

AMOCO PRODUCTION COMPANY

LEASE : DOROTHY LEIGH

WELL NO.: 1-10

TEST NO.: 1
API #15-129-21371

TICKET NO. 70683900
17-APR -95
LIBERAL

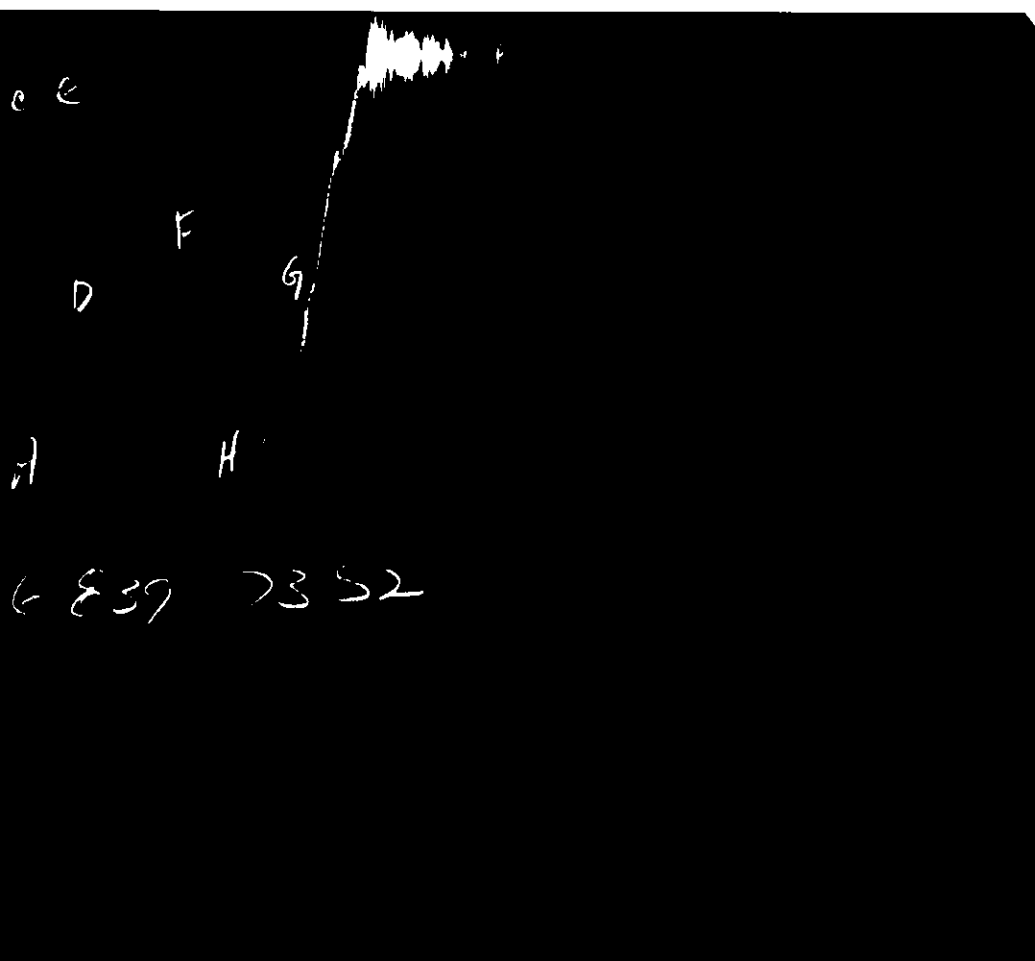
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MAY 11 1995

LEGAL LOCATION	10 - 31 S - 40 W	FIELD AREA	MILLS BROTHERS EXT.	COUNTY	MORTON	STATE	KANSAS
LEASE NAME	DOROTHY LEIGH	WELL NO.	1-10	TEST NO.	1	TESTED INTERVAL	5154.0 - 5210.0
AMOCO PRODUCTION COMPANY LEASE OWNER/COMPANY NAME							

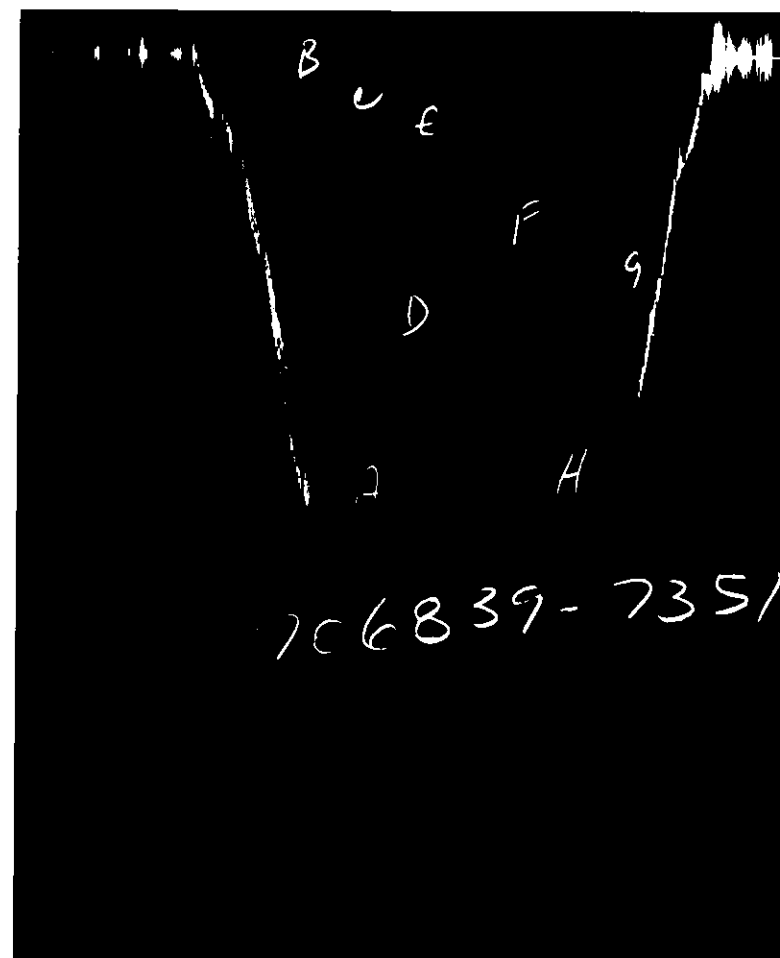
GAUGE NO : 7352

ID	DES
A	INITIAL HY
B	INITIAL FI
C	FINAL FIRS
C	INITIAL FI
D	FINAL FIRS
E	INITIAL SE
F	FINAL SECO
F	INITIAL SE
G	FINAL SECO
H	FINAL HYDR



DEPTH: 5133.3 BLANKED OFF: NO HOUR OF CLOCK: 24

DESCRIPTION	PRESSURE		TIME		TYPE
	REPORTED	CALCULATED	REPORTED	CALCULATED	
HYDROSTATIC	2450	2467.0			
FIRST FLOW	217	73.4			
ST FLOW	357	369.6	9.0	10.4	F
FIRST CLOSED-IN	357	369.6			
ST CLOSED-IN	1385	1405.5	60.0	59.6	C
SECOND FLOW	373	383.9			
ND FLOW	1064	1081.9	121.0	118.6	F
COND CLOSED-IN	1064	1081.9			
ND CLOSED-IN	1385	1399.2	125.0	126.4	C
OSTATIC	2450	2445.8			



GAUGE NO: 7351 DEPTH: 5207.0 BLANKED OFF: NO

ID	DESCRIPTION	PRESSURE	
		REPORTED	CALCULATED
A	INITIAL HYDROSTATIC	2492	
B	INITIAL FIRST FLOW	96	
C	FINAL FIRST FLOW	441	
C	INITIAL FIRST CLOSED-IN	441	
D	FINAL FIRST CLOSED-IN	1431	
E	INITIAL SECOND FLOW	415	
F	FINAL SECOND FLOW	1090	
F	INITIAL SECOND CLOSED-IN	1090	
G	FINAL SECOND CLOSED-IN	1431	
H	FINAL HYDROSTATIC	2492	

D OFF: YES HOUR OF CLOCK: 24

TIME	TIME		TYPE
	REPORTED	CALCULATED	
2504.1			
96.1	9.0	10.4	F
406.0			
405.0	60.0	59.6	C
1441.7			
420.3	121.0	118.6	F
1114.0			
1114.0	125.0	126.4	C
1433.7			
2480.9			

EQUIPMENT & HOLE DATA
 FORMATION TESTED: UPPER MORROW
 NET PAY (ft): 22.0
 GROSS TESTED FOOTAGE: 56.0 PACKER TO T.D.
 ALL DEPTHS MEASURED FROM: K.B. (11' AGL)
 CASING PERFS. (ft):
 HOLE OR CASING SIZE (in): 7.875
 ELEVATION (ft): 3315.4 K.B.
 TOTAL DEPTH (ft): 5210.0
 PACKER DEPTH(S) (ft): 5148, 5154
 FINAL SURFACE CHOKE (in): 0.25000 BLOW HOSE
 BOTTOM HOLE CHOKE (in): 0.750
 MUD WEIGHT (lb/gal): 9.00
 MUD VISCOSITY (sec): 49
 ESTIMATED HOLE TEMP. (°F):
 ACTUAL HOLE TEMP. (°F): 123 @ 5205.1 ft

FLUID PROPERTIES FOR RECOVERED MUD & WATER

SOURCE	RESISTIVITY	CHLORIDES
PIT	@ °F	1000 ppm
SAMPLER	0.045 @ 70 °F	125490 ppm
TOP	0.075 @ 70 °F	69090 ppm
MIDDLE	0.045 @ 70 °F	125400 ppm
BOTTOM	0.045 @ 70 °F	125490 ppm
	@ °F	ppm

HYDROCARBON PROPERTIES
 OIL GRAVITY (°API): @ °F
 GAS/OIL RATIO (cu.ft. per bbl):
 GAS GRAVITY:

RECOVERED :
 2145 FEET OF SALT WATER
 60 FEET OF WATER CUT MUD

REMARKS :

TICKET NUMBER: 7068390
 DATE: 04-12-95 TEST NO
 TYPE DST: OPEN HOLE
 FIELD CAMP: LIBERAL
 TESTER: JEFF CLARK
 WITNESS: SAM CARMAC
 DRILLING CONTRACTOR: CHEYENNE DRILLING RIG #3

SAMPLER DATA
 Psig AT SURFACE: 1055.0
 cu.ft. OF GAS:
 cc OF OIL:
 cc OF WATER: 2240.0
 cc OF MUD:
 TOTAL LIQUID cc: 2240.0

CUSHION DATA
 TYPE AMOUNT

NO: 70683900
D: 17532 HOUR: 24

GAUGE NO: 7352
DEPTH: 5133.3

TICKET NO: 70683900
CLOCK NO: 17532 HOUR: 24

MINUTES	PRESSURE	AP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
FIRST FLOW				
0.0	73.4			
1.0	112.9	39.4		
2.0	138.2	25.4		
3.0	176.9	38.7		
4.0	208.6	31.7		
5.0	237.3	28.6		
6.0	269.3	32.1		
7.0	295.3	26.0		
8.0	319.5	24.2		
9.0	348.0	28.5		
10.4	359.6	21.5		
FIRST CLOSED-IN				
0.0	359.6			
1.0	1321.0	951.5	1.0	1.041
2.0	1345.7	976.1	1.7	0.799
3.0	1359.9	990.3	2.3	0.649
4.0	1368.3	998.8	2.9	0.555
5.0	1374.4	1004.8	3.4	0.487
6.0	1378.6	1009.1	3.8	0.436
7.0	1381.7	1012.2	4.2	0.398
8.0	1384.4	1014.8	4.5	0.363
9.0	1386.9	1017.3	4.8	0.335
10.0	1389.2	1019.7	5.1	0.310
12.0	1392.0	1022.5	5.6	0.272
14.0	1393.9	1024.4	6.0	0.242
16.0	1395.5	1025.9	6.3	0.219
18.0	1397.2	1027.6	6.6	0.199
20.0	1398.1	1028.6	6.9	0.183
22.0	1399.5	1030.0	7.1	0.169
24.0	1399.5	1030.0	7.3	0.157
26.0	1400.2	1030.6	7.5	0.146
28.0	1401.1	1031.5	7.6	0.138
30.0	1401.4	1031.8	7.7	0.130
35.0	1402.2	1032.6	8.0	0.113
40.0	1403.4	1033.9	8.3	0.101
45.0	1403.4	1033.9	8.5	0.091
50.0	1404.5	1035.0	8.6	0.082
55.0	1405.1	1035.6	8.8	0.075
59.6	1405.5	1035.9	8.9	0.070
SECOND FLOW				
0.0	383.9			
5.0	425.7	41.9		
10.0	472.4	46.7		
15.0	519.8	47.3		
20.0	561.8	42.1		
25.0	602.8	41.0		

REF	MINUTES	PRESSURE	AP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
SECOND FLOW - CONTINUED					
	7	30.0	641.1	38.2	
	8	35.0	675.4	34.3	
	9	40.0	708.8	33.4	
	10	45.0	742.5	33.7	
	11	50.0	774.6	32.0	
	12	55.0	808.0	33.4	
	13	60.0	836.0	28.0	
	14	65.0	861.2	25.2	
	15	70.0	886.1	24.9	
	16	75.0	910.6	24.4	
	17	80.0	932.5	21.9	
	18	85.0	955.4	22.9	
	19	90.0	976.3	20.9	
	20	95.0	996.7	20.4	
	21	100.0	1015.8	19.2	
	22	105.0	1033.7	17.9	
	23	110.0	1050.9	17.1	
	24	115.0	1068.8	17.9	
F	25	118.6	1081.9	13.1	
SECOND CLOSED-IN					
F	1	0.0	1081.9		
	2	1.0	1341.0	259.1	1.0 2.125
	3	2.0	1355.2	273.3	2.0 1.808
	4	3.0	1361.3	279.4	2.9 1.650
	5	4.0	1363.9	282.0	3.9 1.520
	6	5.0	1367.4	285.5	4.8 1.425
	7	6.0	1368.9	287.0	5.7 1.354
	8	7.0	1370.2	288.3	6.6 1.290
	9	8.0	1371.6	289.7	7.5 1.233
	10	9.0	1373.0	291.1	8.4 1.186
	11	10.0	1374.2	292.3	9.3 1.143
	12	12.0	1375.8	293.9	11.0 1.070
	13	14.0	1377.7	295.8	12.6 1.011
	14	16.0	1379.2	297.3	14.2 0.957
	15	18.0	1380.3	298.4	15.8 0.911
	16	20.0	1380.9	299.1	17.3 0.871
	17	22.0	1382.3	300.5	18.8 0.837
	18	24.0	1383.3	301.4	20.2 0.805
	19	26.0	1383.8	301.9	21.6 0.775
	20	28.0	1384.7	302.8	23.0 0.749
	21	30.0	1385.5	303.6	24.3 0.725
	22	35.0	1387.0	305.2	27.5 0.671
	23	40.0	1388.7	306.9	30.5 0.625
	24	45.0	1389.8	308.0	33.3 0.588
	25	50.0	1390.9	309.1	36.0 0.554
	26	55.0	1391.9	310.0	38.5 0.525
	27	60.0	1392.7	310.8	41.0 0.498
	28	70.0	1394.1	312.2	45.4 0.454
	29	80.0	1395.2	313.3	49.4 0.417
	30	90.0	1396.4	314.5	53.0 0.386
	31	100.0	1397.2	315.3	56.3 0.360

REF	MINUTES	PRESSURE	AP	$\frac{t \times \Delta t}{t + \Delta t}$
SECONDND CLOSED-IN - CONTINUED				
	32	110.0	1397.8	315.9 59.4
	33	120.0	1398.6	316.7 62.2
G	34	126.4	1399.2	317.3 63.8
REMARKS:				

GAUGE NO: 7352

DEPTH: 5133.3

$\log \frac{t+\Delta t}{\Delta t}$	REF	MINUTES	PRESSURE	ΔP	$\frac{t+\Delta t}{t+\Delta t}$	$\log \frac{t+\Delta t}{\Delta t}$
0.337						
0.317						
0.305						

TICKET NO: 70683900

CLOCK NO: 13833 HOUR: 24

REF	MINUTES	PRESSURE	ΔP	$\frac{t+\Delta t}{t+\Delta t}$	$\log \frac{t+\Delta t}{\Delta t}$
FIRST FLOW					
B 1	0.0	96.1			
2	1.0	134.2	38.1		
3	2.0	170.9	36.7		
4	3.0	211.4	40.5		
5	4.0	244.0	32.6		
6	5.0	274.0	30.0		
7	6.0	305.2	31.2		
8	7.0	329.8	24.6		
9	8.0	361.3	31.5		
10	9.0	387.9	26.6		
C 11	10.4	406.0	18.1		
FIRST CLOSED-IN					
C 1	0.0	406.0			
2	1.0	1342.1	936.1	0.9	1.048
3	2.0	1381.3	975.2	1.7	0.790
4	3.0	1394.2	988.2	2.3	0.656
5	4.0	1404.0	998.0	2.9	0.556
6	5.0	1411.1	1005.1	3.4	0.489
7	6.0	1415.3	1009.2	3.8	0.439
8	7.0	1418.5	1012.4	4.2	0.396
9	8.0	1421.4	1015.3	4.5	0.362
10	9.0	1424.1	1018.0	4.8	0.334
11	10.0	1425.4	1019.3	5.1	0.311
12	12.0	1427.9	1021.9	5.6	0.272
13	14.0	1430.3	1024.3	6.0	0.242
14	16.0	1431.3	1025.3	6.3	0.218
15	18.0	1432.9	1026.9	6.6	0.198
16	20.0	1434.5	1028.5	6.9	0.182
17	22.0	1435.1	1029.1	7.1	0.169
18	24.0	1436.1	1030.1	7.3	0.157
19	26.0	1436.9	1030.9	7.5	0.146
20	28.0	1437.4	1031.4	7.6	0.138
21	30.0	1437.9	1031.8	7.7	0.130
22	35.0	1438.5	1032.5	8.0	0.113
23	40.0	1440.4	1034.4	8.3	0.101
24	45.0	1440.4	1034.4	8.5	0.091
25	50.0	1441.1	1035.0	8.6	0.082
26	55.0	1441.7	1035.7	8.8	0.076
D 27	59.6	1441.7	1035.7	8.9	0.070
SECOND FLOW					
E 1	0.0	420.3			
2	5.0	465.1	45.7		
3	10.0	513.2	47.2		
4	15.0	557.5	44.3		
5	20.0	599.0	41.5		
6	25.0	639.8	40.8		

GAUGE NO:

DEPTH: 52

REF	MINUTES	PRESSURE
SECOND FLOW - CONTINUED		
7	30.0	679.2
8	35.0	713.7
9	40.0	746.9
10	45.0	780.9
11	50.0	811.4
12	55.0	840.5
13	60.0	869.4
14	65.0	895.5
15	70.0	921.1
16	75.0	945.9
17	80.0	968.4
18	85.0	991.8
19	90.0	1012.2
20	95.0	1031.4
21	100.0	1050.5
22	105.0	1067.5
23	110.0	1085.9
24	115.0	1102.8
F 25	118.5	1114.0
SECOND CL		
F 1	0.0	1114.0
2	1.0	1374.2
3	2.0	1387.0
4	3.0	1393.3
5	4.0	1396.6
6	5.0	1399.7
7	6.0	1400.8
8	7.0	1403.0
9	8.0	1404.2
10	9.0	1405.6
11	10.0	1407.2
12	12.0	1408.7
13	14.0	1411.2
14	16.0	1412.7
15	18.0	1413.6
16	20.0	1414.9
17	22.0	1415.0
18	24.0	1417.0
19	26.0	1417.8
20	28.0	1418.5
21	30.0	1419.4
22	35.0	1421.5
23	40.0	1422.9
24	45.0	1423.9
25	50.0	1424.7
26	55.0	1425.7
27	60.0	1427.1
28	70.0	1428.1
29	80.0	1429.4
30	90.0	1430.0
31	100.0	1430.7

REMARKS:

ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
39.4		
34.5		
33.2		
34.0		
30.5		
29.1		
28.9		
26.1		
25.6		
24.8		
22.6		
23.4		
20.5		
19.2		
19.0		
17.0		
18.4		
17.0		
11.2		

260.1	1.0	2.115
273.0	2.0	1.811
279.2	2.9	1.645
282.6	3.8	1.526
285.6	4.9	1.424
286.8	5.7	1.355
289.0	6.7	1.286
290.1	7.6	1.232
291.6	8.4	1.184
293.2	9.3	1.143
294.6	11.0	1.069
297.2	12.6	1.009
298.6	14.2	0.957
299.6	15.8	0.911
300.9	17.3	0.873
302.0	18.8	0.837
303.0	20.2	0.805
303.8	21.6	0.776
304.4	23.0	0.749
305.4	24.3	0.724
307.5	27.6	0.670
308.9	30.5	0.626
309.9	33.4	0.587
310.7	36.0	0.554
311.6	38.5	0.525
313.1	40.9	0.498
314.0	45.4	0.454
315.3	49.4	0.417
316.0	53.0	0.386
316.6	56.3	0.350

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
SECOND CLOSED-IN - CONTINUED					
32	110.0	1431.3	317.3	59.4	0.337
33	120.0	1432.6	318.5	62.2	0.317
G 34	125.4	1433.7	319.7	63.8	0.305

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$

REMARKS:

TICKET NO. 70683900

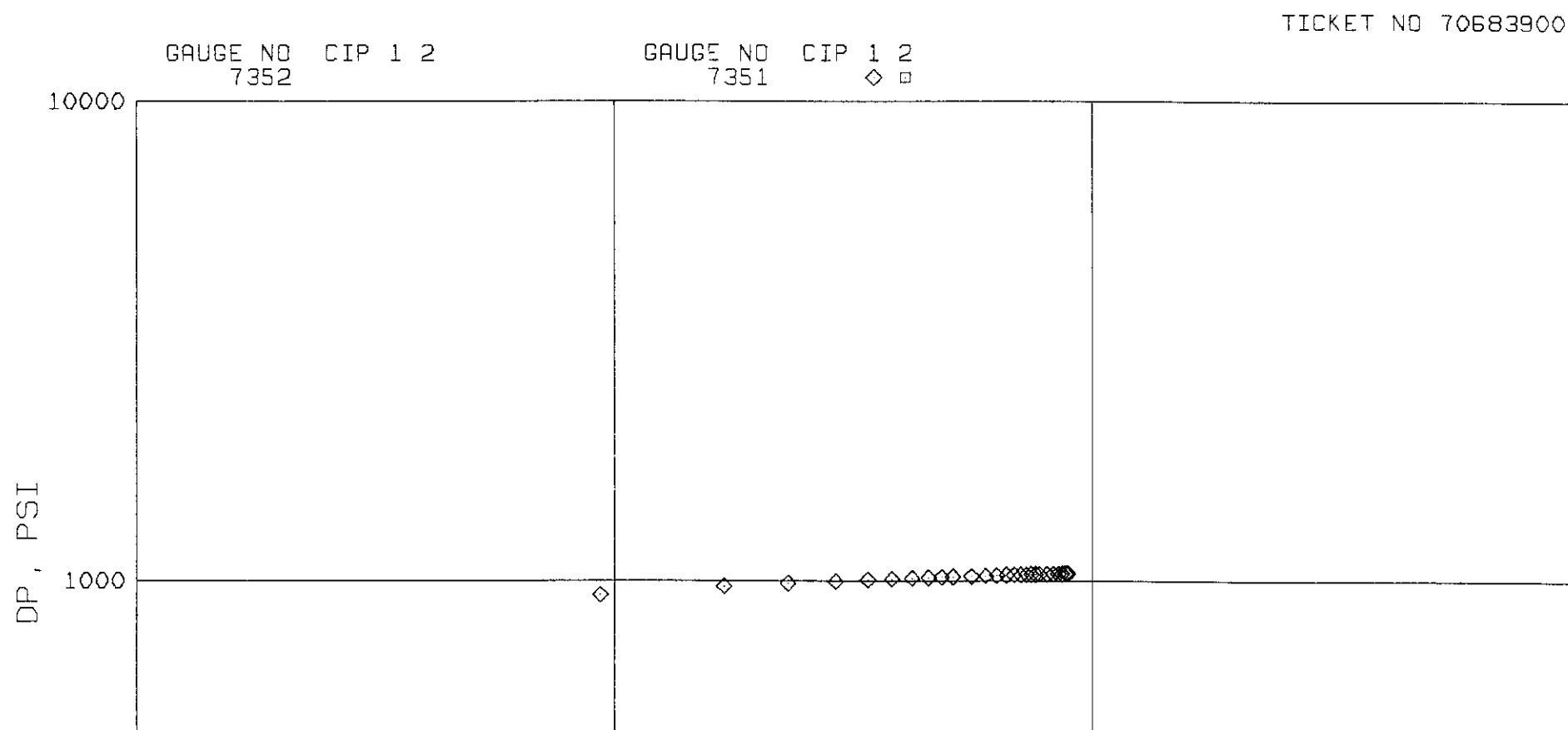
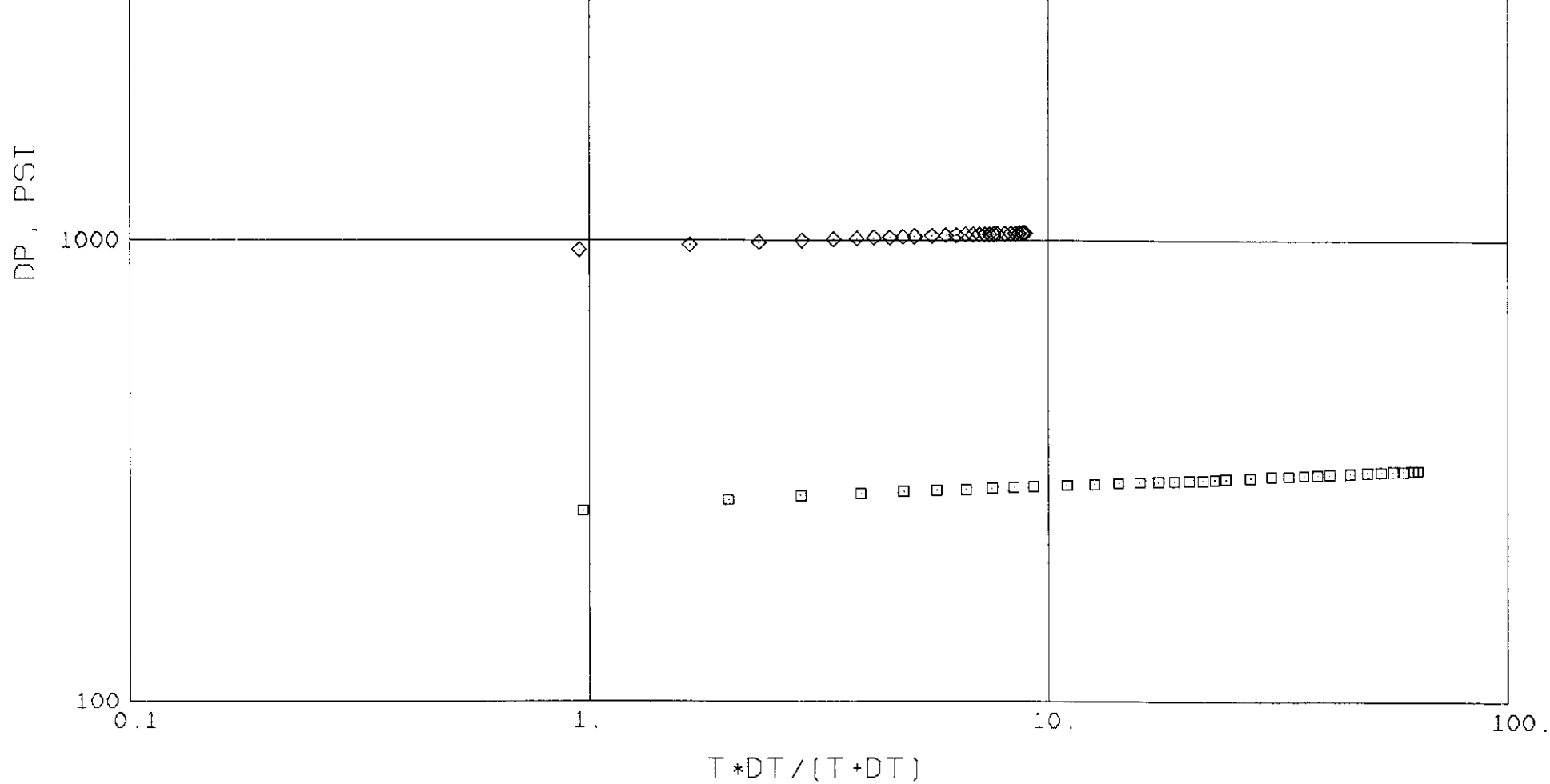
		O.D.	I.D.	LENGTH	DEPTH
1		4.500	3.826	4417.5	
3		6.250	2.250	633.9	
50		6.250	3.000	1.3	5052.1
3		6.250	2.250	62.2	
5		5.563	2.250	1.0	
11		5.000	3.500	0.7	
13		5.000	0.750	6.6	
60		5.000	0.750	5.0	5131.2
80		5.000	2.250	4.1	5133.3
15		5.000	1.750	5.0	
16		5.000	1.000	2.8	
70		6.750	1.530	5.8	5148.1
70		6.750	1.530	5.5	5154.0
20		5.000	2.370	10.0	
5		5.563	2.250	1.0	
3		6.250	2.250	29.6	
5		5.563	2.250	1.0	
5		5.563	2.250	1.0	
20		5.000	2.370	6.0	
83		5.000		1.5	5205.1
81		5.000		4.1	5207.0
TOTAL DEPTH					5210.0

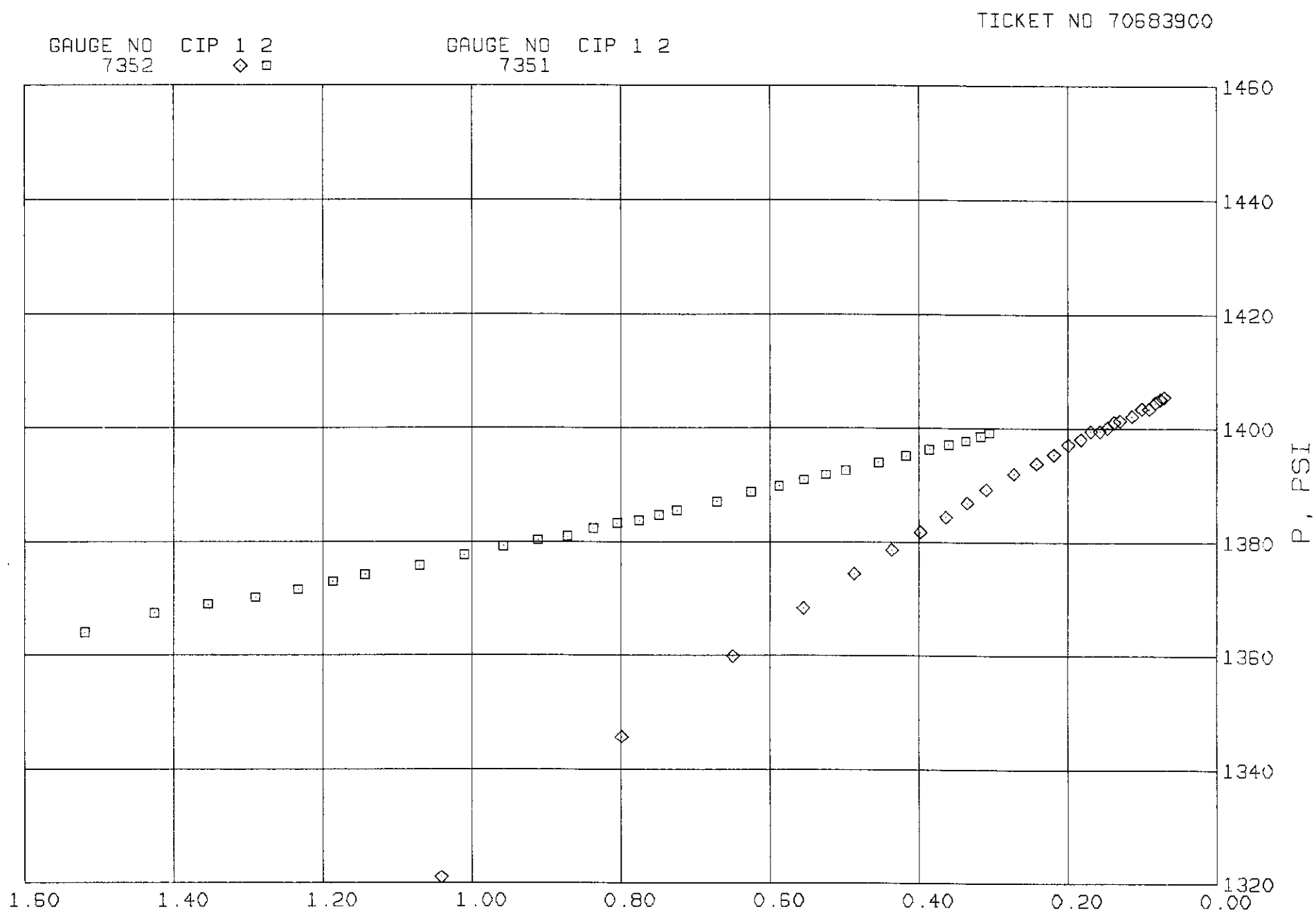
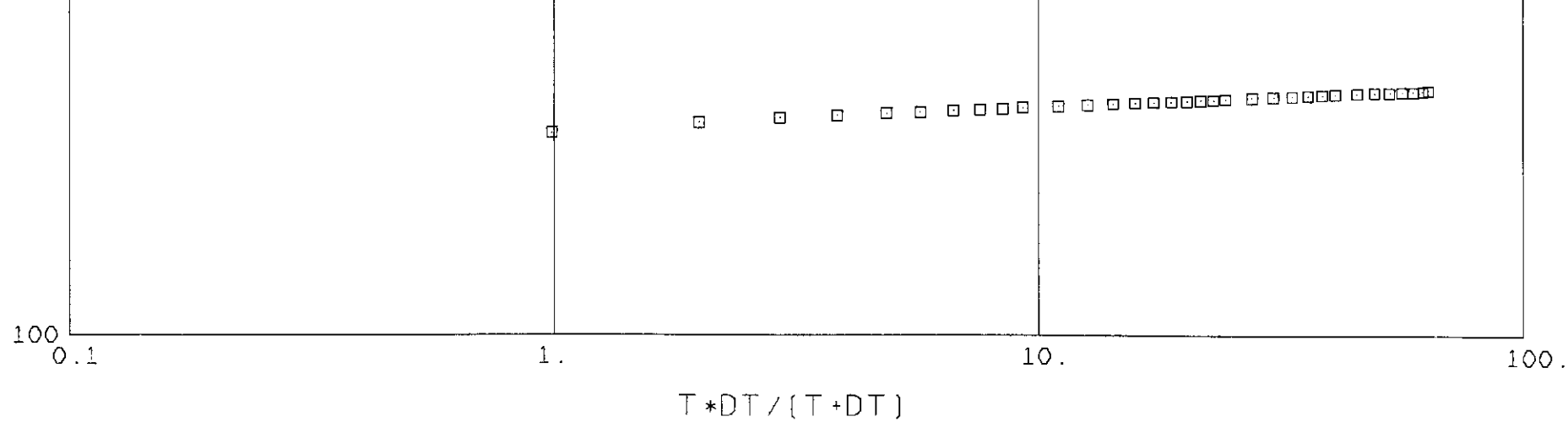
EQUIPMENT DATA

TICKET NO 70683900

GAUGE NO CIP 1 2
7351GAUGE NO CIP 1 2
7352

10000

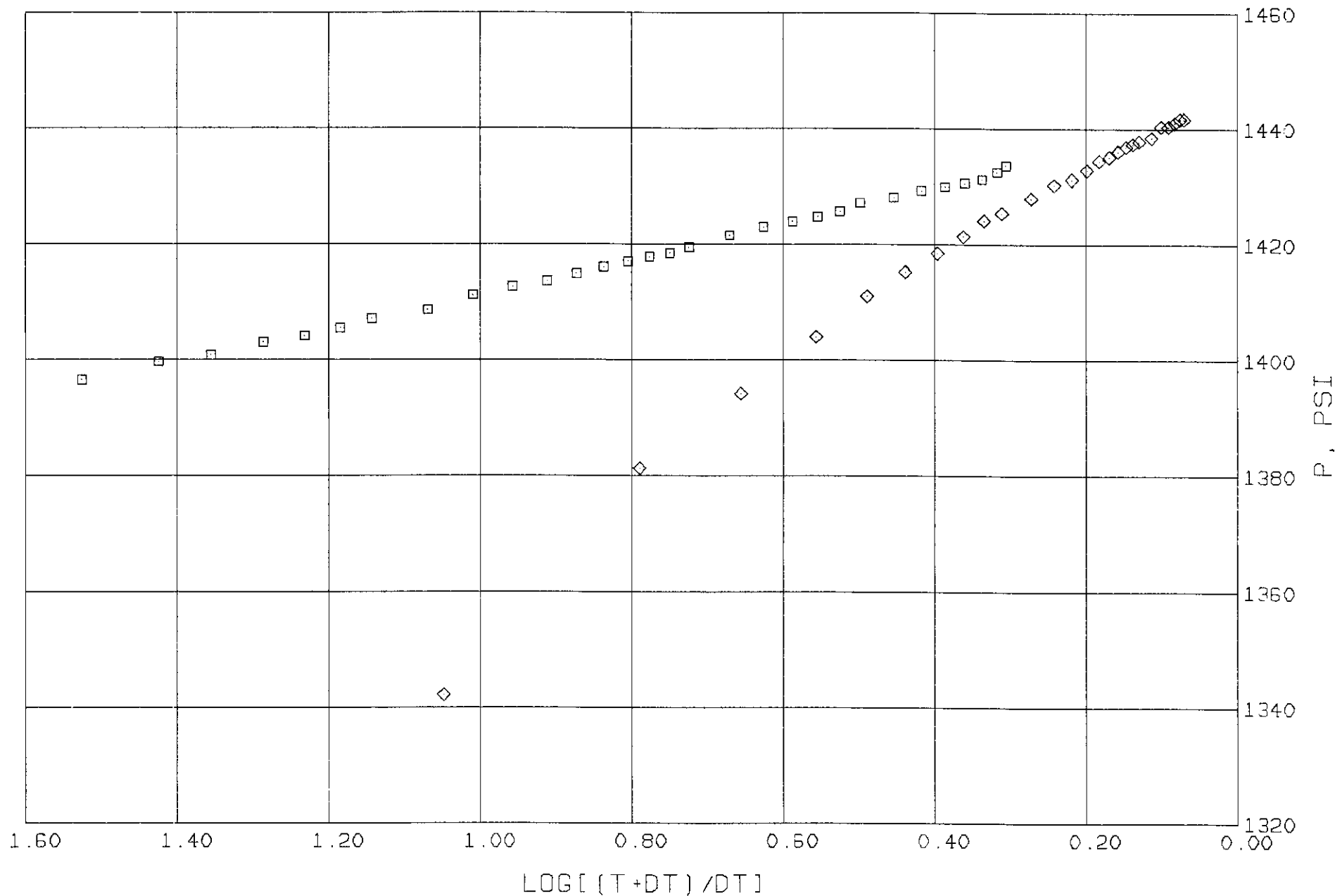




TICKET NO 70683900

GAUGE NO CIP 1 2
7352

GAUGE NO CIP 1 2
7351 $\diamond$ $\square$



TEMPERATURE RECORDER CHART

706839

123°

10° each circle

EQUATIONS FOR DST GAS WELL ANALYSIS

Indicated Flow
Capacity

$$kh = \frac{.001637 Q_o T}{m}$$

md-ft

Average Effective
Permeability

$$kh = \frac{kh}{h}$$

md

Skin Factor

$$S = 1.151 \left[\frac{m(P^*) - m(P_i)}{m} - \text{LOG} \left(\frac{k (t/60)}{\phi \mu c_r r_w^2} \right) + 3.23 \right]$$

Damage Ratio

$$DR = \frac{m(P^*) - m(P_i)}{m(P^*) - m(P_i) - 0.87 mS}$$

Indicated Flow
Rate (Maximum)

$$AOF_1 = \frac{Q_o m(P^*)}{m(P^*) - m(P_i)}$$

MCFD

Indicated Flow
Rate (Minimum)

$$AOF_2 = Q_o \sqrt{\frac{m(P^*)}{m(P^*) - m(P_i)}}$$

MCFD

Approx. Radius of
Investigation

$$r_i = 0.032 \sqrt{\frac{k (t/60)}{\phi \mu c_r}}$$

ft

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