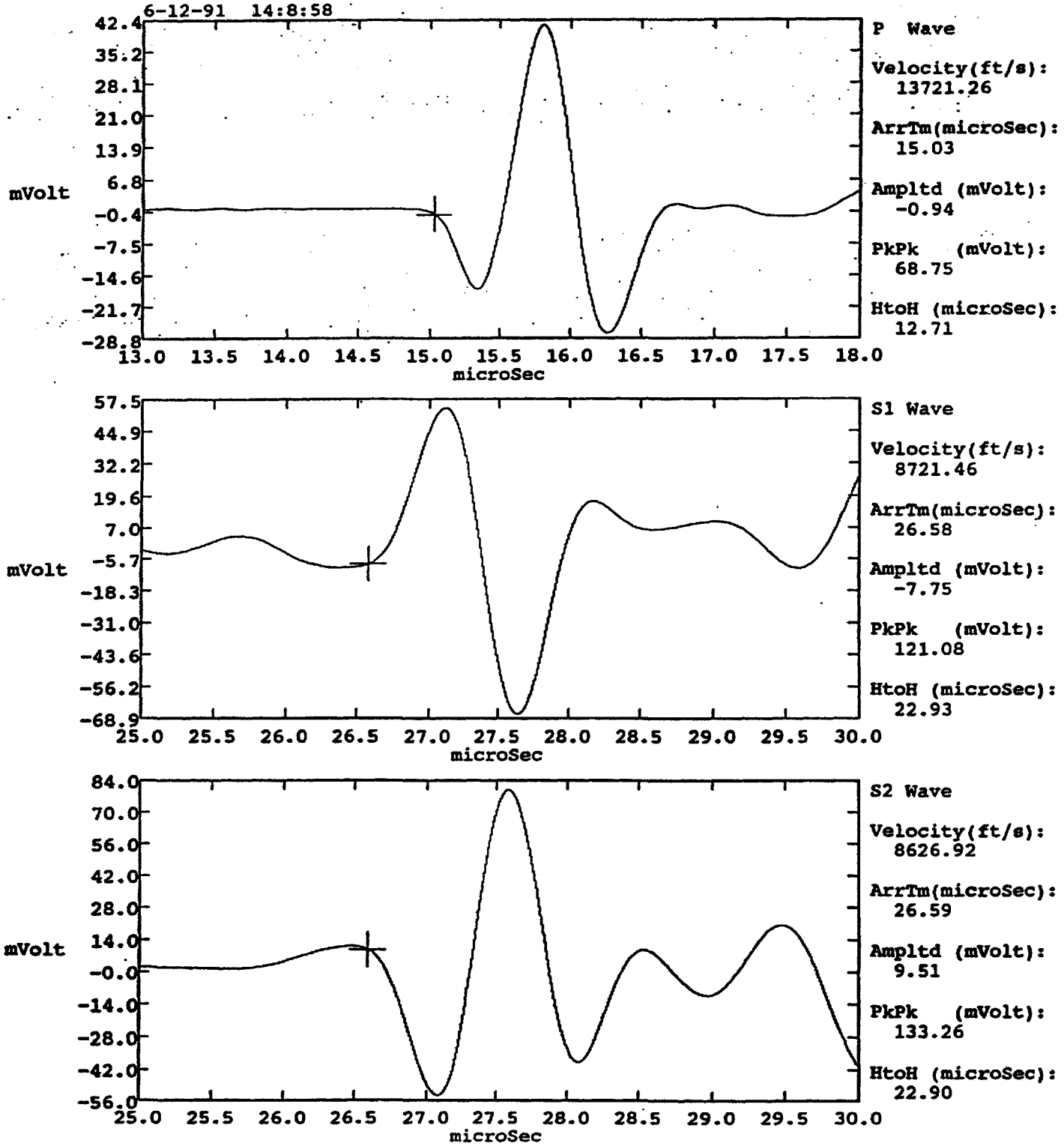
Well: EXXON ANTARES 1
Sample: 8371 Length:0.382 inch Fluid: SOLTROL
Conf Pr:1100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8371.1S Pick: Manual 6-12-91 13:57:0



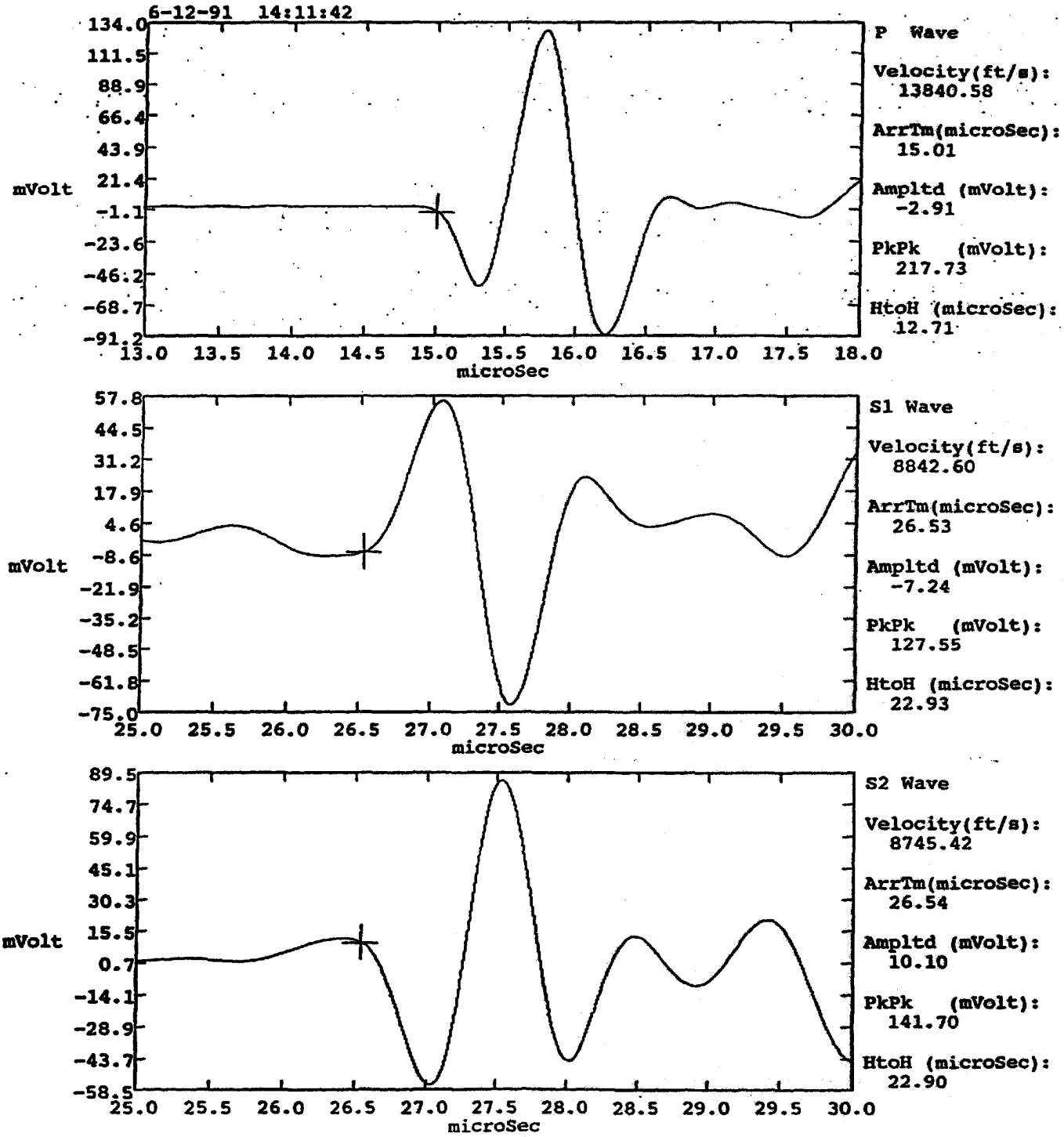
Well: EXXON ANTARES 1
Sample: 8371 Length:0.382 inch Fluid: SOLTROL
Conf Pr:4100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8371.2S Pick: Manual 6-12-91 14:3:50



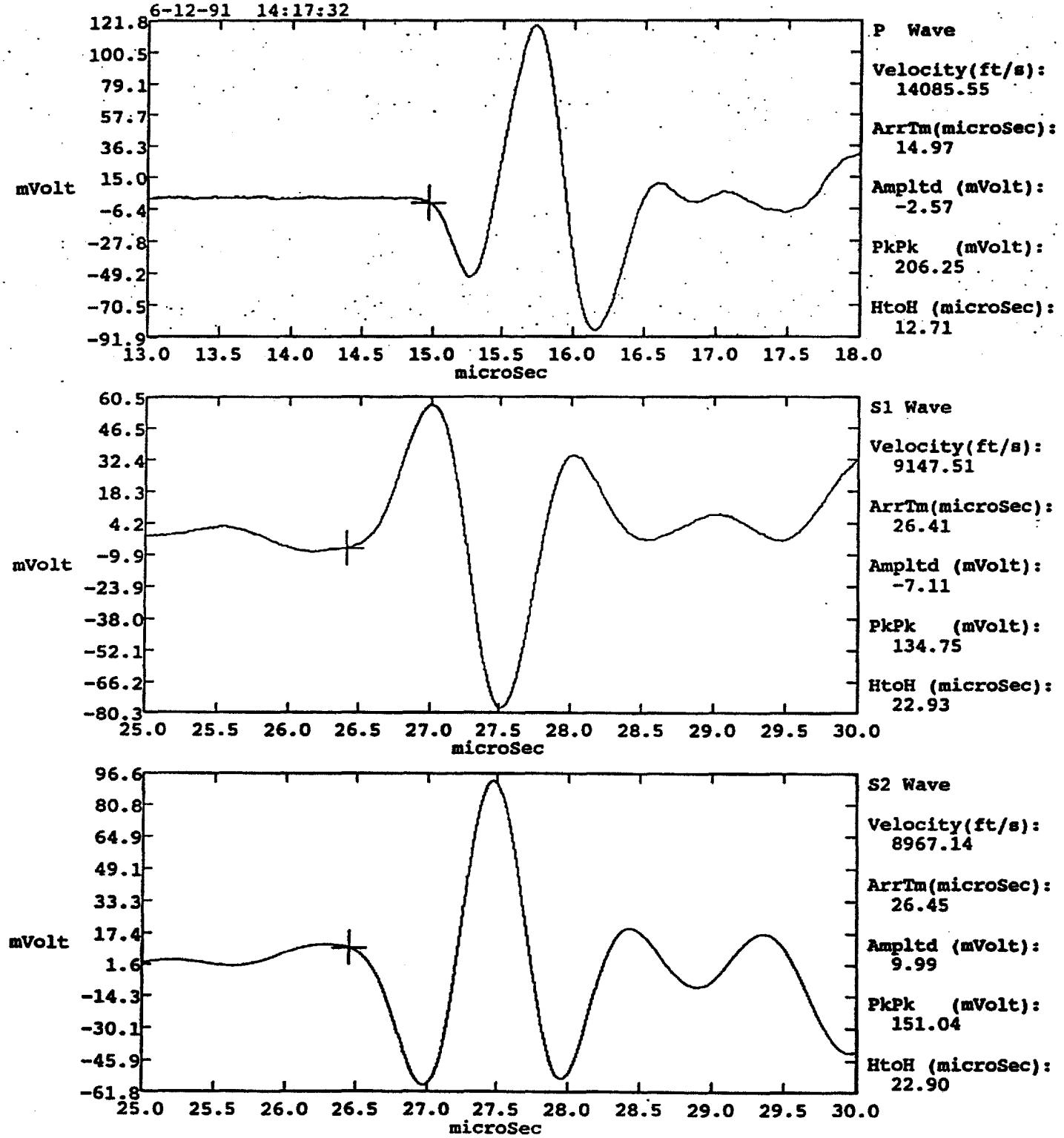
Well: EXXON ANTARES 1
Sample: 8371 Length:0.382 inch Fluid: SOLTROL
Conf Pr:7600.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8371.3S Pick: Manual 6-12-91 14:8:58



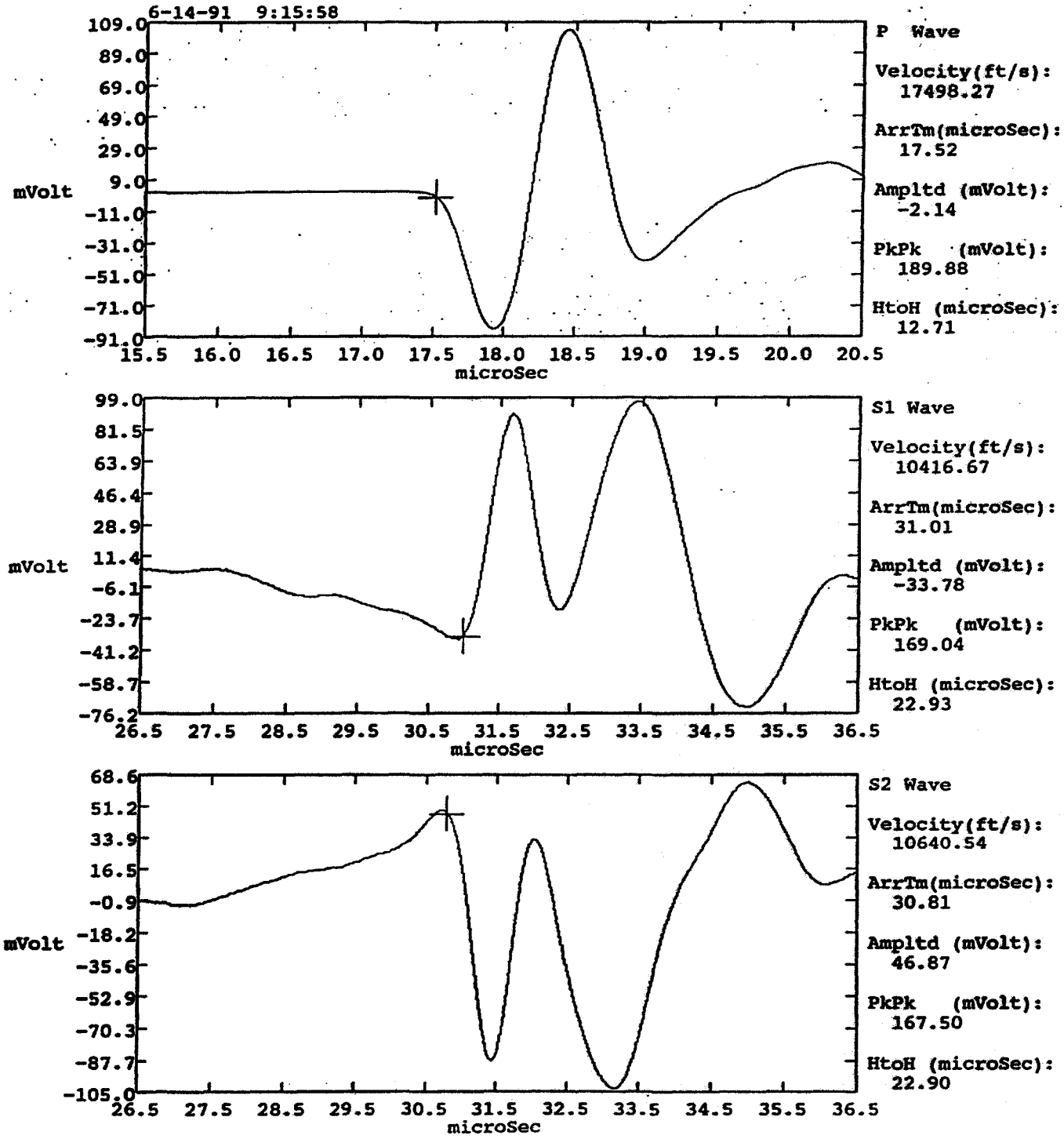
Well: EXXON ANTARES 1
Sample: 8371 Length:0.382 inch Fluid: SOLTROL
Conf Pr:10100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8371.4S Pick: Manual 6-12-91 14:11:42



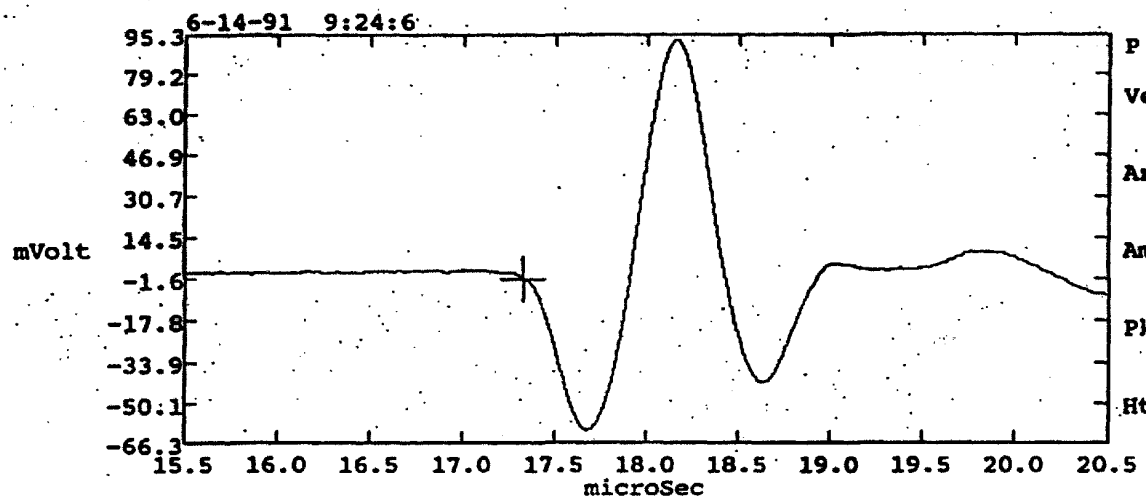
Well: EXXON ANTARES 1
Sample: 8371 Length:0.382 inch Fluid: SOLTROL
Conf Pr:15100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 8371.5S Pick: Manual 6-12-91 14:17:32



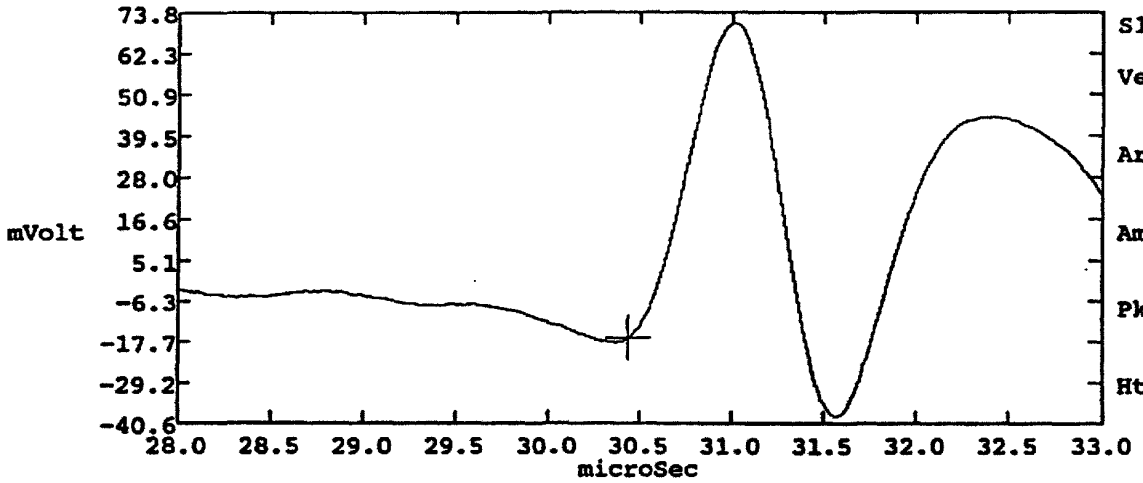
Well: EXXON ANTARES 2
Sample: 10948 Length:1.010 inch Fluid: SOLTROL
Conf Pr:1100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 10948.1S Pick: Manual 6-14-91 9:15:58



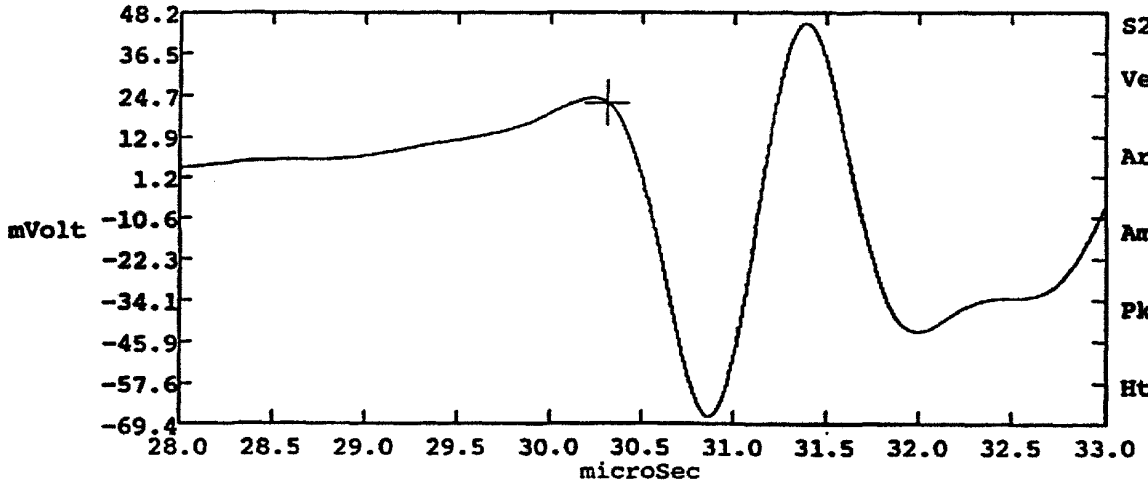
Well: EXXON ANTARES 2
Sample: 10948 Length:1.010 inch Fluid: SOLTROL
Conf Pr:4100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 10948.2S Pick: Manual 6-14-91 9:24:6



P Wave
Velocity(ft/s): 18217.89
ArrTm(microSec): 17.33
Ampltd (mVolt): -1.87
PkPk (mVolt): 154.03
HtoH (microSec): 12.71

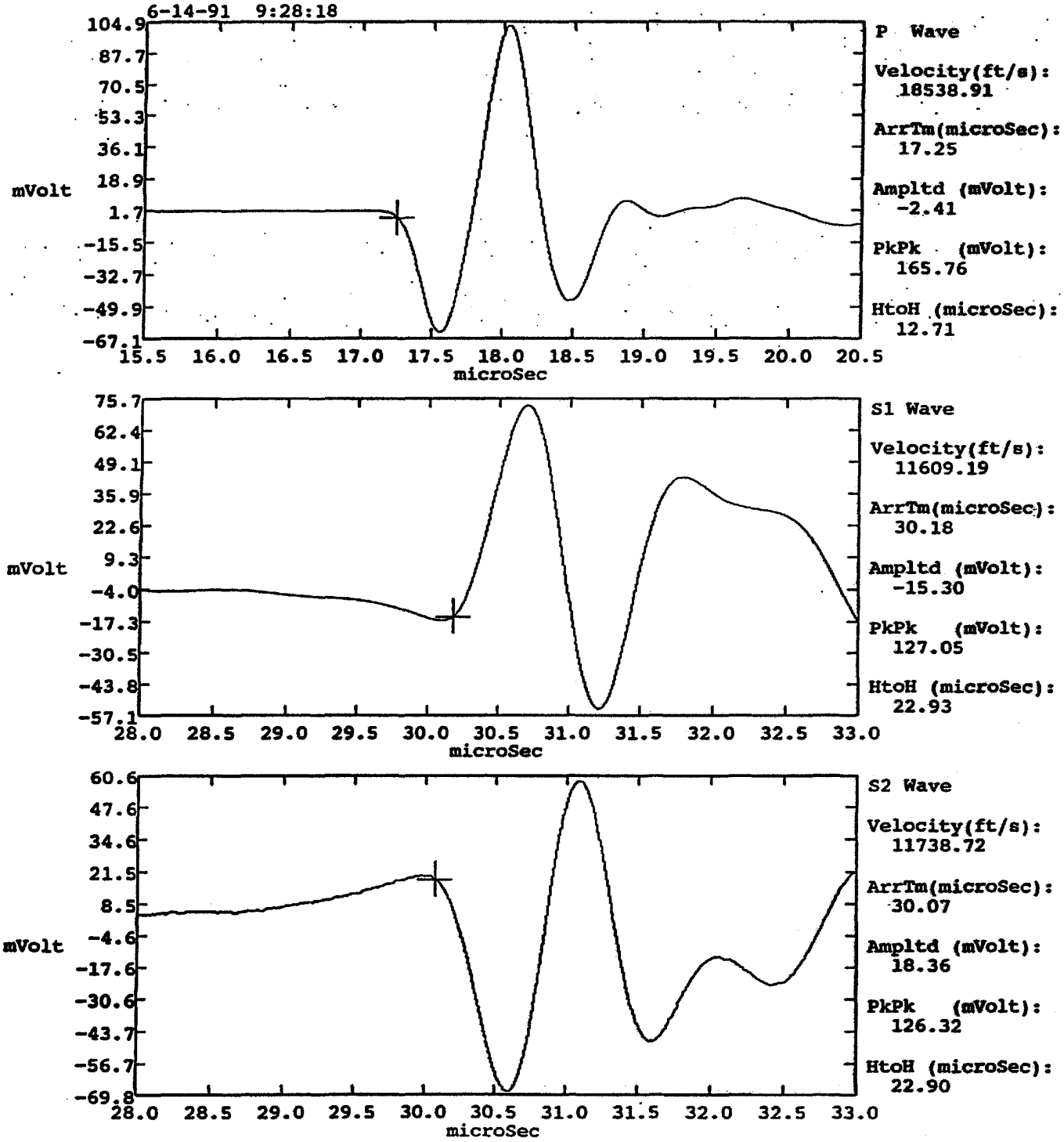


S1 Wave
Velocity(ft/s): 11207.28
ArrTm(microSec): 30.44
Ampltd (mVolt): -16.70
PkPk (mVolt): 109.26
HtoH (microSec): 22.93

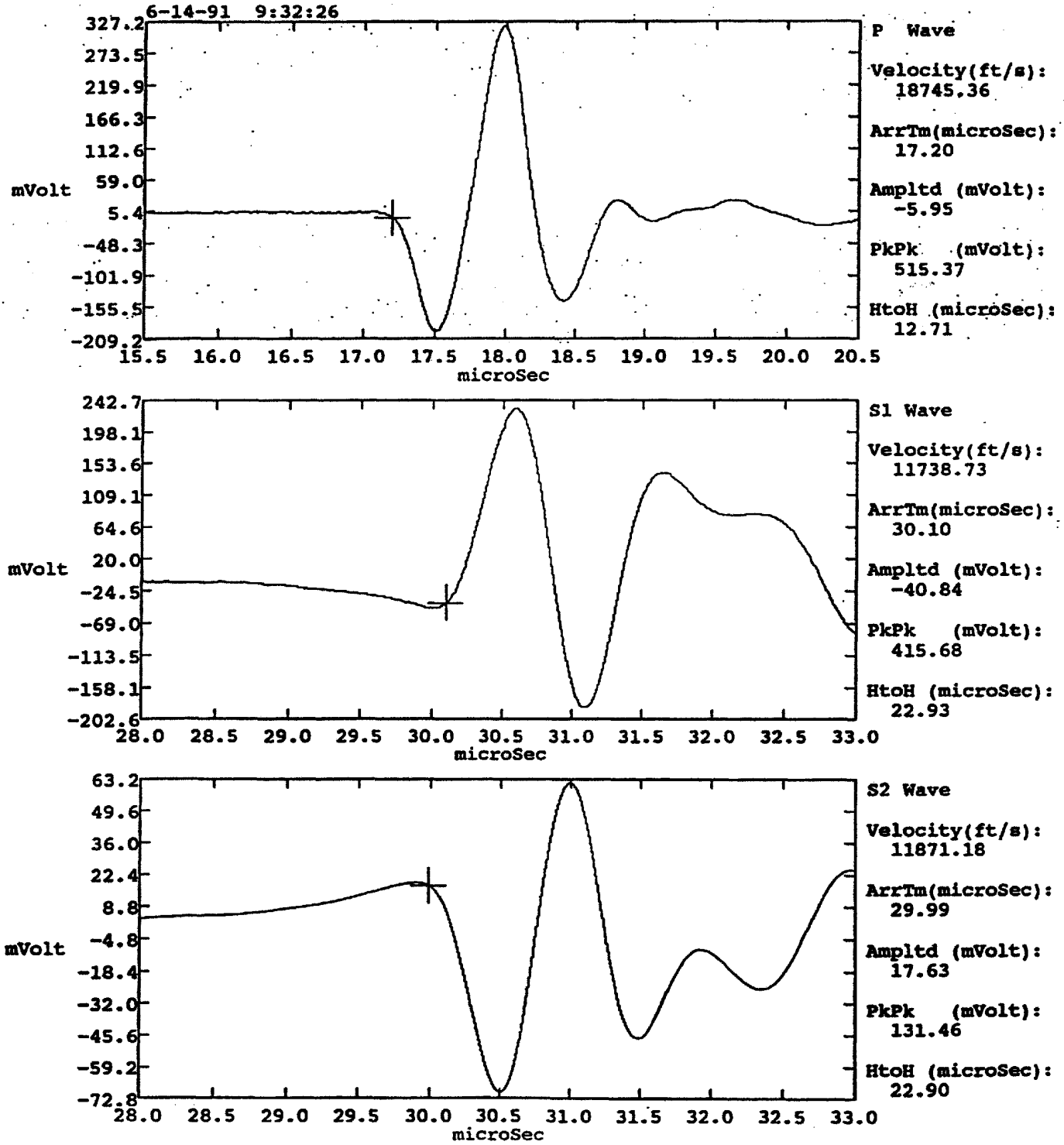


S2 Wave
Velocity(ft/s): 11358.52
ArrTm(microSec): 30.31
Ampltd (mVolt): 22.62
PkPk (mVolt): 112.27
HtoH (microSec): 22.90

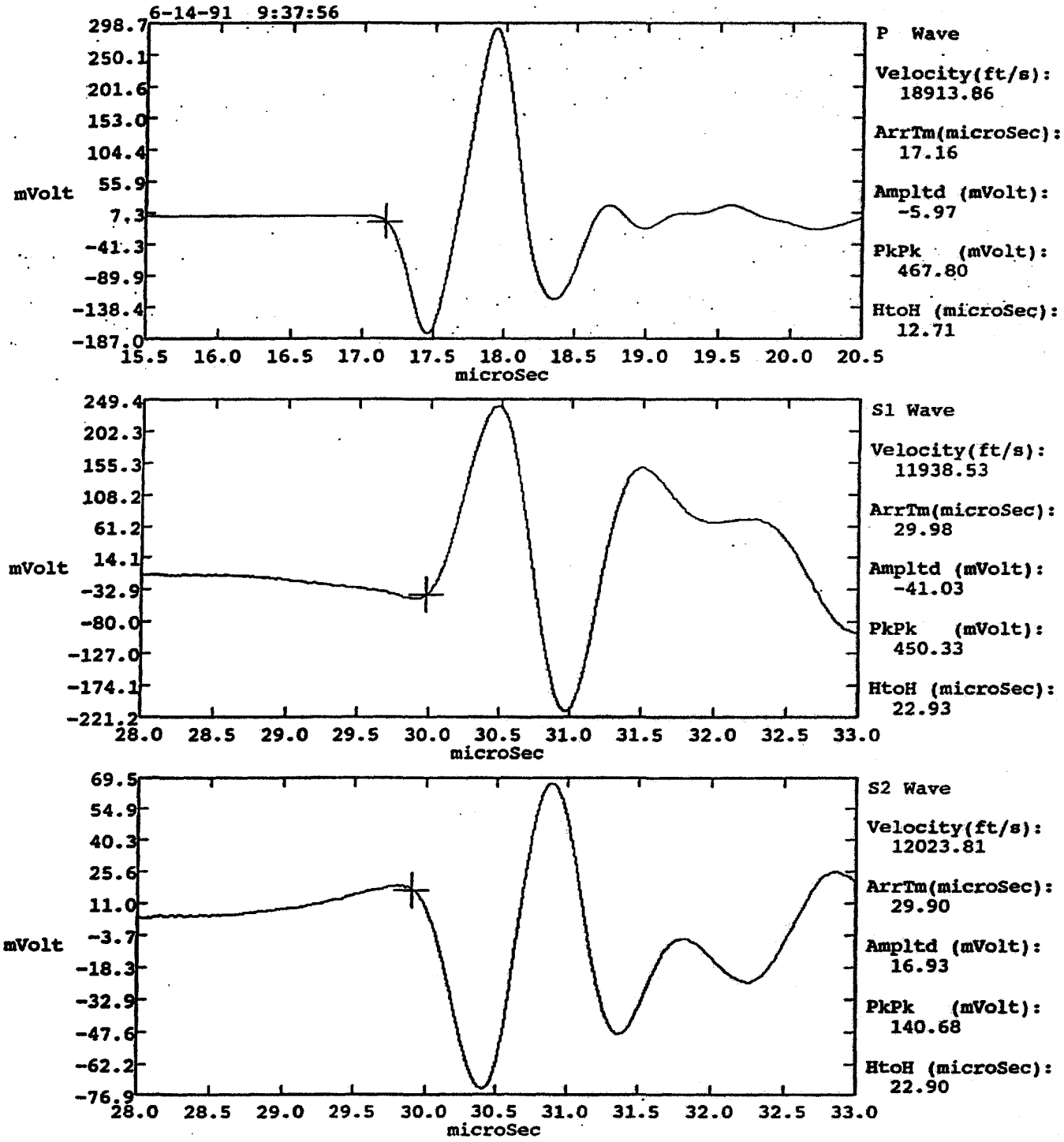
Well: EXXON ANTARES 2
Sample: 10948 Length:1.010 inch Fluid: SOLTROL
Conf Pr:7600.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 10948.3S Pick: Manual 6-14-91 9:28:18



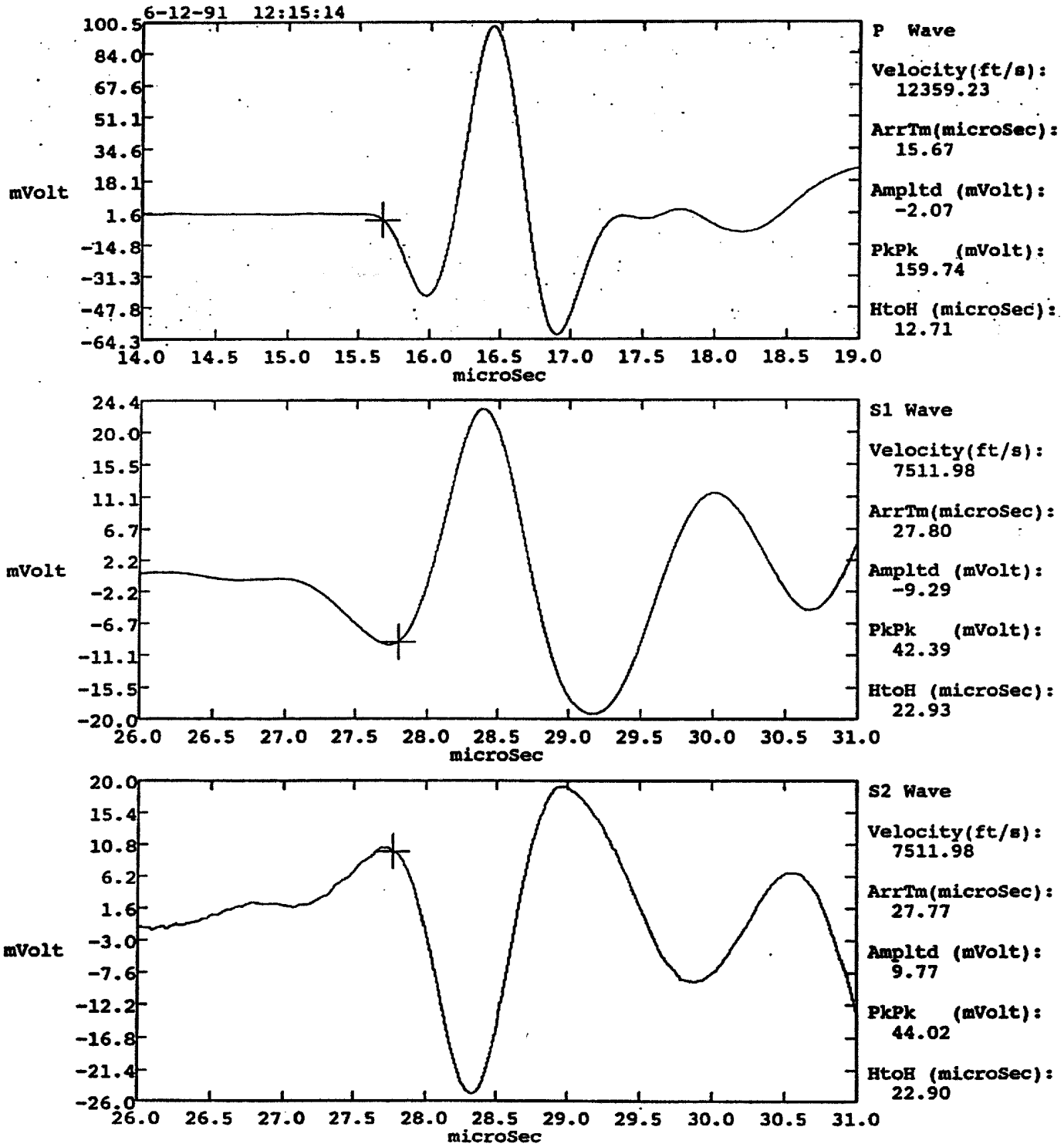
Well: EXXON ANTARES 2
Sample: 10948 Length:1.010 inch Fluid: SOLTROL
Conf Pr:10100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 10948.4S Pick: Manual 6-14-91 9:32:26



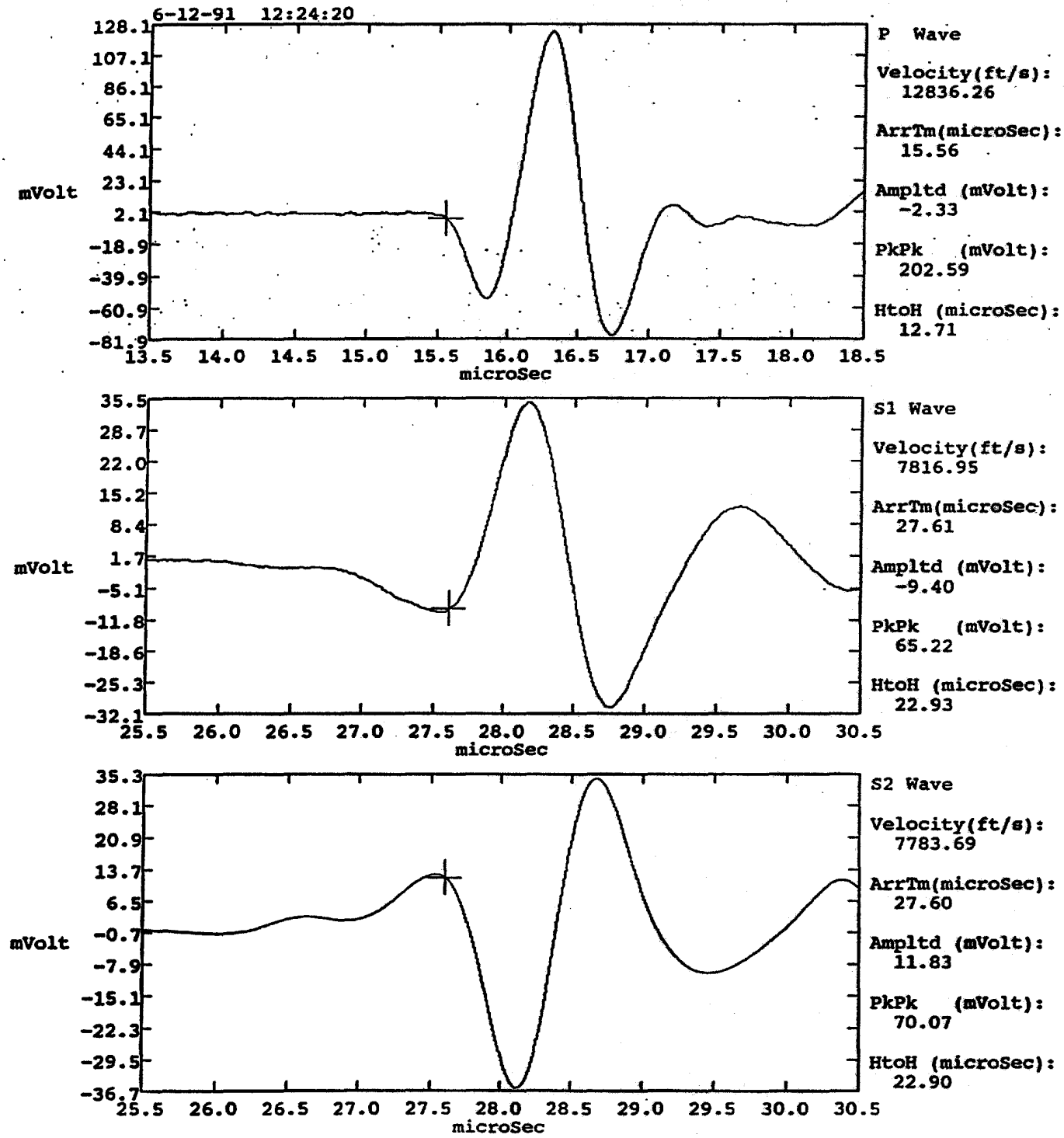
Well: EXXON ANTARES 2
Sample: 10948 Length:1.010 inch Fluid: SOLTROL
Conf Pr:15100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 10948.5S Pick: Manual 6-14-91 9:37:56



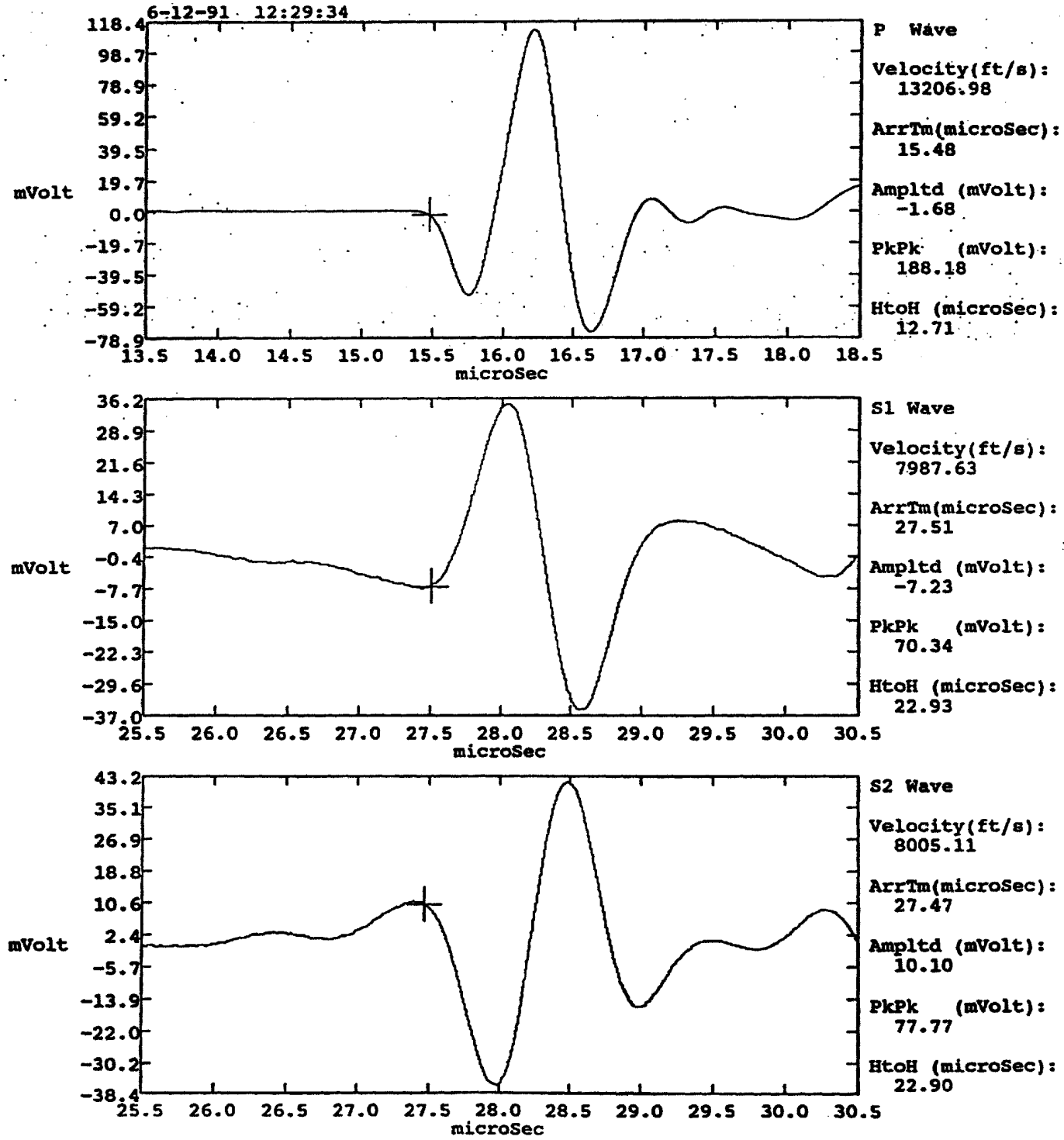
Well: EXXON ANTARES 2
Sample: 10979 Length:0.439 inch Fluid: SOLTROL
Conf Pr:1100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 10979.1S Pick: Manual 6-12-91 12:15:14



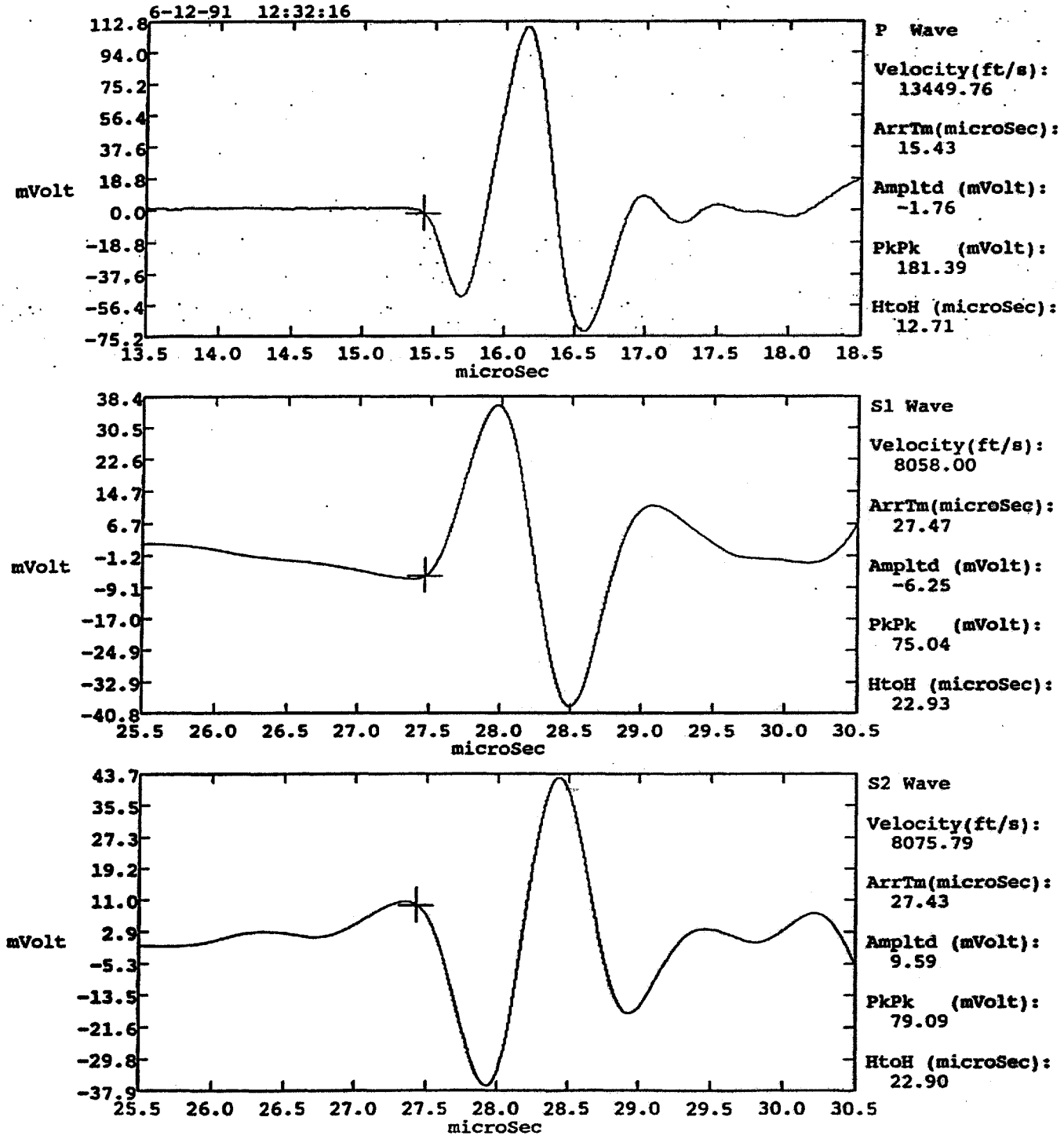
Well: EXXON ANTARES 2
Sample: 10979 Length:0.439 inch Fluid: SOLTROL
Conf Pr:4100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 10979.2S Pick: Manual 6-12-91 12:24:20



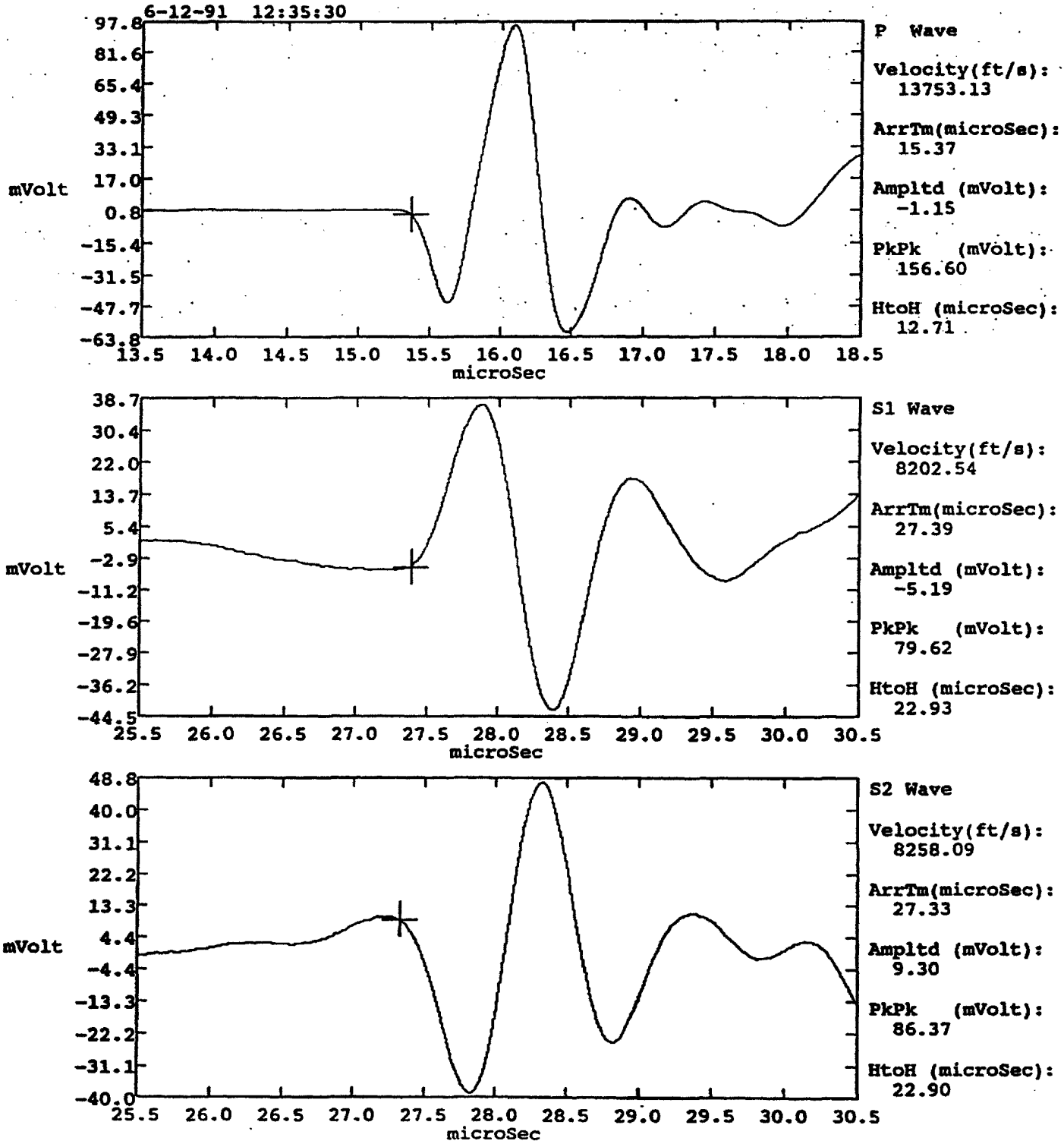
Well: EXXON ANTARES 2
Sample: 10979 Length:0.439 inch Fluid: SOLTROL
Conf Pr:7600.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 10979.3S Pick: Manual 6-12-91 12:29:34



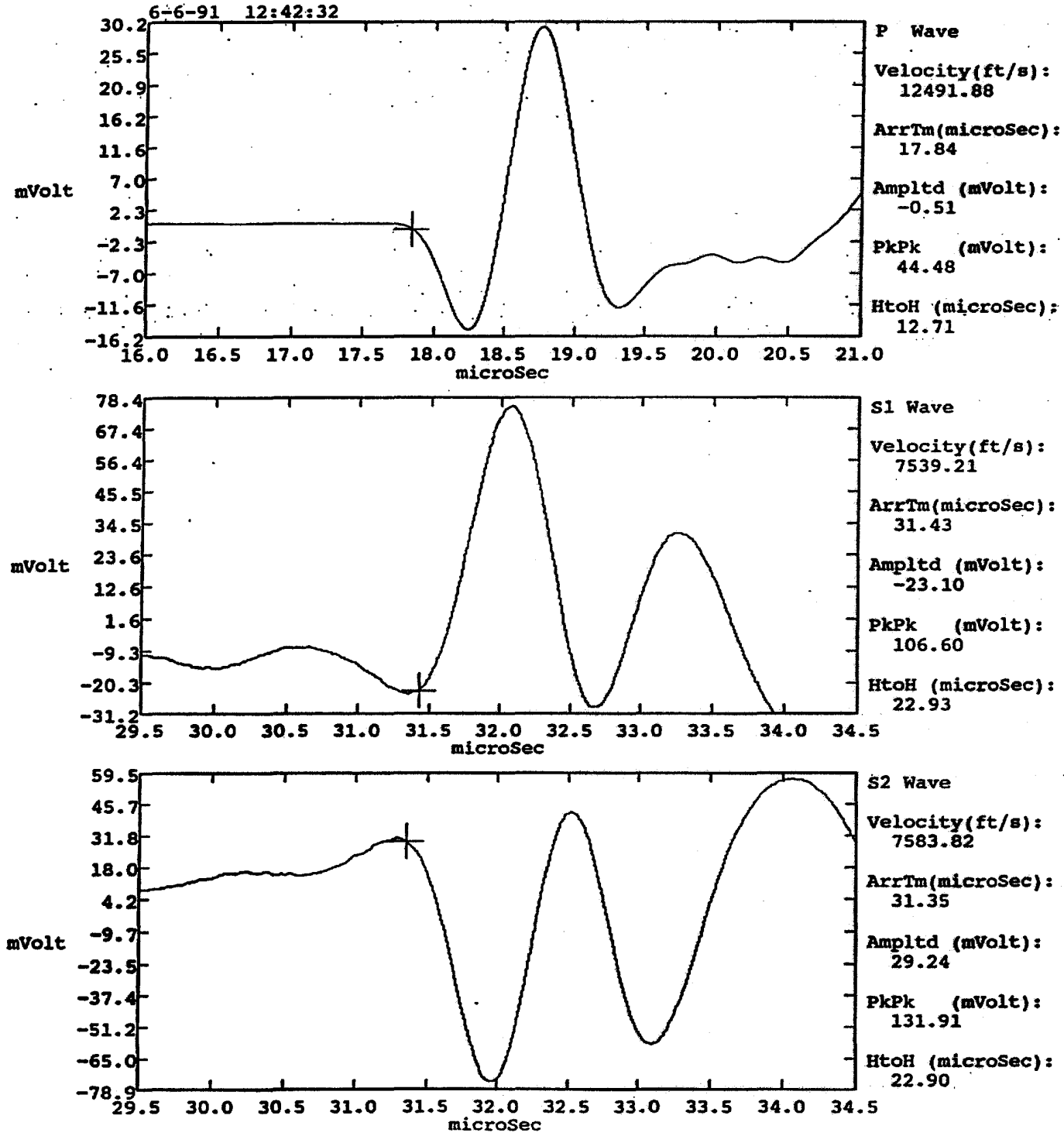
Well: EXXON ANTARES 2
Sample: 10979 Length:0.439 inch Fluid: SOLTROL
Conf Pr:10100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 10979.4S Pick: Manual 6-12-91 12:32:16



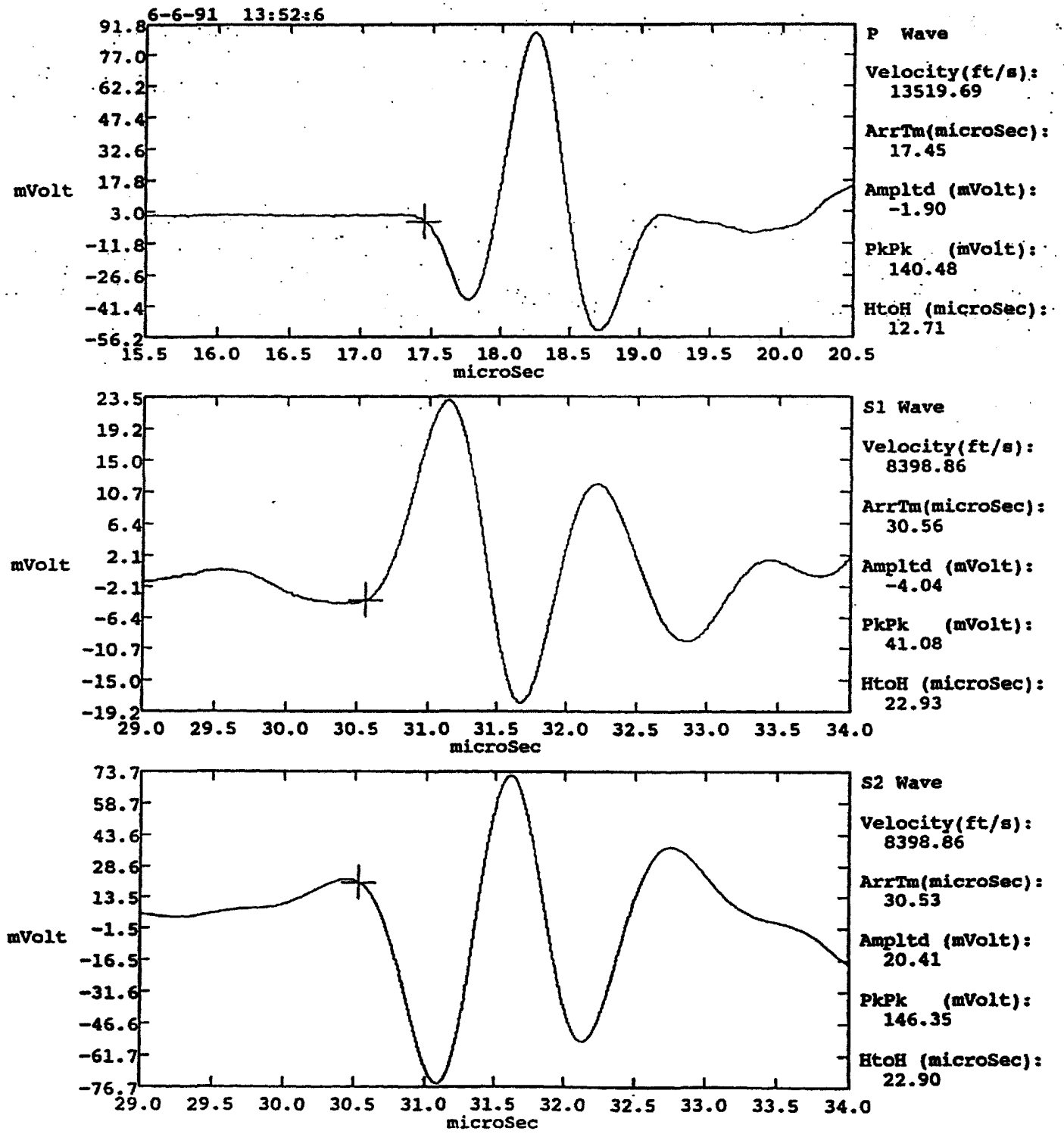
Well: EXXON ANTARES 2
Sample: 10979 Length:0.439 inch Fluid: SOLTROL
Conf Pr:15100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 10979.5S Pick: Manual 6-12-91 12:35:30



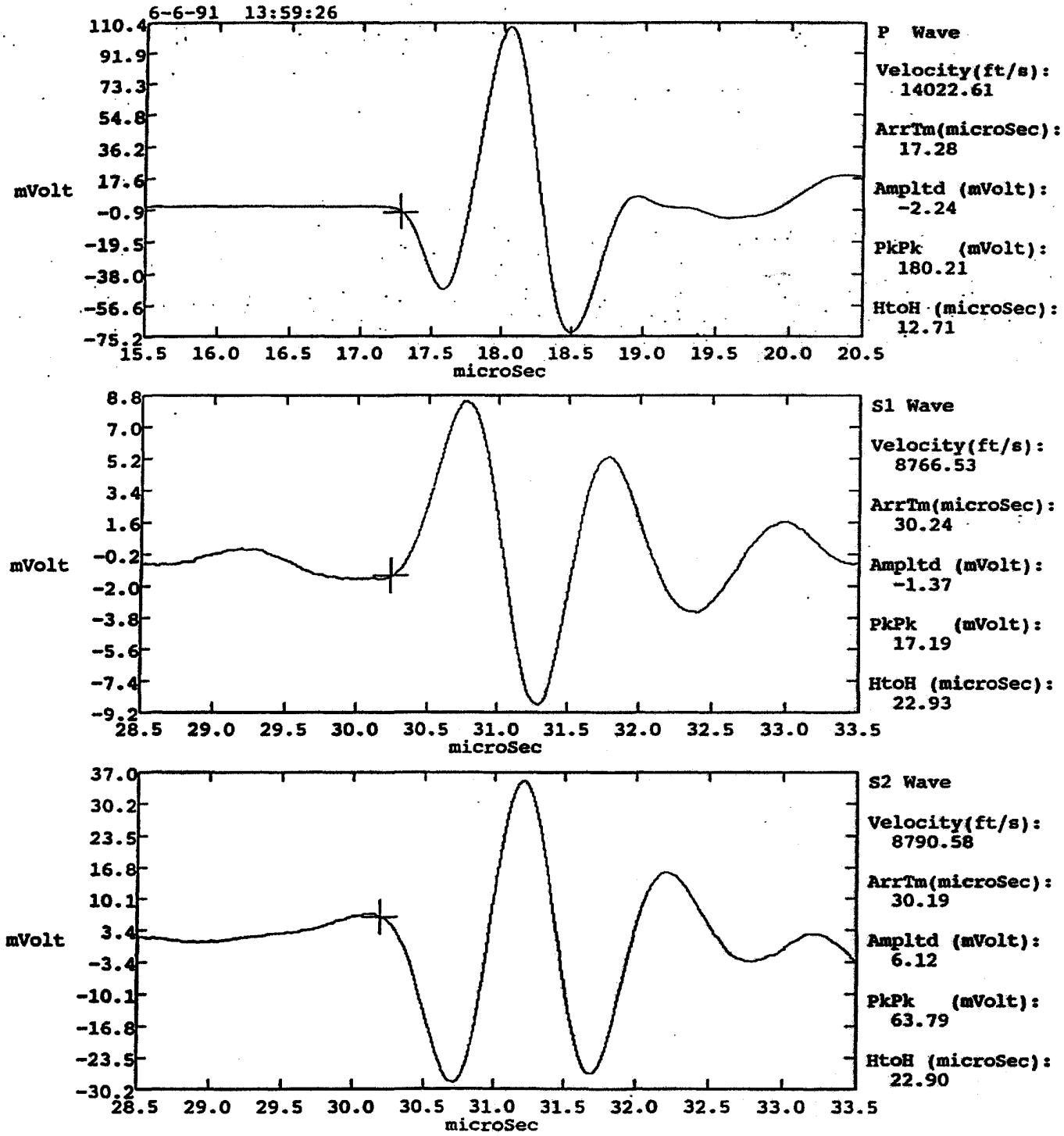
Well: EXXON ANTARES 2
Sample: 11082 Length:0.769 inch Fluid: Soltrol
Conf Pr:1100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11082.1S Pick: Manual 6-6-91 12:42:32



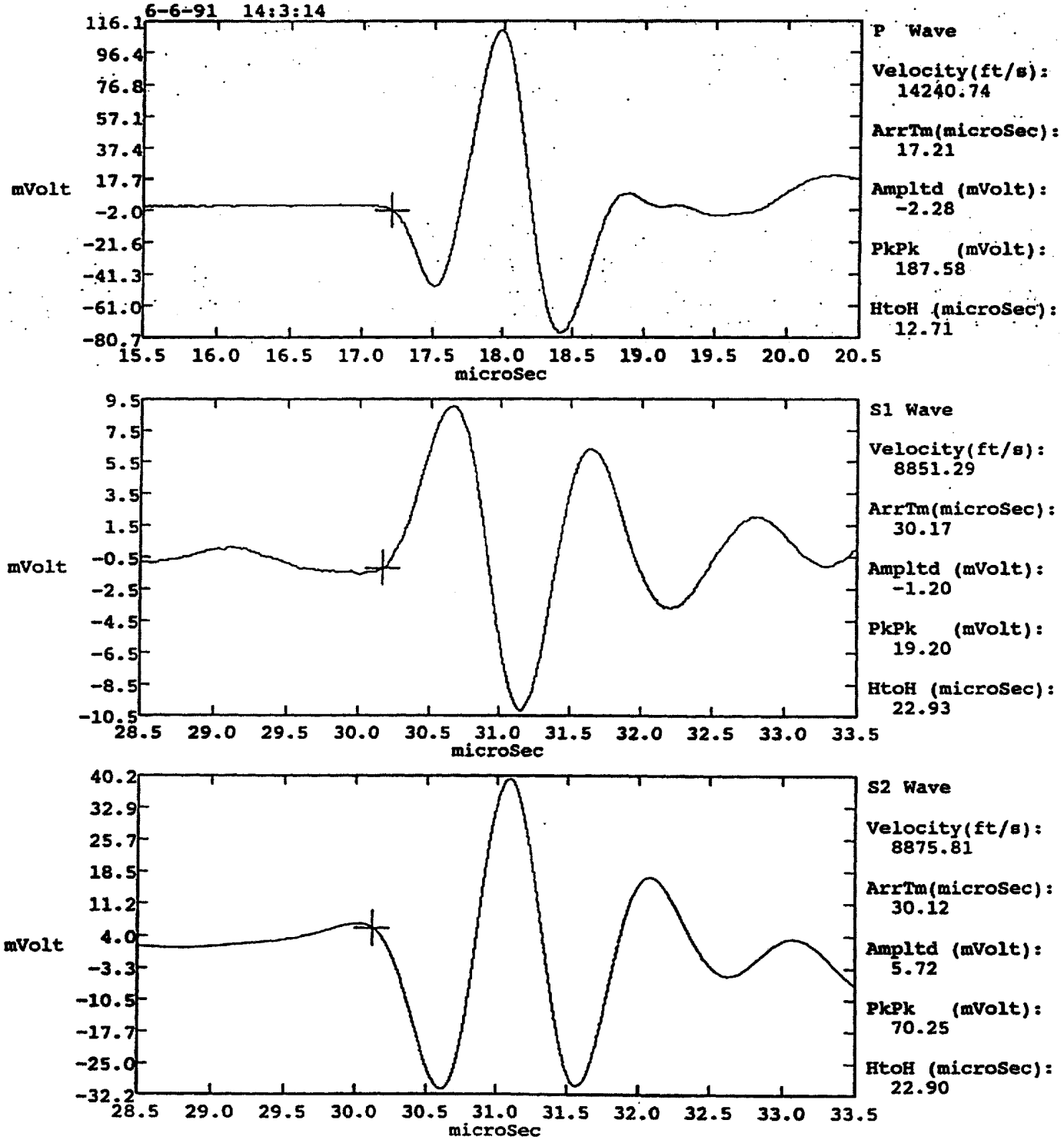
Well: EXXON ANTARES 2
Sample: 11082 Length:0.769 inch Fluid: Soltrol
Conf Pr:4100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11082.2S Pick: Manual 6-6-91 13:52:6



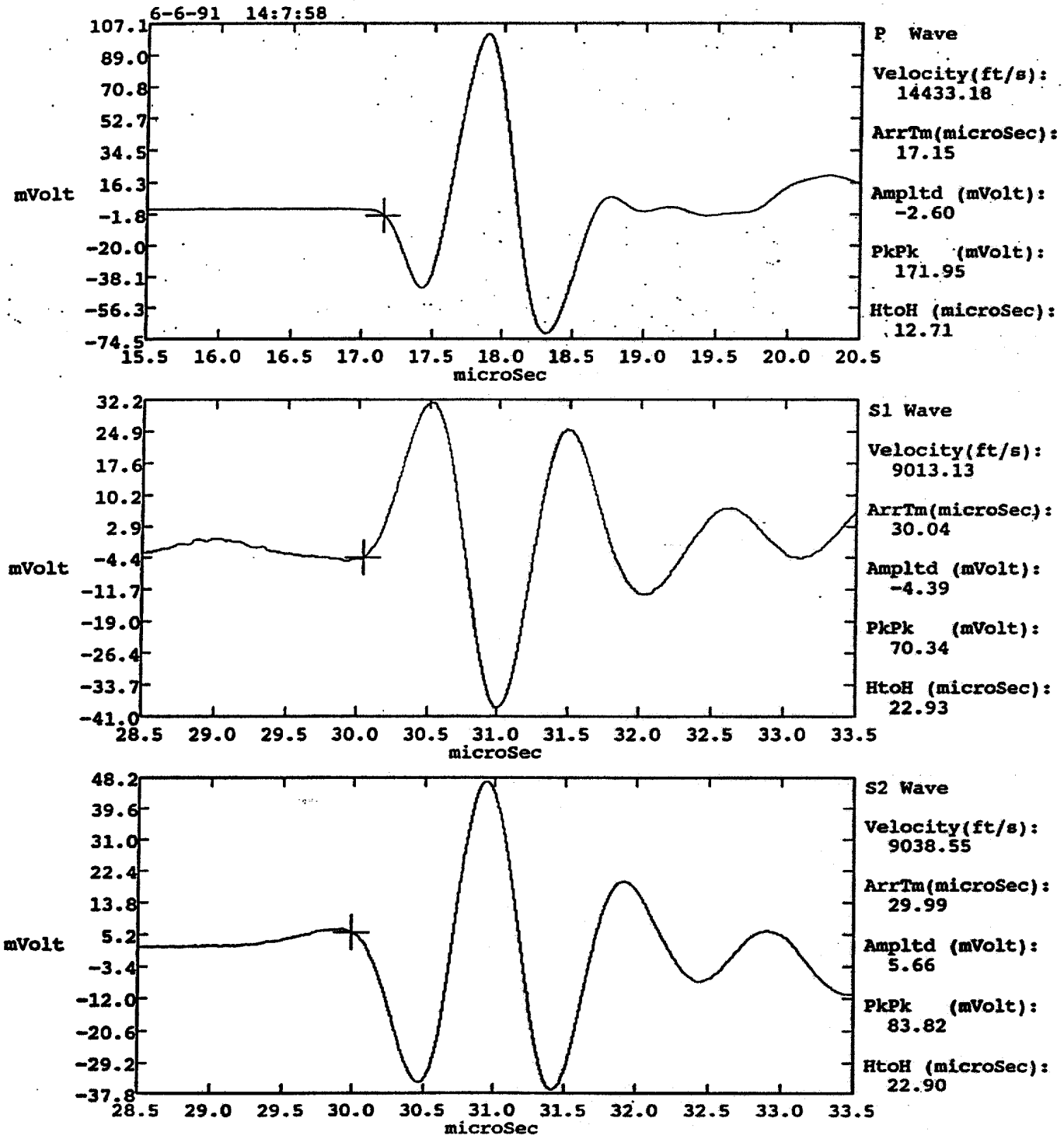
Well: EXXON ANTARES 2
Sample: 11082 Length:0.769 inch Fluid: Soltrol
Conf Pr:7600.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11082.3S Pick: Manual 6-6-91 13:59:26



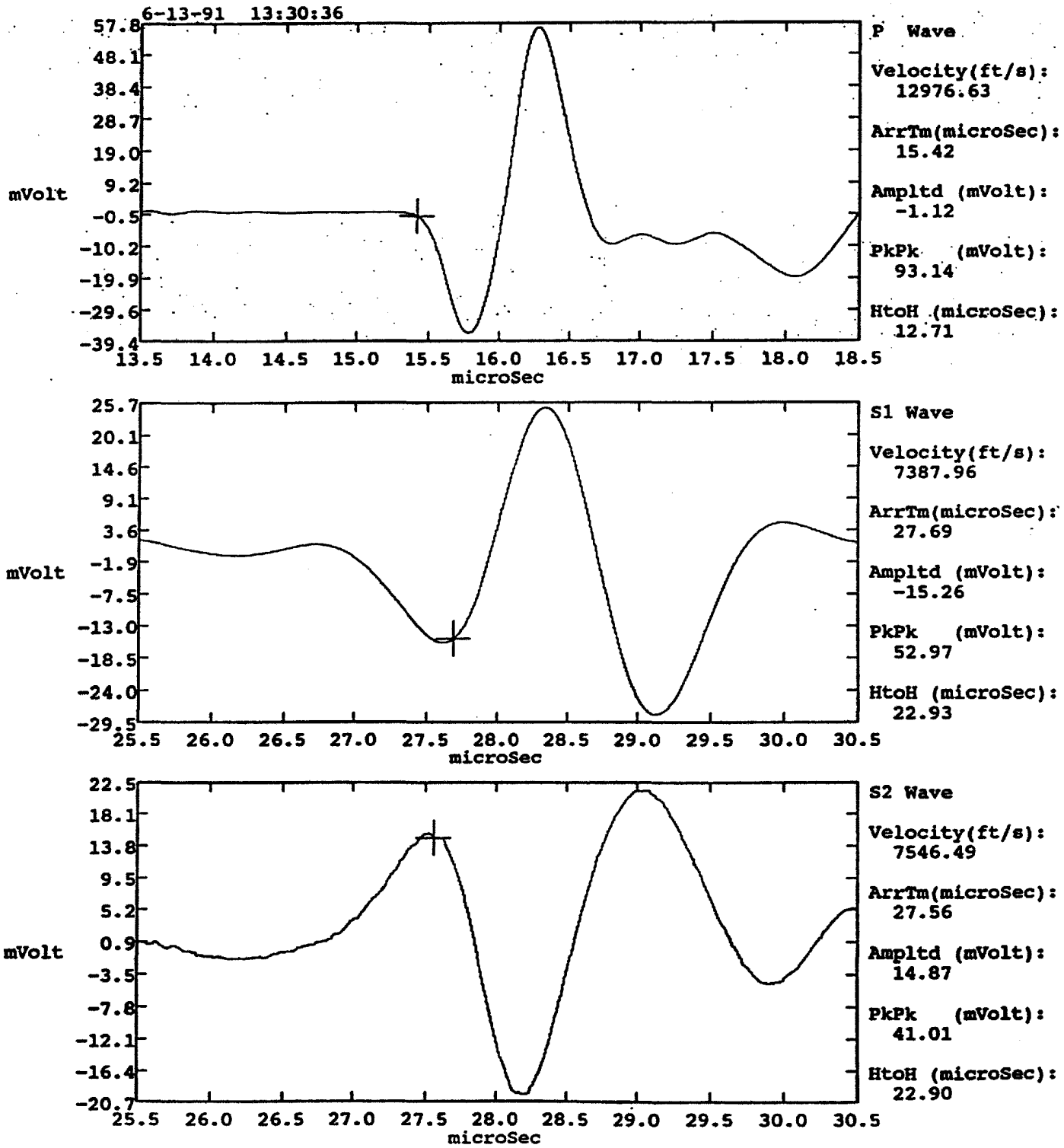
Well: EXXON ANTARES 2
Sample: 11082 Length:0.769 inch Fluid: Soltrol
Conf Pr:10100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11082.4S Pick: Manual 6-6-91 14:3:14



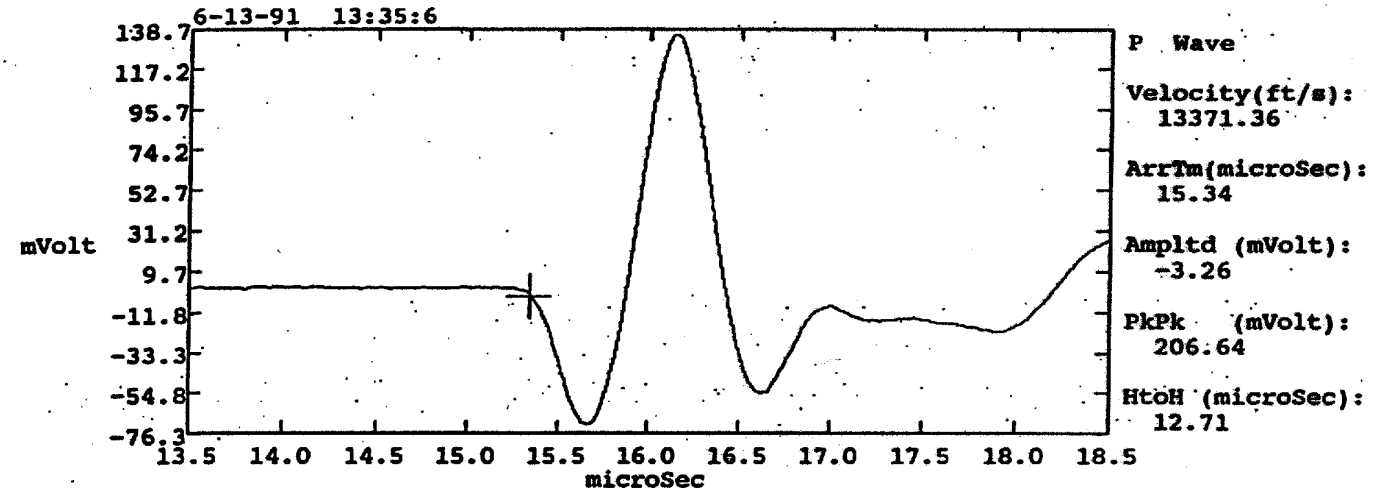
Well: EXXON ANTARES 2
Sample: 11082 Length:0.769 inch Fluid: Soltrol
Conf Pr:15100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11082.5S Pick: Manual 6-6-91 14:7:58

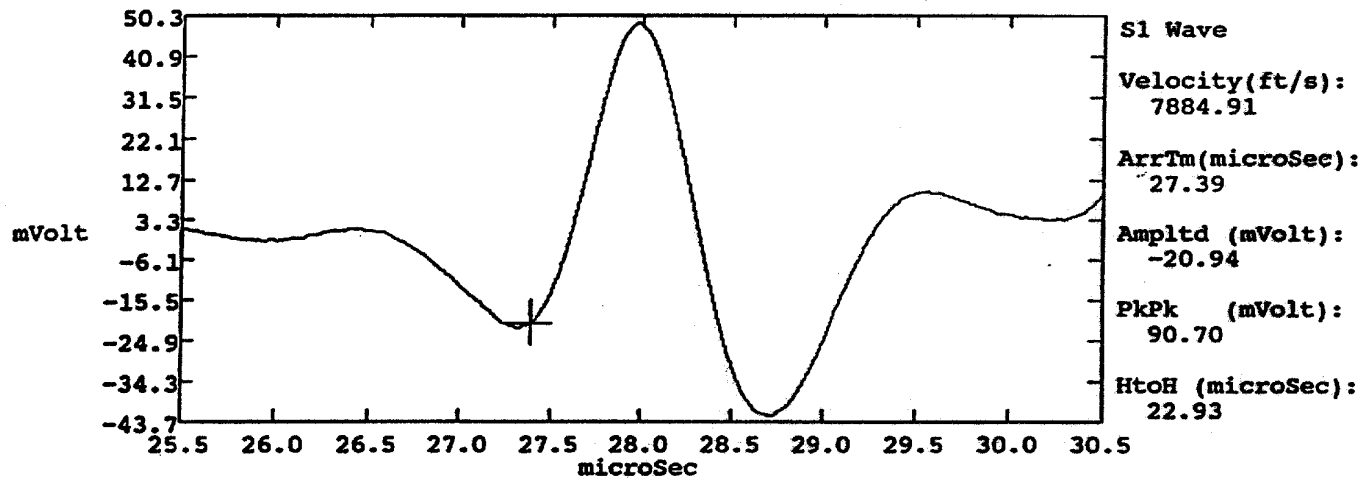


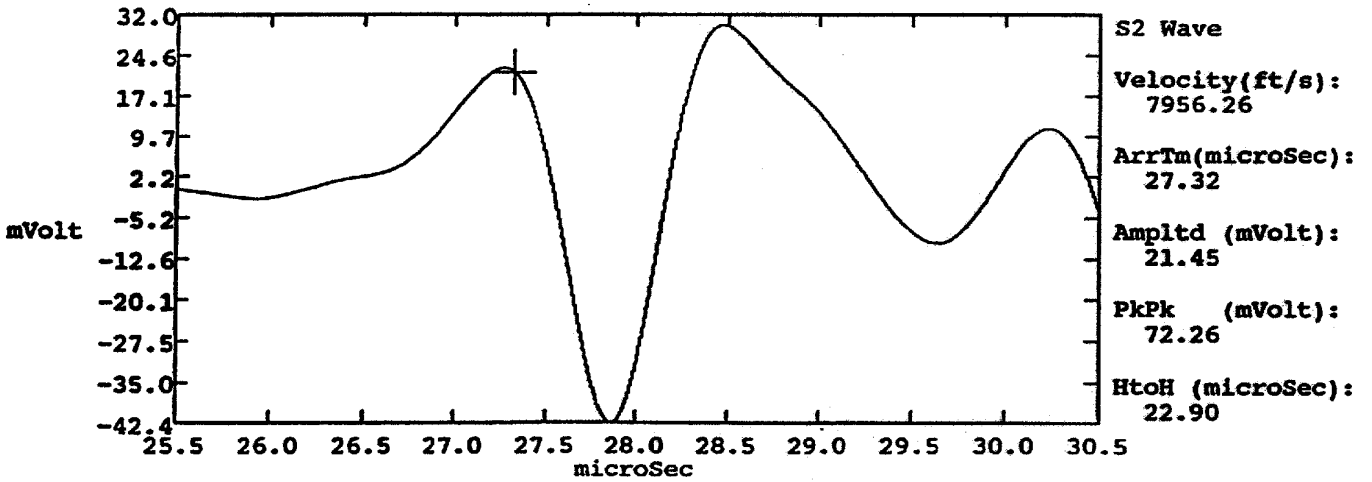
Well: EXXON ANTARES 2
Sample: 11106 Length:0.422 inch Fluid: SOLTROL
Conf Pr:1100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11106.1S Pick: Manual 6-13-91 13:30:36



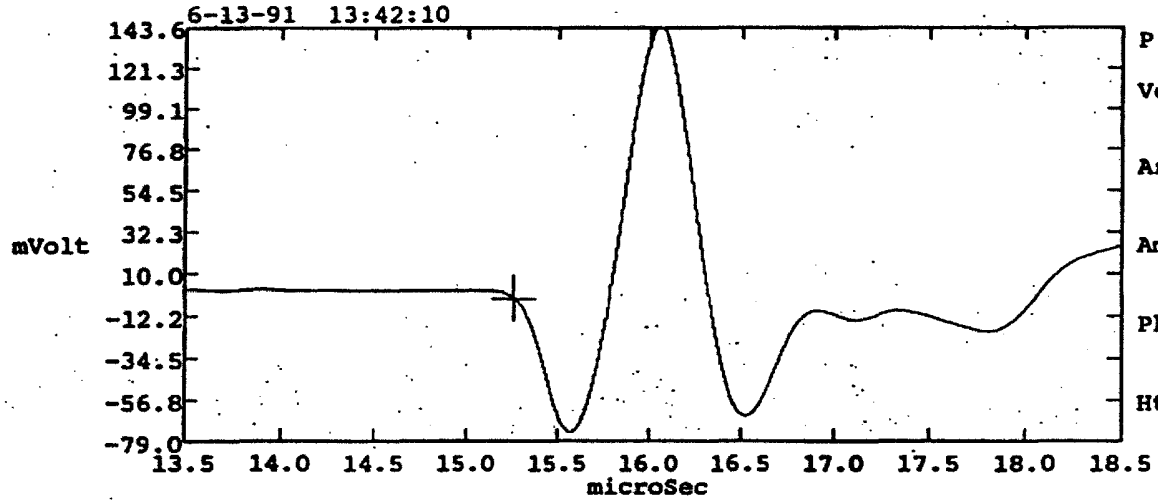
Well: EXXON ANTARES 2
Sample: 11106 Length:0.422 inch Fluid: SOLTROL
Conf Pr:4100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11106.2S Pick: Manual 6-13-91 13:35:6



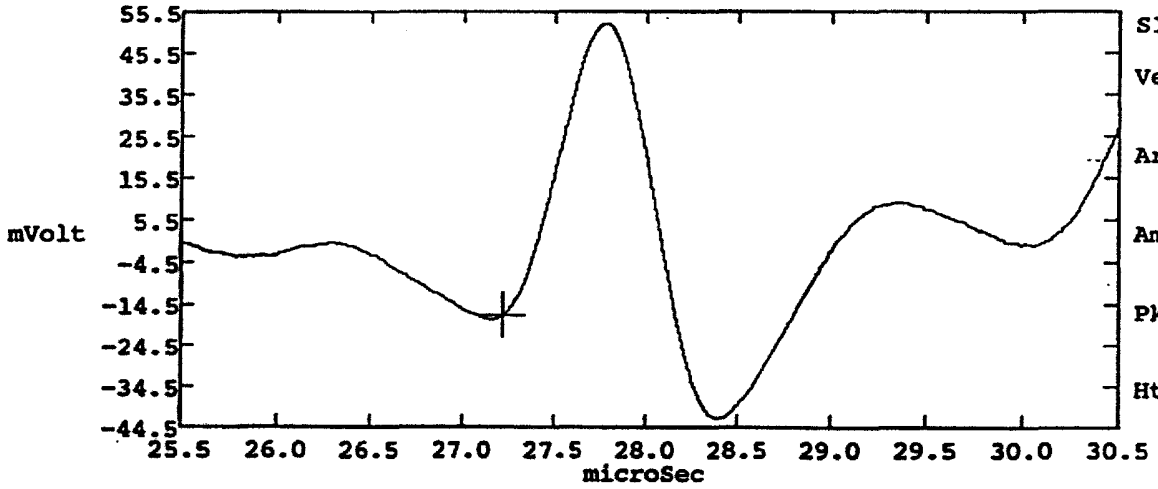




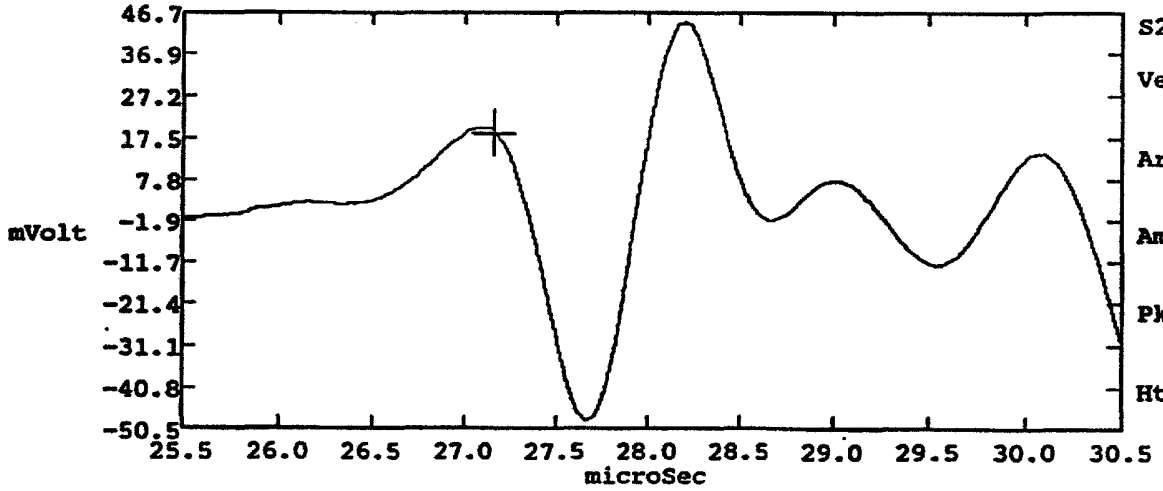
Well: EXXON ANTARES 2
Sample: 11106 Length:0.422 inch Fluid: SOLTROL
Conf Pr:7600.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11106.3S Pick: Manual 6-13-91 13:42:10



P Wave
Velocity(ft/s): 13790.85
ArrTm(microSec): 15.26
Ampltd (mVolt): -2.88
PkPk (mVolt): 216.70
HtoH (microSec): 12.71

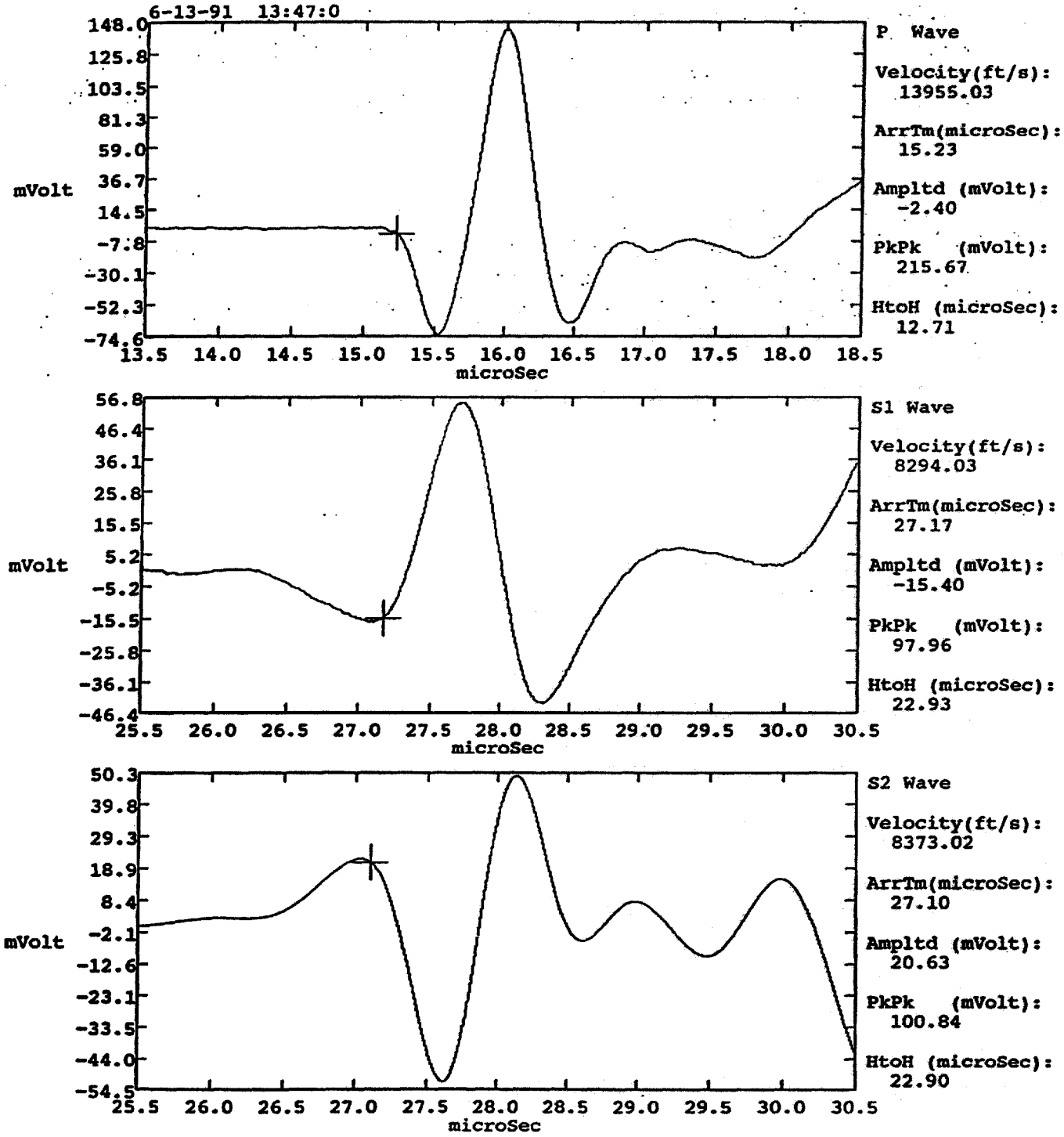


S1 Wave
Velocity(ft/s): 8197.36
ArrTm(microSec): 27.22
Ampltd (mVolt): -17.16
PkPk (mVolt): 94.53
HtoH (microSec): 22.93

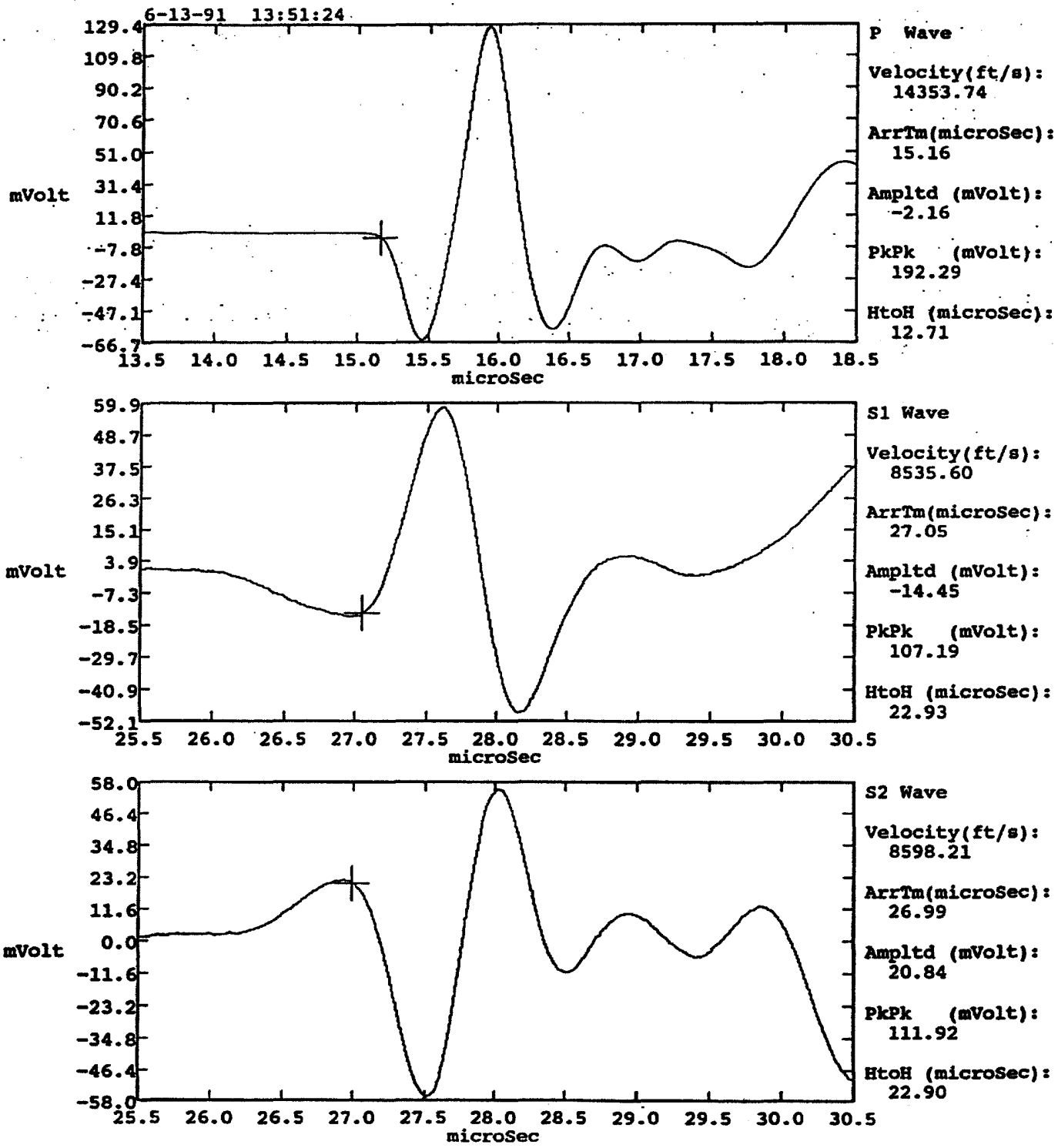


S2 Wave
Velocity(ft/s): 8255.08
ArrTm(microSec): 27.16
Ampltd (mVolt): 18.56
PkPk (mVolt): 93.02
HtoH (microSec): 22.90

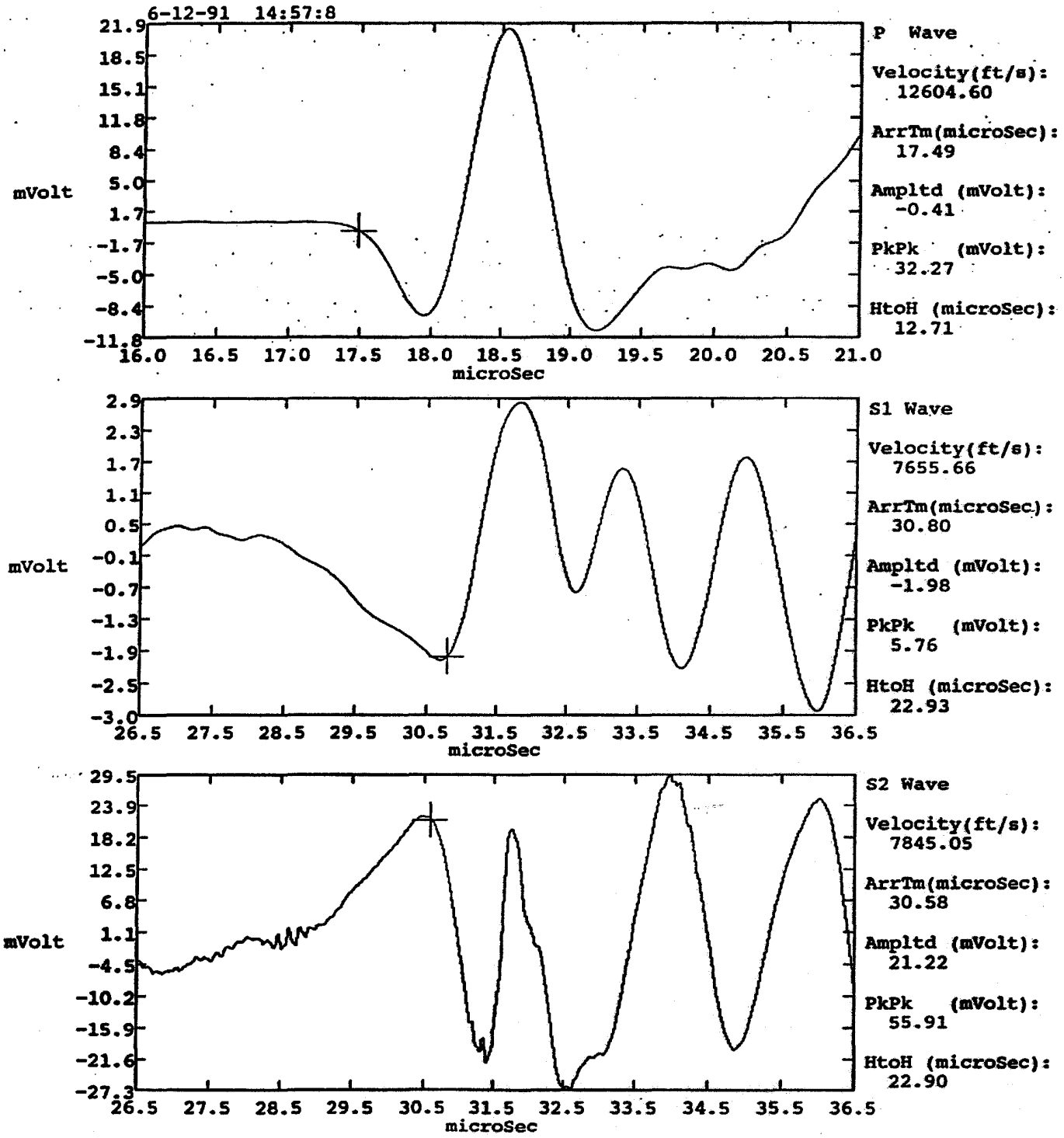
Well: EXXON ANTARES 2
Sample: 11106 Length:0.422 inch Fluid: SOLTROL
Conf Pr:10100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11106.4S Pick: Manual 6-13-91 13:47:0



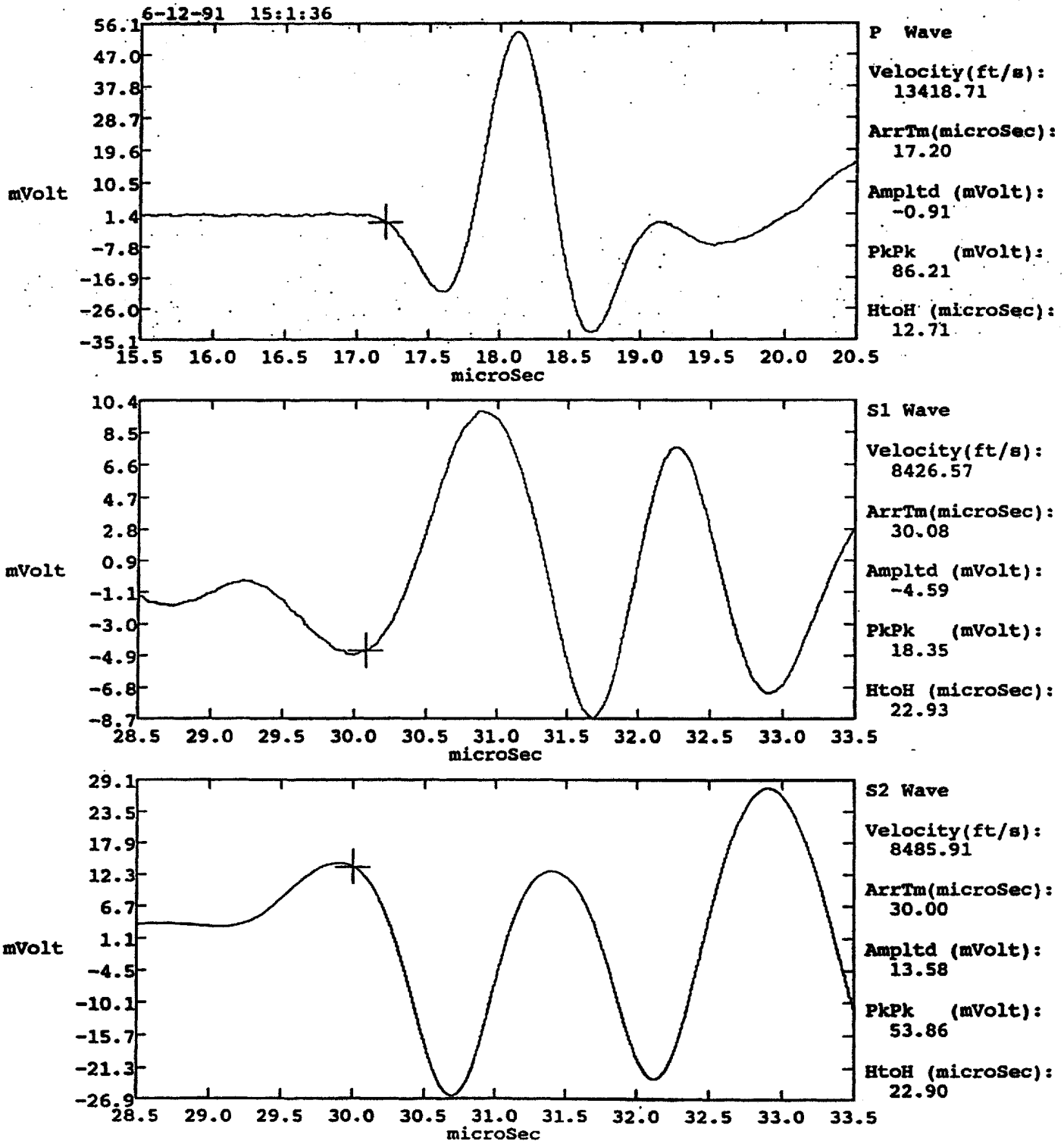
Well: EXXON ANTARES 2
Sample: 11106 Length:0.422 inch Fluid: SOLTROL
Conf Pr:15100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11106.5S Pick: Manual 6-13-91 13:51:24



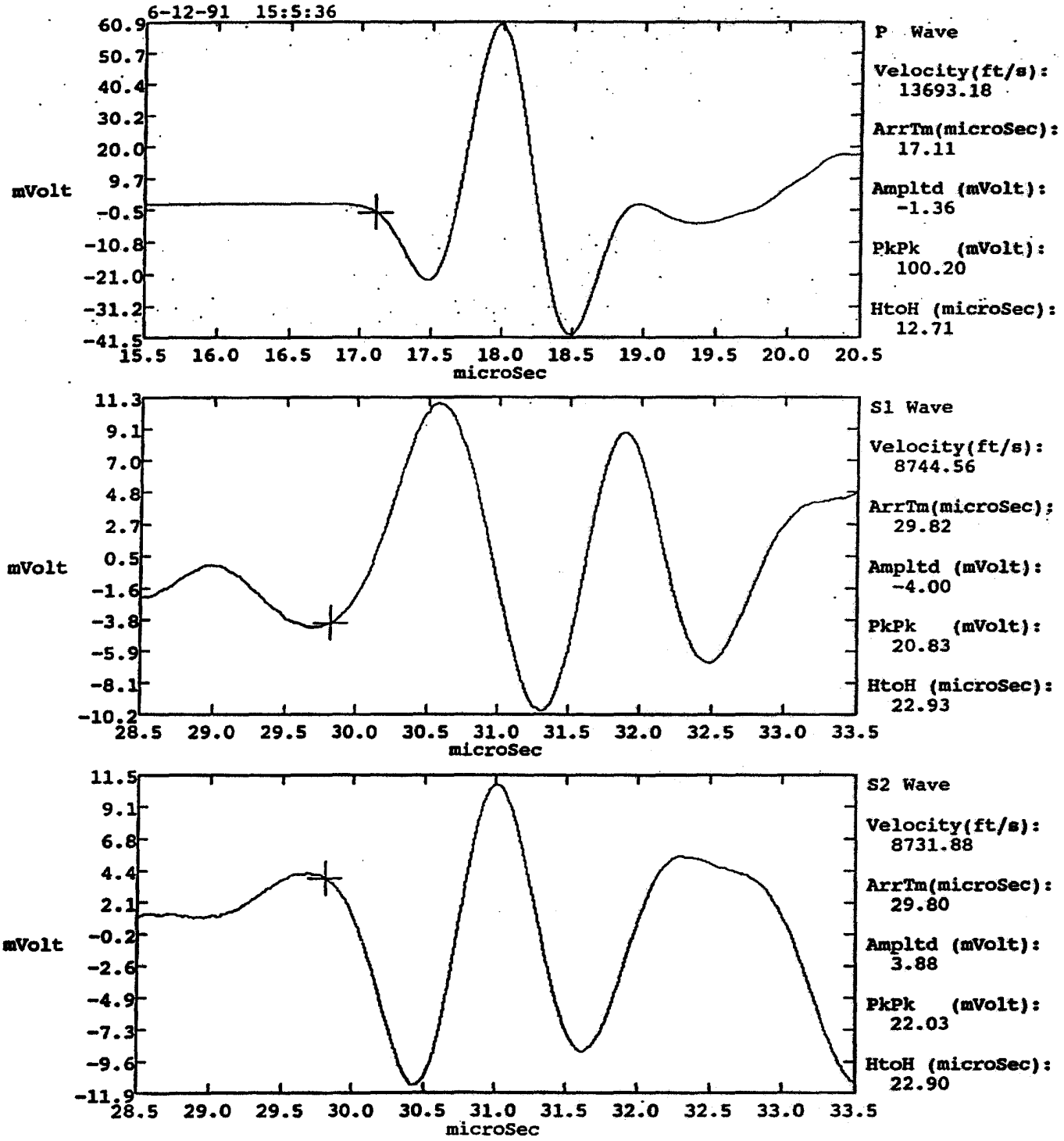
Well: EXXON ANTARES 2
Sample: 11186 Length:0.723 inch Fluid: SOLTROL
Conf Pr:1100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11186.1S Pick: Manual 6-12-91 14:57:8



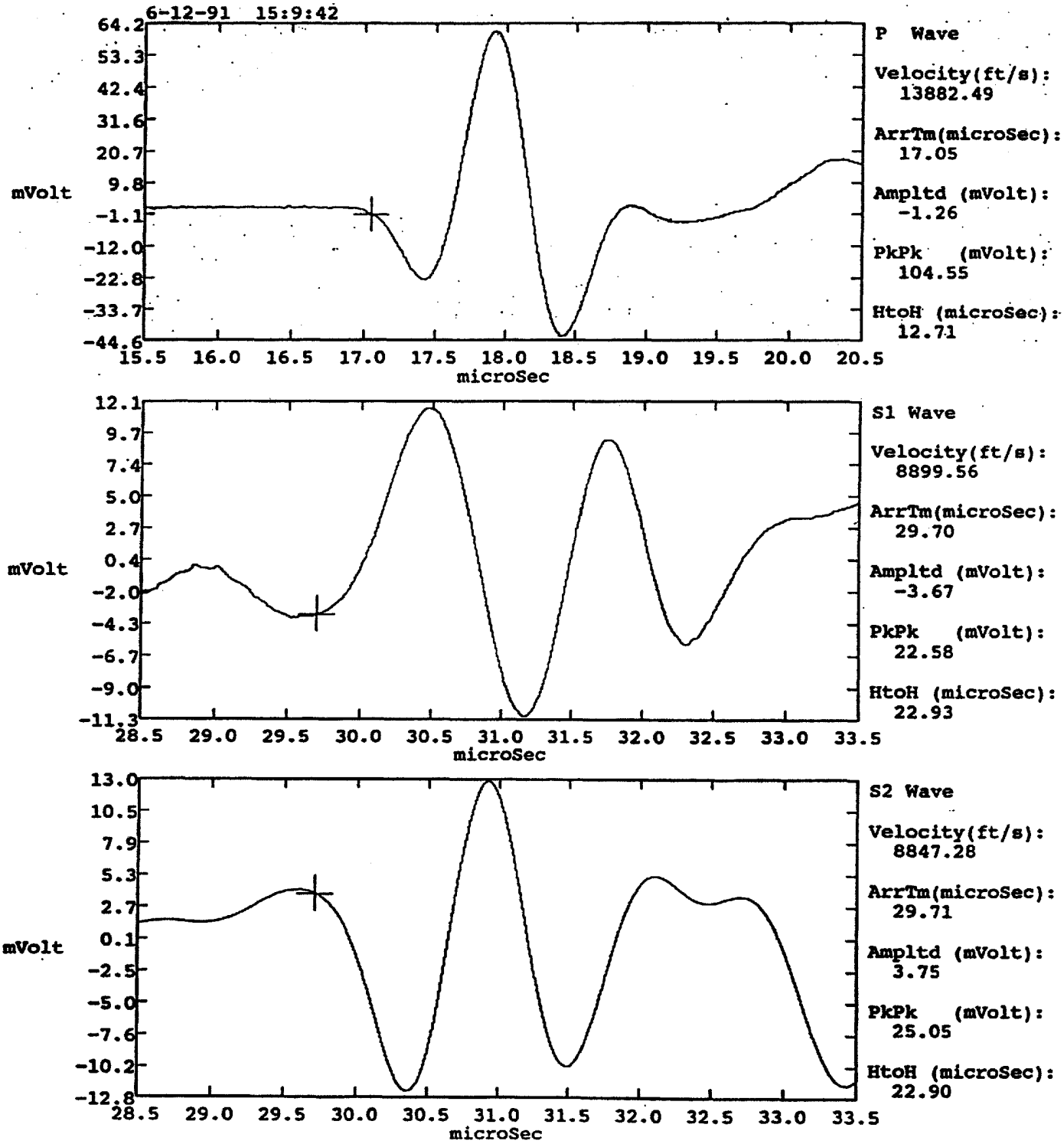
Well: EXXON ANTARES 2
Sample: 11186 Length:0.723 inch Fluid: SOLTROL
Conf Pr:4100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11186.2S Pick: Manual 6-12-91 15:1:36



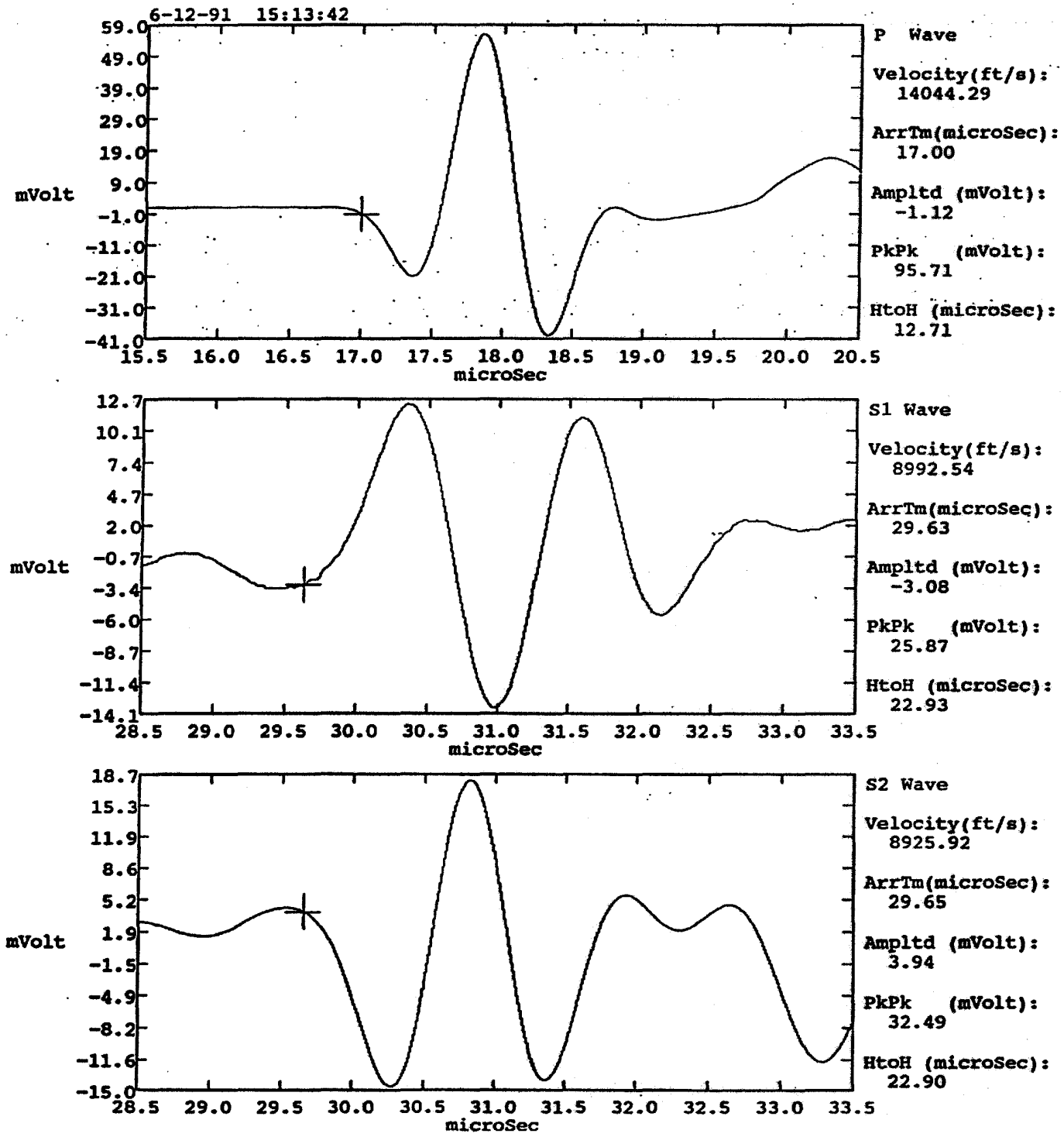
Well: EXXON ANTARES 2
Sample: 11186 Length:0.723 inch Fluid: SOLTROL
Conf Pr:7600.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11186.3S Pick: Manual 6-12-91 15:5:36



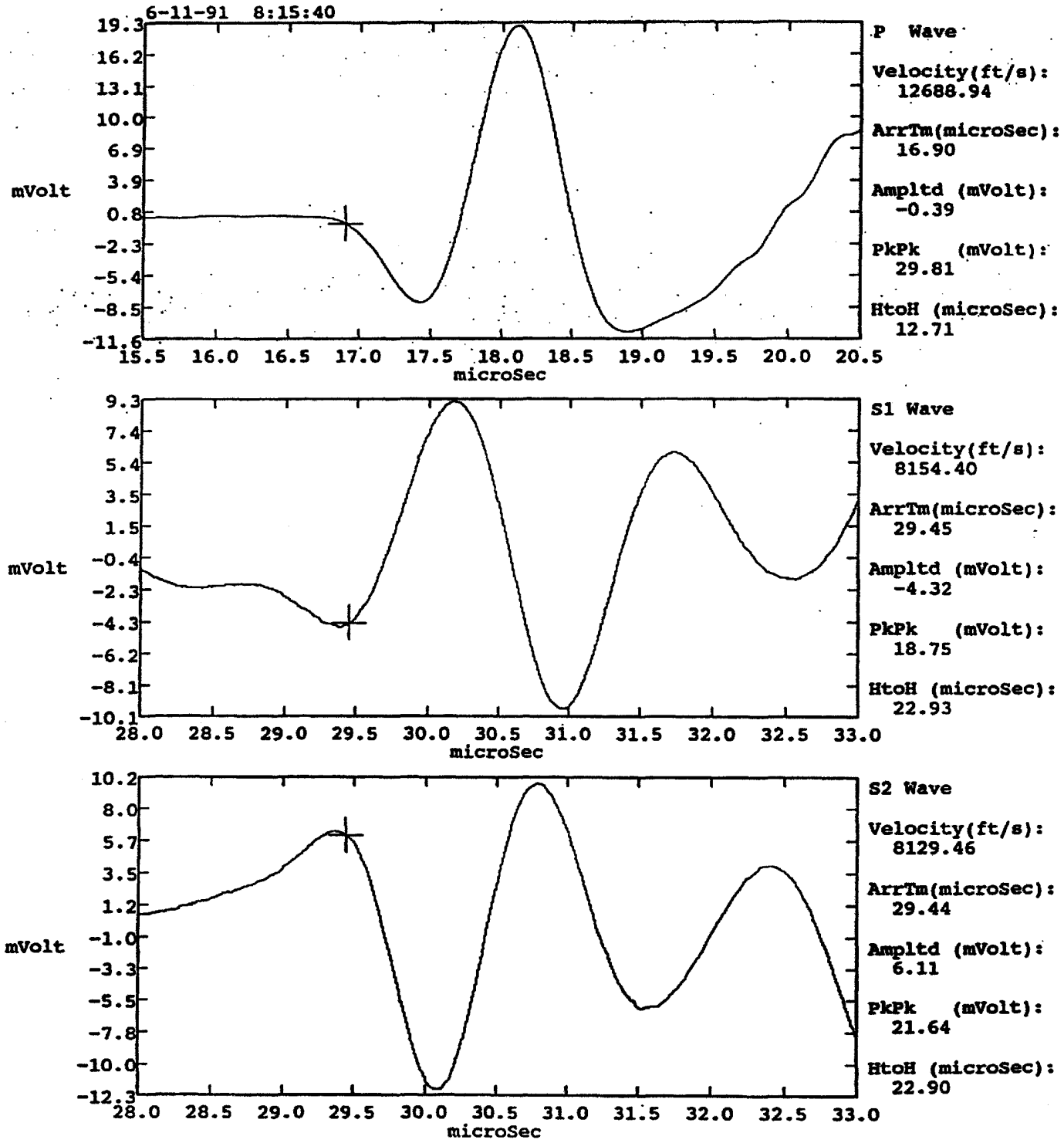
Well: EXXON ANTARES 2
Sample: 11186 Length:0.723 inch Fluid: SOLTROL
Conf Pr:10100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11186.4S Pick: Manual 6-12-91 15:9:42



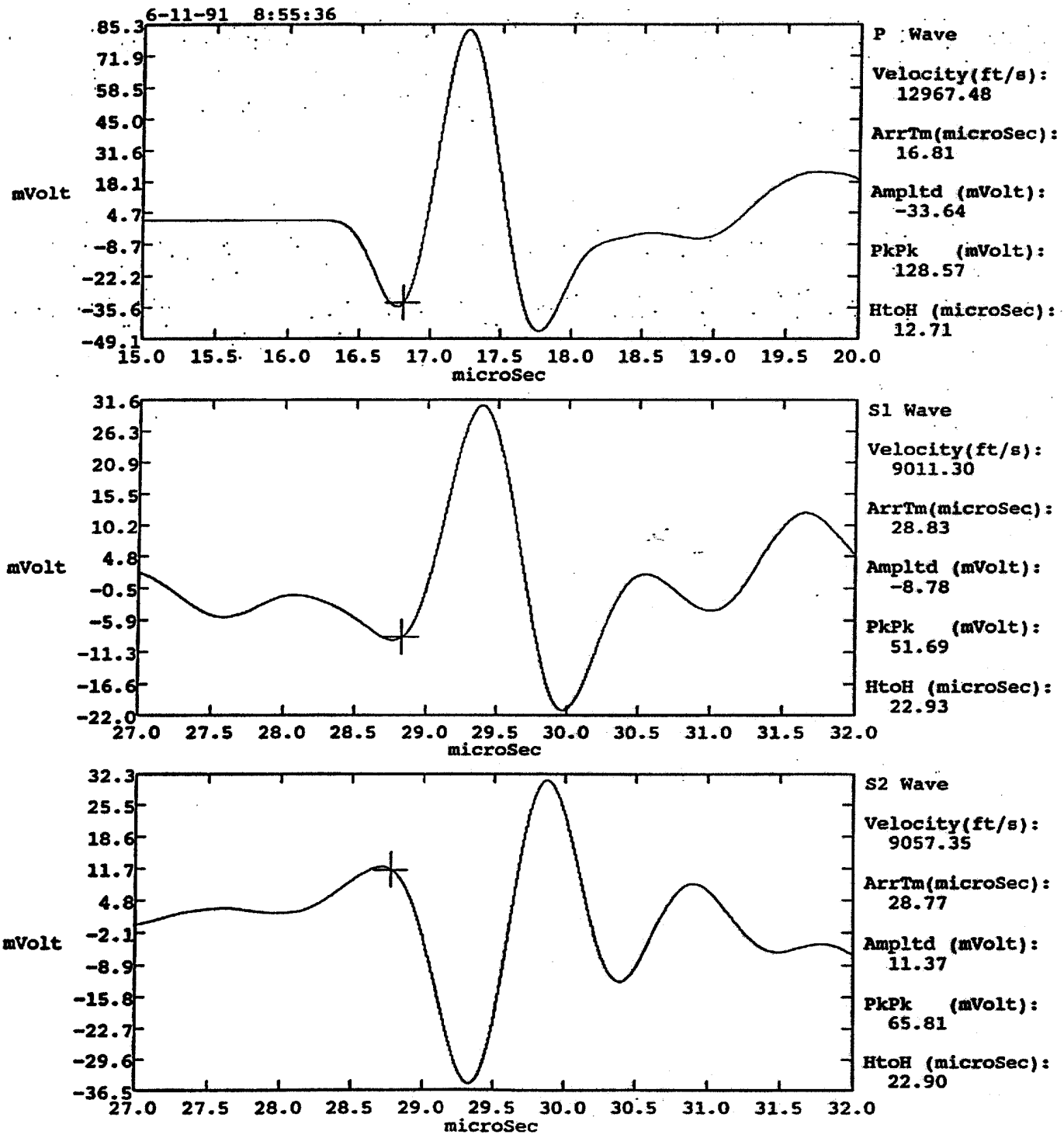
Well: EXXON ANTARES 2
Sample: 11186 Length:0.723 inch Fluid: SOLTROL
Conf Pr:15100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11186.5S Pick: Manual 6-12-91 15:13:42



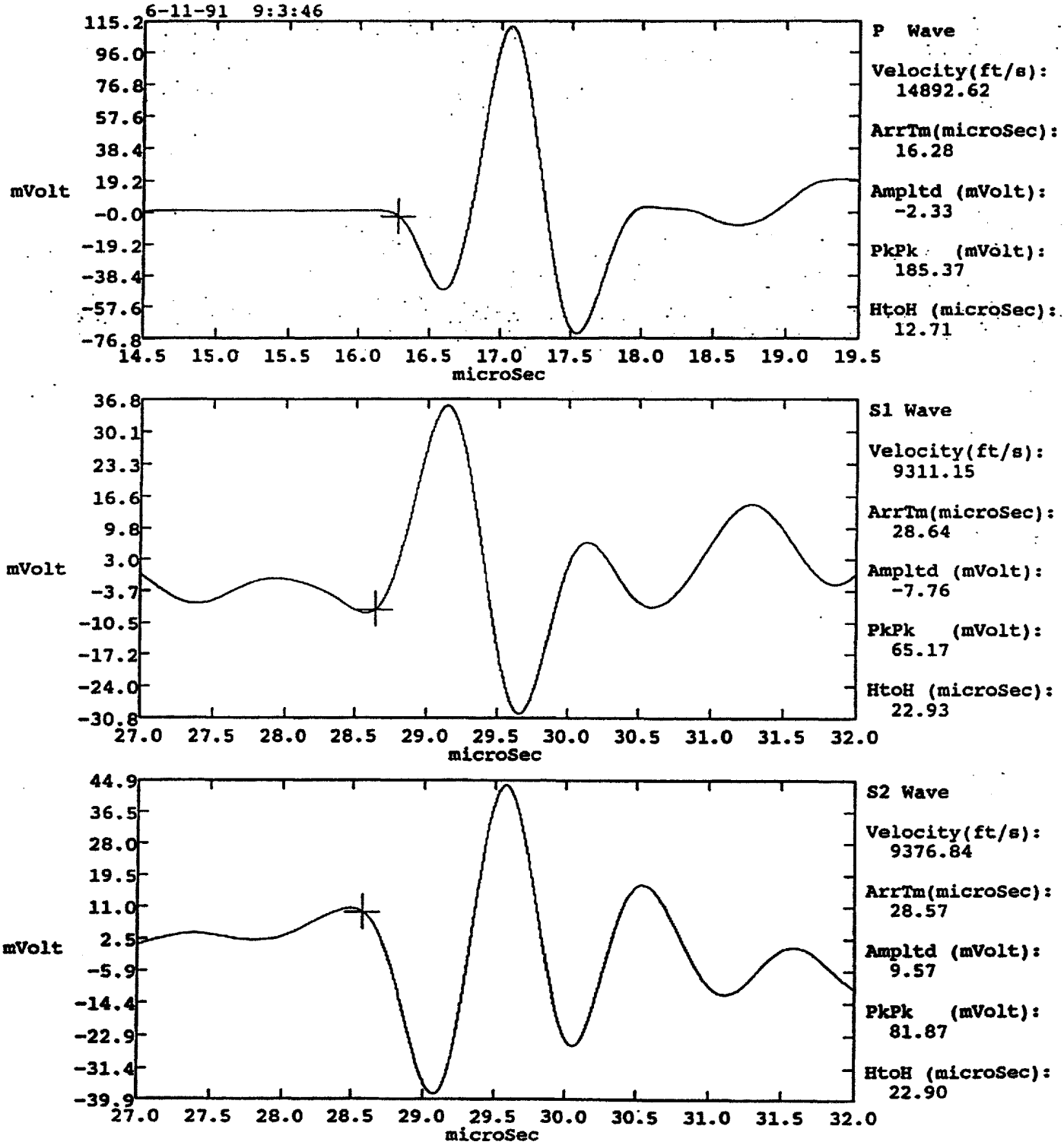
Well: EXXON ANTARES 2
Sample: 11235 Length:0.638 inch Fluid: SOLTROL
Conf Pr:1100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11235.1S Pick: Manual 6-11-91 8:15:40



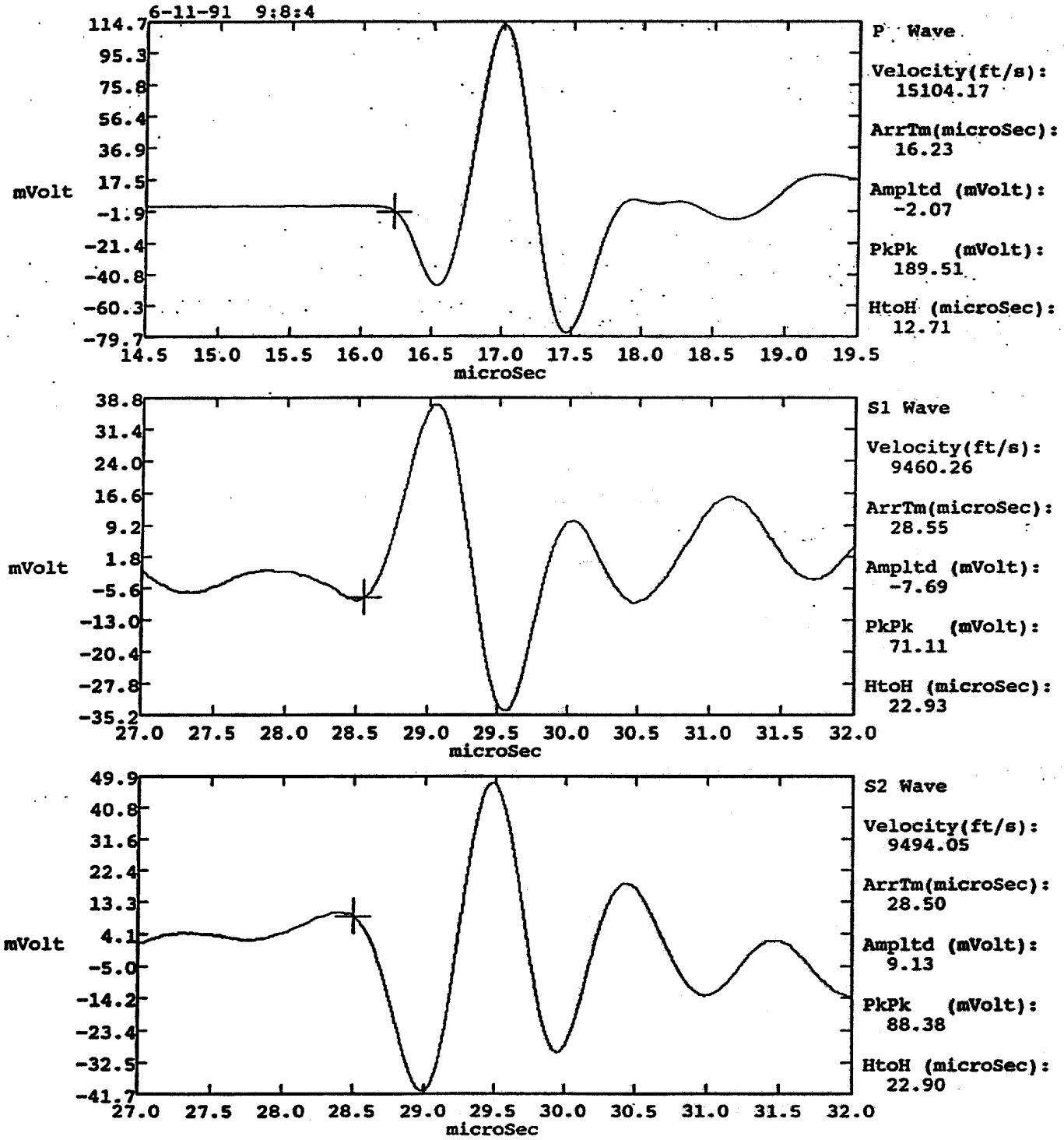
Well: EXXON ANTARES 2
Sample: 11235 Length:0.638 inch Fluid: SOLTROL
Conf Pr:4100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11235.2S Pick: Manual 6-11-91 8:55:36



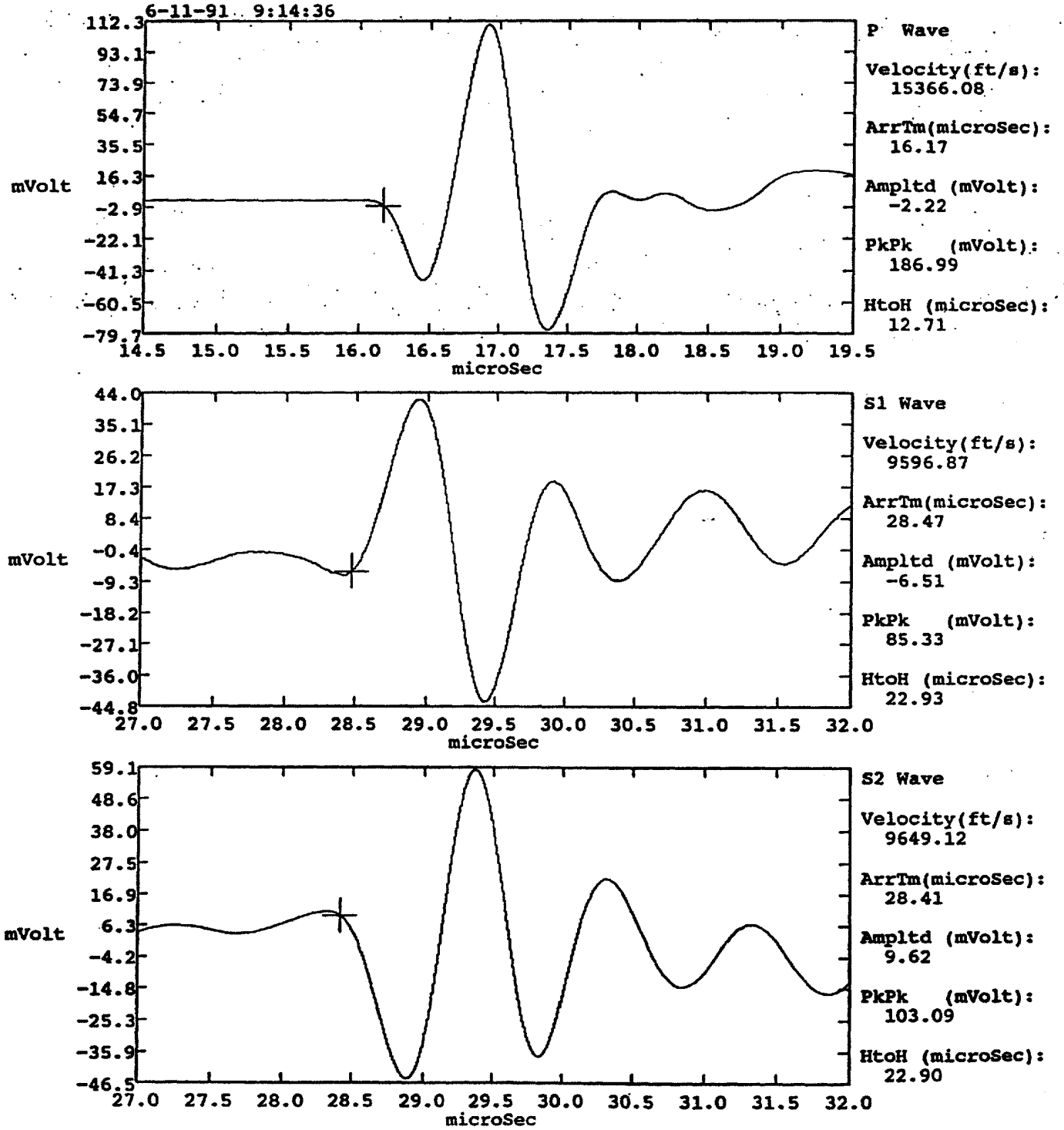
Well: EXXON ANTARES 2
Sample: 11235 Length:0.638 inch Fluid: SOLTROL
Conf Pr:7600.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11235.3S Pick: Manual 6-11-91 9:3:46



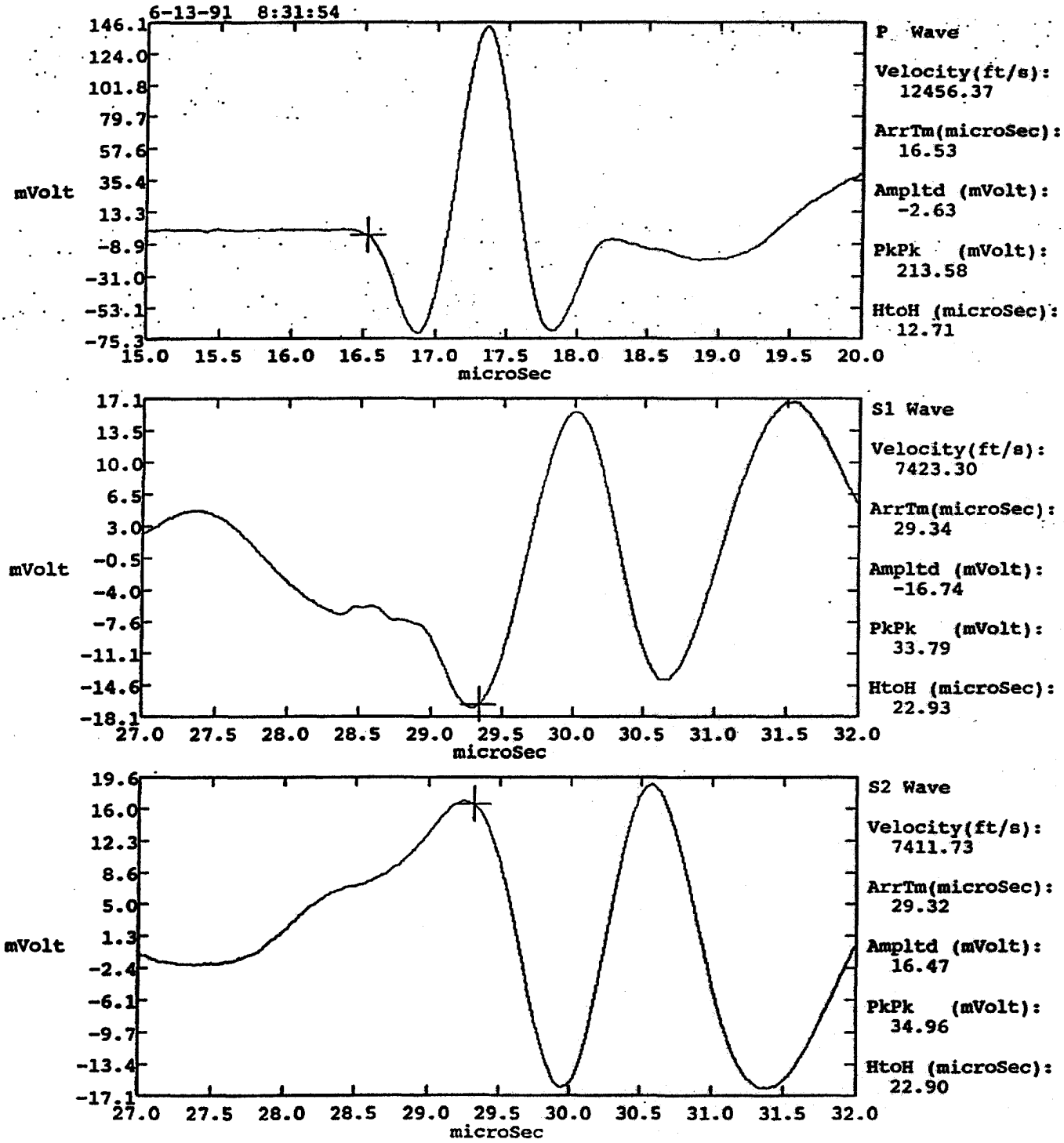
Well: EXXON ANTARES 2
Sample: 11235 Length:0.638 inch Fluid: SOLTROL
Conf Pr:10100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11235.4S Pick: Manual 6-11-91 9:8:4



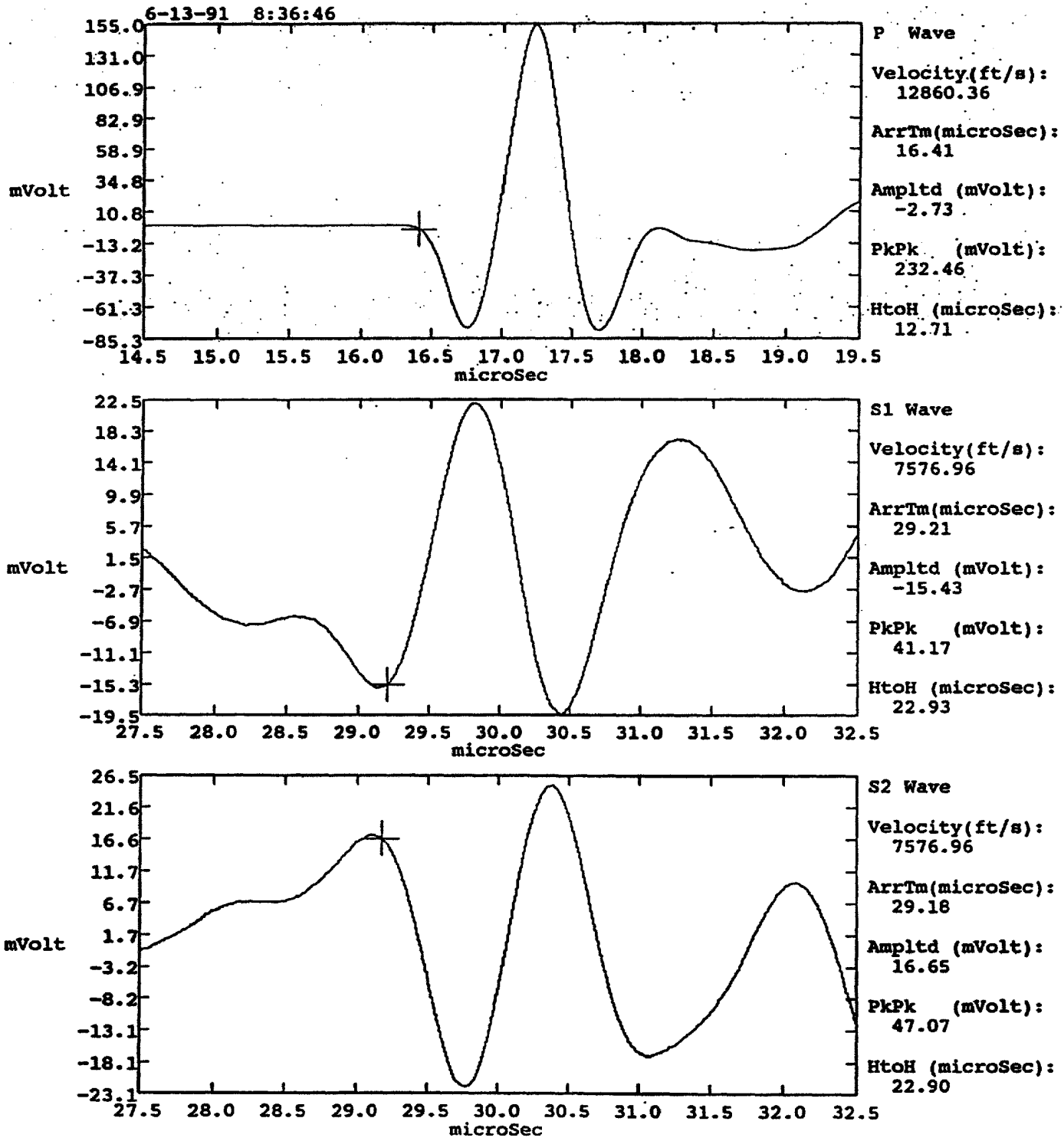
Well: EXXON ANTARES 2
Sample: 11235 Length:0.638 inch Fluid: SOLTROL
Conf Pr:15100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11235.5S Pick: Manual 6-11-91 9:14:36



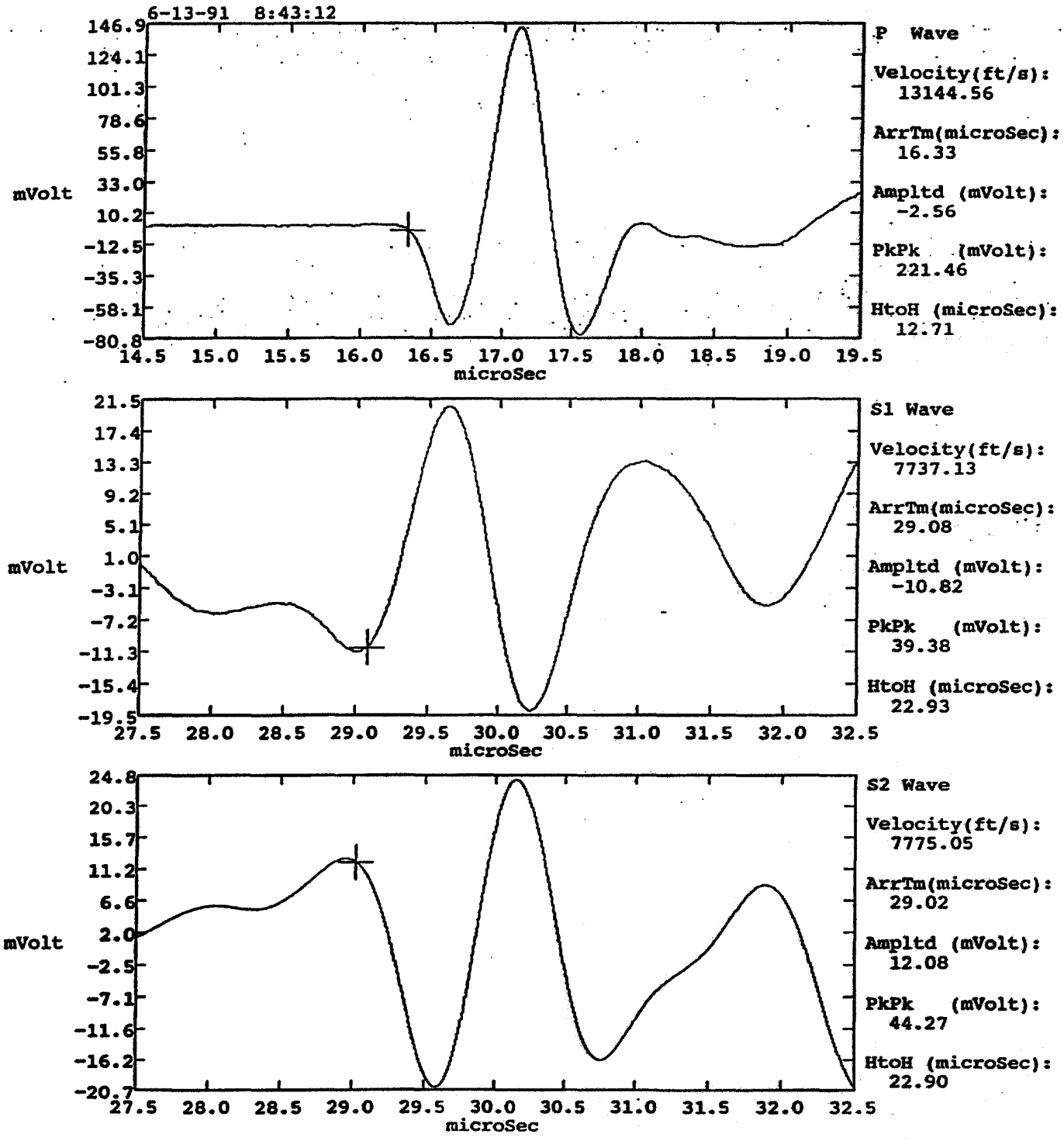
Well: EXXON ANTARES 2
Sample: 11264 Length:0.571 inch Fluid: SOLTROL
Conf Pr:1100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11264.1S Pick: Manual 6-13-91 8:31:54



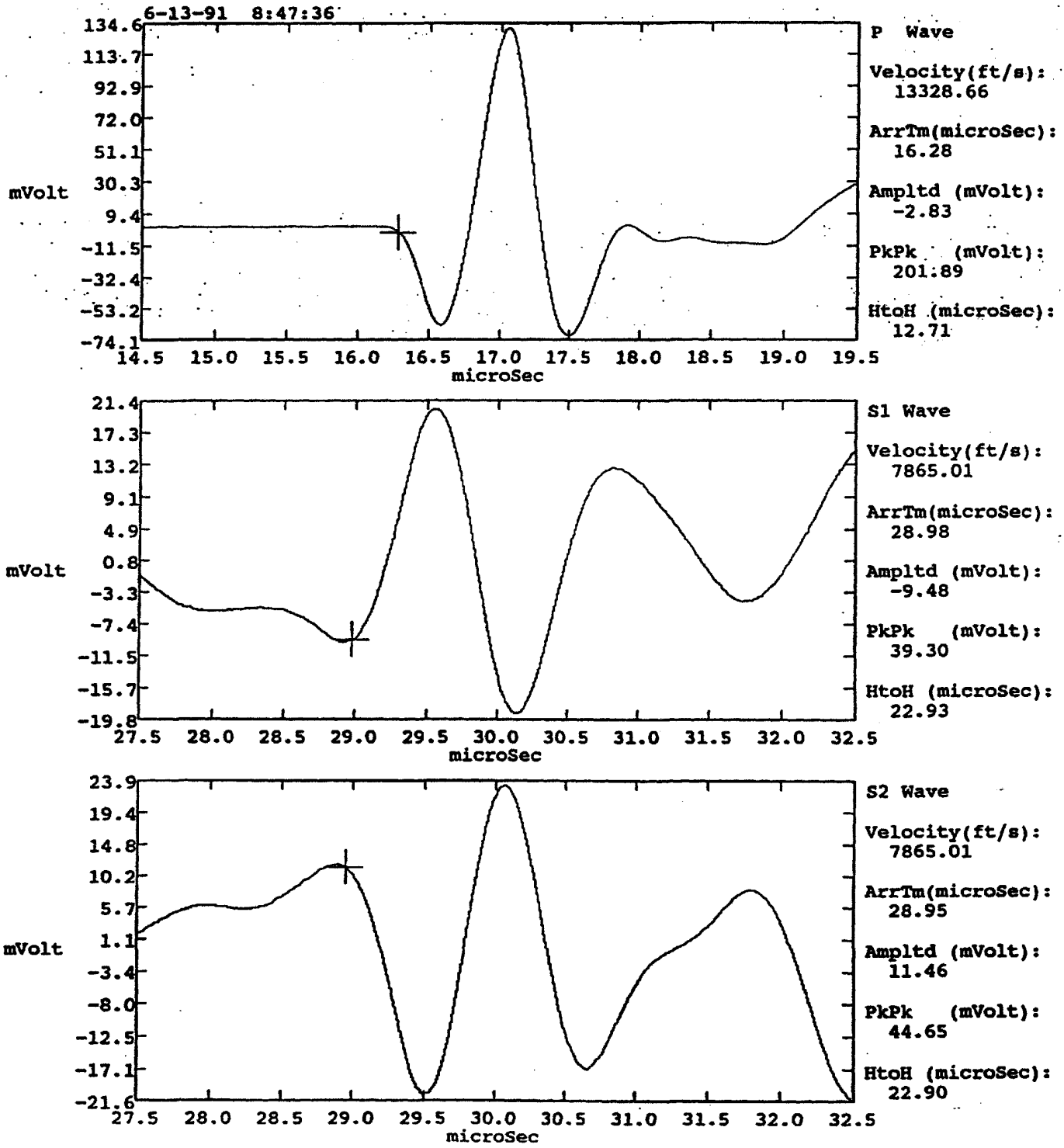
Well: EXXON ANTARES 2
Sample: 11264 Length:0.571 inch Fluid: SOLTROL
Conf Pr:4100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11264.2S Pick: Manual 6-13-91 8:36:46



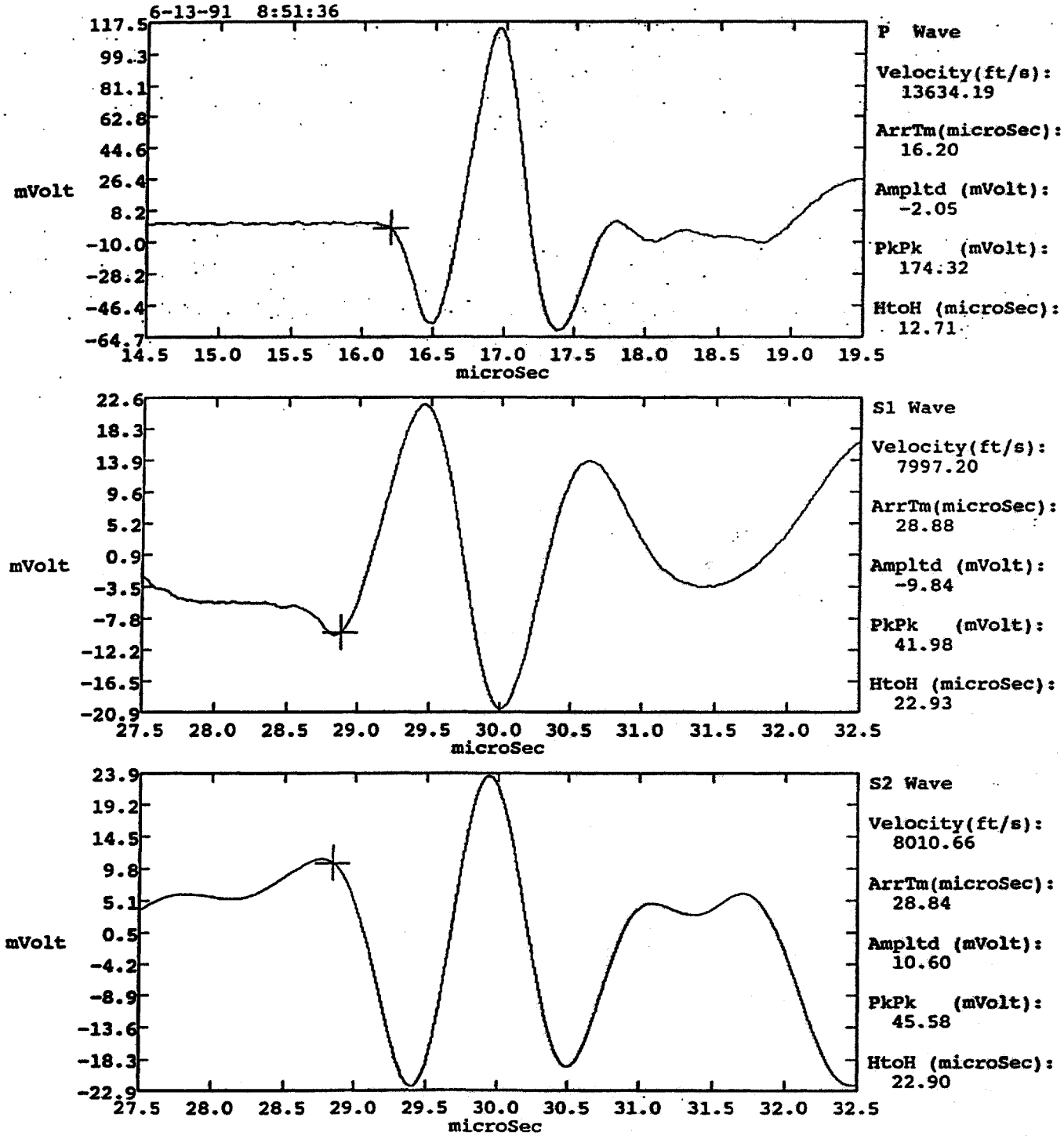
Well: EXXON ANTARES 2
Sample: 11264 Length:0.571 inch Fluid: SOLTROL
Conf Pr:7600.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11264.3S Pick: Manual 6-13-91 8:43:12



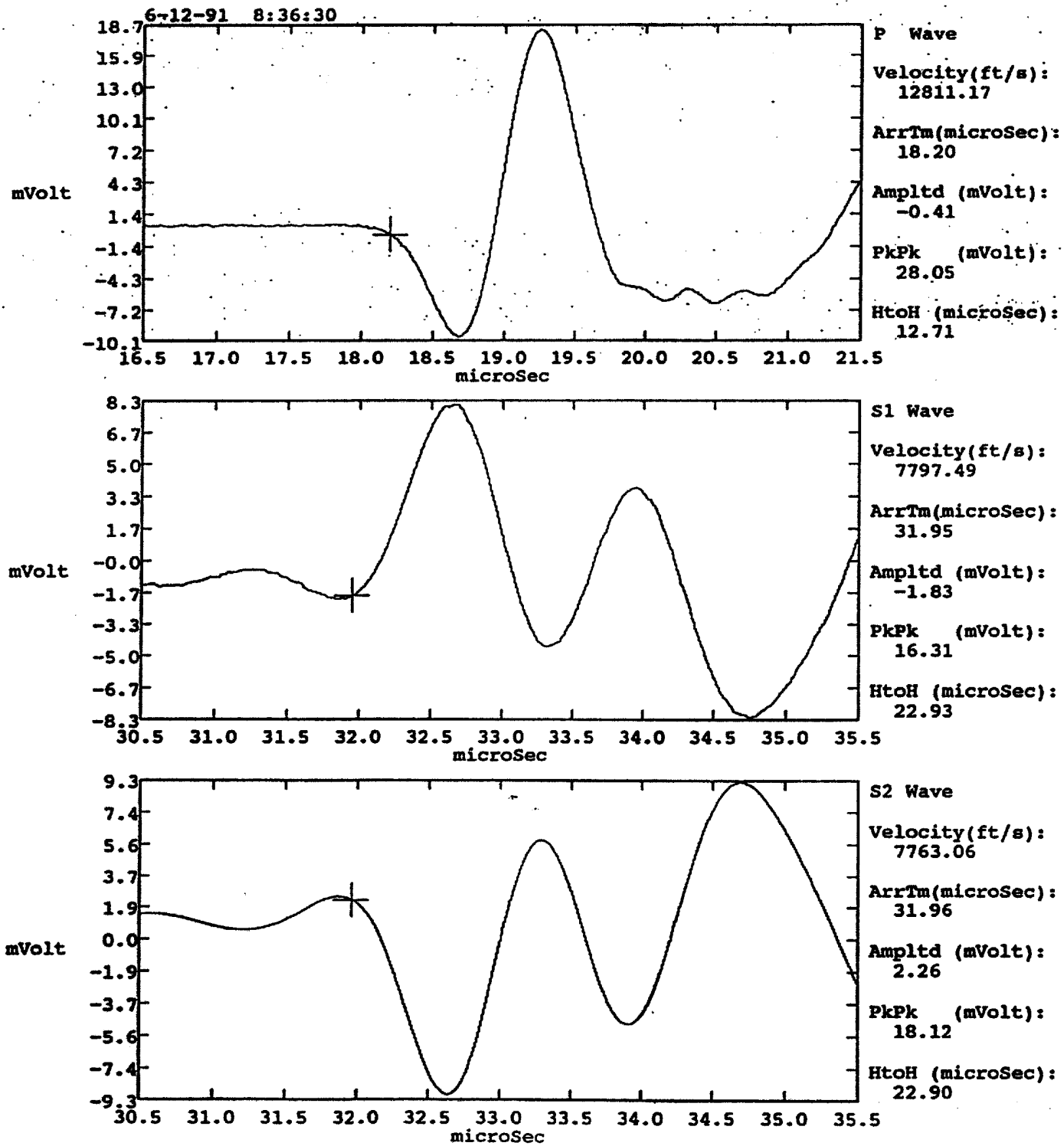
Well: EXXON ANTARES 2
Sample: 11264 Length:0.571 inch Fluid: SOLTROL
Conf Pr:10100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11264.4S Pick: Manual 6-13-91 8:47:36



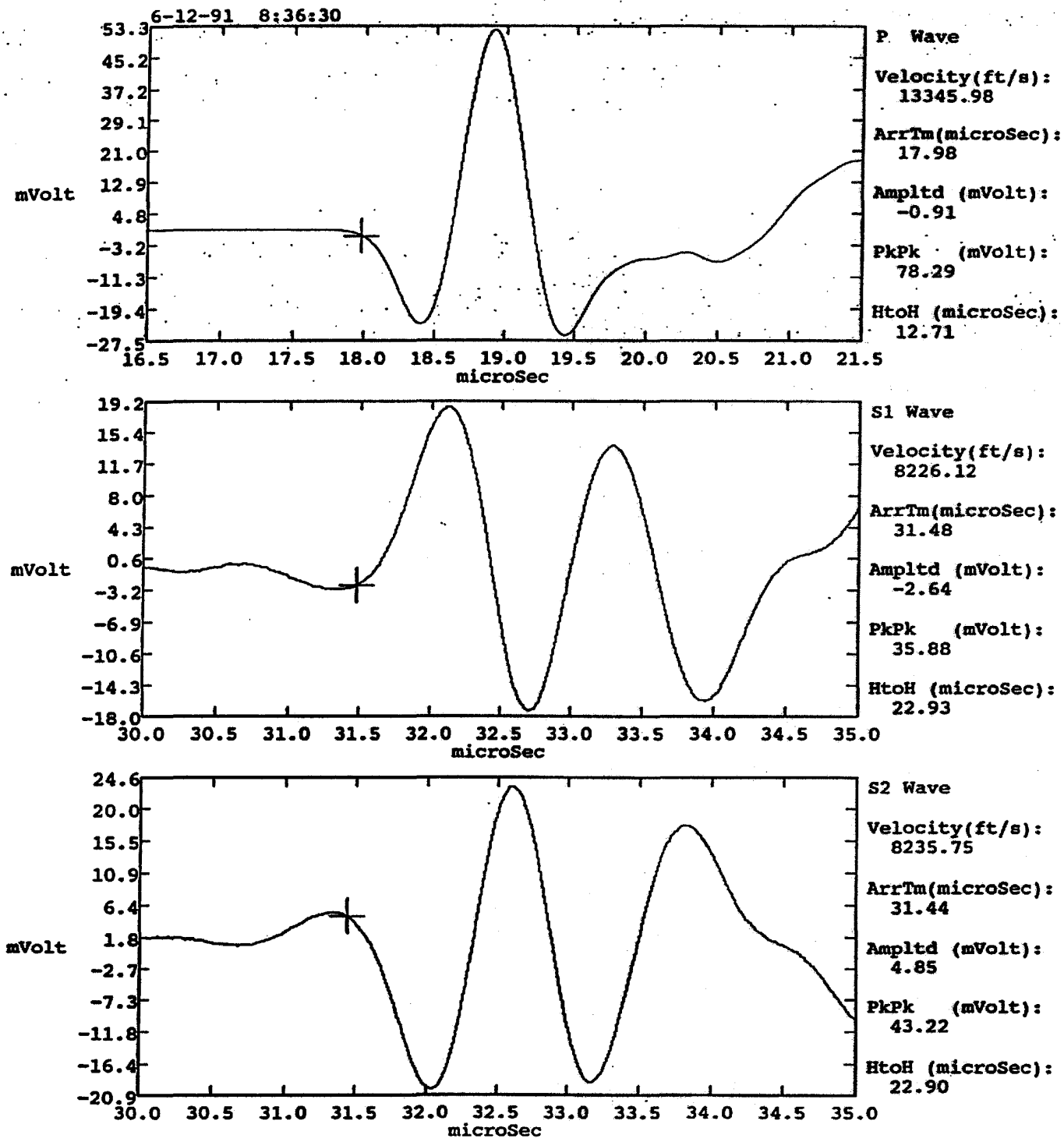
Well: EXXON ANTARES 2
Sample: 11264 Length:0.571 inch Fluid: SOLTROL
Conf Pr:15100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11264.5S Pick: Manual 6-13-91 8:51:36



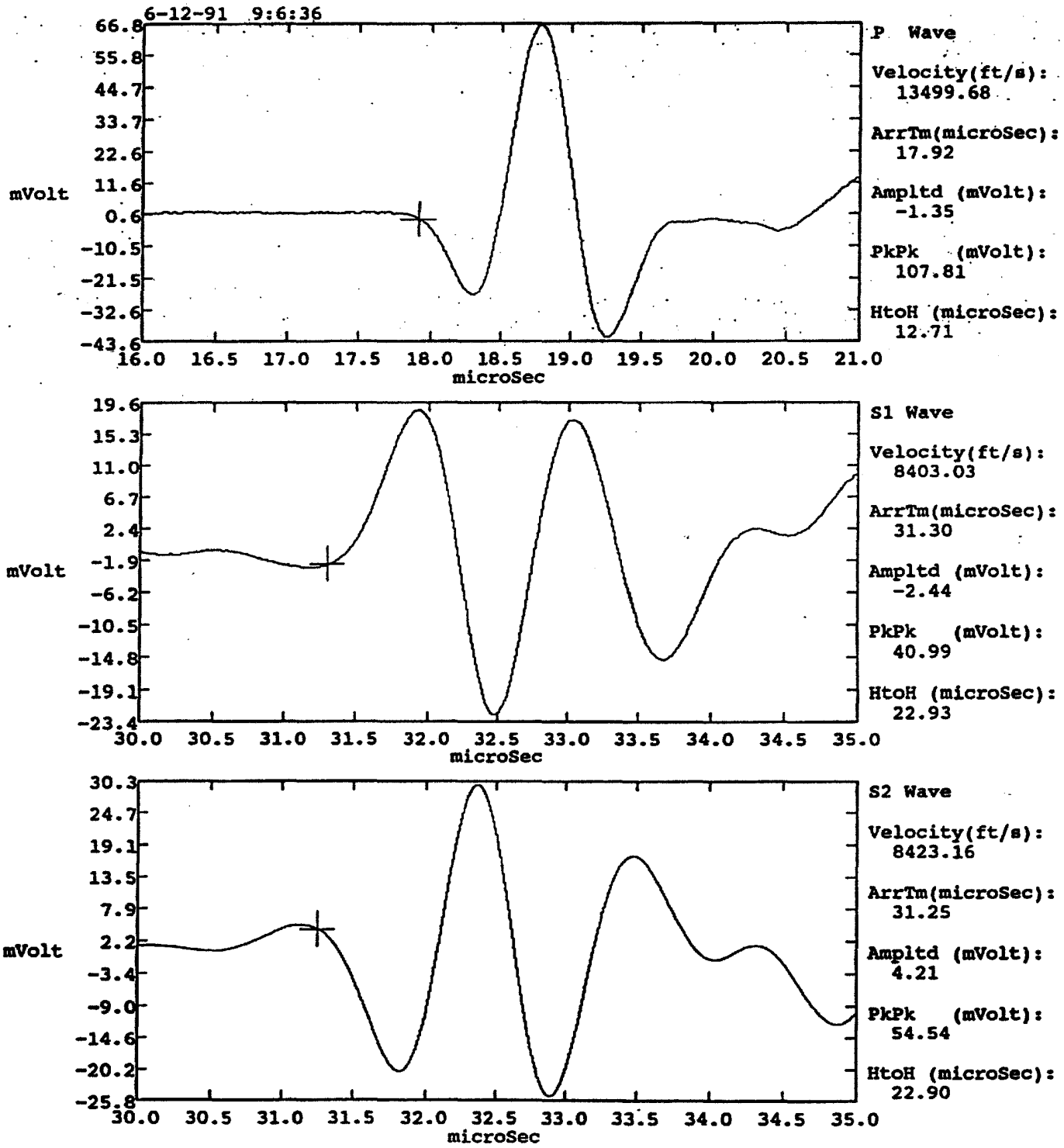
Well: EXXON ANTARES 2
Sample: 11305 Length:0.844 inch Fluid: SOLTROL
Conf Pr:1100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11305.1S Pick: Manual 6-12-91 8:36:30



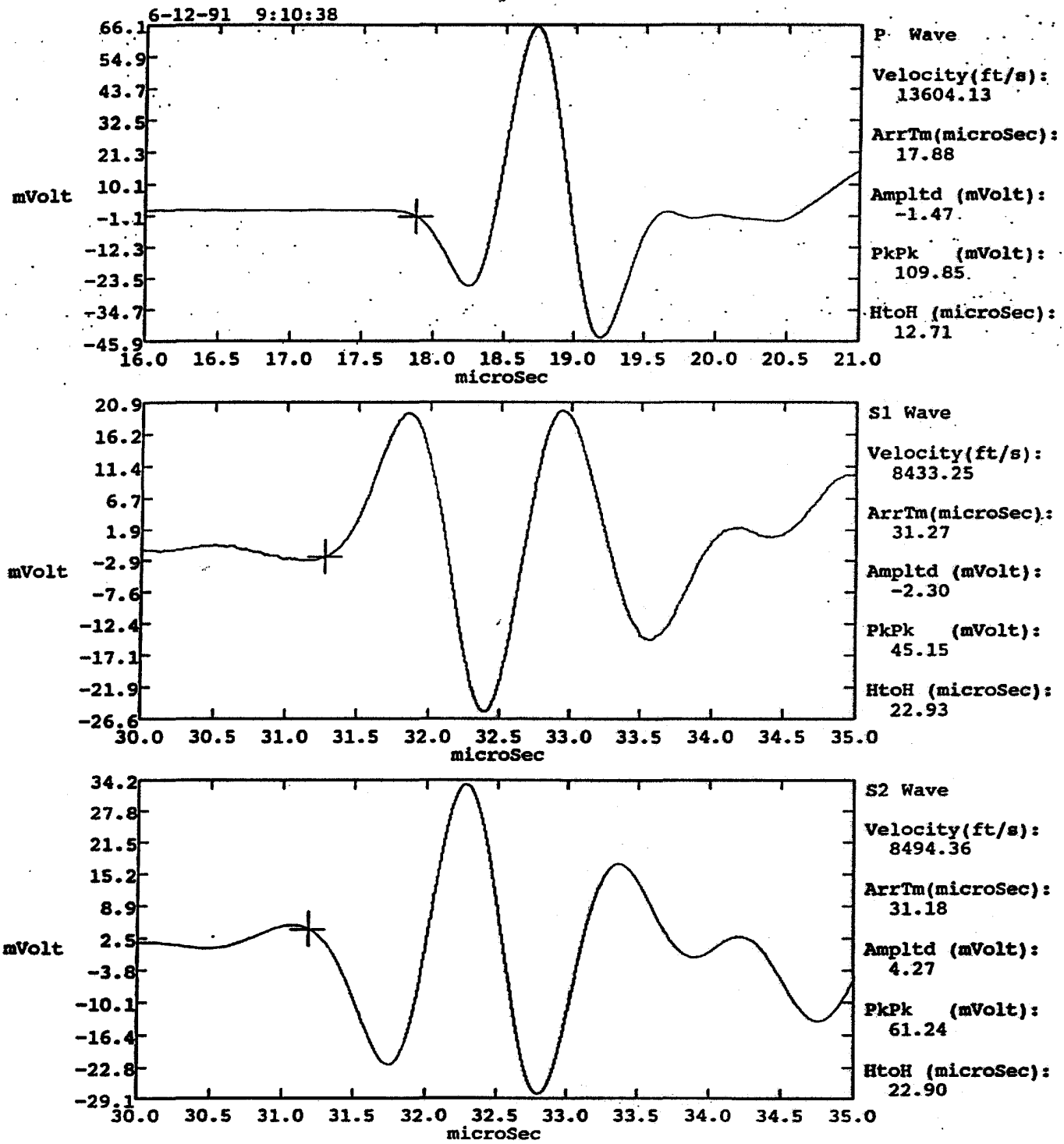
Well: EXXON ANTARES 2
Sample: 11305 Length:0.844 inch Fluid: SOLTROL
Conf Pr:4100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11305.DS Pick: Manual 6-12-91 8:36:30



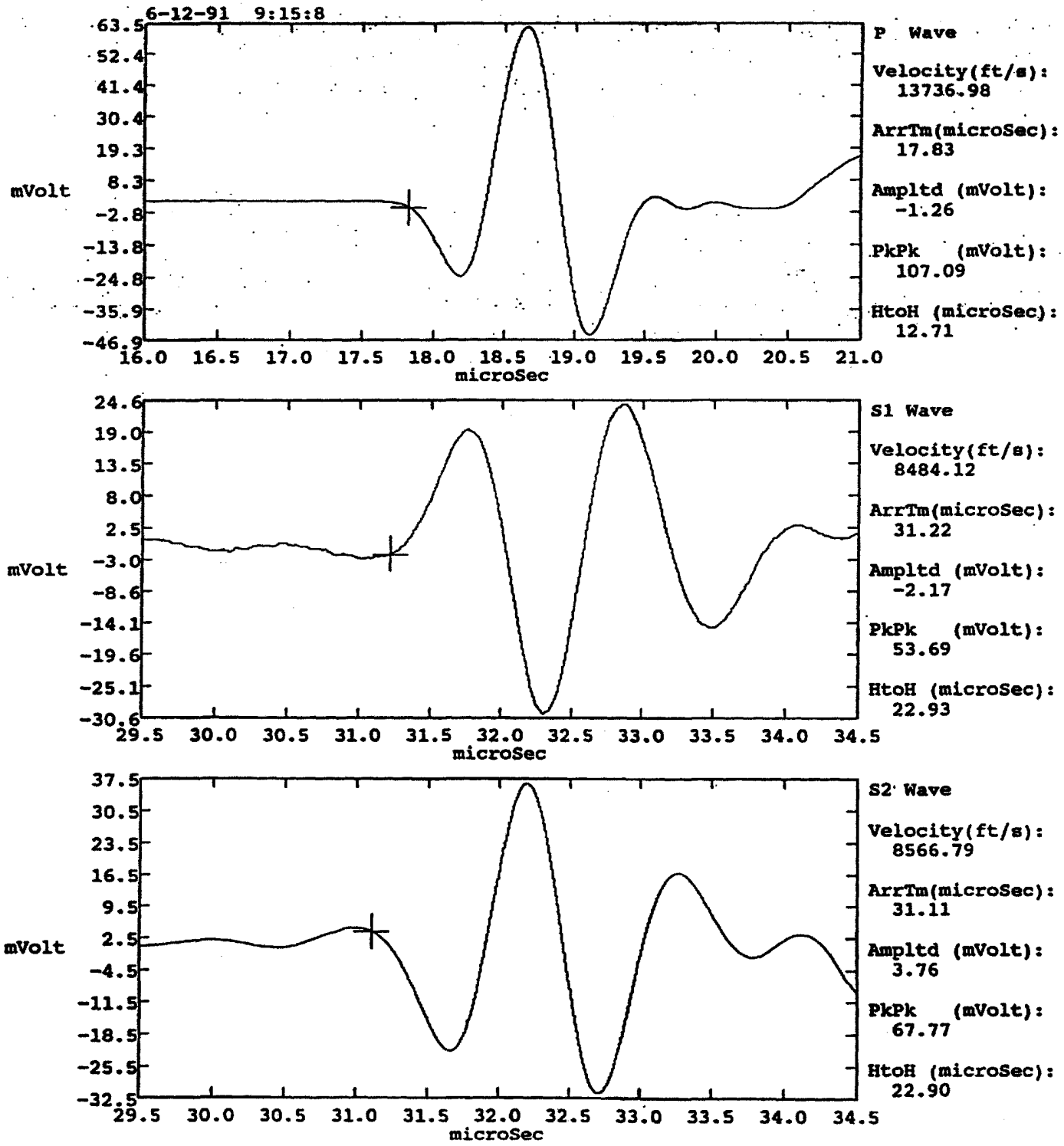
Well: EXXON ANTARES 2
Sample: 11305 Length:0.844 inch Fluid: SOLTROL
Conf Pr:7600.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11305.3S Pick: Manual 6-12-91 9:6:36



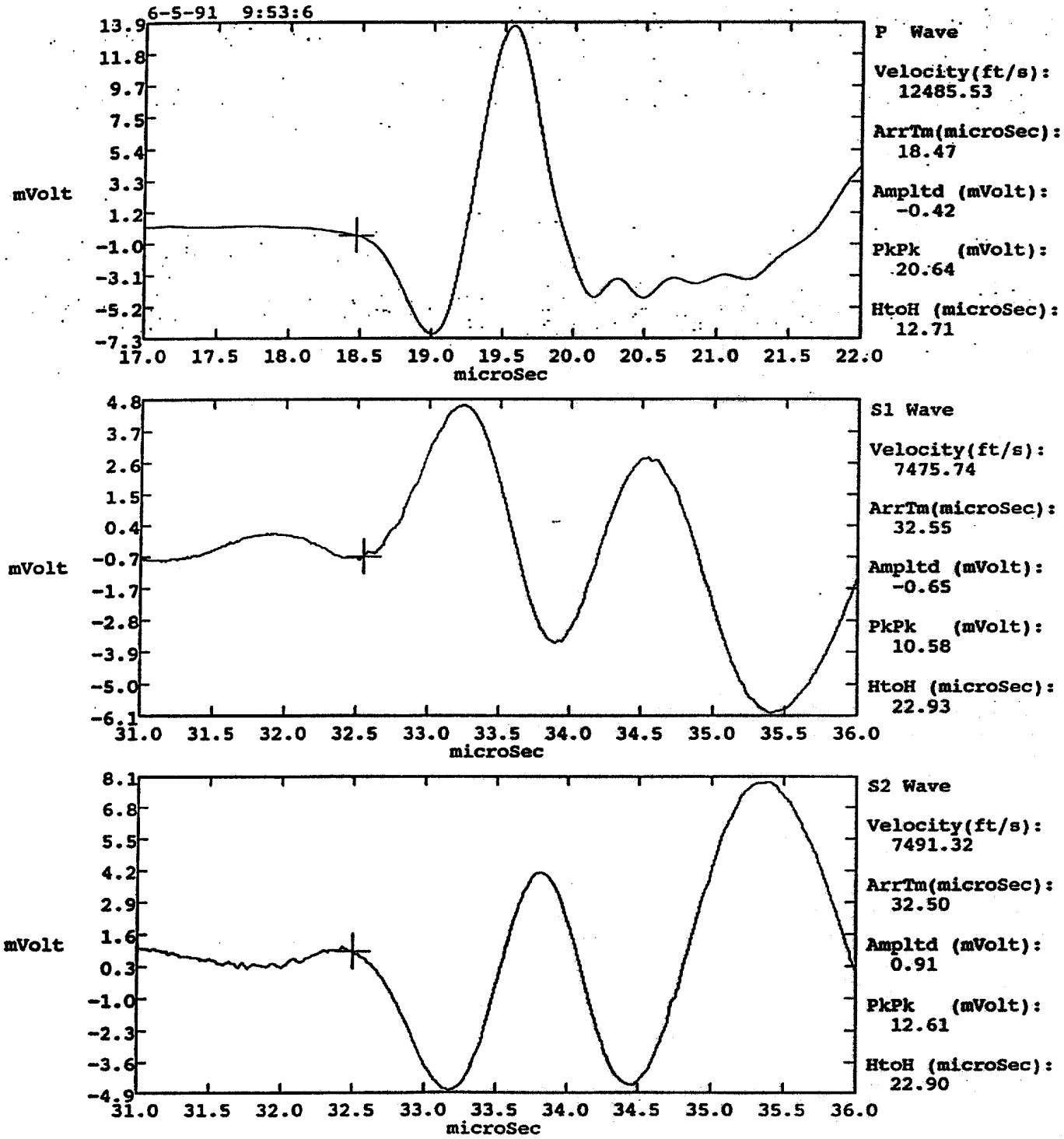
Well: EXXON ANTARES 2
Sample: 11305 Length:0.844 inch Fluid: SOLTROL
Conf Pr:10100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11305.4S Pick: Manual 6-12-91 9:10:38



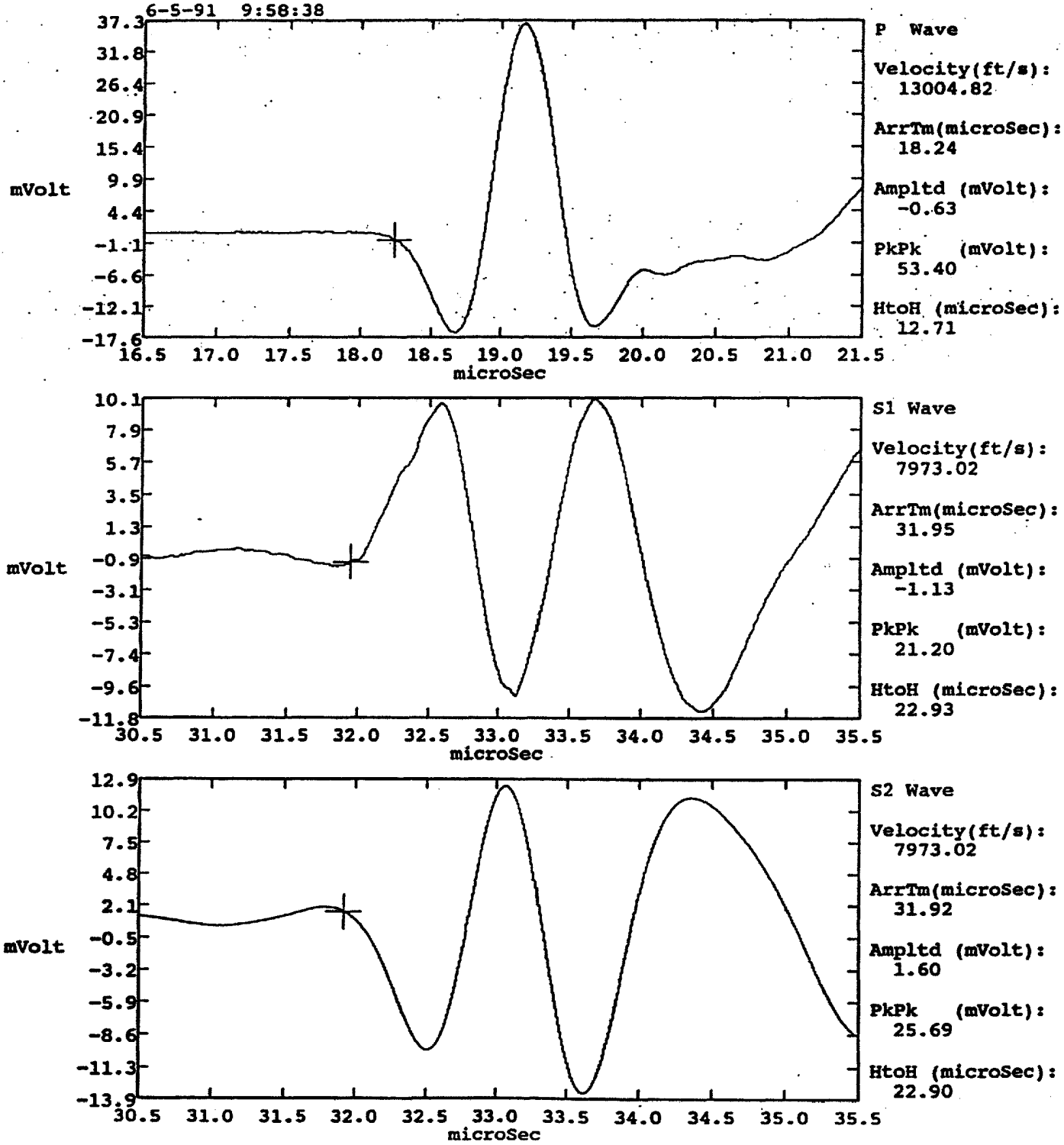
Well: EXXON ANTARES 2
Sample: 11305 Length:0.844 inch Fluid: SOLTROL
Conf Pr:15100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11305.5S Pick: Manual 6-12-91 9:15:8



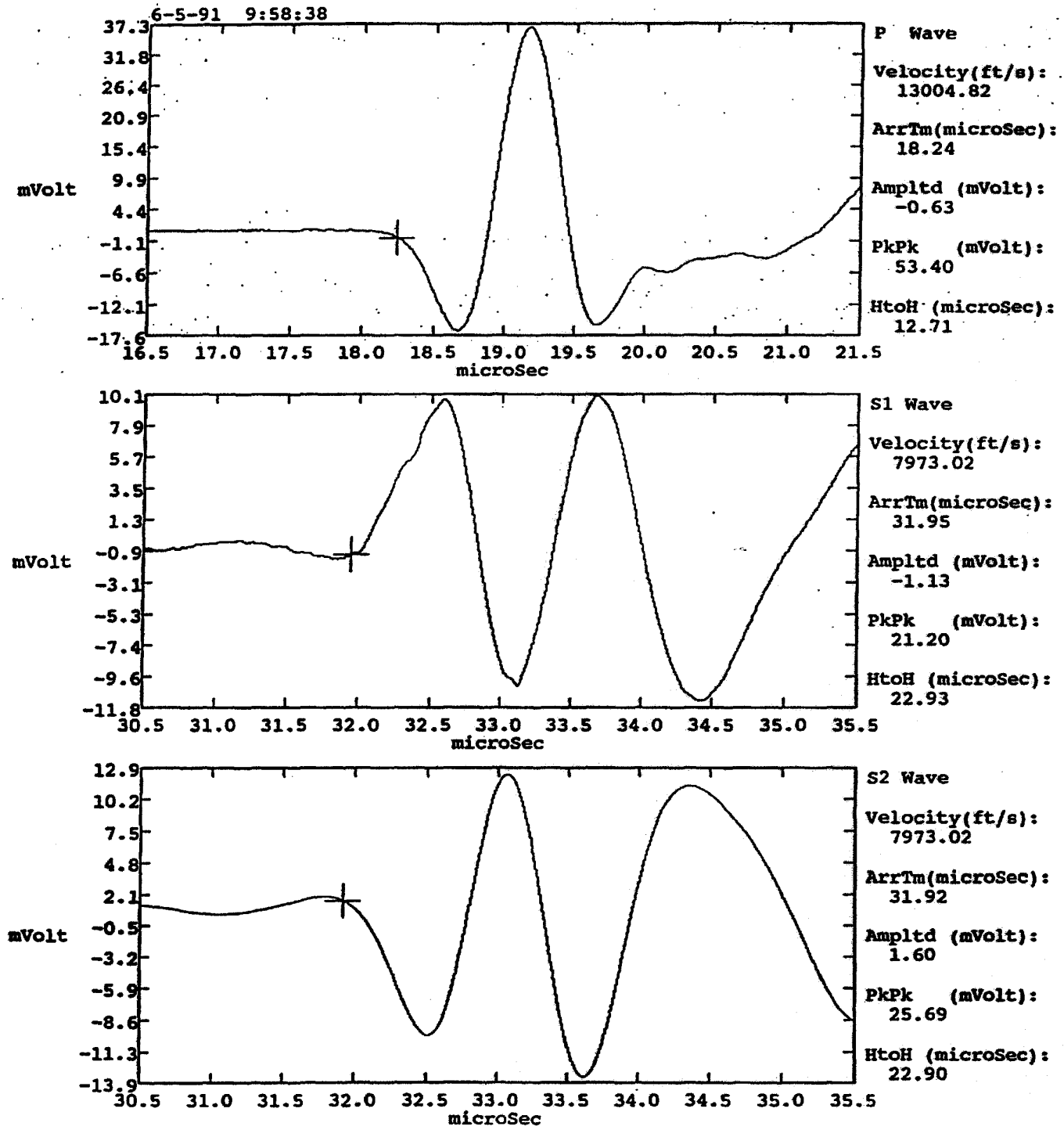
Well: EXXON ANTARES 2
Sample: 11330 Length:0.863 inch Fluid: Soltrol
Conf Pr:1100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11330.1S Pick: Manual 6-5-91 9:53:6



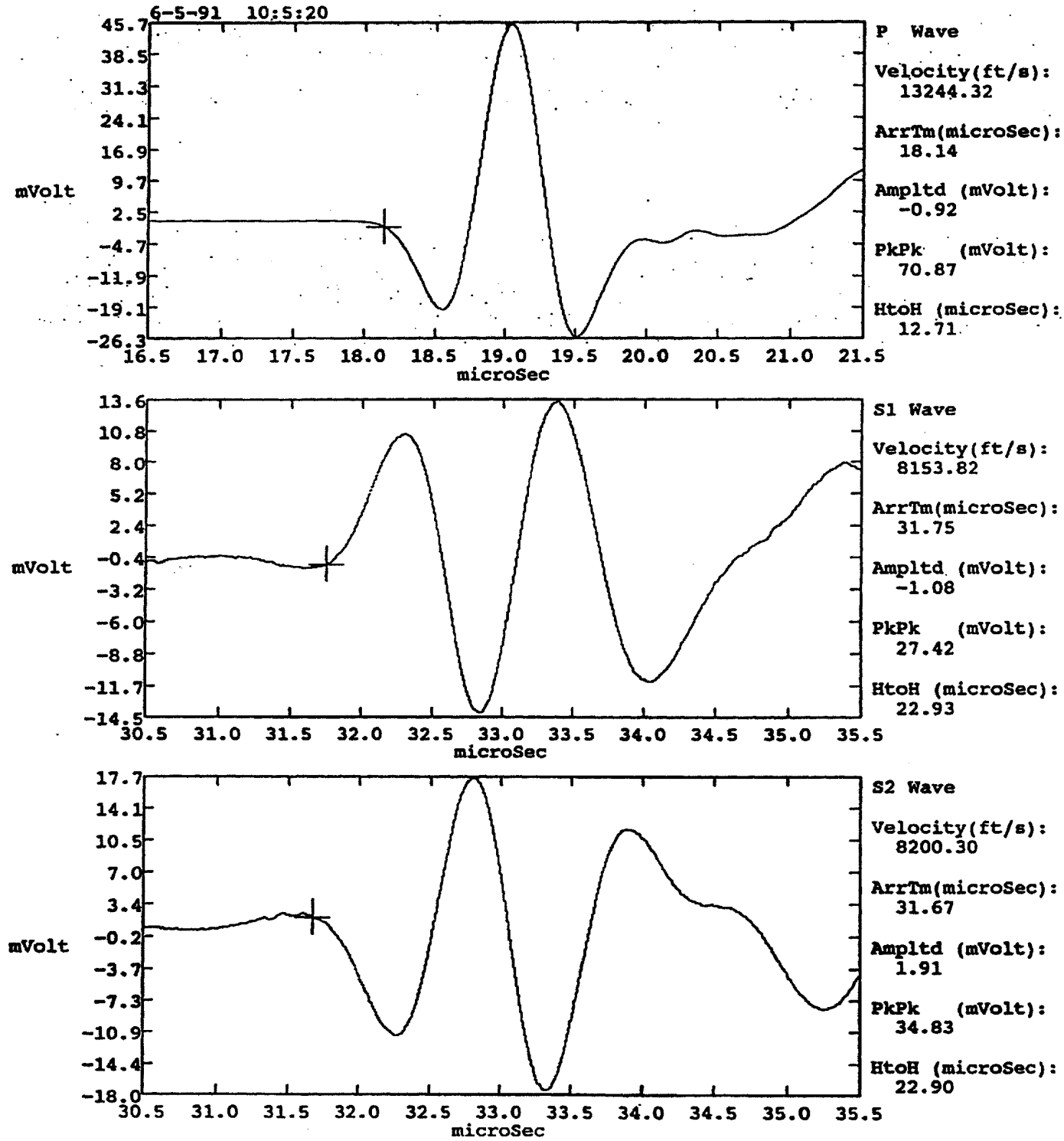
Well: EXXON ANTARES 2
Sample: 11330 Length:0.863 inch Fluid: Soltrol
Conf Pr:4100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11330.2S Pick: Manual 6-5-91 9:58:38



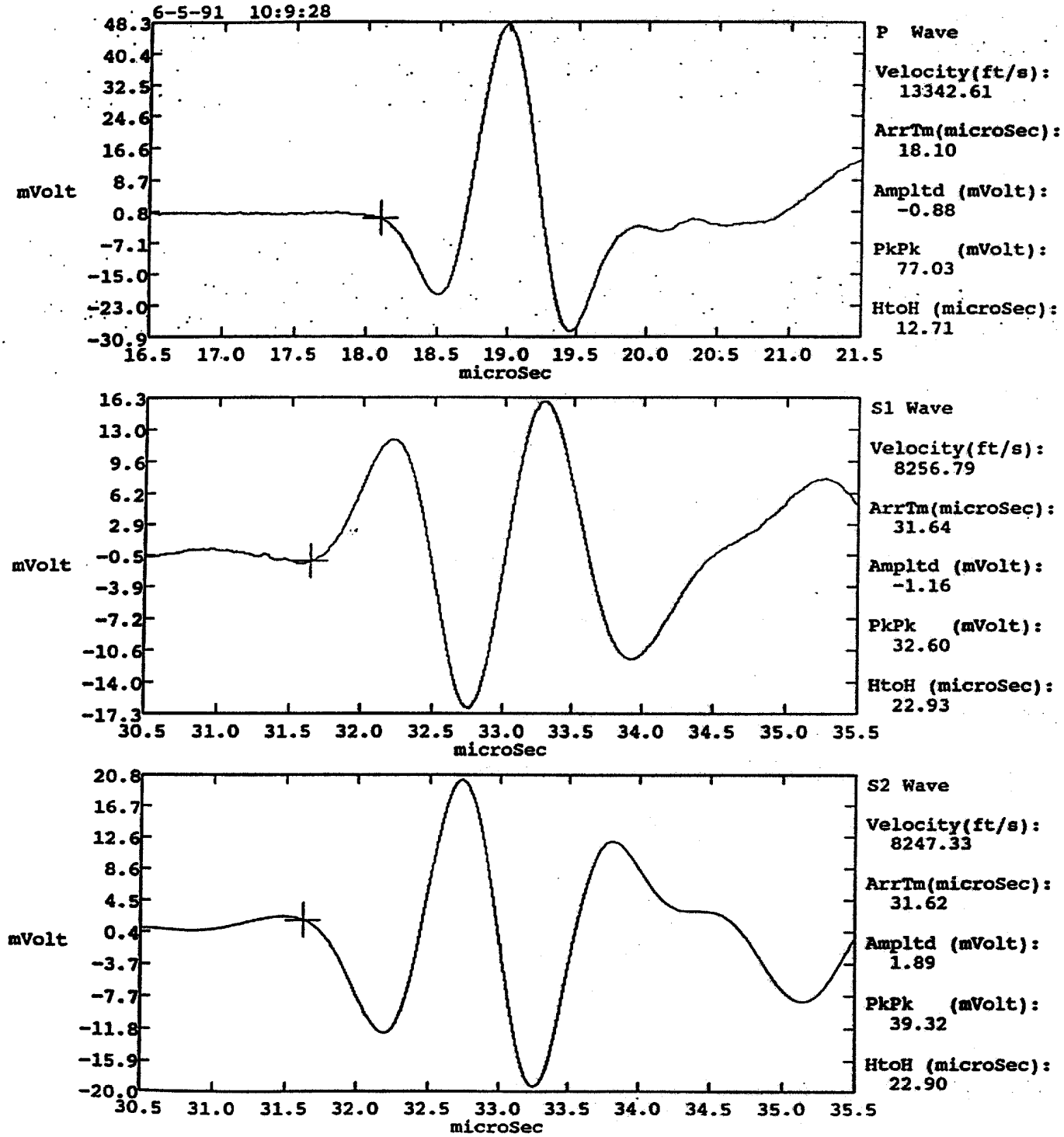
Well: EXXON ANTARES 2
Sample: 11330 Length:0.863 inch Fluid: Soltrol
Conf Pr:4100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11330.2S Pick: Manual 6-5-91 9:58:38



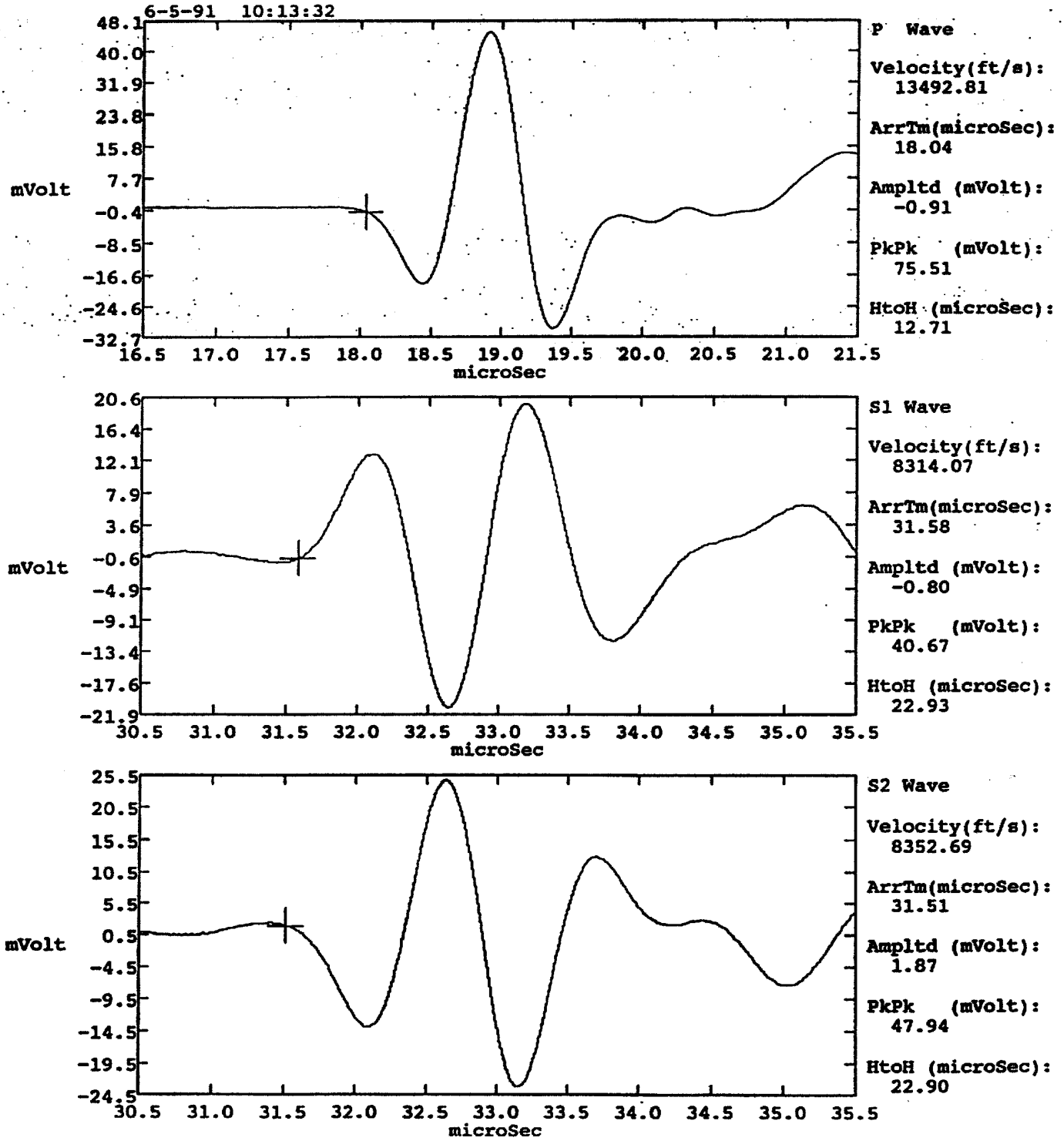
Well: EXXON ANTARES 2
Sample: 11330 Length:0.863 inch Fluid: Soltrol
Conf Pr:7600.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11330.3S Pick: Manual 6-5-91 10:5:20



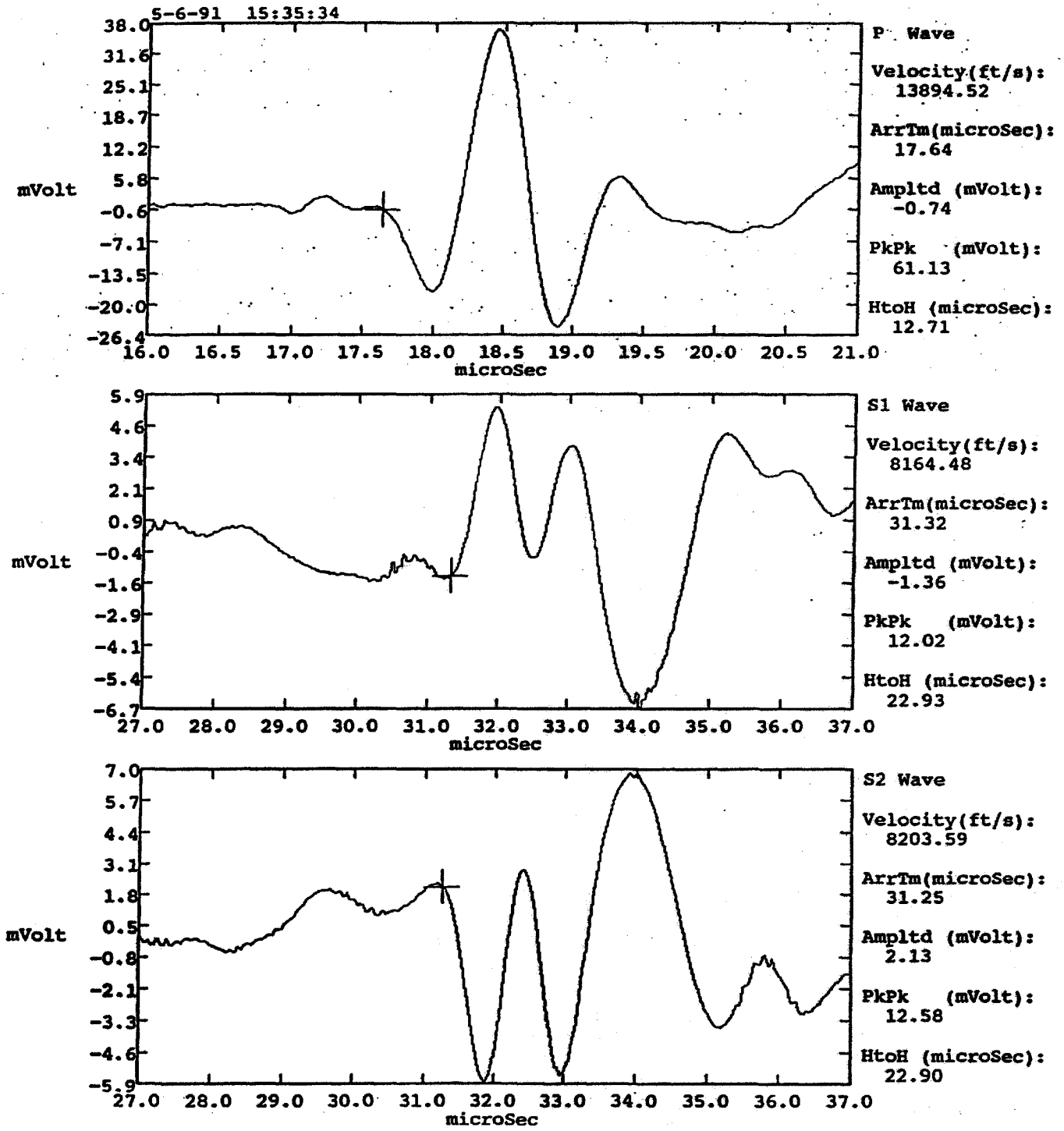
Well: EXXON ANTARES 2
Sample: 11330 Length:0.863 inch Fluid: Soltrol
Conf Pr:10100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11330.4S Pick: Manual 6-5-91 10:9:28



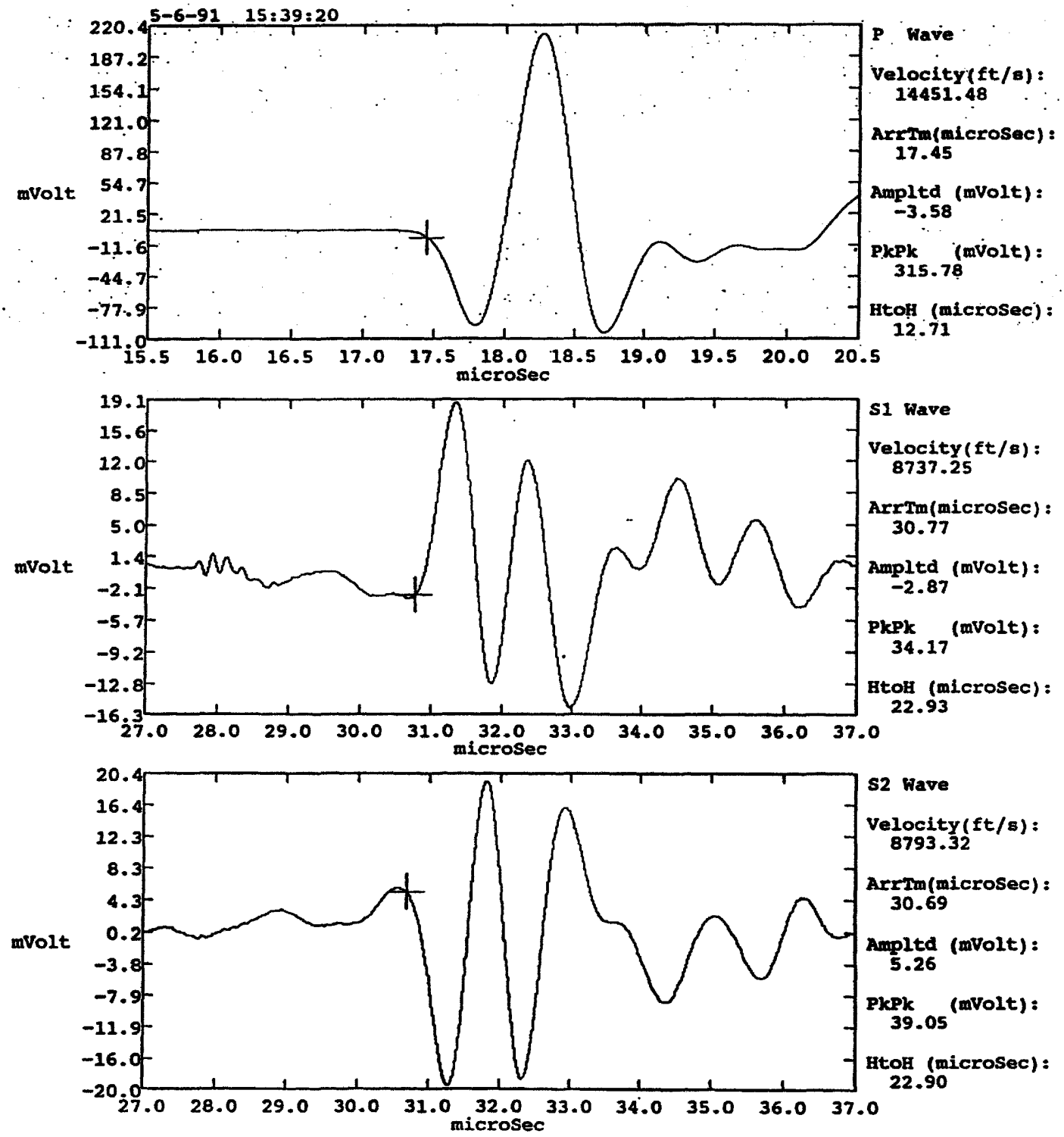
Well: EXXON ANTARES 2
Sample: 11330 Length:0.863 inch Fluid: Soltrol
Conf Pr:15100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11330.5S Pick: Manual 6-5-91 10:13:32



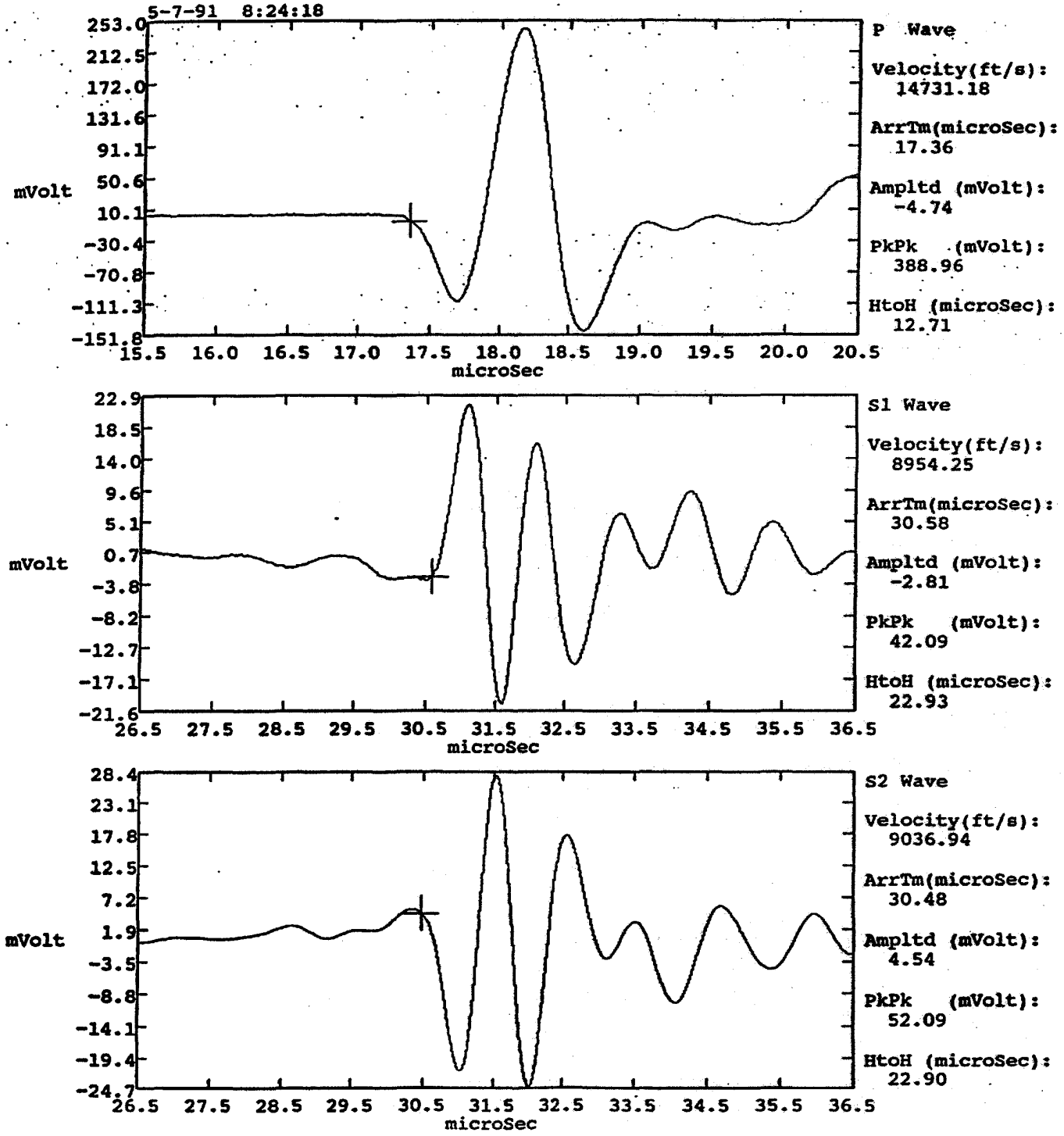
Well: EXXON ANTARES 2
Sample: 11384 Length:0.822 inch Fluid: BRINE
Conf Pr:1100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11384.1B Pick: Manual 5-6-91 15:35:34



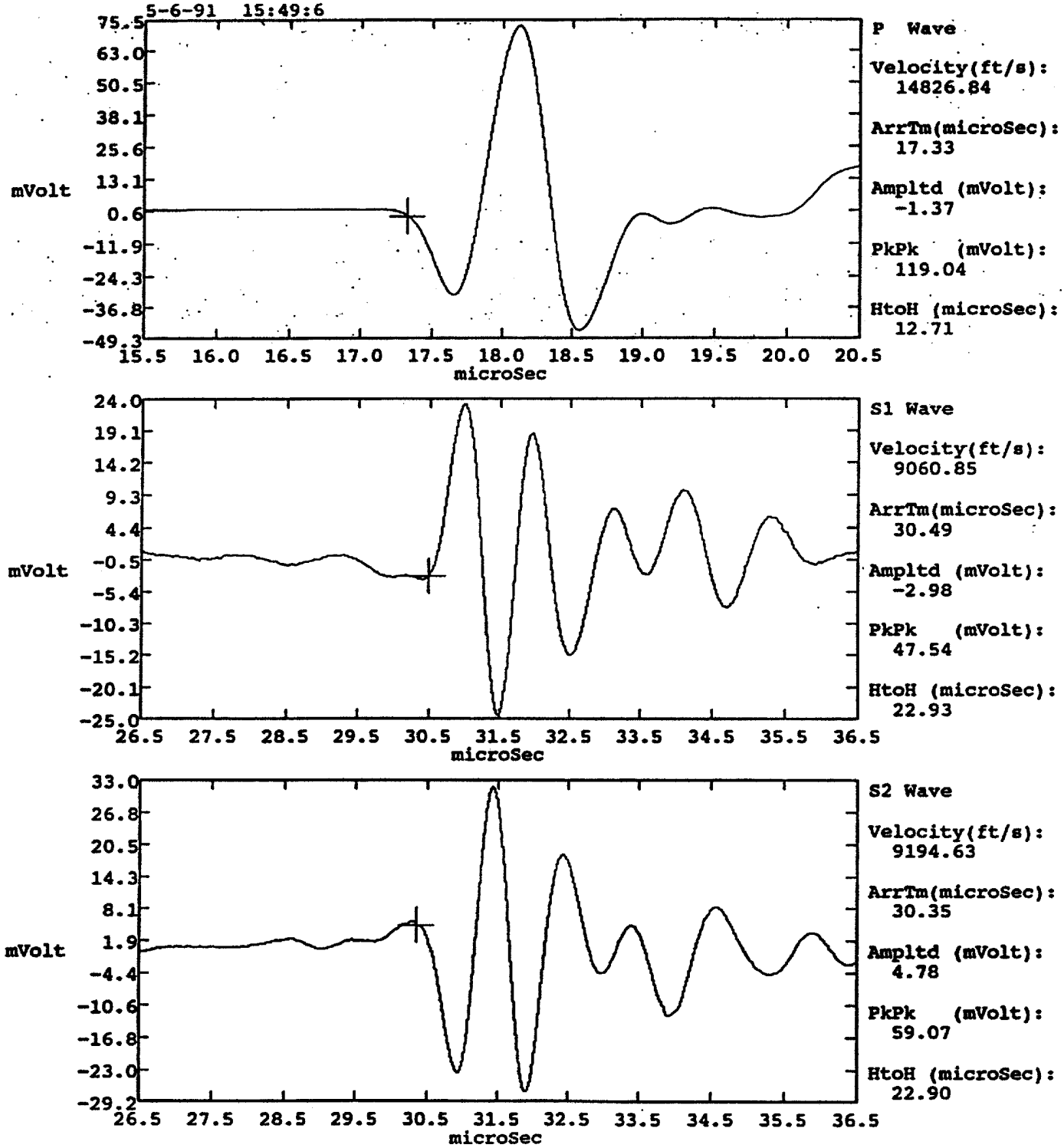
Well: EXXON ANTARES 2
Sample: 11384 Length:0.822 inch Fluid: Brine
Conf Pr:4100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11384.2B Pick: Manual 5-6-91 15:39:20



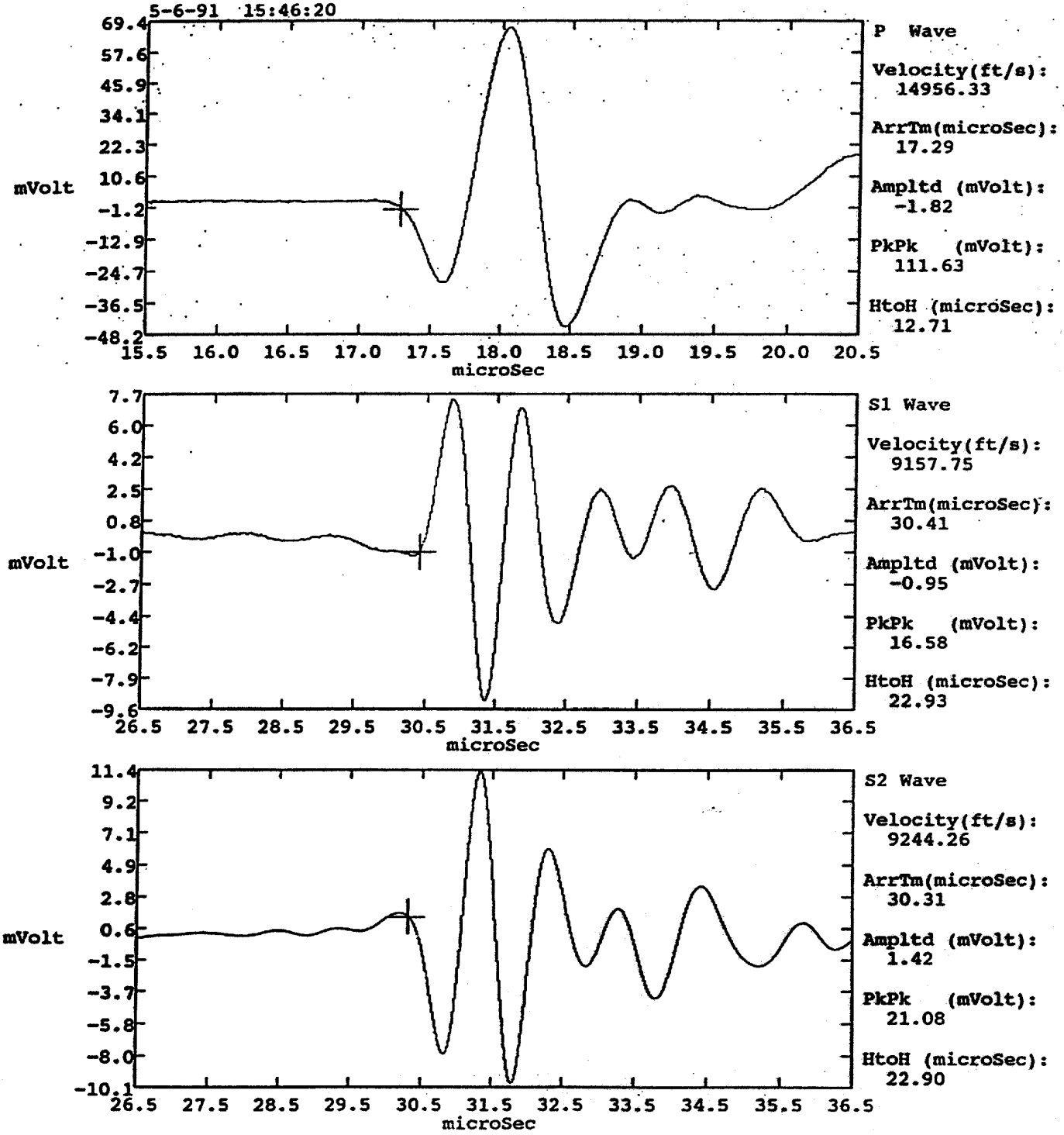
Well: EXXON ANTARES 2
Sample: 11384 Length:0.822 inch Fluid: Brine
Conf Pr:7600.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11384.3B Pick: Manual 5-7-91 8:24:18



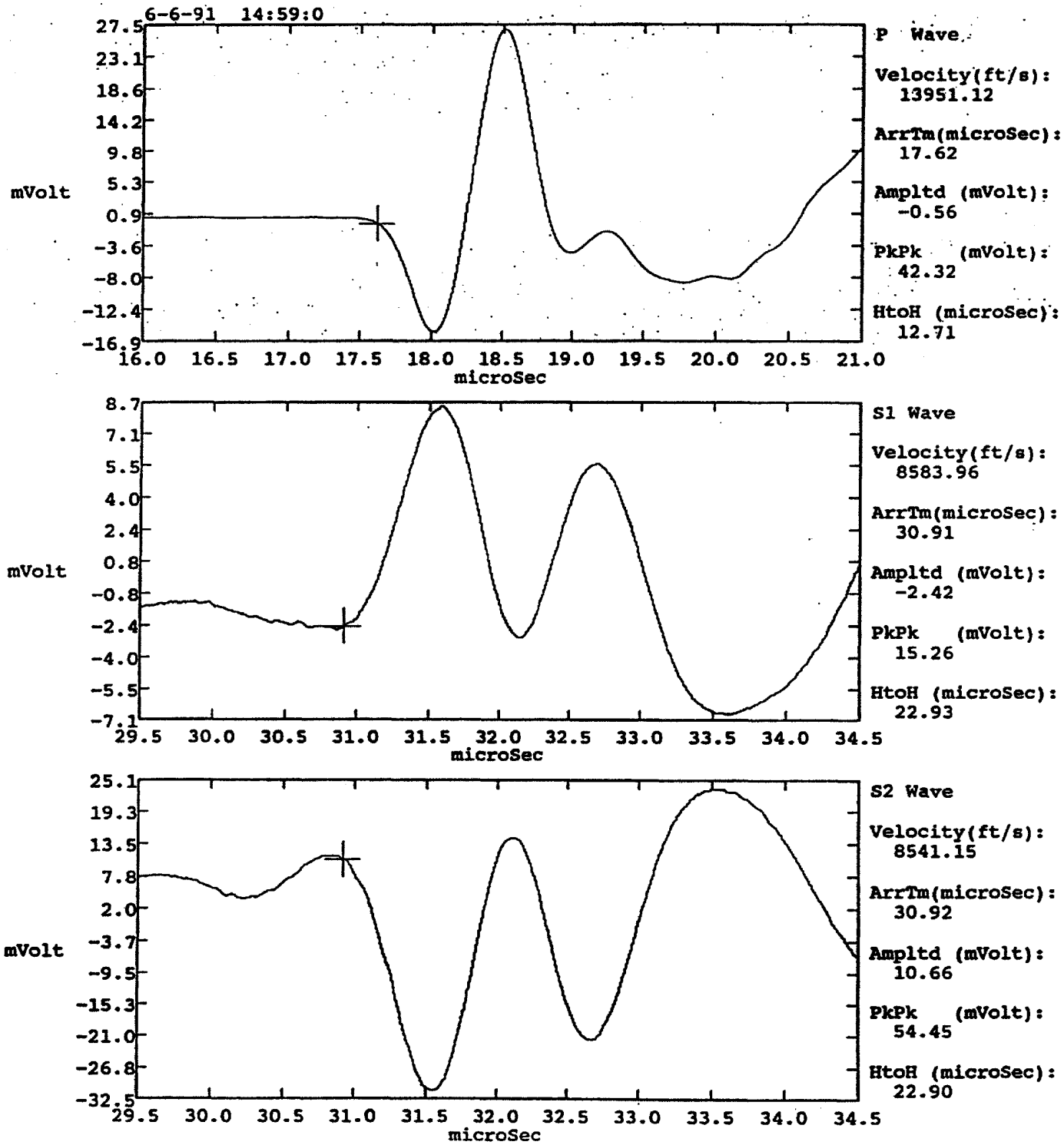
Well: EXXON ANTARES 2
Sample: 11384 Length:0.822 inch Fluid: Brine
Conf Pr:10100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11384.4B Pick: Manual 5-6-91 15:49:6



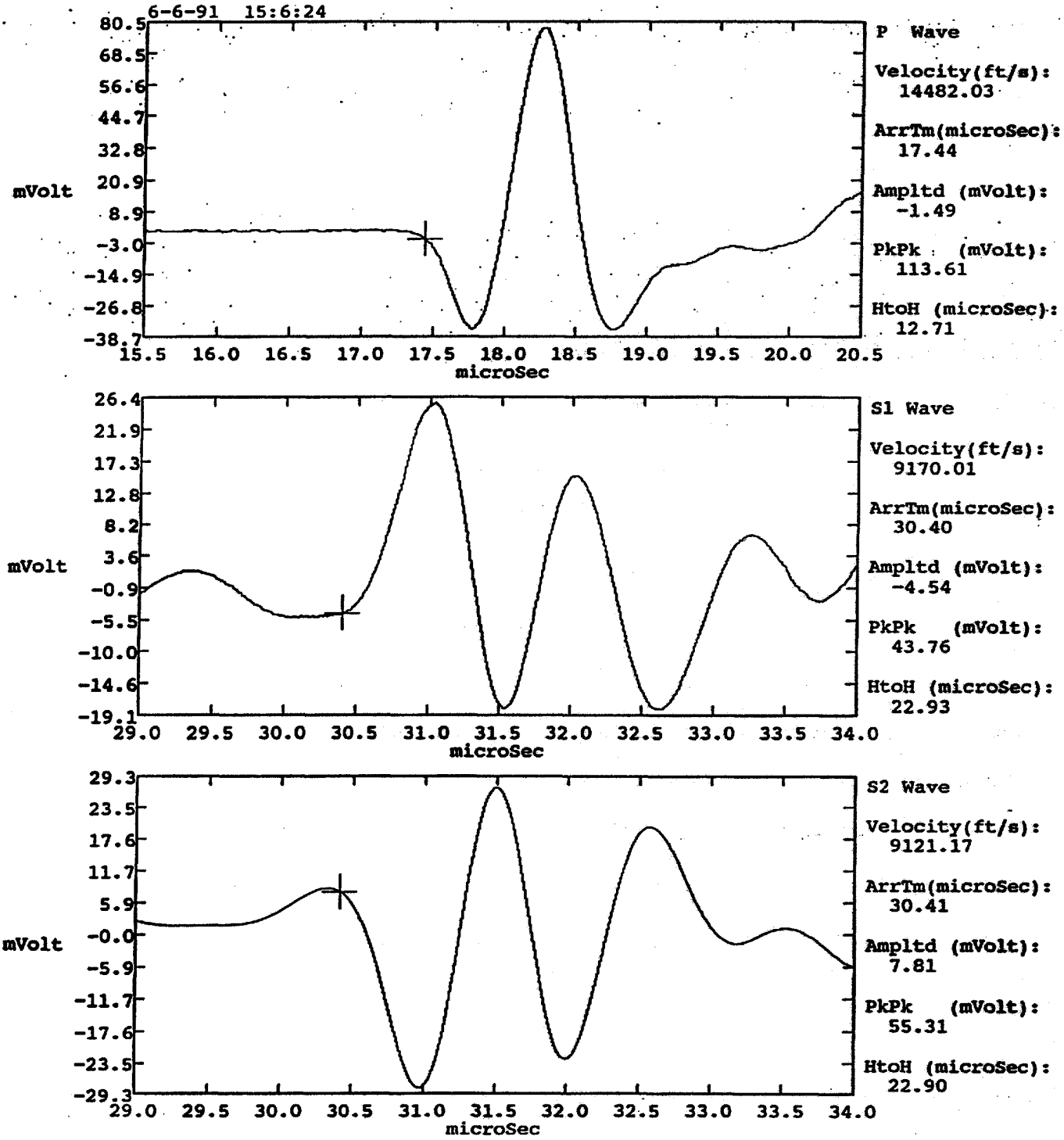
Well: EXXON ANTARES 2
Sample: 11384 Length:0.822 inch Fluid: Brine
Conf Pr:15100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11384.5B Pick: Manual 5-6-91 15:46:20



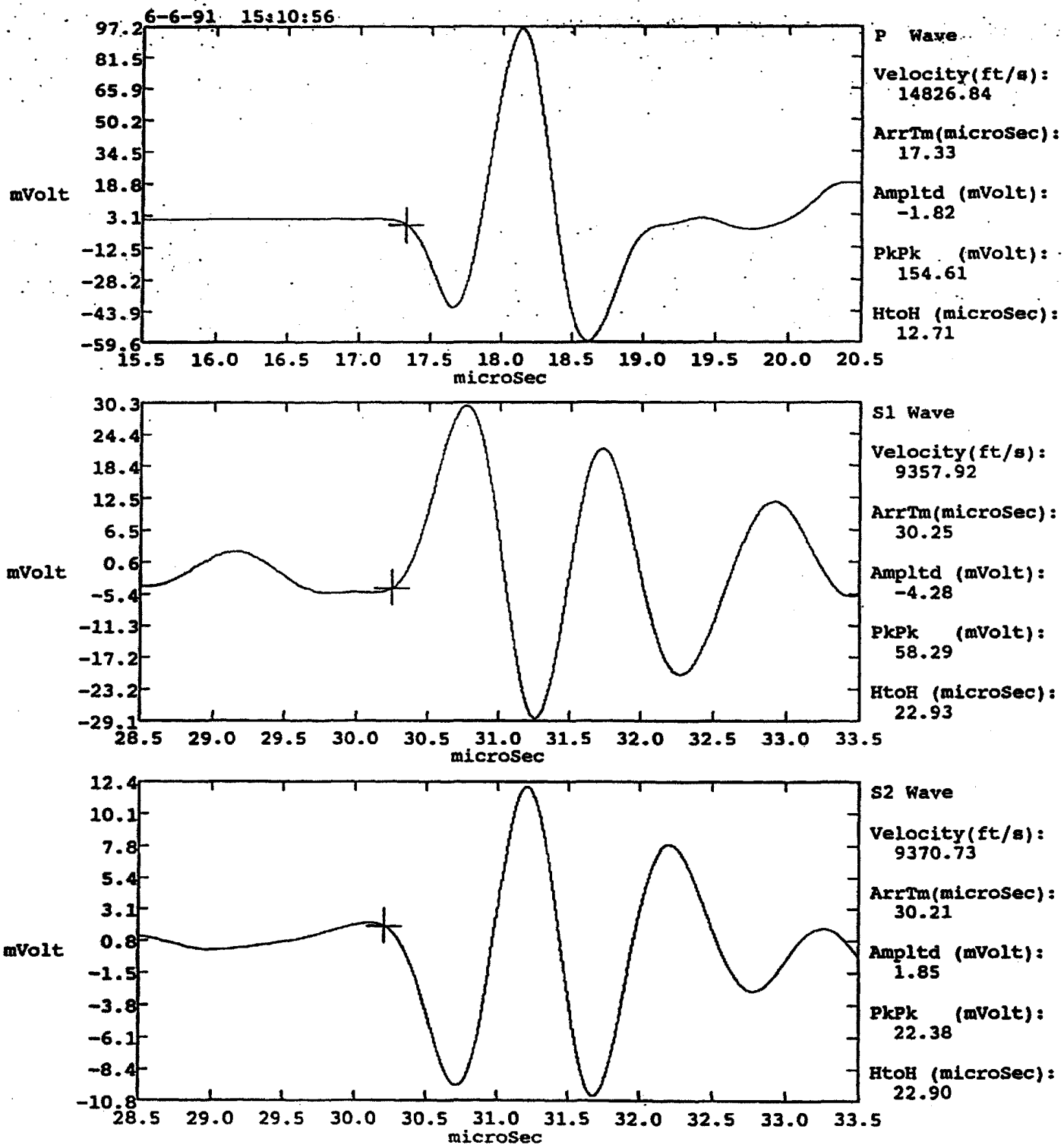
Well: EXXON ANTARES 2
Sample: 11384 Length:0.822 inch Fluid: SOLTROL
Conf Pr:1100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11384.1SO Pick: Manual 6-6-91 14:59:0



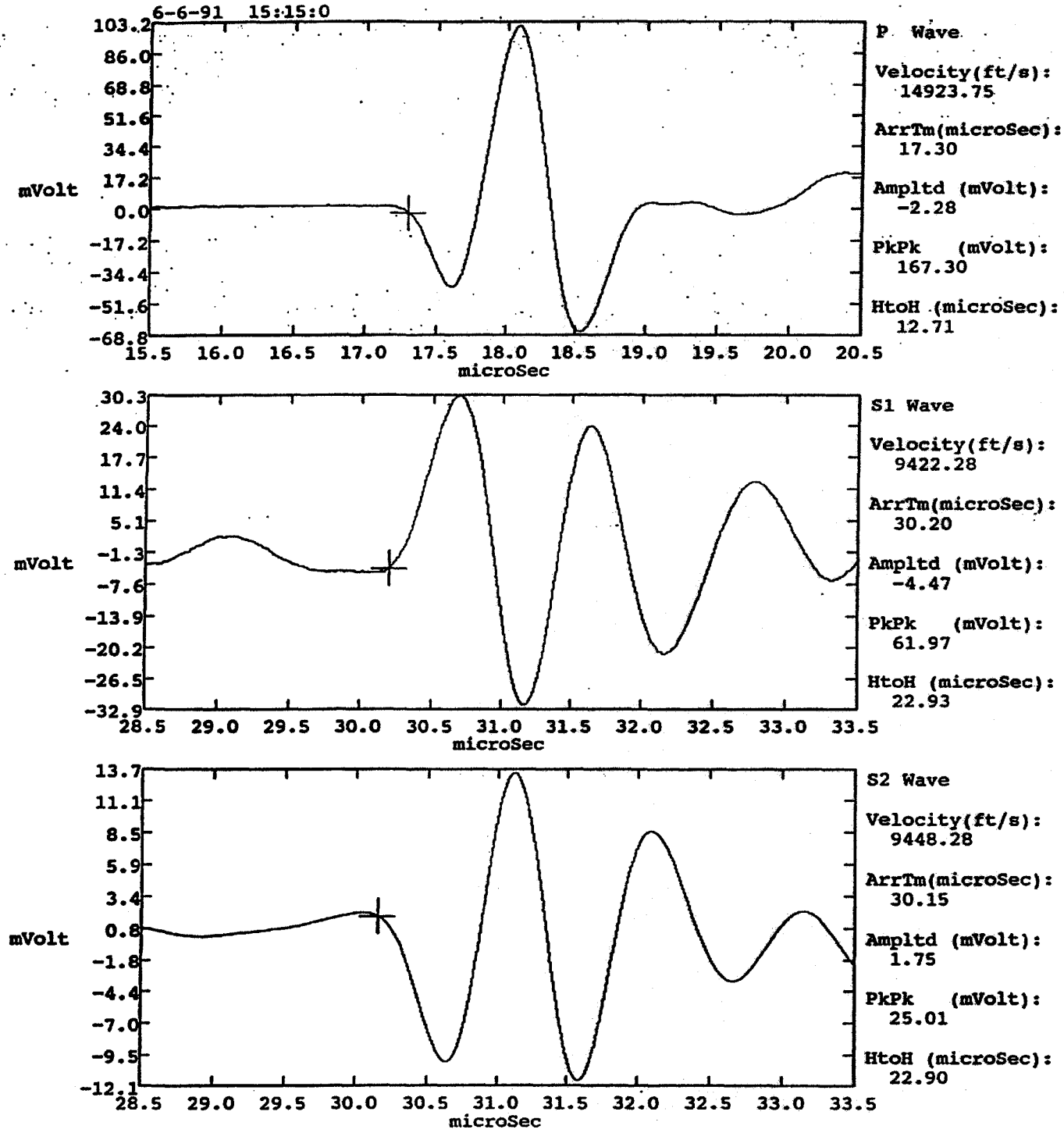
Well: EXXON ANTARES 2
Sample: 11384 Length:0.822 inch Fluid: SOLTROL
Conf Pr:4100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11384.2SO Pick: Manual 6-6-91 15:6:24



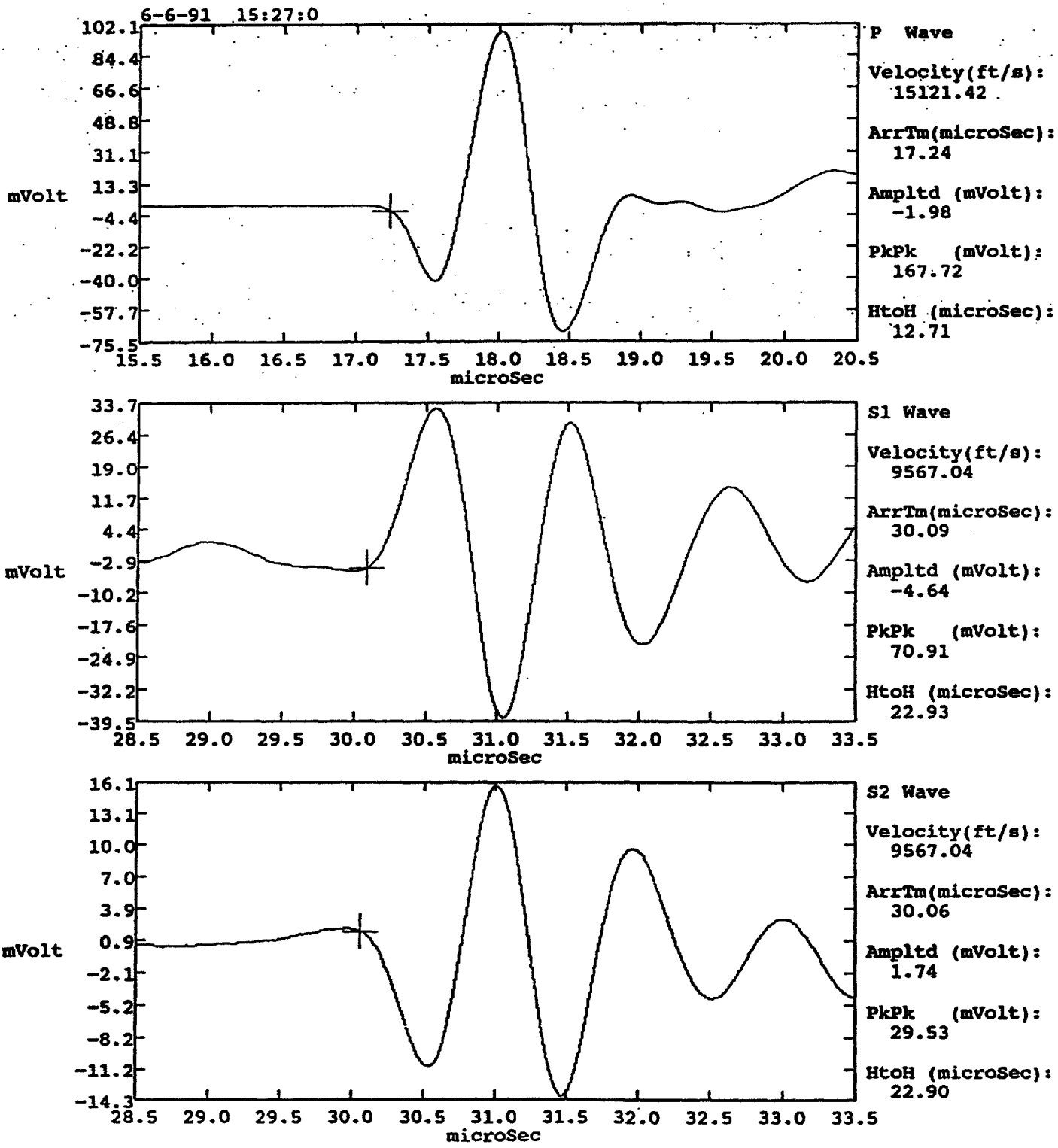
Well: EXXON ANTARES 2
Sample: 11384 Length:0.822 inch Fluid: SOLTROL
Conf Pr:7600.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11384.3SO Pick: Manual 6-6-91 15:10:56



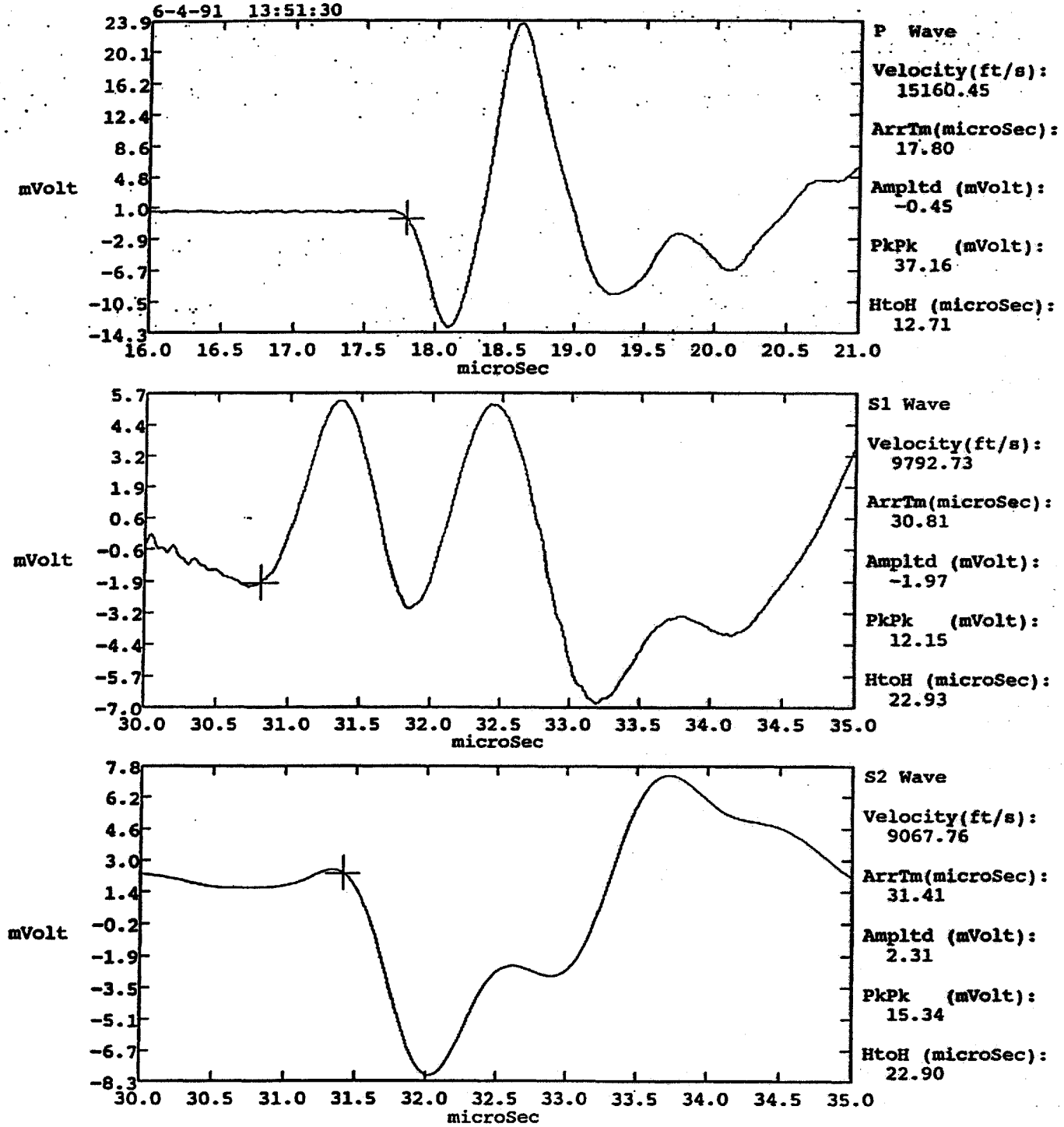
Well: EXXON ANTARES 2
Sample: 11384 Length:0.822 inch Fluid: SOLTROL
Conf Pr:10100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11384.4SO Pick: Manual 6-6-91 15:15:0



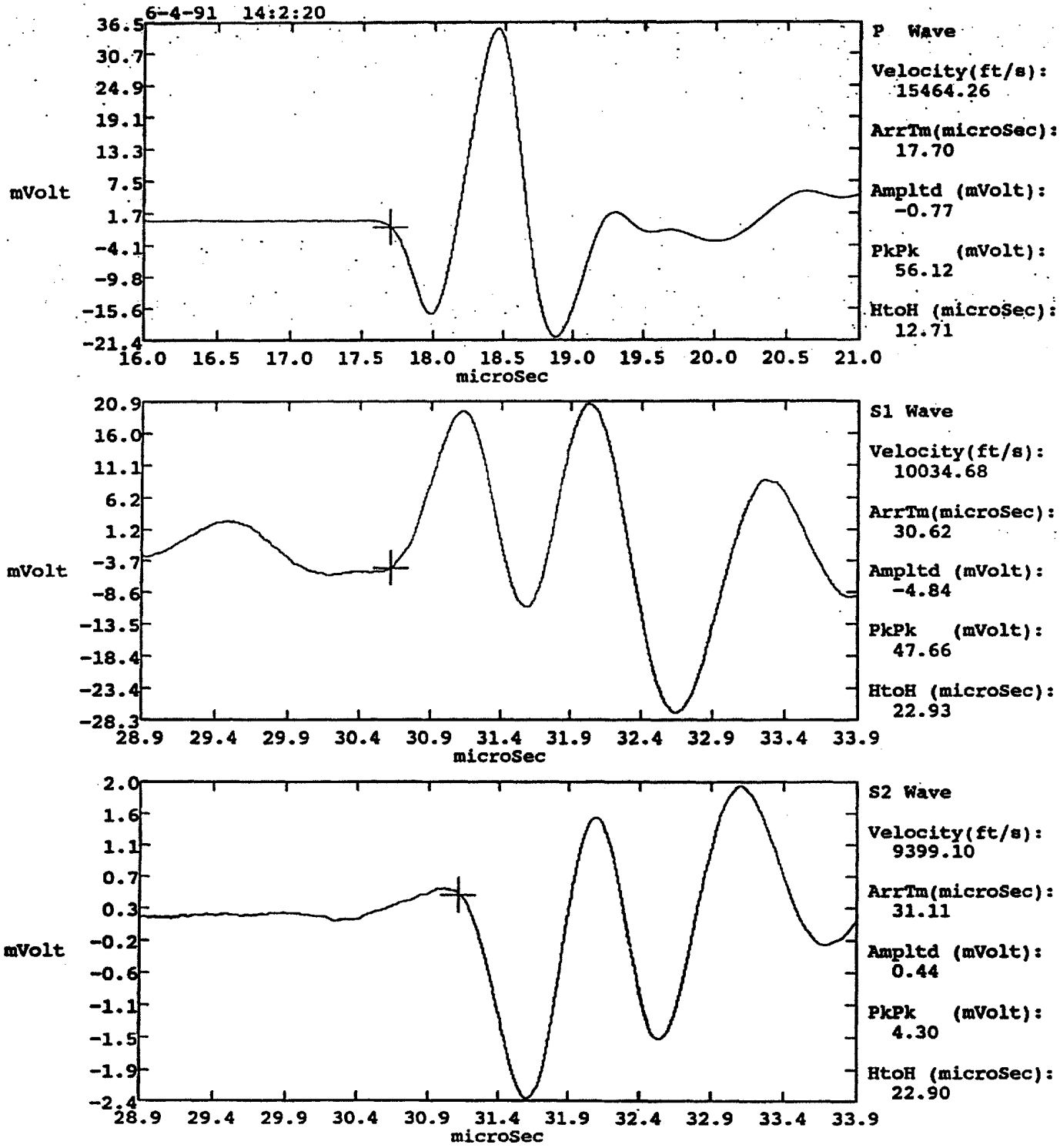
Well: EXXON ANTARES 2
Sample: 11384 Length:0.822 inch Fluid: SOLTROL
Conf Pr:15100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11384.5SO Pick: Manual 6-6-91 15:27:0



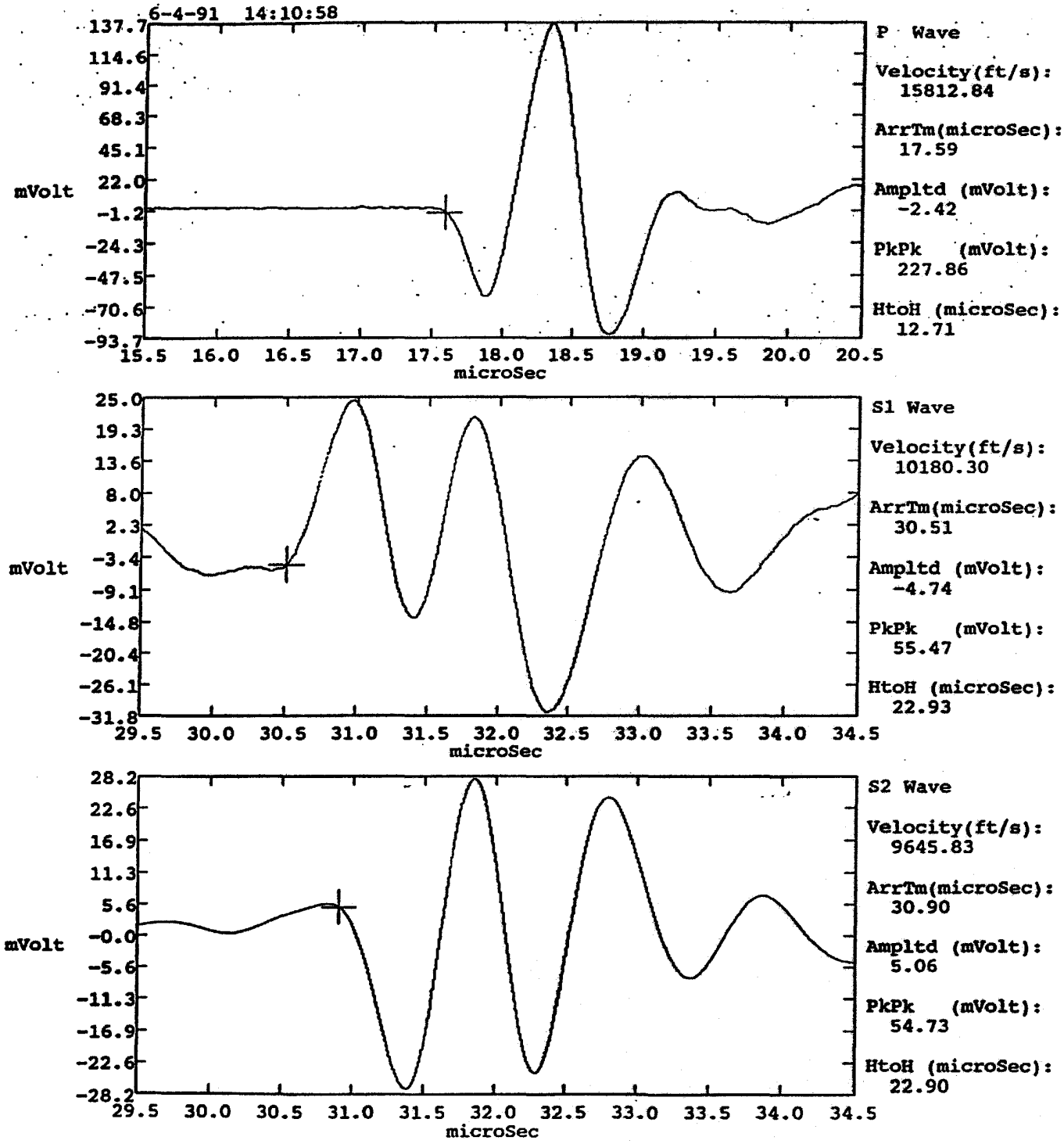
Well: EXXON ANTARES 2
Sample: 11449 Length:0.926 inch Fluid: Soltrol
Conf Pr:1100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11449.1S Pick: Manual 6-4-91 13:51:30



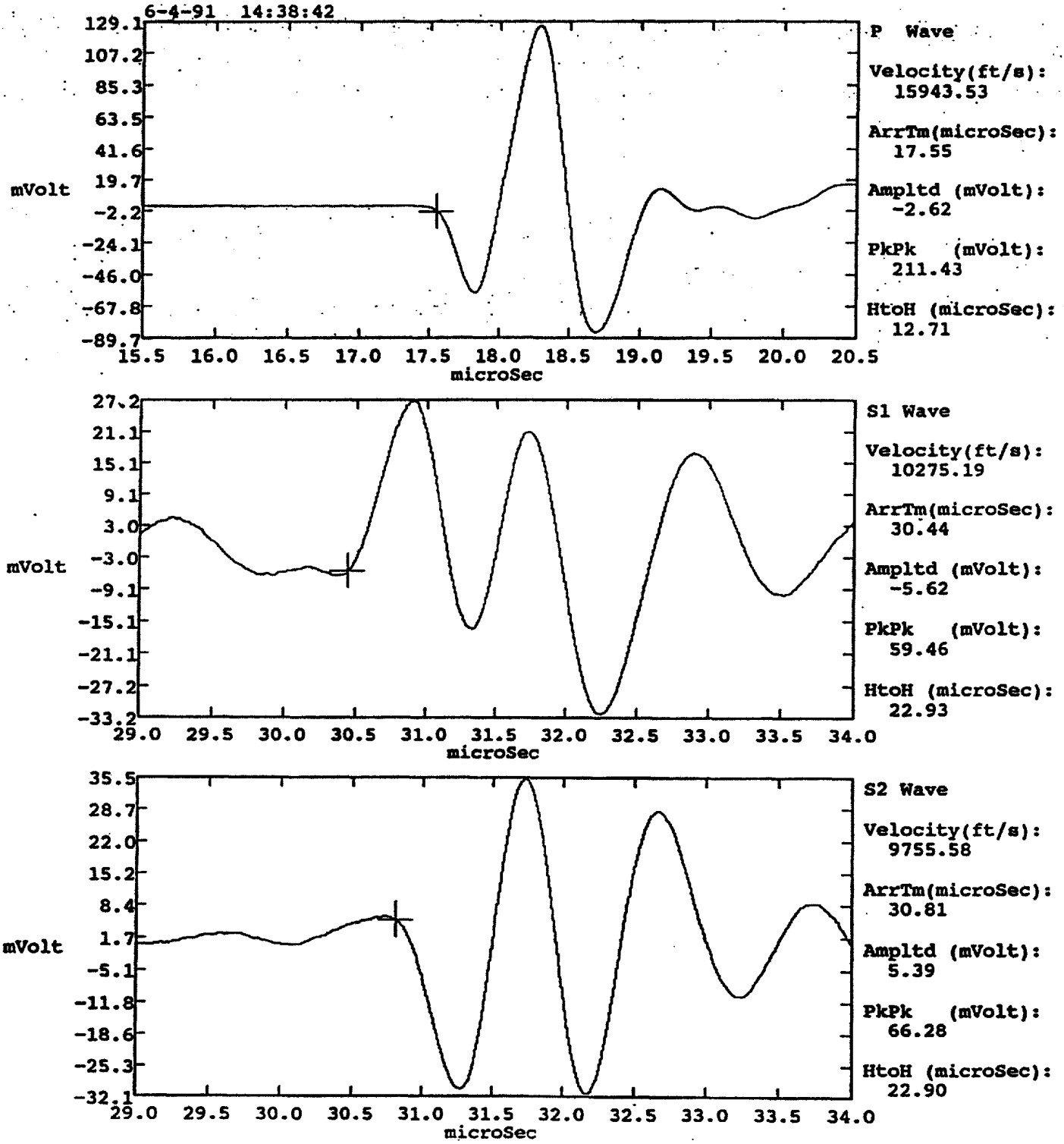
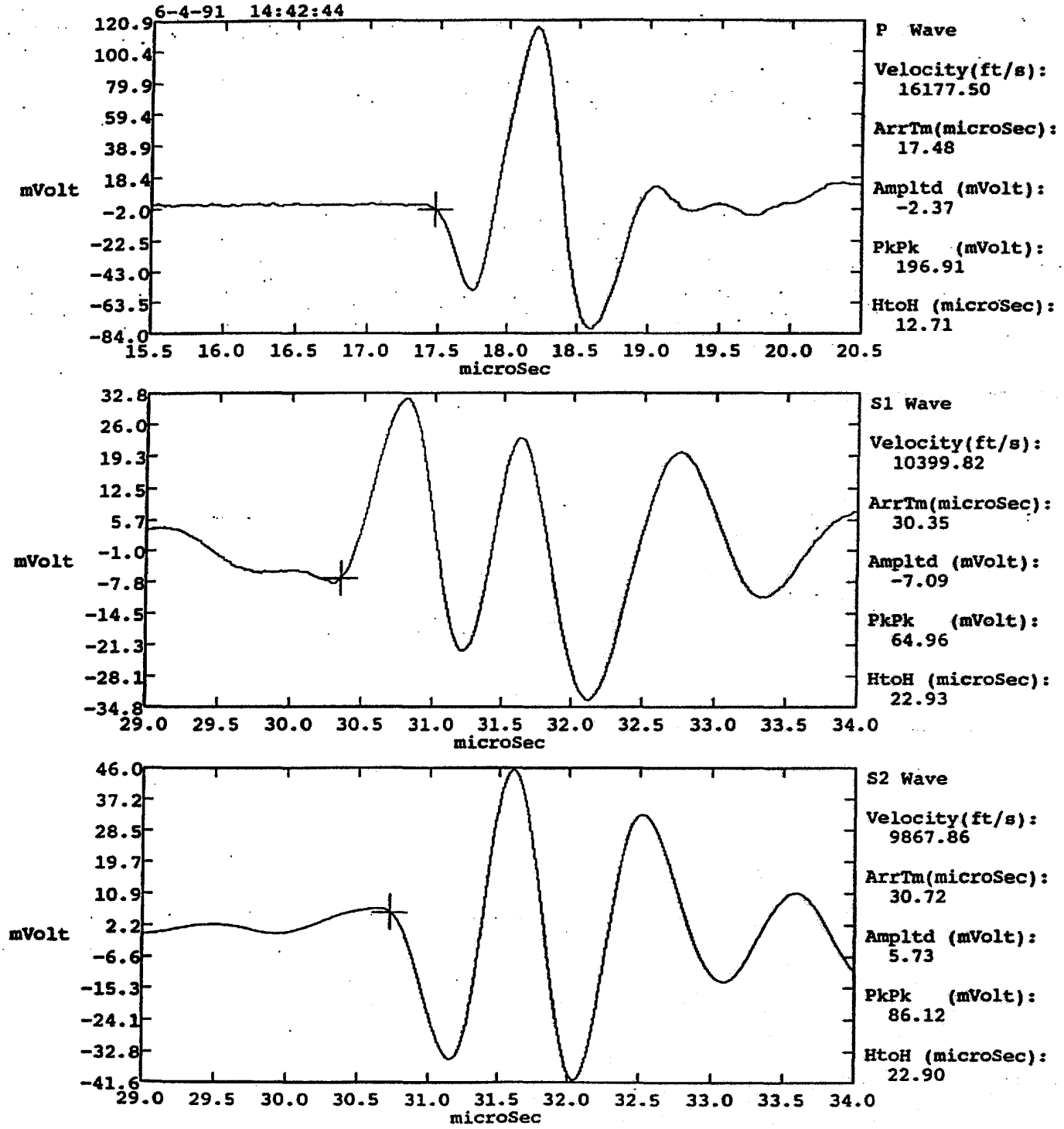
Well: EXXON ANTARES 2
Sample: 11449 Length:0.926 inch Fluid: Soltrol
Conf Pr:4100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11449.2S Pick: Manual 6-4-91 14:2:20



Well: EXXON ANTARES 2
Sample: 11449 Length:0.926 inch Fluid: Soltrol
Conf Pr:7600.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11449.3S Pick: Manual 6-4-91 14:10:58



Well: EXXON ANTARES 2
Sample: 11449 Length:0.926 inch Fluid: Soltrol
Conf Pr:10100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11449.4S Pick: Manual 6-4-91 14:38:42



Well: EXXON ANTARES 2
Sample: 11449 Length:0.926 inch Fluid: Soltrol
Conf Pr:15100.00 psi Pore Pr :100.00 psi Temp :21.00 C
File: 11449.5S Pick: Manual 6-4-91 14:42:44