

36-8s-24w

FORM 181-R2—PRINTED IN U.S.A.

FORMATION TEST DATA

LITTLE'S 102548 5M 9/76

Legal Location
Sec. - Twp. - Rng

SCHRADER
Lease Name

Well No.

Test No.

Tested Interval
3763' - 3790'

THE MAURICE L. BROWN COMPANY
Lease Owner/Company Name

Lease Owner/Company Name

Casing perms. _____ Bottom choke _____ Surf. temp. _____ °F Ticket No. 135318
Gas gravity _____ Oil gravity _____ GOR _____
Spec. gravity _____ Chlorides _____ ppm Res. _____ @ _____ °F

INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED

[illegible]

Gauge No. 690			Depth 3752			Clock No. 14248			12 hour			Ticket No. 135318		
First Flow Period			First Closed In Pressure			Second Flow Period			Second Closed In Pressure			Third Flow Period		
Time Defl. "000"	PSIG Temp. Corr.		Time Defl. "000"	$\text{Log } \frac{t + \theta}{\theta}$	PSIG Temp. Corr.	Time Defl. "000"	$\text{Log } \frac{t + \theta}{\theta}$	PSIG Temp. Corr.	Time Defl. "000"	$\text{Log } \frac{t + \theta}{\theta}$	PSIG Temp. Corr.	Time Defl. "000"	$\text{Log } \frac{t + \theta}{\theta}$	PSIG Temp. Corr.
0	.0000	24	.0000		219	.0000		224	.0000		332			
1	.0616	76	.0203		662	.0616		250	.0273		677			
2	.1232	121	.0407		677	.1232		274	.0547		688			
3	.1848	158	.0610		688	.1848		295	.0820		695			
4	.2464	190	.0813		694	.2464		313	.1093		701			
5	.3080	219	.1017		700	.3080		332	.1367		704			
6			.1220		704				.1640		708			
7			.1423		709				.1913		711			
8			.1626		712				.2186		713			
9			.1830		715				.2460		715			
10			.2033		718				.2733		718			
11			.2236		720				.3006		720			
12			.2440		722				.3280		721			
13			.2643		724				.3553		722			
14			.2846		726				.3826		724			
15			.3050		728				.4100		726			

Gauge No. 228			Depth 3786			Clock No. 4773			12 hour					
Time Defl. "000"	PSIG Temp. Corr.		Time Defl. "000"	$\text{Log } \frac{t + \theta}{\theta}$	PSIG Temp. Corr.	Time Defl. "000"	$\text{Log } \frac{t + \theta}{\theta}$	PSIG Temp. Corr.	Time Defl. "000"	$\text{Log } \frac{t + \theta}{\theta}$	PSIG Temp. Corr.			
0	.0000	43	.0000		234	.0000		239	.0000		346			
1	.0596	93	.0198		674	.0596		264	.0267		690			
2	.1192	138	.0396		691	.1192		288	.0535		701			
3	.1788	175	.0594		702	.1788		309	.0802		708			
4	.2384	207	.0792		709	.2384		328	.1069		714			
5	.2980	234	.0990		715	.2980		346	.1337		718			
6			.1188		720				.1604		721			
7			.1386		723				.1871		724			
8			.1584		726				.2138		727			
9			.1782		730				.2406		729			
10			.1980		732				.2673		732			
11			.2178		734				.2940		733			
12			.2376		737				.3208		734			
13			.2574		739				.3475		736			
14			.2772		740				.3742		738			
15			.2970		742				.4010		739			
Reading Interval 9			3			9			4			Minutes		
REMARKS:														

	O. D.	I. D.	LENGTH	DEPTH
Drill Pipe or Tubing				
Reversing Sub				
Water Cushion Valve				
Drill Pipe	4.5"	3.826"	3740'	
Drill Collars				
Reverse Sub	5.75"	2.75"	1.00'	3740'
Dual CIP Valve	5.0"	.87"	6.00'	3745'
Dual CIP Sampler				
Hydro-Spring Tester	5.0"	.75"	5.00'	3751'
Multiple CIP Sampler				
Extension Joint				
AP Running Case	5.0"	3.06"	4.00'	3752'
Hydraulic Jar	5.0"	1.75"	5.00'	
VR Safety Joint	5.0"	1.00"	2.80'	
Pressure Equalizing Crossover				
Packer Assembly	6.75"	1.53"	4.50'	3763'
Distributor				
Packer Assembly				
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Distributor				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Wall Anchor				
Drill Collars				
Flush Joint Anchor	5.0"	3.84"	16.00'	
Temp Case	5.0"	3.00"	1.50'	3785'
Blanked-Off B.T. Running Case	5.0"	2.75"	4.00'	3786'
Total Depth				3790'

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PRESSURE

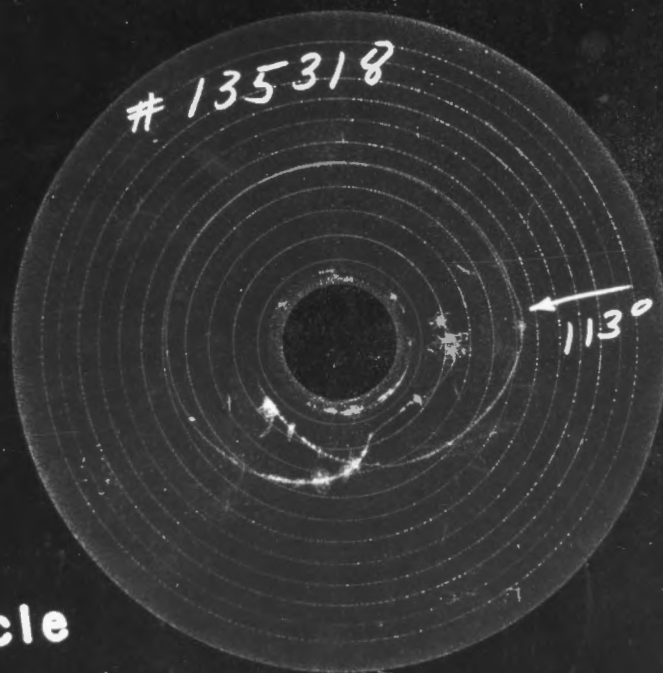
TIME

135318-690

135318-228

Each Horizontal Line Equal to 1000 p.s.i.

TEMPERATURE RECORDER CHART



10° each circle

	w/Damage Removed Max.	MCF/D
OF_4	= Theoretical Open Flow Potential with/Damage Removed Min.	MCF/D
P_s	= Extrapolated Static Pressure	Psig.
P_F	= Final Flow Pressure	Psig.
P_{ot}	= Potentiometric Surface (Fresh Water *)	Feet
Q	= Average Adjusted Production Rate During Test	bbls/day
Q_1	= Theoretical Production w/Damage Removed	bbls/day
Q_g	= Measured Gas Production Rate	MCF/D
R	= Corrected Recovery	bbls
r_w	= Radius of Well Bore	Feet
t	= Flow Time	Minutes
t_o	= Total Flow Time	Minutes
T	= Temperature Rankine	°R
Z	= Compressibility Factor	—
μ	= Viscosity Gas or Liquid	CP
Log	= Common Log	

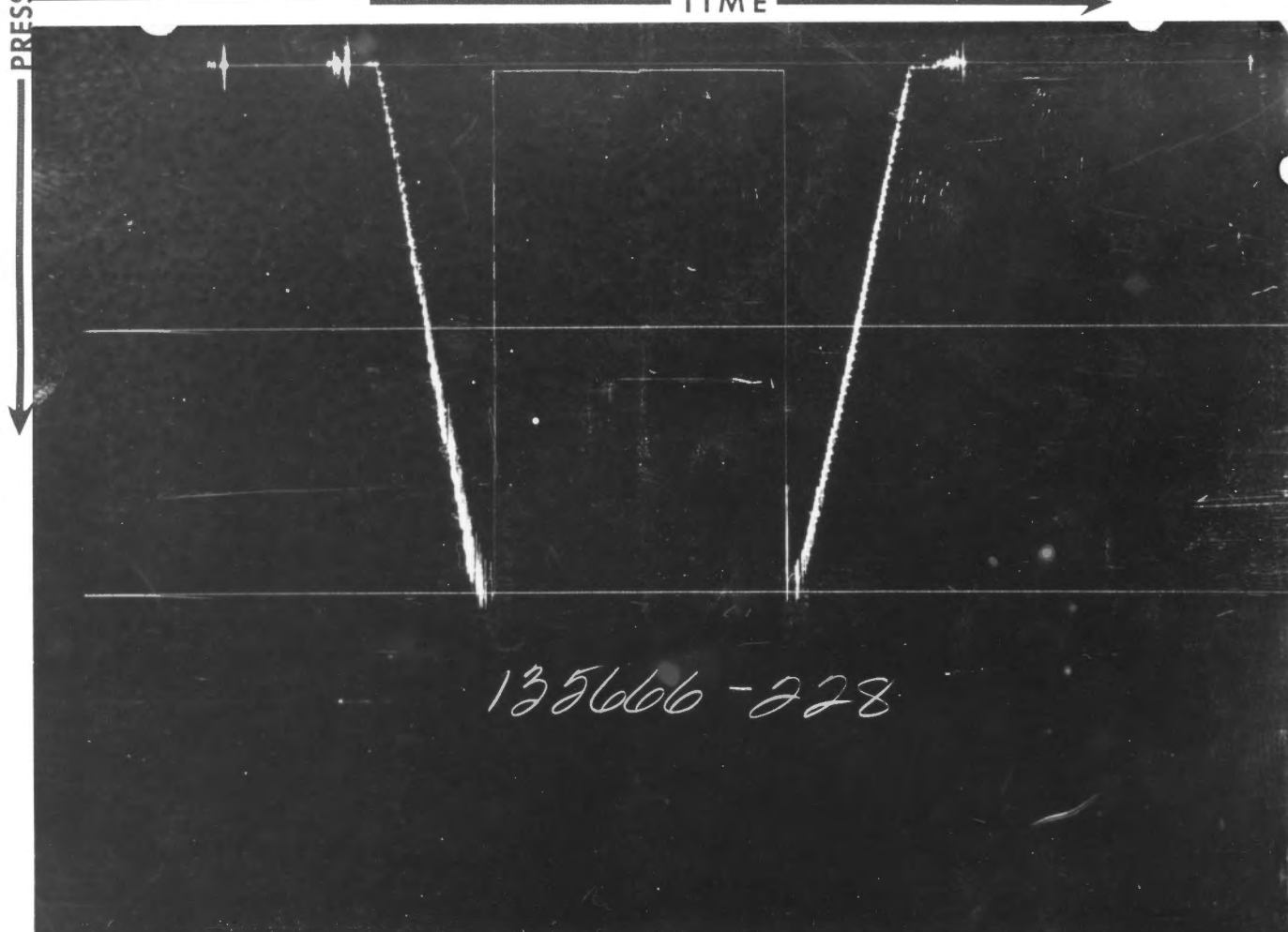
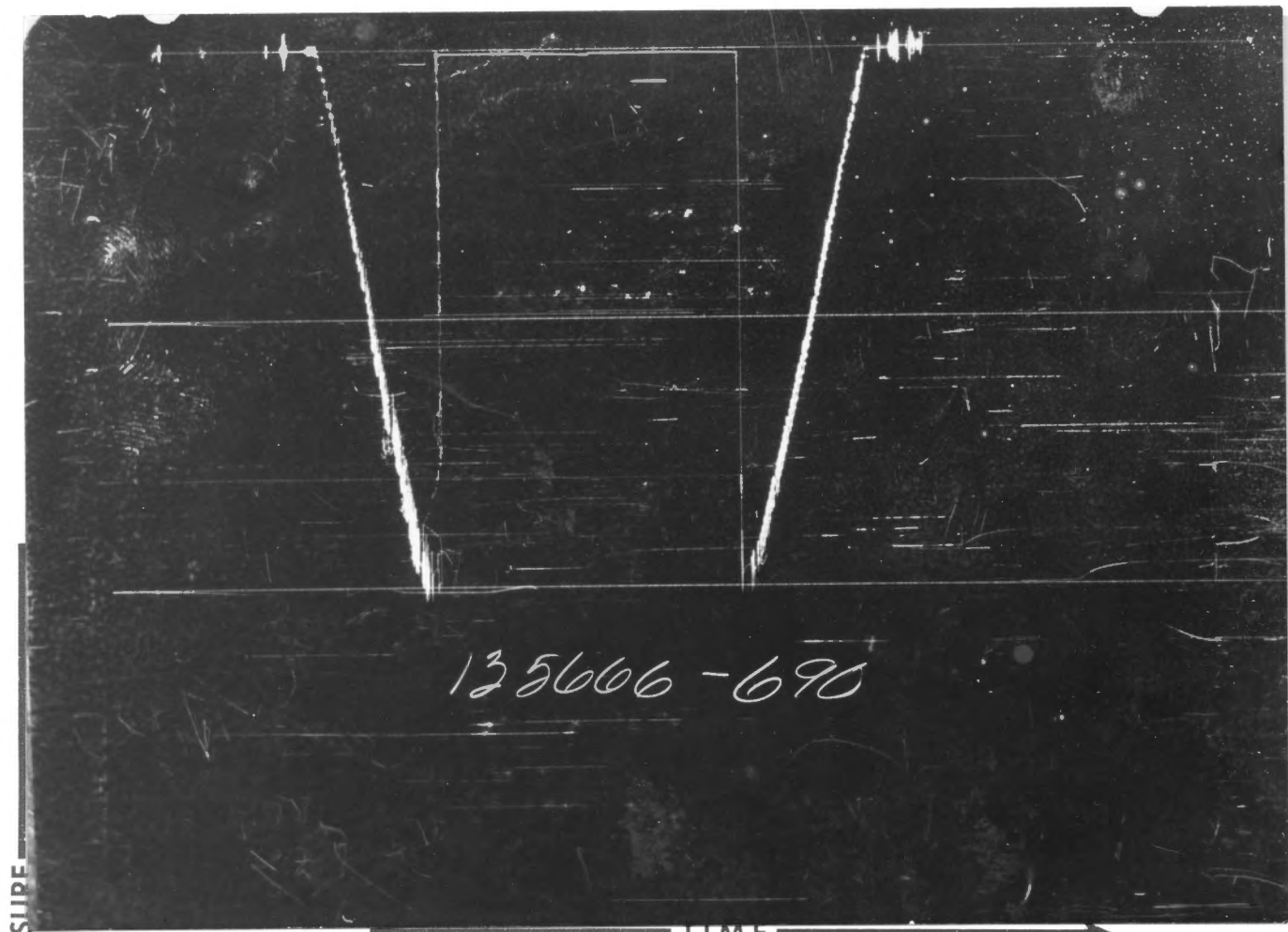
* Potentiometric Surface Reference to Rotary Table When Elevation Not Given,
Fresh Water Corrected to 100° F.

Casing perms. _____ Bottom choke _____ Surf. temp. _____ °F Ticket No. 135666
Gas gravity _____ Oil gravity _____ GOR _____
Spec. gravity _____ Chlorides _____ ppm Res. _____ @ _____ °F

INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED.

[illegible]

	O. D.	I. D.	LENGTH	DEPTH
Drill Pipe or Tubing	5.75"	2.75"	1'	
Reversing Sub				
Water Cushion Valve				
Drill Pipe	4 1/2"	3.826"	3765'	
Drill Collars				
Handling Sub & Choke Assembly	5.0"	.87"	5'	3772'
Dual CIP Valve				
Dual CIP Sampler	5.0"	.75"	5'	3777'
Hydro-Spring Tester				
Multiple CIP Sampler				
Extension Joint				
AP Running Case				
Hydraulic Jar	5.0"	1.75"	5'	
VR Safety Joint	5.0"	1.0"	3'	
Pressure Equalizing Crossover				
Packer Assembly	6.75"	1.53"	4'	3788'
Distributor				
Packer Assembly				
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case	5.0"	3.06"	4'	3790'
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Distributor				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Wall Anchor				
Drill Collars				
Flush Joint Anchor	5.0"	3.84"	14'	
Blanked-Off B.T. Running Case	5.0"	2.44"	4'	3806'
Total Depth				3810'



Each Horizontal Line Equal to 1000 p.s.i.

TEMPERATURE RECORDER CHART



10° each circle

OF_3	= Theoretical Open Flow Potential with/Damage Removed Max.	MCF/D
OF_4	= Theoretical Open Flow Potential with/Damage Removed Min.	MCF/D
P_s	= Extrapolated Static Pressure	Psig.
P_f	= Final Flow Pressure	Psig.
P_{ot}	= Potentiometric Surface (Fresh Water *)	Feet
Q	= Average Adjusted Production Rate During Test	bbls/day
Q_1	= Theoretical Production w/Damage Removed	bbls/day
Q_g	= Measured Gas Production Rate	MCF/D
R	= Corrected Recovery	bbls
r_w	= Radius of Well Bore	Feet
t	= Flow Time	Minutes
t_o	= Total Flow Time	Minutes
T	= Temperature Rankine	°R
Z	= Compressibility Factor	—
μ	= Viscosity Gas or Liquid	CP
Log	= Common Log	

* Potentiometric Surface Reference to Rotary Table When Elevation Not Given,
Fresh Water Corrected to 100° F.

FLUID SAMPLE DATA				Date 12-18-76		Ticket Number 135667	
Sampler Pressure _____ P.S.I.G. at Surface Recovery: Cu. Ft. Gas _____ cc. Oil _____ cc. Water _____ cc. Mud _____ Tot. Liquid cc. _____ Gravity _____ ° API @ _____ ° F. Gas/Oil Ratio _____ cu. ft./bbl. RESISTIVITY CHLORIDE CONTENT Recovery Water _____ @ _____ ° F. _____ ppm Recovery Mud _____ @ _____ ° F. _____ ppm Recovery Mud Filtrate _____ @ _____ ° F. _____ ppm Mud Pit Sample _____ @ _____ ° F. _____ ppm Mud Pit Sample Filtrate _____ @ _____ ° F. _____ ppm Mud Weight 9.7 vis 43 Sec. = 40				Kind of Job OPEN HOLE Tester MR. PALMBERG Drilling Contractor MR. KENNEDY ABERCROMBIE DRILLING COMPANY BC S		Halliburton District HAYS Witness MR. DONNELLY BC S	
EQUIPMENT & HOLE DATA							
Formation Tested				Lansing-Kansas City			
Elevation				2412' KB			
Net Productive Interval				4' _____ Ft.			
All Depths Measured From				Kelly Bushing			
Total Depth				3822' _____ Ft.			
Main Hole/Casing Size				7 7/8"			
Drill Collar Length				- I.D.			
Drill Pipe Length				3782' I.D. 3.826"			
Packer Depth(s)				3805' _____ Ft.			
Depth Tester Valve				3794' _____ Ft.			
TYPE		AMOUNT		Depth Back		Surface	
Cushion				Ft. Pres. Valve		Choke 1/4" Bottom Choke 3/4"	
Recovered	290	Feet of	Muddy salt water with a trace of oil on top				
Recovered		Feet of					
Recovered		Feet of					
Recovered		Feet of					
Recovered		Feet of					
Remarks SEE PRODUCTION TEST DATA SHEET.							
TEMPERATURE		Gauge No. 690		Gauge No. 228		Gauge No.	
		Depth: 3807' Ft.		Depth: 3818' Ft.		Depth: _____ Ft.	
		12 Hour Clock		12 Hour Clock		Hour Clock	
Est. _____ ° F.	Blanked Off NO		Blanked Off YES		Blanked Off		Tool _____ A.M.
3817'							Opened 0820 P.M.
Actual 120° F.							Opened _____ A.M.
		Pressures		Pressures		Pressures	
	Field	Office	Field	Office	Field	Office	Reported _____ Minutes
Initial Hydrostatic	1990	1931	1983	1940			Computed _____ Minutes
First Period	Flow Initial	18	15	28	20		
	Flow Final	73	76	84	82		
	Closed in	982	998	999	1006		
Second Period	Flow Initial	73	81	84	88		
	Flow Final	146	155	149	160		
	Closed in	1000	1005	981	1007		
Third Period	Flow Initial						
	Flow Final						
	Closed in						
	Final Hydrostatic	1953	1915	1965	1915		

Legal Location Sec. - Twp. - Rng. NE NW NW 36 - 8S - 24W
 Lease Name SCHRADER
 Well No. 1
 Test No. 3
 Tested Interval 3805' - 3822'
 County GRAHAM
 State KANSAS

THE MAURICE L. BROWN COMPANY
 Lease Owner/Company Name

135667

INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED

FORM 102-R1—PRINTED IN U.S.A.

LITTLE'S 96572 5M 8/74

Gauge No. 690		Depth 3807'		Clock No. 14248		12 hour		Ticket No. 135667	
First Flow Period		First Closed In Pressure		Second Flow Period		Second Closed In Pressure		Third Flow Period	
Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t + \theta}{\theta}$	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t + \theta}{\theta}$	Time Defl. .000"	PSIG Temp. Corr.
0 .0000	15	.0000		.0000	81	.0000			
1 .0552	25	.0138		.0750	94**	.0343			
2 .1103	33	.0413		.1432	107	.0754			
3 .1655	45	.0688		.2114	120	.1165			
4 .2207	56	.0963		.2796	132	.1576			
5 .2758	65	.1239		.3478	144	.1988			
6 .3310	76	.1514		.4160	155	.2399			
7		.1789				.2810			
8		.2064				.3221			
9		.2340				.3633			
10		.2615				.4044			
11		.2890				.4455			
12						.4866			
13						.5278			
14						.5689			
15						.6100			

Gauge No. 288		Depth 3818'		Clock No. 4773		12 hour	
First Flow Period		First Closed In Pressure		Second Flow Period		Second Closed In Pressure	
Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t + \theta}{\theta}$	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t + \theta}{\theta}$
0 .0000	20	.0000		.0000	88	.0000	
1 .0528	33	.0135		.0729	100**	.0334	
2 .1057	40	.0404		.1391	113	.0735	
3 .1585	51	.0674		.2053	125	.1137	
4 .2113	62	.0943		.2715	138	.1538	
5 .2642	71	.1213		.3378	149	.1939	
6 .3170	82	.1482		.4040	160	.2340	
7		.1752				.2741	
8		.2021				.3142	
9		.2291				.3543	
10		.2560				.3944	
11		.2830				.4346	
12						.4747	
13						.5148	
14						.5549	
15						.5950	
Reading Interval 8		4		10		6	
REMARKS: *Interval = 2 minutes		**Interval = 11 minutes		***Interval = 5 minutes		Minutes	

	O. D.	I. D.	LENGTH	DEPTH
Drill Pipe or Tubing	5.75"	2.75"	1'	
Reversing Sub				
Water Cushion Valve				
Drill Pipe	4 $\frac{1}{2}$ "	3.826"	3782'	
Drill Collars				
Handling Sub & Choke Assembly	5.0"	.87"	5'	3789'
Dual CIP Valve				
Dual CIP Sampler	5.0"	.75"	5'	3794'
Hydro-Spring Tester				
Multiple CIP Sampler				
Extension Joint				
AP Running Case				
Hydraulic Jar	5.0"	1.75"	5'	
VR Safety Joint	5.0"	1.0"	3'	
Pressure Equalizing Crossover				
Packer Assembly ESWP	6.75"	1.53"	4'	3805'
Distributor				
Packer Assembly				
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case	5.0"	3.06"	4'	3807'
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Distributor				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Wall Anchor				
Drill Collars				
Flush Joint Anchor	5.0"	3.84"	9'	
Blanked-Off B.T. Running Case	5.0"	2.44"	4'	3818'
Total Depth				3822'

135667-690

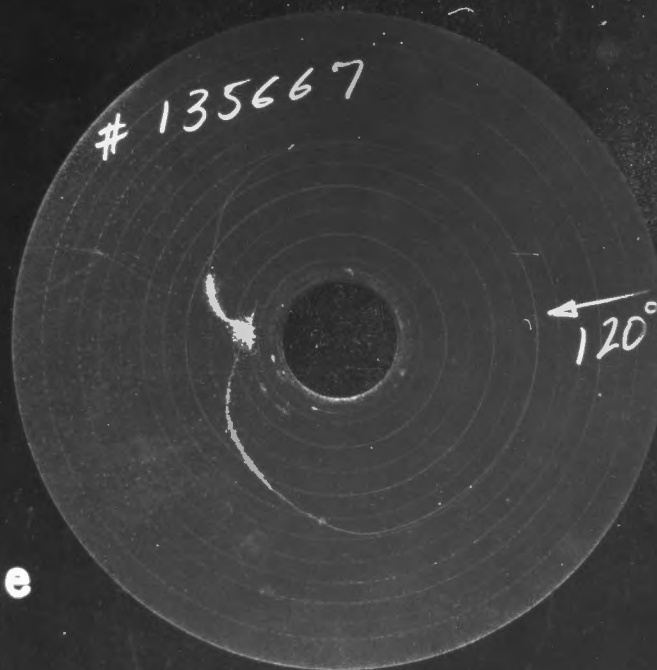
TIME

PRESSURE

135667-228

Each Horizontal Line Equal to 1000 p.s.i.

TEMPERATURE RECORDER CHART



10° each circle

OF_3	= Theoretical Open Flow Potential with/Damage Removed Max.	MCF/D
OF_4	= Theoretical Open Flow Potential with/Damage Removed Min.	MCF/D
P_s	= Extrapolated Static Pressure	Psig.
P_f	= Final Flow Pressure	Psig.
P_{or}	= Potentiometric Surface (Fresh Water *)	Feet
Q	= Average Adjusted Production Rate During Test	bbls/day
Q_1	= Theoretical Production w/Damage Removed	bbls/day
Q_g	= Measured Gas Production Rate	MCF/D
R	= Corrected Recovery	bbls
r_w	= Radius of Well Bore	Feet
t	= Flow Time	Minutes
t_o	= Total Flow Time	Minutes
T	= Temperature Rankine	°R
Z	= Compressibility Factor	—
μ	= Viscosity Gas or Liquid	CP
Log	= Common Log	

* Potentiometric Surface Reference to Rotary Table When Elevation Not Given,
Fresh Water Corrected to 100° F.

Casing perms. _____ Bottom choke _____ Surf. temp. _____ °F Ticket No. 135008
 Gas gravity _____ Oil gravity _____ GOR _____
 Spec. gravity _____ Chlorides _____ ppm Res. _____ @ _____ °F
INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED _____

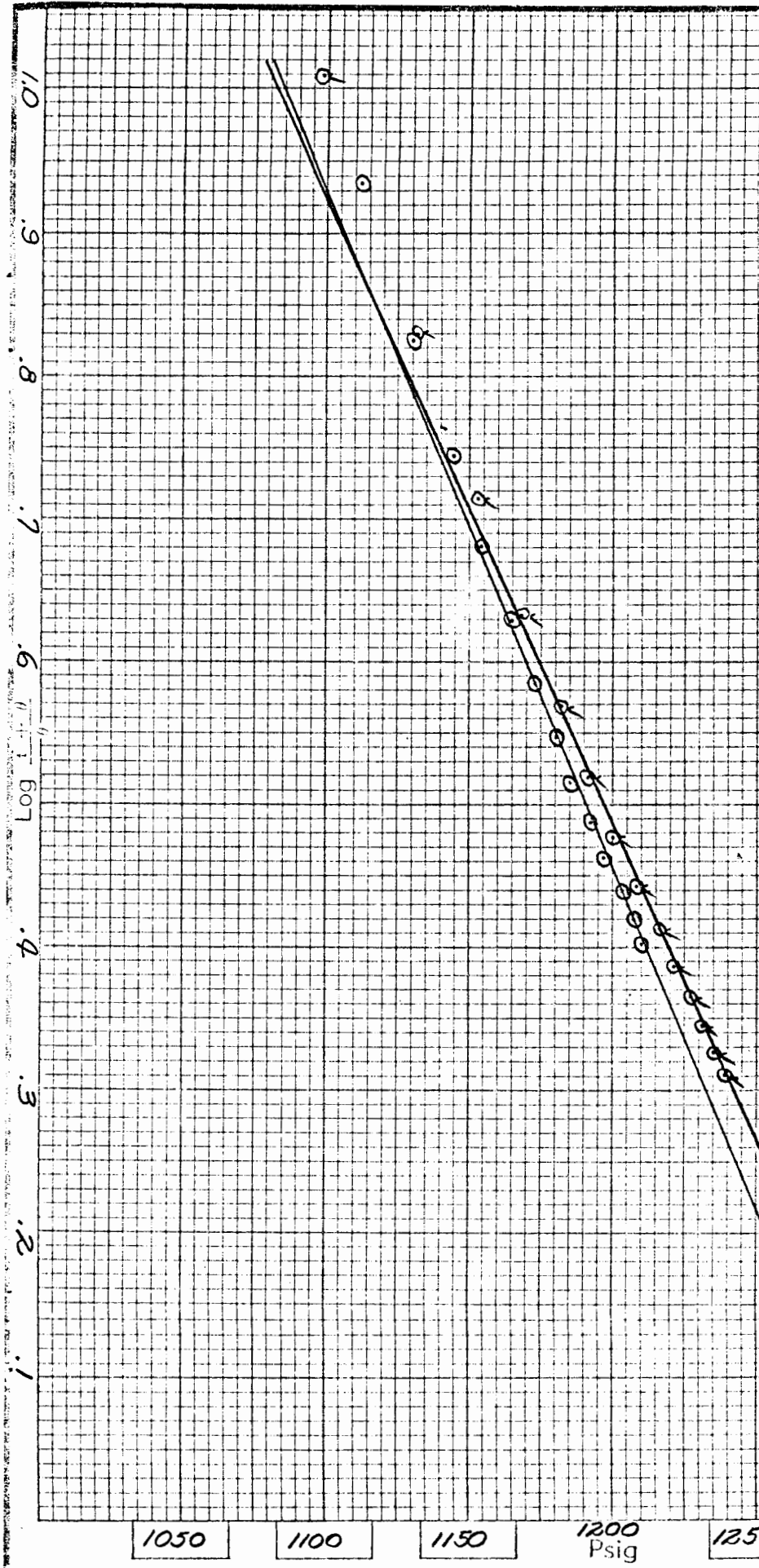
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Gauge No. 690		Depth		3858'		Clock No. 14248		12 hour		Ticket No. 135668	
First Flow Period		Closed In Pressure		Second Flow Period		Second Closed In Pressure		Third Flow Period		Third Closed In Pressure	
Time Defl. "000"	PSIG Temp. Corr.	Time Defl. "000"	$\text{Log } t + \frac{\theta}{\theta}$	Time Defl. "000"	PSIG Temp. Corr.	Time Defl. "000"	$\text{Log } t + \frac{\theta}{\theta}$	Time Defl. "000"	PSIG Temp. Corr.	Time Defl. "000"	$\text{Log } t + \frac{\theta}{\theta}$
0 .000	22	.000	---	.000	201	.000	---				
1 .0409	50*	.0136	1.381	.0342	208	.0273	1.377				
2 .0751	68	.0341	1.009	.0684	224	.0545	1.094				
3 .1092	85	.0545	.830	.1027	238	.0818	.935				
4 .1434	103	.0750	.715	.1369	253	.1091	.826				
5 .1775	118	.0954	.633	.1711	267	.1364	.745				
6 .2116	134	.1159	.569	.2053	280	.1636	.681				
7 .2457	150	.1363	.519	.2395	293	.1909	.629				
8 .2799	165	.1568	.477	.2738	306	.2182	.586				
9 .3140	180	.1772	.443	.3080	320	.2454	.548				
10		.1977	.413			.2727	.516				
11		.2181	.387			.3000	.488				
12		.2386	.365			.3272	.463				
13		.2590	.345			.3545	.440				
14		.2795	.327			.3818	.420				
15		.3000	.311			.4090	.402				

Gauge No. 228		Depth		3882'		Clock No. 4773		hour 12	
First Flow Period		Closed In Pressure		Second Flow Period		Second Closed In Pressure		Third Flow Period	
Time Defl. "000"	PSIG Temp. Corr.	Time Defl. "000"	$\text{Log } t + \frac{\theta}{\theta}$	Time Defl. "000"	PSIG Temp. Corr.	Time Defl. "000"	$\text{Log } t + \frac{\theta}{\theta}$	Time Defl. "000"	PSIG Temp. Corr.
0 .000	36	.000	---	.000	210	.000	---		
1 .0397	61*	.0134	1.376	.0333	215	.0267	1.374		
2 .0727	79	.0334	1.004	.0667	231	.0533	1.091		
3 .1057	95	.0535	.825	.1000	246	.0800	.932		
4 .1388	112	.0735	.711	.1333	260	.1067	.824		
5 .1718	128	.0936	.628	.1667	275	.1334	.743		
6 .2049	144	.1136	.565	.2000	288	.1600	.679		
7 .2379	159	.1337	.515	.2333	301	.1867	.627		
8 .2710	174	.1537	.474	.2667	314	.2134	.583		
9 .3040	188	.1738	.439	.3000	327	.2400	.546		
10		.1938	.410			.2667	.514		
11		.2139	.384			.2934	.486		
12		.2339	.362			.3200	.461		
13		.2539	.342			.3467	.438		
14		.2740	.324			.3734	.418		
15		.2940	.308			.4000	.400		
Reading Interval 5		3		5		4		Minutes	

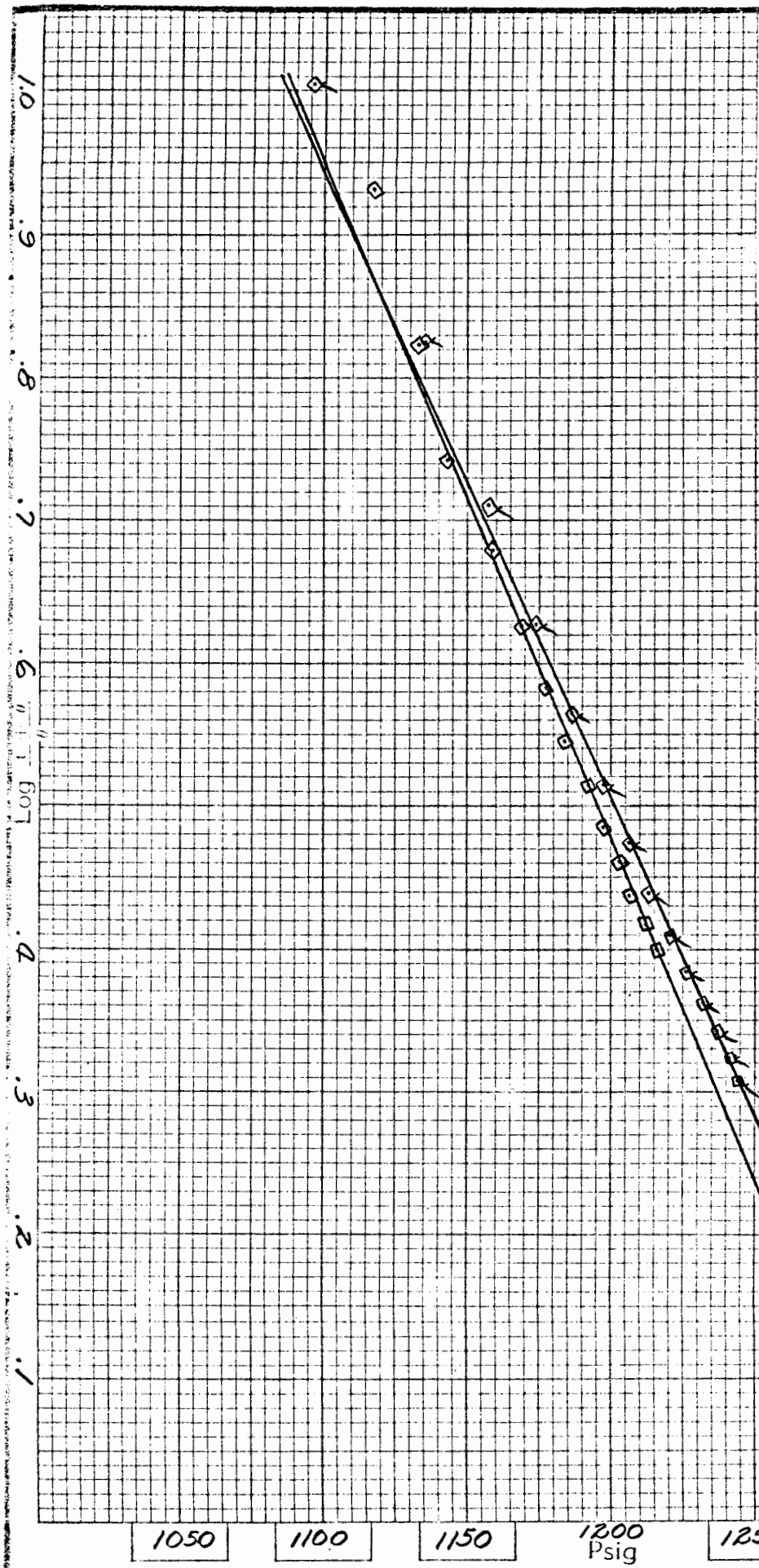
REMARKS: *-6 minutes **-2 minutes.

TICKET NO.	135668	
BT GAUGE NO.	INITIAL	FINAL
690		
228		
TOP GAUGE ONLY		



EXTRAPOLATED PRESSURE GRAPH

TICKET NO.	135668	
BT GAUGE NO.	INITIAL	FINAL
690	✗	✗
228	◇✓	◇
BOTTOM GAUGE ONLY		



EXTRAPOLATED PRESSURE GRAPH

Liquid Production

B.T. Gauge Numbers			690	228	Ticket Number		135668
			PRESSURE	PRESSURE			
Initial Hydrostatic			2040	2052	Elevation		2412 KB ft.
Final Hydrostatic			1960	1968			
1st Flow	Initial	Time	22	36	Indicated Production	1st Flow	171 bbls./day
	Final	46	180	188		2nd Flow	151 bbls./day
	Closed In Pressure	44	1239	1244		3rd Flow	- bbls./day
2nd Flow	Initial		201	210	Drill Collar Length		
	Final	45	320	327	Drill Collar I.D.		
	Closed In Pressure	60	1210	1216	Drill Pipe Factor		
3rd Flow	Initial	Time			Hole Size		
	Final				Footage Tested		
	Closed In Pressure				Mud Weight		
Extrapolated Static Pressure			1st	1310	Viscosity, Oil or XXXX		
			2nd	1295	Oil API Gravity		
			3rd	-	Water Specific Gravity		
					Temperature		
Slope P/10			1st	1082			
			2nd	1084			
			3rd	-			

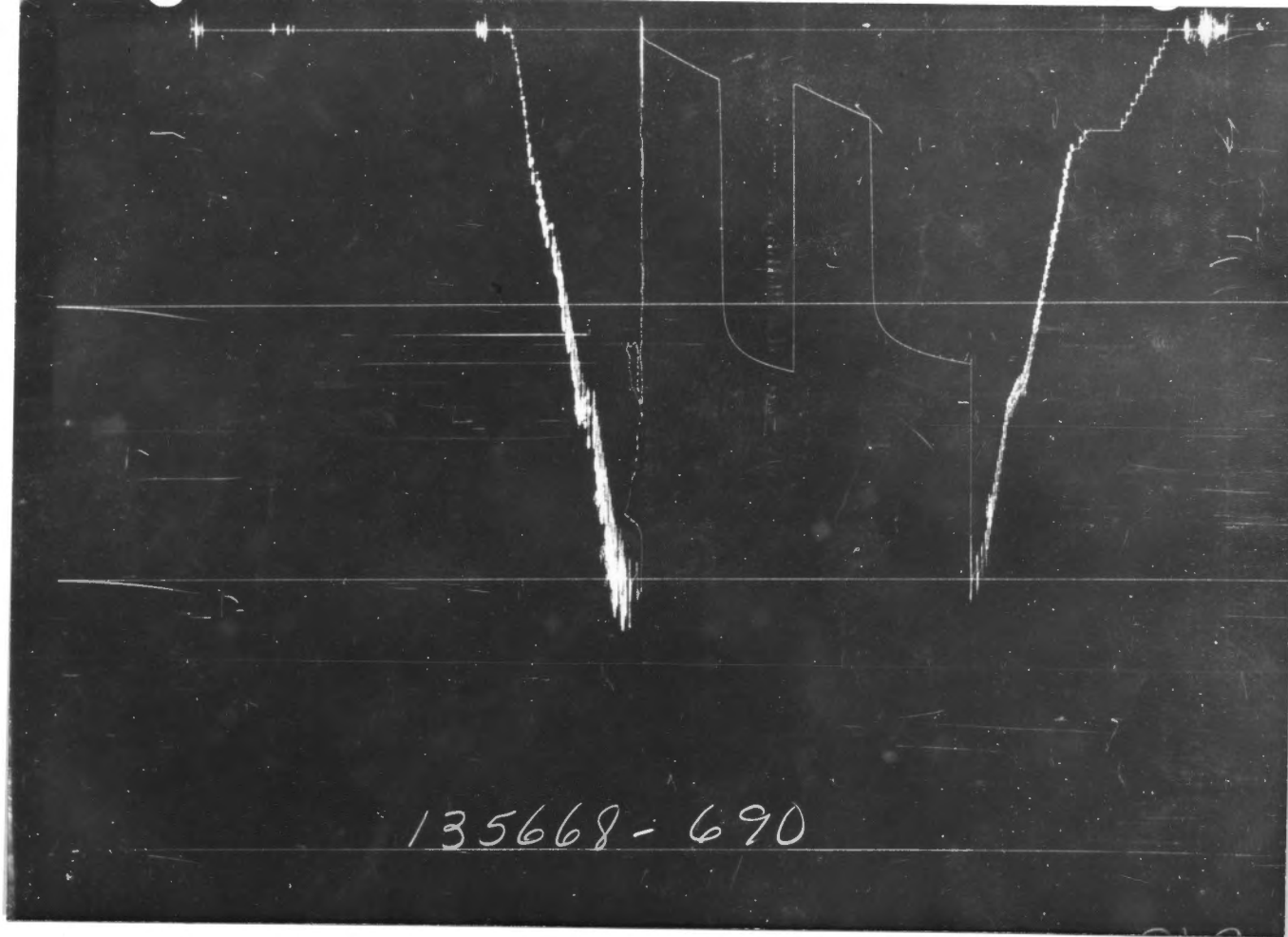
Remarks:

SUMMARY		B.T. Gauge No. 690			B.T. Gauge No. 228		
		Depth 3858'			Depth 3882'		
PRODUCT	EQUATION	FIRST	SECOND	THIRD	FIRST	SECOND	THIRD
Production	$Q = \frac{1440 R}{t}$	176	151		171	151	
Transmissibility	$\frac{Kh}{\mu} = \frac{162.6 Q}{m}$	125.447	116.189		122.087	116.189	
Indicated Flow Capacity	$Kh = \frac{Kh}{\mu} \mu$	752.681	697.134		732.520	697.134	
Average Effective Permeability	$K = \frac{Kh}{h}$	-	-		-	-	
	$K_i = \frac{Kh}{h_i}$	188.171	174.284		183.130	174.284	
Damage Ratio	$DR = .183 \frac{P_s - P_f}{m}$	0.907	0.846		0.905	0.844	
Theoretical Potential w/Damage Removed	$Q_1 = Q DR$	176	151		171	151	
Approx. Radius of Investigation	$b \approx \sqrt{Kt}$ or $\sqrt{Kt_0}$	-	-		-	-	
	$b_1 \approx \sqrt{K_1 t}$ or $\sqrt{K_1 t_0}$	93	126		92	126	
Potentiometric Surface *	$Pot. = EI - CD + 2.319 P_s$	1592	1557		1579	1545	

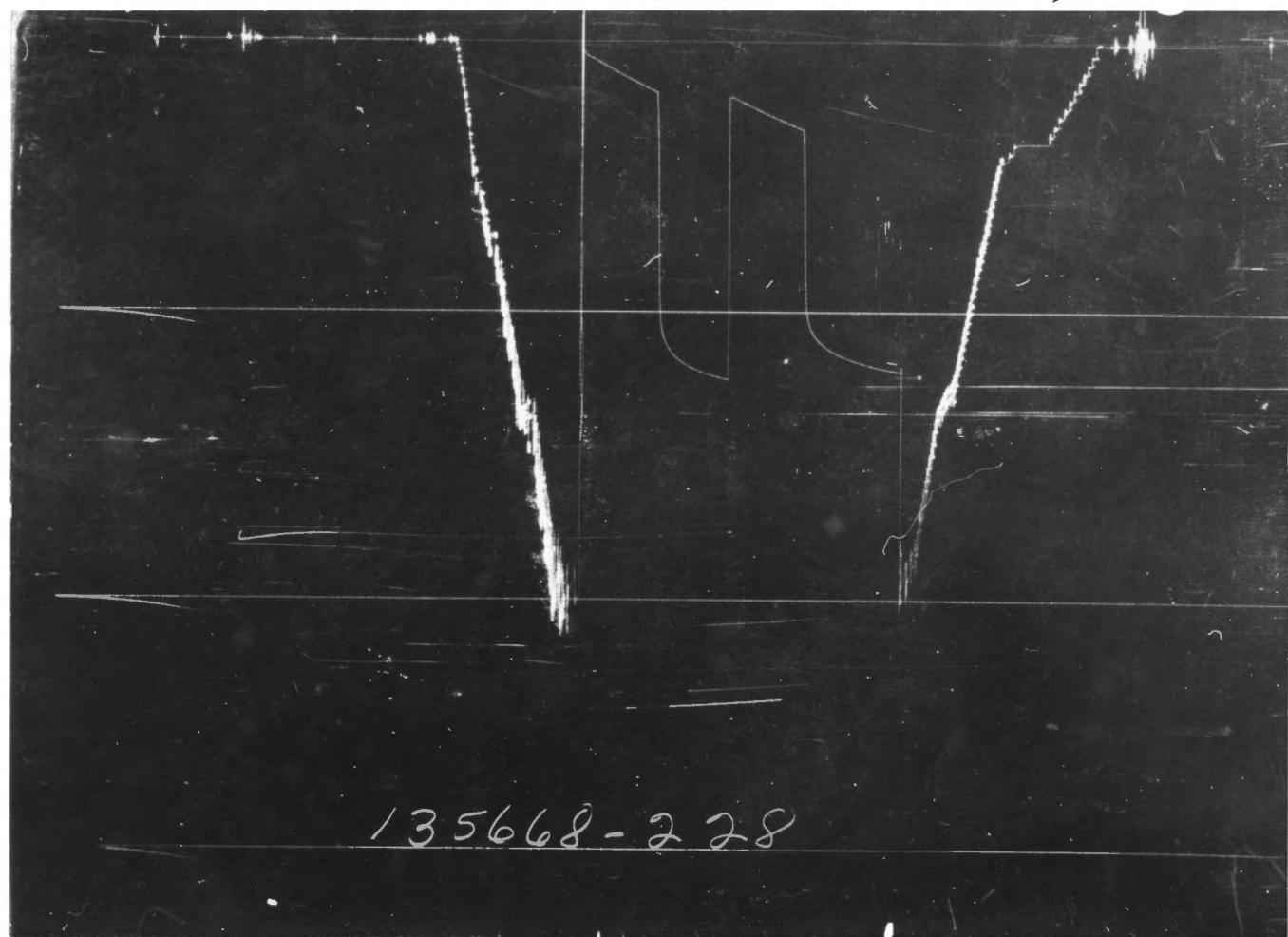
NOTICE: These calculations are based upon information furnished by you and taken from Drill Stem Test pressure charts, and are furnished you for your information. In furnishing such calculations and evaluations based thereon, Halliburton is merely expressing its opinion. You agree that Halliburton makes no warranty express or implied as to the accuracy of such calculations or opinions, and that Halliburton shall not be liable for any loss or damage, whether due to negligence or otherwise, in connection with such calculations and opinions.

	O. D.	I. D.	LENGTH	DEPTH
Drill Pipe or Tubing	5.75"	2.75"	1'	
Reversing Sub				
Water Cushion Valve				
Drill Pipe	4½"	3.826"	3833'	
Drill Collars				
Handling Sub & Choke Assembly	5.0"	.87"	5'	3840'
Dual CIP Valve				
Dual CIP Sampler	5.0"	.75'	5'	3845'
Hydro-Spring Tester				
Multiple CIP Sampler				
Extension Joint				
AP Running Case				
Hydraulic Jar	5.0"	1.75"	5'	
VR Safety Joint	5.0"	1.0"	3'	
Pressure Equalizing Crossover				
Packer Assembly	6.75"	1.53"	4'	3856'
Distributor				
Packer Assembly				
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case	5.0"	3.06"	4'	3858'
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Distributor				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Wall Anchor				
Drill Collars				
Flush Joint Anchor	5.0"	3.84"	22'	
Blanked-Off B.T. Running Case	5.0"	2.44"	4'	3882'
Total Depth				3886'

PRESSURE



TIME



Each Horizontal Line Equal to 1000 p.s.i.

TEMPERATURE RECORDER CHART



10° each circle

OF_3	= Theoretical Open Flow Potential with/Damage Removed Max.	MCF/D
OF_4	= Theoretical Open Flow Potential with/Damage Removed Min.	MCF/D
P_s	= Extrapolated Static Pressure	Psig.
P_f	= Final Flow Pressure	Psig.
P_{or}	= Potentiometric Surface (Fresh Water *)	Feet
Q	= Average Adjusted Production Rate During Test	bbls/day
Q_1	= Theoretical Production w/Damage Removed	bbls/day
Q_g	= Measured Gas Production Rate	MCF/D
R	= Corrected Recovery	bbls
r_w	= Radius of Well Bore	Feet
t	= Flow Time	Minutes
t_o	= Total Flow Time	Minutes
T	= Temperature Rankine	°R
Z	= Compressibility Factor	—
μ	= Viscosity Gas or Liquid	CP
Log	= Common Log	

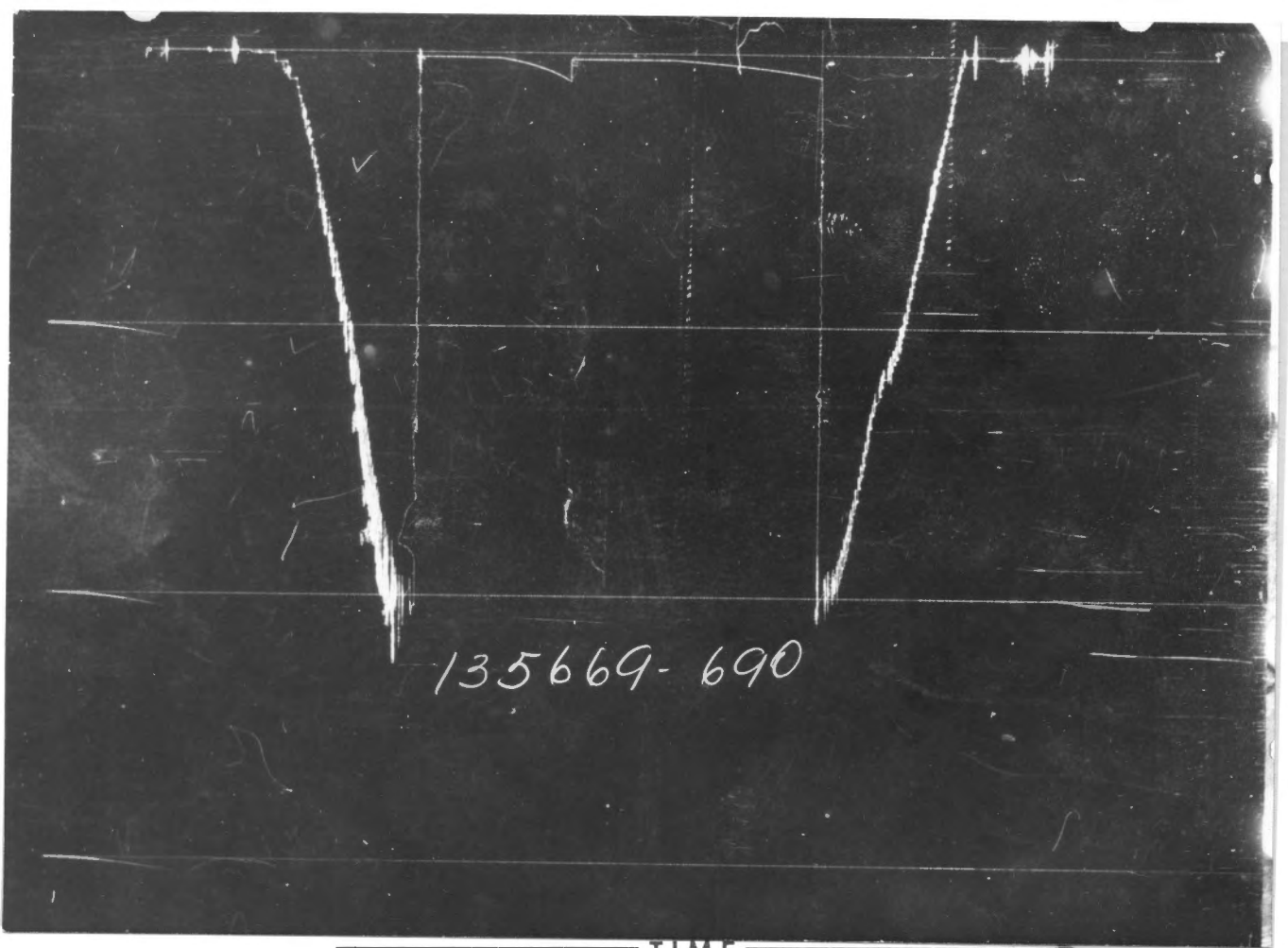
* Potentiometric Surface Reference to Rotary Table When Elevation Not Given,
Fresh Water Corrected to 100° F.

FLUID SAMPLE DATA				Date	12-19-76	Ticket Number	135669
Sampler Pressure _____ P.S.I.G. at Surface				Kind of Job	OPEN HOLE	Halliburton District	HAYS
Recovery: Cu. Ft. Gas _____					MR. KENNEDY		
cc. Oil _____				Tester	MR. PALMBERG	Witness	MR. DONNELLY
cc. Water _____							
cc. Mud _____				Drilling Contractor	ABERCROMBIE DRILLING COMPANY SM		
Tot. Liquid cc. _____					EQUIPMENT & HOLE DATA		
Gravity _____ ° API @ _____ °F.				Formation Tested	Lower Kansas City		
Gas/Oil Ratio _____ cu. ft./bbl.				Elevation	2412 Kelly bushing Ft.		
RESISTIVITY _____ CHLORIDE CONTENT _____				Net Productive Interval	4' Ft.		
Recovery Water _____ @ _____ °F. _____ ppm				All Depths Measured From	Kelly bushing		
Recovery Mud _____ @ _____ °F. _____ ppm				Total Depth	3920' Ft.		
Recovery Mud Filtrate _____ @ _____ °F. _____ ppm				Main Hole/Casing Size	7 7/8"		
Mud Pit Sample _____ @ _____ °F. _____ ppm				Drill Collar Length	- I.D.		
Mud Pit Sample Filtrate _____ @ _____ °F. _____ ppm				Drill Pipe Length	3862' I.D. 3.826"		
Mud Weight 9.7 vis 51 sec				Packer Depth(s)	3885' Ft.		
				Depth Tester Valve	3874' Ft.		
TYPE AMOUNT				Surface Choke	Bottom Choke		
Cushion _____ Ft. Depth Back Pres. Valve _____				1/4"	3/4"		
Recovered 25 Feet of very slightly oil cut mud				Med. From Tester Valve			
Recovered _____ Feet of _____							
Recovered _____ Feet of _____							
Recovered _____ Feet of _____							
Recovered _____ Feet of _____							
Remarks SEE PRODUCTION TEST DATA SHEET							

Casing perms. _____ Bottom choke _____ Surf. temp _____ °F Ticket No. _____ 155009
Gas gravity _____ Oil gravity _____ GOR _____
Spec. gravity _____ Chlorides _____ ppm Res. _____ @ _____ °F
INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED _____

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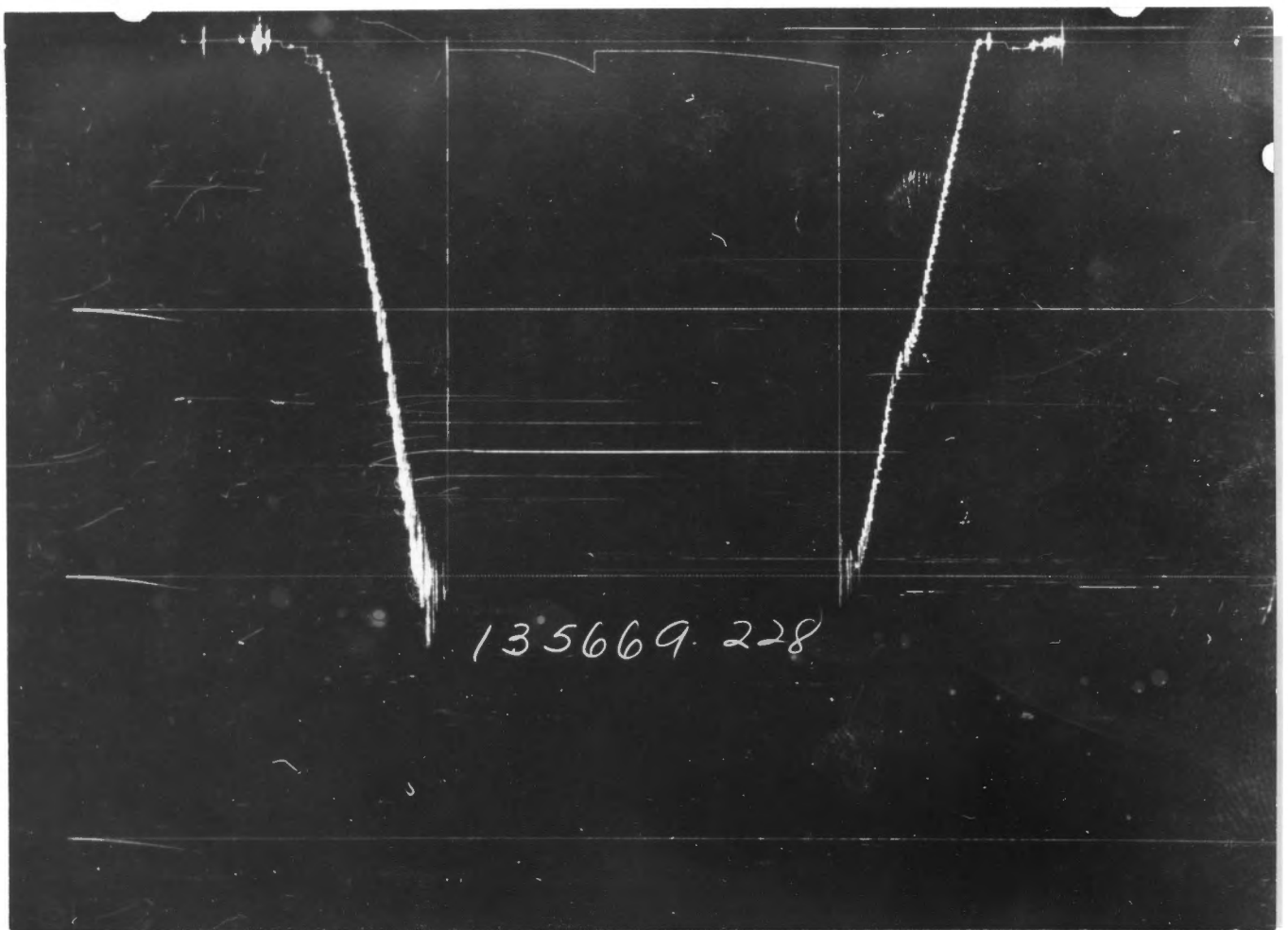
	O. D.	I. D.	LENGTH	DEPTH
Drill Pipe or Tubing	5.75"	2.75"	1'	
Reversing Sub				
Water Cushion Valve				
Drill Pipe	4½"	3.826"	3862'	
Drill Collars				
Handling Sub & Choke Assembly				
Dual CIP Valve	5.0"	.87"	5'	3869'
Dual CIP Sampler				
Hydro-Spring Tester	5.0"	.75"	5'	3874'
Multiple CIP Sampler				
Extension Joint				
AP Running Case				
Hydraulic Jar	5.0"	1.75"	5'	
VR Safety Joint	5.0"	1.0"	3'	
Pressure Equalizing Crossover				
Packer Assembly	6.75"	1.53"	4'	3885'
Distributor				
Packer Assembly				
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case	5.0"	3.06"	4'	3887'
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Distributor				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Wall Anchor				
Drill Collars				
Flush Joint Anchor	5.0"	3.84"	27'	
Blanked-Off B.T. Running Case	5.0"	2.44"	4'	3916'
Total Depth				3920'



135669-690

PRESSURE

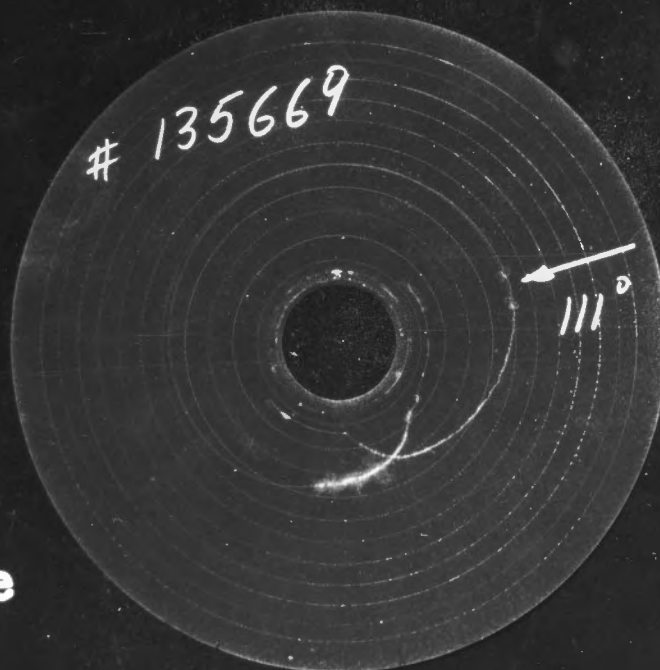
TIME



135669-228

Each Horizontal Line Equal to 1000 p.s.i.

TEMPERATURE RECORDER CHART



10° each circle

OF_3	= Theoretical Open Flow Potential with/Damage Removed Max.	MCF/D
OF_4	= Theoretical Open Flow Potential with/Damage Removed Min.	MCF/D
P_s	= Extrapolated Static Pressure	Psig.
P_f	= Final Flow Pressure	Psig.
P_{or}	= Potentiometric Surface (Fresh Water *)	Feet
Q	= Average Adjusted Production Rate During Test	bbls/day
Q_1	= Theoretical Production w/Damage Removed	bbls/day
Q_g	= Measured Gas Production Rate	MCF/D
R	= Corrected Recovery	bbls
r_w	= Radius of Well Bore	Feet
t	= Flow Time	Minutes
t_o	= Total Flow Time	Minutes
T	= Temperature Rankine	°R
Z	= Compressibility Factor	—
μ	= Viscosity Gas or Liquid	CP
Log	= Common Log	

* Potentiometric Surface Reference to Rotary Table When Elevation Not Given,
Fresh Water Corrected to 100° F.

FLUID SAMPLE DATA						Date	Ticket Number
Sampler Pressure _____ P.S.I.G. at Surface						Kind of Job	Halliburton HAYS District
Recovery: Cu. Ft. Gas _____ cc. Oil _____ cc. Water _____ cc. Mud _____ Tot. Liquid cc. _____						Tester	MR. KENNEDY MR. PALMBERG
						Witness	MR. DONNELLY
Gravity _____ ° API @ _____ ° F.						Drilling Contractor	ABERCROMBIE DRILLING COMPANY BC S
Gas/Oil Ratio _____ cu. ft./bbl.						EQUIPMENT & HOLE DATA	
RESISTIVITY _____ CHLORIDE CONTENT _____						Formation Tested	Lower Kansas City
Recovery Water @ _____ ° F. _____ ppm						Elevation	2412' KB Ft.
Recovery Mud @ _____ ° F. _____ ppm						Net Productive Interval	4' Ft.
Recovery Mud Filtrate @ _____ ° F. _____ ppm						All Depths Measured From	Kelly Bushing
Mud Pit Sample @ _____ ° F. _____ ppm						Total Depth	3940' Ft.
Mud Pit Sample Filtrate @ _____ ° F. _____ ppm						Main Hole/Casing Size	7 7/8"
Mud Weight 9.6 vis 48 Sec. sec						Drill Collar Length	- I.D.
						Drill Pipe Length	3895' I.D. 3.826"
						Packer Depth(s)	3918' Ft.
						Depth Tester Valve	3907' Ft.
TYPE		AMOUNT		Depth Back Pres. Valve		Surface Choke	Bottom Choke
Cushion				Ft.		1/4"	3/4"
Recovered	60	Feet of	Thin mud with a scum of oil				
Recovered		Feet of					
Recovered		Feet of					
Recovered		Feet of					
Recovered		Feet of					
Remarks SEE PRODUCTION TEST DATA SHEET.							
TEMPERATURE		Gauge No. 690	Gauge No. 228	Gauge No.		TIME	
Depth:		3920' Ft.	Depth: 3936' Ft.	Depth:		Ft.	
Est. ° F.		Blanked Off NO	Blanked Off YES	Hour Clock		Tool A.M.	
3935'						Opened 0800 P.M.	
Actual 115 ° F.		Pressures		Pressures		Opened 1200 A.M.	
		Pressures		Pressures		Bypass 1200 P.M.	
	Field	Office	Field	Office	Field	Office	Reported Minutes
Initial Hydrostatic	2082	2028	2086	2035			Computed Minutes
First Period Flow	Initial	27	32	28	43		
	Final	37	32	37	39		
	Closed in	1210	1211	1212	1214		
Second Period Flow	Initial	37	41	37	44		
	Final	46	43	56	48		
	Closed in	1210	1214	1203	1216		
Third Period Flow	Initial						
	Final						
	Closed in						
Final Hydrostatic	2045	2014	2039	2013			

Casing perms. _____ Bottom choke _____ Surf. temp. _____ °F Ticket No. 135670
 Gas gravity _____ Oil gravity _____ GOR _____
 Spec. gravity _____ Chlorides _____ ppm Res. _____ @ _____ °F
 INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED _____

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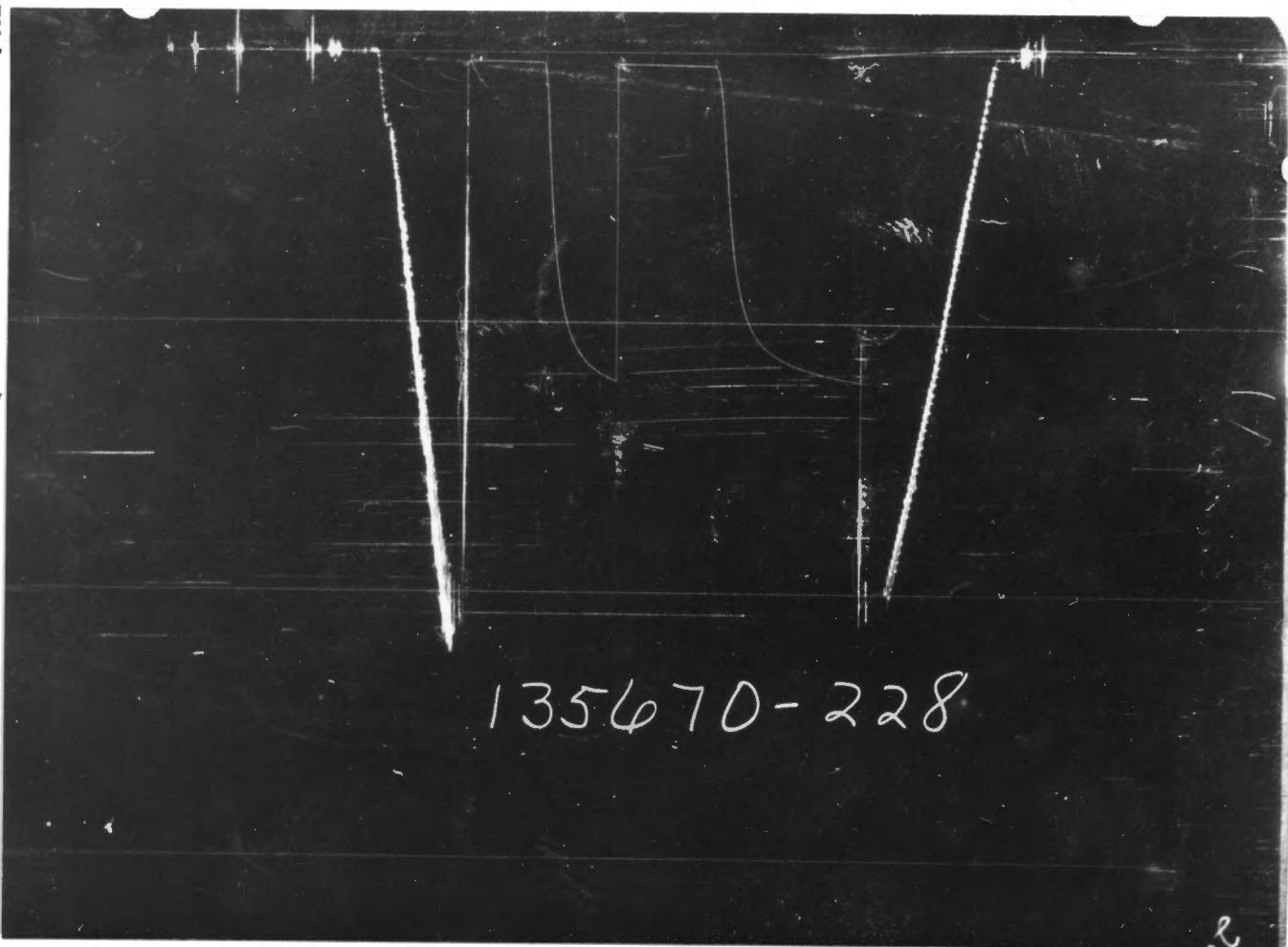
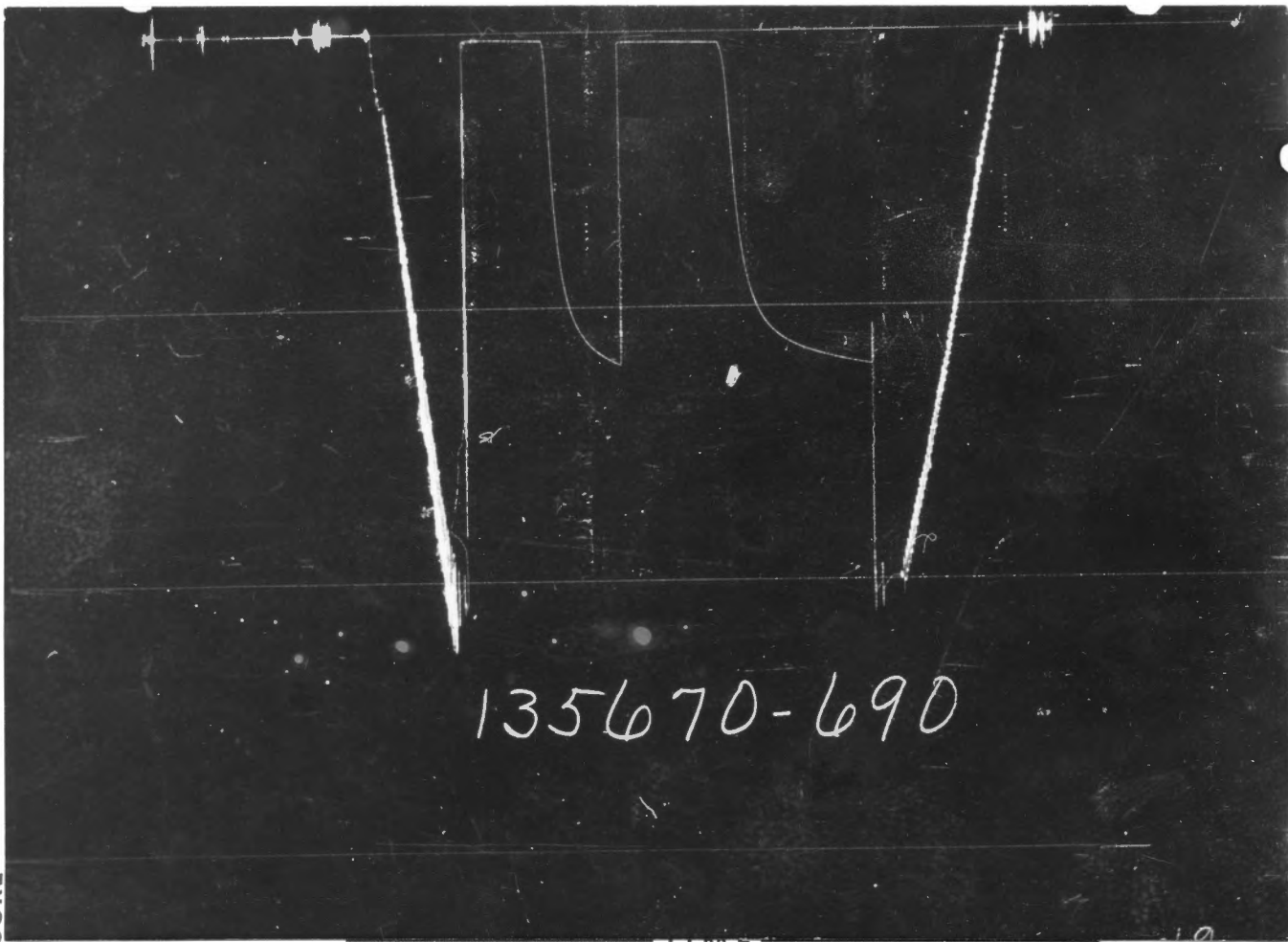
Gauge No. 690		Depth		3920'		Clock No. 14248		12 hour		Ticket No. 135670	
First Flow Period		First Closed In Pressure		Second Flow Period		Second Closed In Pressure		Third Flow Period		Third Closed In Pressure	
Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.
0 .0000	32	.0000	32	.0000	41	.0000	43				
1 .3220	32	.0338	487*	.4060	43	.0342	216*				
2		.0608	800			.0820	769				
3		.0878	960			.1298	966				
4		.1148	1039			.1776	1052				
5		.1419	1090			.2254	1099				
6		.1689	1125			.2733	1128				
7		.1959	1151			.3211	1149				
8		.2229	1171			.3689	1165				
9		.2500	1186			.4167	1177				
10		.2770	1200			.4645	1188				
11		.3040	1211			.5124	1198				
12						.5602	1207				
13						.6080	1214				
14											
15											

Gauge No. 228		Depth		3936'		Clock No. 4773		12 hour	
Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.
0 .0000	43	.0000	39	.0000	44	.0000	48		
1 .3130	39	.0330	529*	.3950	48	.0333	221*		
2		.0594	804			.0800	773		
3		.0858	962			.1266	972		
4		.1122	1045			.1732	1056		
5		.1386	1095			.2199	1103		
6		.1650	1131			.2665	1131		
7		.1914	1156			.3132	1151		
8		.2178	1176			.3598	1167		
9		.2442	1192			.4064	1180		
10		.2706	1204			.4531	1191		
11		.2970	1214			.4997	1201		
12						.5464	1208		
13						.5930	1216		
14									
15									

Reading Interval		4		7		Minutes	
REMARKS:		*Interval = 5 minutes					

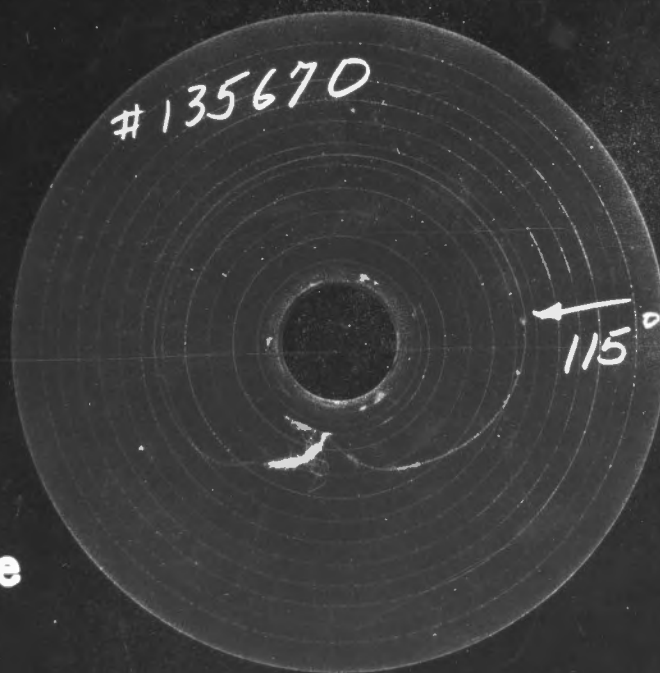
	O. D.	I. D.	LENGTH	DEPTH
Drill Pipe or Tubing	5.75"	2.75"	1'	
Reversing Sub				
Water Cushion Valve				
Drill Pipe	4½"	3.826"	3895'	
Drill Collars				
Handling Sub & Choke Assembly				
Dual CIP Valve	5.0"	.87"	5'	3902'
Dual CIP Sampler				
Hydro-Spring Tester	5.0"	.75"	5'	3907'
Multiple CIP Sampler				
Extension Joint				
AP Running Case				
Hydraulic Jar	5.0"	1.75"	5'	
VR Safety Joint	5.0"	1.0"	3'	
Pressure Equalizing Crossover				
Packer Assembly	6.75"	1.53"	4'	3918'
Distributor				
Packer Assembly				
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case	5.0"	3.06"	4'	3920'
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Distributor				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Woll Anchor				
Drill Collars				
Flush Joint Anchor	5.0"	3.84"	14'	
Blanked-Off B.T. Running Case	5.0"	2.44"	4'	3936'
Total Depth				3940'

↓
PRESSURE
↓



Each Horizontal Line Equal to 1000 p.s.i.

TEMPERATURE RECORDER CHART



10° each circle

Q_1 = Theoretical Open Flow Potential with/Damage Removed Max. MCF/D

OF_4 = Theoretical Open Flow Potential with/Damage Removed Min. MCF/D

P_s = Extrapolated Static Pressure Psig.

P_f = Final Flow Pressure Psig.

P_{or} = Potentiometric Surface (Fresh Water *) Feet

Q = Average Adjusted Production Rate During Test bbls/day

Q_1 = Theoretical Production w/Damage Removed bbls/day

Q_g = Measured Gas Production Rate MCF/D

R = Corrected Recovery bbls

r_w = Radius of Well Bore Feet

t = Flow Time Minutes

t_o = Total Flow Time Minutes

T = Temperature Rankine °R

Z = Compressibility Factor —

μ = Viscosity Gas or Liquid CP

Log = Common Log

* Potentiometric Surface Reference to Rotary Table When Elevation Not Given,
Fresh Water Corrected to 100° F.