



**PART 1 – TEST DESIGN DATA (TO BE PREPARED BY PROJECT ENGINEER/ESTIMATOR)**

<b>Test Description</b>												
Line Number or Station Name DFM 3001-01						Division/District DIABLO			Job Number 74005501			
Purpose of Test TEST NEW PIPE						MAOP to be Established by this Test <u>720</u> PSIG						
Description of Pipe being Tested (include reference drawings, field stationing, and mile points) TEST NEWLY INSTALLED PIPE ON DFM 3001-01, MP 2.16												
<input checked="" type="checkbox"/> New Facility (no spike test required) <input type="checkbox"/> Existing Facility Will spike test be performed? <input type="checkbox"/> Yes <input type="checkbox"/> No (explain on right)						If no spike test for existing facility, explain:						
<b>Static Head Calculation</b>												
Maximum Elevation <u>0</u> FT						For Water <u>0</u> (Elev. Diff.) x 0.433 = <u>0</u> PSIG <i>K2MR</i>						
Minimum Elevation <u>0</u> FT						For Other Test Medium _____						
Elevation Difference <u>0</u> FT						Contact the responsible engineer for guidance on completing this field.						
<b>Pipe to be Tested</b>												
Size		API or ASTM Spec	SMYS (psi)	Long Seam (ERW, DSAW, SMLS etc.)	JF (E)	Footage to be Tested	Actual Footage	Location Class	Most Restrictive Design Factor	% of SMYS		
OD (in.)	WT (in.)									At MAOP	At Min. Test Press.	At Max. Test Press.
4.500	0.188	API-5L	42,000	ERW	1	<del>10'</del> <i>1992'</i>	3	.50	20.51	30.77	36.47	
4.500	0.237	ASTM	35,000	SMLS	1	2 caps <i>2 ea</i>	3	.50	19.52	29.29	34.71	
All fittings included in the test (except those listed above) are the same wall thickness and grade as the pipe <input type="checkbox"/>												
Pipe specs verified in field <input checked="" type="checkbox"/> Signature of person supervising test <i>Keith Lanham EXTD</i>												
Component(s) limiting test pressure/Control Point exceptions												
<b>Test Specifications (include a spike test when testing existing facilities)</b>												
Test Factor <u>1.5</u>	[1A]	Min. Test Pressure at Max. Elev. <u>1080</u> PSIG				[1B]	Max. Test Pressure at Min. Elev. <u>1280</u> PSIG					
Spike Test (complete only for spike test)	[1C]	Spike Factor _____				[1D]	Spike Pressure at Max. Elev. Box [1A] x [1C] = _____ PSIG					
	[1E]	Spike Pressure at Min. Elev. _____ PSIG				[1F]	Max. Post-Spike Pressure at Min. Elev. Box [1E] x 0.95 = _____ PSIG					
Test Medium to be Used <u>WATER</u>		Minimum Test Duration <u>1</u> Hours				<ul style="list-style-type: none"> <li>▪ Under 30% SMYS: 1 hour minimum</li> <li>▪ 30% SMYS and over: 8 hours minimum</li> <li>▪ Pre-installation Test: Refer to A-34, Attachment A</li> <li>▪ Spike Test: 30 minutes minimum (included in test)</li> </ul>						
<b>Signatures</b>												
Prepared by (signature) <i>Keith Lanham</i>				Print Name and Phone Number KEITH LANHAM				Date <u>10/14/16</u>		LAN ID K2L4		
Approved by (signature) <i>Konrad Myca</i>				Print Name KONRAD MYCA				Date <u>11/2/16</u>		LAN ID K2MR		
Test Supervised by (signature) <i>Keith Lanham</i>				Time and Date Test Pressure Reached (from Part 2) <u>1506HR 11/2/16</u>		Time and Date Test Ended (from Part 2) <u>1616HR 11/2/16</u>		Actual Duration of Test (from Part 2) <u>1 hr 10min</u>				





**PART 2 – TEST DATA (TO BE PREPARED BY PERSON SUPERVISING TEST AT TIME OF TEST)**

<b>Test Elevation</b>			
Elevation at Test Point <u>5</u> FT	Max. Elevation in Test Section <u>2</u> FT	Min. Elevation in Test Section <u>1</u> FT	
[2A] Static Head b/t Test Point and Max. Elev. <u>-2</u> PSIG	[2B] Static Head b/t Test Point and Min. Elev. <u>2</u> PSIG		
<b>No Spike Test: Calculations and Test Results (complete for strength test without a spike test)</b>			
Min. Required Test Pressure at Test Point Box [1A] + Box [2A] = <u>1079</u> PSIG	Max. Allowable Test Pressure at Test Point Box [1B] – Box [2B] = <u>1278</u> PSIG	Pressure Range During Test <u>199</u> PSIG	
[2C] Min. Test Pressure Indicated <u>1189</u> PSIG	[2D] Max. Test Pressure Indicated <u>1209</u> PSIG		
Calculated Min. Test Pressure at Max. Elev. Box [2C] – Box [2A] = <u>1190</u> PSIG	Calculated Max. Test Pressure at Min. Elev. Box [2D] + Box [2B] = <u>1211</u> PSIG		
<b>Spike Test: Calculations and Test Results (complete for strength test with a spike test)</b>			
Spike Pressure at Test Point Box [1E] – Box [2B] = _____ PSIG	Min. Required Test Pressure at Test Point Box [1A] + Box [2A] = _____ PSIG	Max. Post-Spike Pressure at Test Point Box [1F] – Box [2B] = _____ PSIG	Pressure Range After Spike Test _____ PSIG
[2E] Spike Pressure Indicated _____ PSIG	[2F] Min. Test Pressure Indicated _____ PSIG	[2G] Max. Post-Spike Test Pressure Indicated _____ PSIG	
Calculated Spike Pressure at Min. Elev. Box [2E] + Box [2B] = _____ PSIG	Calculated Min. Test Pressure at Max. Elev. Box [2F] – Box [2A] = _____ PSIG	Calculated Max. Post-Spike Pressure at Min. Elev. Box [2G] + Box [2B] = _____ PSIG	
<b>Test Acceptance</b>			
Were Leaks Observed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes, explain:		
Acceptable Strength Test? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If no, explain:		
Report strength test failures to Regulatory Compliance			
Test Medium Used <u>Water</u>	Time and Date Test Pressure Reached <u>1506HR 11/2/16</u>	Time and Date Test Ended <u>1616HR 11/2/16</u>	Actual Duration of Test <u>1hr 10min</u>
<b>Test Instruments</b>			
Make, Range, and Serial No. of Pressure Recording Device <u>Technical 0-2000 psig SN 04346</u>		Date Last Calibrated <u>8/25/16</u>	
Make, Range and Serial No. of Dead Weight Tester A dead weight tester and/or an electronic pressure recorder is required for tests of any pipe segment equal to or greater than 90% of SMYS. <u>Ametek 25-3025 psig SN HL6406</u>		Date Last Calibrated <u>3/2/16</u>	
<b>Signatures</b>			
Test Supervised by (signature) <u>[Signature]</u>	Print Name <u>ERIC TSAI</u>	Date <u>11/2/16</u>	LAN ID <u>EXTD</u>
Testing Contractor (if third party)			
Approved by (signature) <u>[Signature]</u>	Print Name <u>AZUA TARIN</u>	Date <u>11-14-2016</u>	LAN ID <u>AXTB</u>

**Attachments**

- Test chart
- Schematic piping sketch
- Test log with pressure noted every 15 minutes

**Distribution**

- Gas Job Closeout Desk, 6121 Bollinger Canyon Road, Building Z1, San Ramon, CA 94583







STRENGTH TEST INFORMATION REV. 1

1. JOB # 74005501 TEST 1 V-499
2. LOCATION New 4" Pipe DFM 3001-01 MP 2.16 LAFAYETTE
3. DATE 11-2-2016
4. TIME 15:06 hrs - 16:16 hrs MIN. PRESSURE 1,189 PSI
5. RECORDING GA. MFG. TECH CAL DURATION 1 hr & 10 mins
6. RANGE 0-2,000 PSI SER. # 04346
7. DEAD WGT MFG. AMETEK LAST CALIBRATED 8-25-2016
8. RANGE 25-3,025 PSI SER. # HL-6406
9. TEST FLUID WATER LAST CALIBRATED 3-2-2016
10. SIZE/O.D. 4.500" W.T. 0.188" PIPE SPEC API 5L 35, 42,000 ERW LENGTH 19.92'
11. SIZE/O.D. 4.500" W.T. 0.237" PIPE SPEC ASTM A-234 35,000 CAP LENGTH 2 EA
12. SUPERVISED [Signature] DATE 4/2/16
13. APPROVED [Signature] DATE 11-14-2016

ARC 1117

- |               |      |           |        |
|---------------|------|-----------|--------|
| 14. SIZE/O.D. | W.T. | PIPE SPEC | LENGTH |
| 15. SIZE/O.D. | W.T. | PIPE SPEC | LENGTH |
| 16. SIZE/O.D. | W.T. | PIPE SPEC | LENGTH |
| 17. SIZE/O.D. | W.T. | PIPE SPEC | LENGTH |
| 18. SIZE/O.D. | W.T. | PIPE SPEC | LENGTH |
| 19. SIZE/O.D. | W.T. | PIPE SPEC | LENGTH |
| 20. SIZE/O.D. | W.T. | PIPE SPEC | LENGTH |
| 21. SIZE/O.D. | W.T. | PIPE SPEC | LENGTH |
| 22. SIZE/O.D. | W.T. | PIPE SPEC | LENGTH |
| 23. SIZE/O.D. | W.T. | PIPE SPEC | LENGTH |
| 24. SIZE/O.D. | W.T. | PIPE SPEC | LENGTH |
| 25. SIZE/O.D. | W.T. | PIPE SPEC | LENGTH |
| 26. SIZE/O.D. | W.T. | PIPE SPEC | LENGTH |
| 27. SIZE/O.D. | W.T. | PIPE SPEC | LENGTH |
| 28. SIZE/O.D. | W.T. | PIPE SPEC | LENGTH |
| 29. SIZE/O.D. | W.T. | PIPE SPEC | LENGTH |
| 30. SIZE/O.D. | W.T. | PIPE SPEC | LENGTH |



PM # 74005501  
JOB DESC. 2" Bypass Hoses  
V-499 LAFAYETTE

START 12:07 hr END 13:10 hr

PR #/w. TECH CAL 04345  
DATE: 11-2-2016

MC MP-2000-PGE  
PACIFIC GAS and ELECTRIC CO.

START TEST  
240 PSI  
12:07 hrs 11-2-2016  
ARB, Inc. Edmo

END TEST  
232 PSI  
13:10 hrs 11-2-2016  
ARB, Inc. Edmo

There is no leaks observed during this test.  
EPI/LSW GATD  
11/2/16

REGISTERED TRADE MARK  
KAYE M. GARDNER

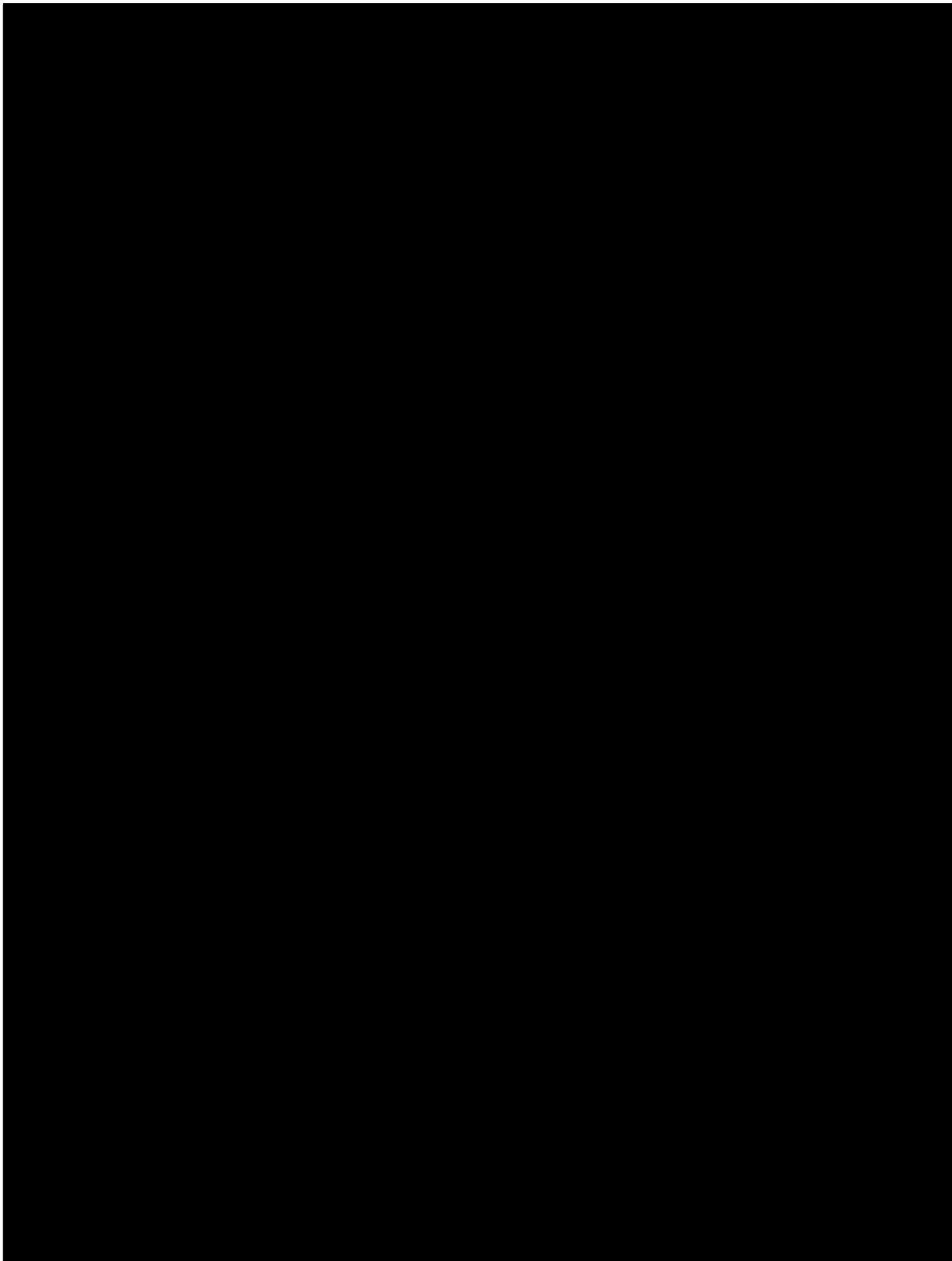


STRENGTH TEST INFORMATION REV. 1

1. JOB # \_\_\_\_\_  
2. LOCATION \_\_\_\_\_  
3. DATE \_\_\_\_\_  
4. TIME \_\_\_\_\_ MIN. PRESSURE \_\_\_\_\_  
5. RECORDING GA. MFG. \_\_\_\_\_ DURATION \_\_\_\_\_  
6. RANGE \_\_\_\_\_ SER. # \_\_\_\_\_  
7. DEAD WGT MFG. \_\_\_\_\_ LAST CALIBRATED \_\_\_\_\_  
8. RANGE \_\_\_\_\_ SER. # \_\_\_\_\_  
9. TEST FLUID \_\_\_\_\_ LAST CALIBRATED \_\_\_\_\_  
10. SIZE/O.D. \_\_\_\_\_ W.T. \_\_\_\_\_ PIPE SPEC \_\_\_\_\_ LENGTH \_\_\_\_\_  
11. SIZE/O.D. \_\_\_\_\_ W.T. \_\_\_\_\_ PIPE SPEC \_\_\_\_\_ LENGTH \_\_\_\_\_  
12. SUPERVISED \_\_\_\_\_ DATE \_\_\_\_\_  
13. APPROVED \_\_\_\_\_ DATE \_\_\_\_\_

ARC 1117

14. SIZE/O.D. \_\_\_\_\_ W.T. \_\_\_\_\_ PIPE SPEC \_\_\_\_\_ LENGTH \_\_\_\_\_  
15. SIZE/O.D. \_\_\_\_\_ W.T. \_\_\_\_\_ PIPE SPEC \_\_\_\_\_ LENGTH \_\_\_\_\_  
16. SIZE/O.D. \_\_\_\_\_ W.T. \_\_\_\_\_ PIPE SPEC \_\_\_\_\_ LENGTH \_\_\_\_\_  
17. SIZE/O.D. \_\_\_\_\_ W.T. \_\_\_\_\_ PIPE SPEC \_\_\_\_\_ LENGTH \_\_\_\_\_  
18. SIZE/O.D. \_\_\_\_\_ W.T. \_\_\_\_\_ PIPE SPEC \_\_\_\_\_ LENGTH \_\_\_\_\_  
19. SIZE/O.D. \_\_\_\_\_ W.T. \_\_\_\_\_ PIPE SPEC \_\_\_\_\_ LENGTH \_\_\_\_\_  
20. SIZE/O.D. \_\_\_\_\_ W.T. \_\_\_\_\_ PIPE SPEC \_\_\_\_\_ LENGTH \_\_\_\_\_  
21. SIZE/O.D. \_\_\_\_\_ W.T. \_\_\_\_\_ PIPE SPEC \_\_\_\_\_ LENGTH \_\_\_\_\_  
22. SIZE/O.D. \_\_\_\_\_ W.T. \_\_\_\_\_ PIPE SPEC \_\_\_\_\_ LENGTH \_\_\_\_\_  
23. SIZE/O.D. \_\_\_\_\_ W.T. \_\_\_\_\_ PIPE SPEC \_\_\_\_\_ LENGTH \_\_\_\_\_  
24. SIZE/O.D. \_\_\_\_\_ W.T. \_\_\_\_\_ PIPE SPEC \_\_\_\_\_ LENGTH \_\_\_\_\_  
25. SIZE/O.D. \_\_\_\_\_ W.T. \_\_\_\_\_ PIPE SPEC \_\_\_\_\_ LENGTH \_\_\_\_\_  
26. SIZE/O.D. \_\_\_\_\_ W.T. \_\_\_\_\_ PIPE SPEC \_\_\_\_\_ LENGTH \_\_\_\_\_  
27. SIZE/O.D. \_\_\_\_\_ W.T. \_\_\_\_\_ PIPE SPEC \_\_\_\_\_ LENGTH \_\_\_\_\_  
28. SIZE/O.D. \_\_\_\_\_ W.T. \_\_\_\_\_ PIPE SPEC \_\_\_\_\_ LENGTH \_\_\_\_\_  
29. SIZE/O.D. \_\_\_\_\_ W.T. \_\_\_\_\_ PIPE SPEC \_\_\_\_\_ LENGTH \_\_\_\_\_  
30. SIZE/O.D. \_\_\_\_\_ W.T. \_\_\_\_\_ PIPE SPEC \_\_\_\_\_ LENGTH \_\_\_\_\_





# HYDROSTATIC TEST LOG SHEET

Date  
**11/2/2016**

Owner Company:	PG&E	Job Number:	74005501
Construction Co:	ARB, Inc.	Job Number:	0628-128C
Testing Co:	ARB, Inc.	Job Number:	0628-128C

<b>Test Section</b>	Name:	V-499 Test 1 New 4" Pipe DFM3001-01 MP 2.16 Lafayette					
		Station (0+00)					Elevation (Feet)
	Test Location:					5	
	Begin:						
	End:						
	High Elevation:					2	
Low Elevation:					1		

<b>Pipe Data</b>	Section	Length (ft.)	O.D. (in.)	W.T. (in.)	Restrained (ft.)	Unrestrained (ft.)	Grade	Seam/Joint Type
	1.	19.92	4.500	0.188		19.92	42,000	ERW/Arc Weld
	2.	2 EA	4.500	0.237		2 Ea	35,000	CAP/Arc Weld
	3.							
	4.							
	5.							
	6.							
	7.							
	8.							
	9.							
	10.							
	11.							
	12.							
	13.							
	14.							
	15.							
	16.							
	17.							
	18.							
	19.							
	20.							
	21.							
	22.							
	23.							
	24.							
	25.							
	26.							
	27.							
	28.							

<b>Test Period</b>		Date	Time	<b>Test Medium</b>	Water:	<input checked="" type="checkbox"/>
	Begin:	11/2/2016	15:06		Nitrogen:	<input type="checkbox"/>
	End:	11/2/2016	16:16		Other:	<input type="checkbox"/>

<b>Test Instrumentation</b>	Description	Calibration Checked	Serial Number	Date Calibrated/Certified	Installation Correct?
	Dead Weight Pressure Tester:	<input checked="" type="checkbox"/> Yes	HL-6406	3-2-2016	<input checked="" type="checkbox"/> Yes
	Pressure Recorder:	<input checked="" type="checkbox"/> Yes	04346	8-25-2016	<input checked="" type="checkbox"/> Yes
	Ambient Temperature Recorder:	<input checked="" type="checkbox"/> Yes	04350	8-25-2016	<input checked="" type="checkbox"/> Yes
	Restrained Pipe Temperature Recorder:	<input type="checkbox"/> Yes	-----N/A	-----	<input type="checkbox"/> Yes
Unrestrained Pipe Temperature Recorder:	<input checked="" type="checkbox"/> Yes	04351	8-25-2016	<input checked="" type="checkbox"/> Yes	



**A:B**



## DEAD WEIGHT TEST LOG

Job Number: 0628-128C

Log No.	Time	Test Pressure (psig)	Temperature (°F)		Volume		Comments:	Stroke Count			
			Ambient	Pipe		<input type="checkbox"/>			Ounces	<input type="checkbox"/>	Gallons
				Restrained	Unrestrained	Bleed			Inject		
1.	14:41	400					Shows 400 psi				
2.	14:43	1,000					Shows 1,000 psi				
3.	14:45	1,600					Shows 1,610 psi				
4.	14:58	500					50% Leak Check				
5.	15:03	498					End Leak Check				
6.	15:06	1,208	68		70		Start Test				
7.	15:10	1,209	68		70		Sunny				
8.	15:15	1,209	68		70						
9.	15:20	1,209	68		70						
10.	15:25	1,208	68		69						
11.	15:30	1,207	68		69						
12.	15:35	1,206	68		69						
13.	15:40	1,204	68		68						
14.	15:45	1,202	68		68						
15.	15:50	1,196	68		68						
16.	15:55	1,192	68		68						
17.	15:57	1,189	68		68		Inject				
18.	15:59	1,208	68		68		End Inject				
19.	16:00	1,206	68		68						
20.	16:05	1,200	68		69						
21.	16:05	1,196	68		69						
22.	16:10	1,192	68		69						
23.	16:15	1,190	68		69						
24.	16:16	1,189	68		69		End Test				
25.											
26.											
27.											
28.											
29.											
30.											
31.											
32.											
33.											
34.											
35.											
36.											
37.											
38.											
39.											
40.											

Was a leak observed during Test Period?  Yes  No

If "Yes", Explain: \_\_\_\_\_ High Test Pressure: **1,209**  
 Low Test Pressure: **1,189**

**Certification:** \_\_\_\_\_ **Date:** 11/2/2016  
 Test Supervisor:  Company Representative:   
 cl\_rev\_3-21-14 Signature \_\_\_\_\_ Signature \_\_\_\_\_

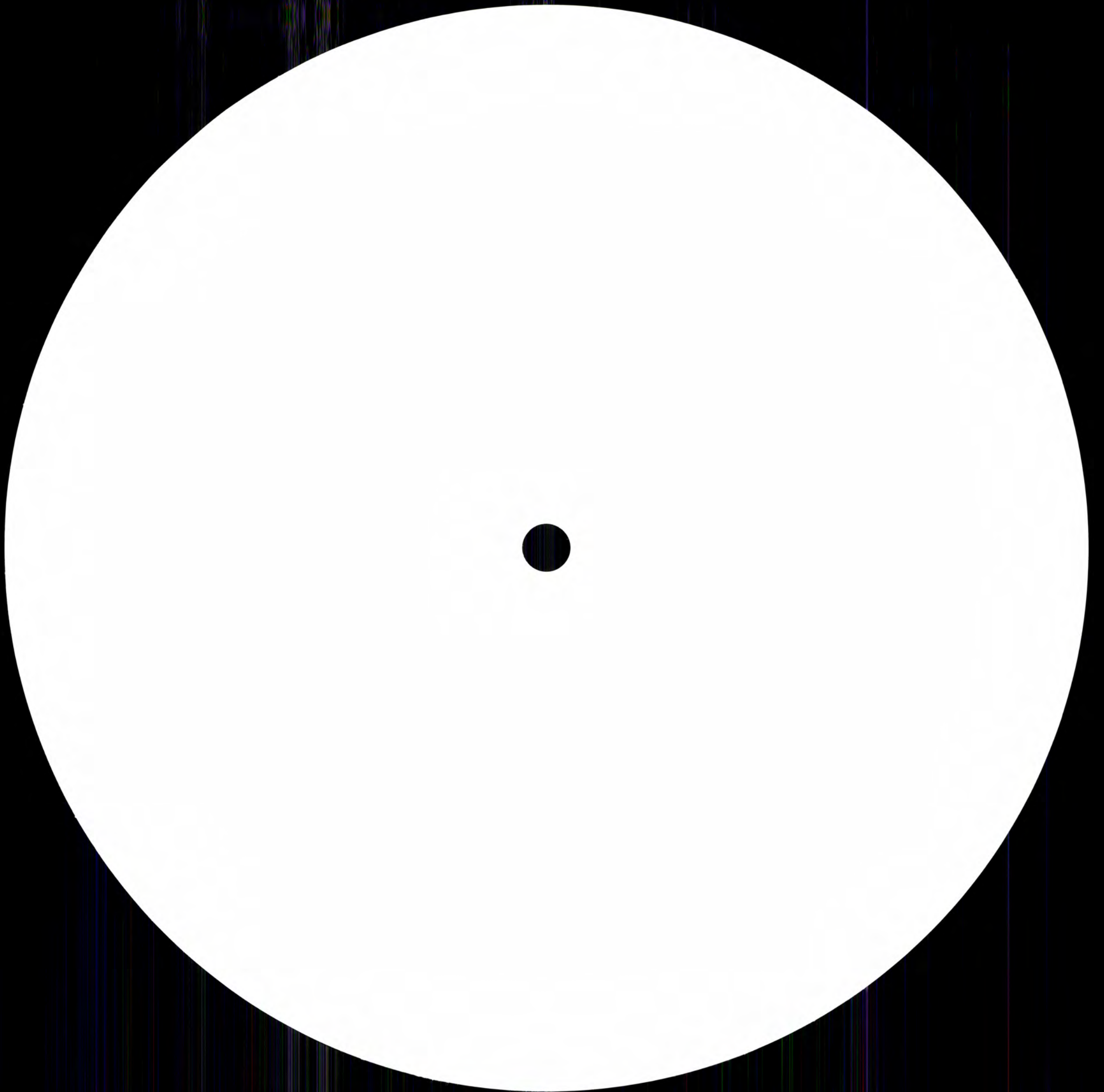


PM # 74005501 TEST  
V-499 NEW 4" PIPE  
JOB DESC. DFM 3001-01 MP 2.16 LAFAYETTE  
START 15:06 hr END 16:16 hr  
TR %/hr. TECH CAL 04351  
DATE: 11.2.2016  
MC MP-150-PGE  
"UNRESTRAINED"  
PACIFIC GAS and ELECTRIC CO.

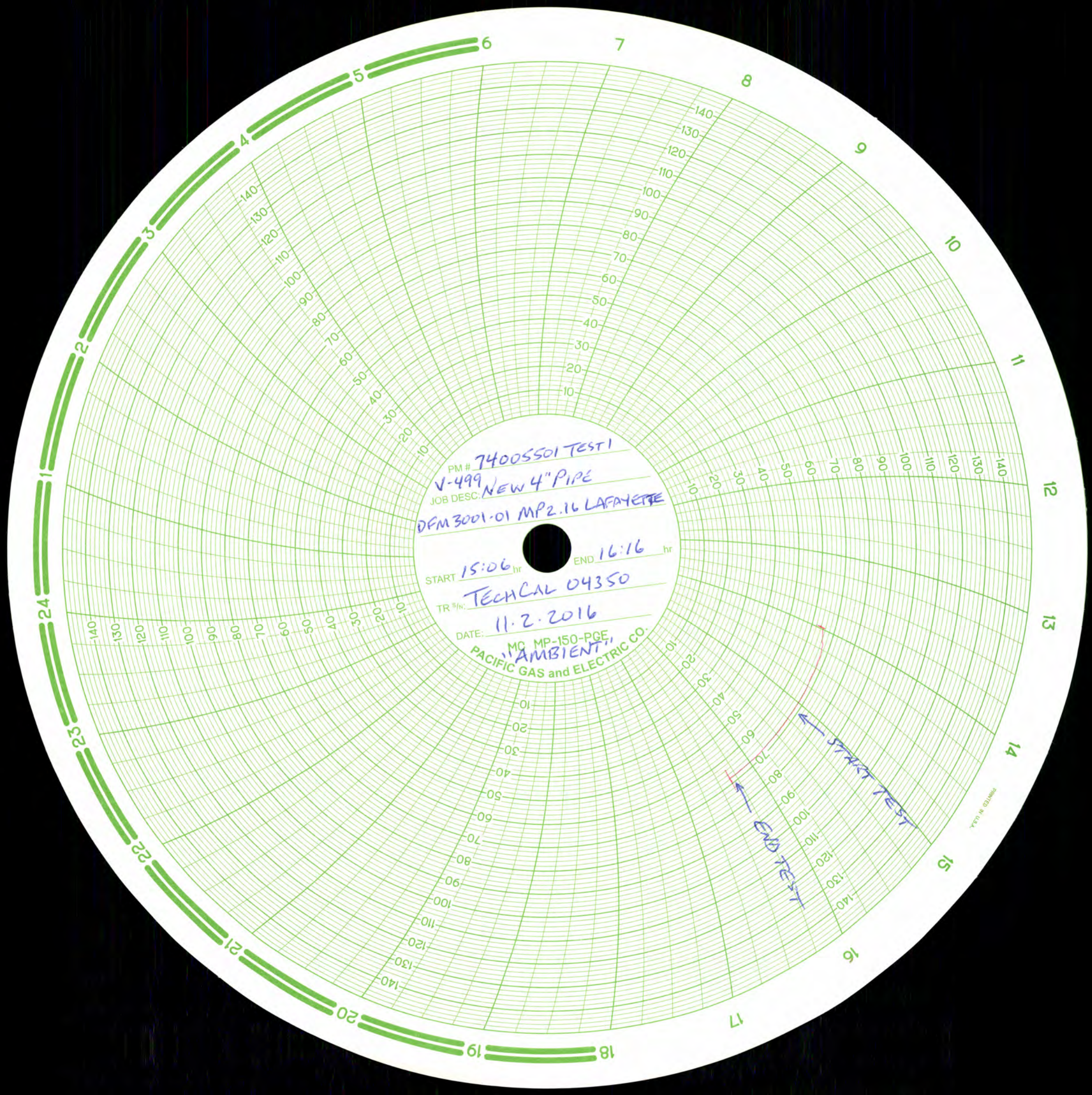
START TEST  
RECORDED  
END TEST

MADE IN U.S.A.









PM # 74005501 TEST 1  
V-499 NEW 4" PIPE  
JOB DESC: DFM 3001-01 MP 2.16 LAFAYETTE  
START 15:06 hr END 16:16 hr  
TR #/IN: TECHCAL 04350  
DATE: 11.2.2016  
MC MP-150-PGE  
"AMBIENT"  
PACIFIC GAS and ELECTRIC CO.

START TEST  
END TEST

PRINTED IN U.S.A.









2900 Main St Alameda CA 94501 Phone (510)522-8326 Fax (510)522-3136

## Certificate of Calibration

ARB, INC. PITTSBURG  
1875 LOVRIDGE ROAD  
PITTSBURG  
CALIFORNIA 94565

Customer ID #	3773	Certificate Number:	2405289
File #	1329	Rated Accuracy	1%
Instrument Type	RECORDER, PRESSURE	Pass/Fail as Found	PASS
Range	0-2000	Pass/Fail as Left	PASS
Units	PSIG	1st (Mfg) S/N	04346
Resolution	20	2nd S/N	N/A
Mfg.	TECHCAL		
Model	1B200		
Cal By	J.P.		
Current Cal Cycle (Months)	6	Cal Date	8/25/2016
Previous Cal Cycle	6	Cal Due	2/25/2017
Standards Used	AMETEK DM-T-150 S/N 8681 DUE 3/27/2018 NIST 49467.001	Notes	

TECHNICAL SERVICES GROUP CERTIFIES THAT THIS INSTRUMENT HAS BEEN CALIBRATED TRACEABLE TO THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY AND CONFORMS TO ISO 10012 AND ANSI / NCSL Z-540. UNLESS OTHERWISE SPECIFIED MEASUREMENT UNCERTAINTIES ARE LESS THAN 1/4 OF TOLERANCE OR 1 MINOR DIVISION.





# CALIBRATION DATA SHEET PRESSURE / TEMPERATURE

2900 MAIN ST ALAMEDA, CA 94501 PHONE (510) 522-8326 FAX (510) 522-3136

CUSTOMER: ARB  
 MFG.: TECHCAL  
 RANGE: MIN 0 MAX 2,000  
 PRESS.: X TEMP. VACUUM  
 X MFG. AMATEK  
 X EUTECHNICS

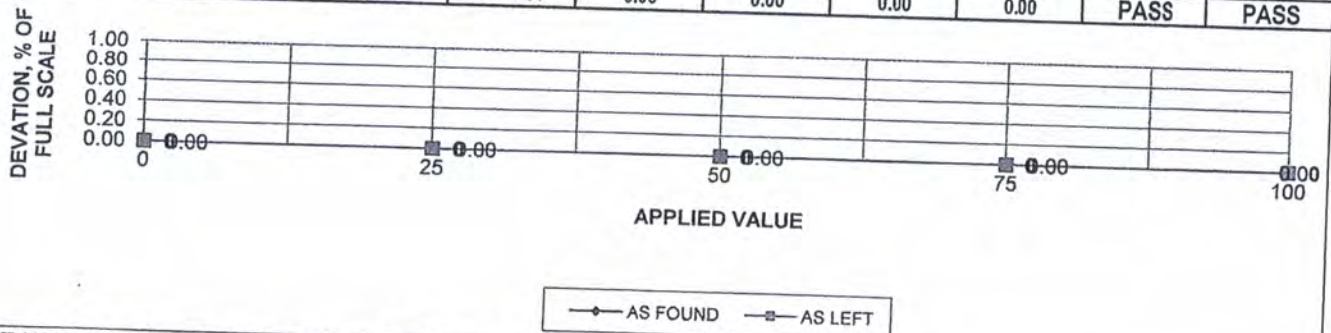
TSG JOB & ITEM #: 3773  
 MODEL: 1B200  
 UNITS: PSIG  
 RESOLUTION: 20  
 CASE SIZE: 12"  
 MODEL: DM-T-150  
 139200-1.2

CERTIFICATE NO.: 2405289  
 CAL BY: J.P.  
 RATED ACCURACY, % FULL SCALE: 1.00 %  
 INSTRUMENT DISCIPTION: 1/4"  
 STANDARDS USED: S/N 8681, 10049

CAL DATE: 8/25/2016  
 MFG S/N: 04346  
 2NDS/N: N/A  
 CONN. LOCATION: BACK  
 RECAL: 3/27/2018, 9/10/2016  
 CAL DUE: 2/25/2017  
 N.I.S.T #: 49467.001, S00012

### CALIBRATION DETAIL

% SPAN	APPLIED VALUE	OBSERVED INDICATION		ERROR		% DEVIATION		PASS / FAIL	
		AS FOUND	AS LEFT	AS FOUND	AS LEFT	AS FOUND	AS LEFT	AS FOUND	AS LEFT
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	PASS	PASS
25	500.00	500.00	500.00	0.00	0.00	0.00	0.00	PASS	PASS
50	1,000.00	1000.00	1000.00	0.00	0.00	0.00	0.00	PASS	PASS
75	1,500.00	1500.00	1500.00	0.00	0.00	0.00	0.00	PASS	PASS
100	2,000.00	2000.00	2000.00	0.00	0.00	0.00	0.00	PASS	PASS



IMPACT / NOTES : CALIBRATED WITH CHART # MCI MI 0-2000-12

TECHNICAL SERVICES GROUP CERTIFIES THAT THIS INSTRUMENT HAS BEEN CALIBRATED TRACEABLE TO THE NATIONAL INSTITUTE OF STANDARDS & TECHNOLOGY AND CONFORMS TO ISO 10012 AND ANSI / NCSL Z-540. UNLESS OTHERWISE SPECIFIED MEASUREMENT UNCERTAINTIES ARE LESS THAN 1/4 OF TOLERANCE OR 1 MINOR DIVISION. LABRATORY CONDITIONS AT TECHNICAL SERVICES GROUP 68-72 DEG F. < 40% R.H.

*J.P.*  
 TSG CALIBRATION / Q.A. SUPERVISOR





2900 Main St Alameda CA 94501 Phone (510)522-8326 Fax (510)522-3136

## Certificate of Calibration

ARB, INC. PITTSBURG  
1875 LOVRIDGE ROAD  
PITTSBURG  
CALIFORNIA 94565

Customer ID #	3773	Certificate Number:	2405296
File #	1329	Rated Accuracy	1%
Instrument Type	RECORDER, TEMPERATURE	Pass/Fail as Found	PASS
Range	0-150	Pass/Fail as Left	PASS
Units	DEG F	1st (Mfg) S/N	04351
Resolution	3	2nd S/N	N/A
Mfg.	TECHCAL		
Model	1BT00		
Cal By	J.P.		
Curent Cal Cycle (Months)	6	Cal Date	8/25/2016
Previous Cal Cycle	6	Cal Due	2/25/2017
Standards Used	EUTECHNICS 139200-1.2 S/N 100049 DUE 9/10/2016 NIST S00012	Notes	

**TECHNICAL SERVICES GROUP CERTIFIES THAT THIS INSTRUMENT HAS BEEN CALIBRATED TRACEABLE TO THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY AND CONFORMS TO ISO 10012 AND ANSI / NCSL Z-540. UNLESS OTHERWISE SPECIFIED MEASUREMENT UNCERTAINTIES ARE LESS THAN 1/4 OF TOLERANCE OR 1 MINOR DIVISION.**





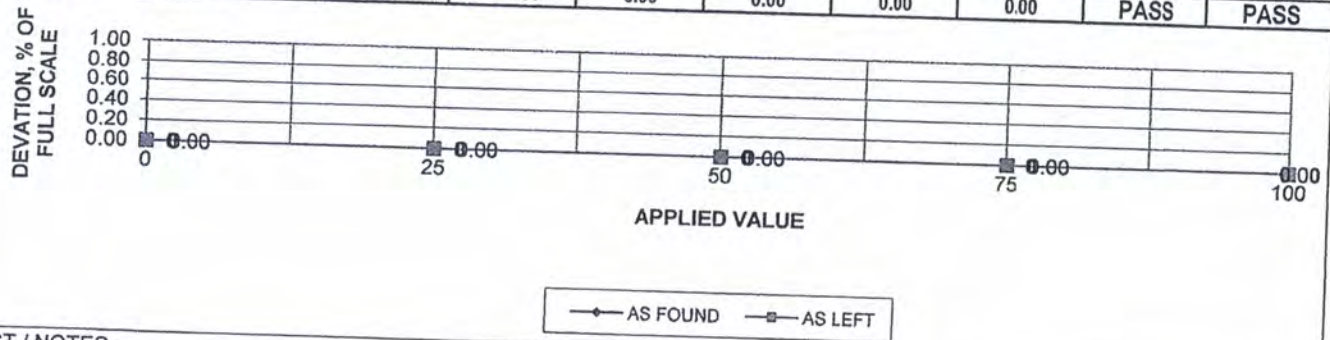
# CALIBRATION DATA SHEET PRESSURE / TEMPERATURE

2900 MAIN ST ALAMEDA, CA 94501 PHONE (510) 522-8326 FAX (510) 522-3136

CUSTOMER: ARB  
 MFG: TECHCAL  
 RANGE: MIN 0 MAX 150  
 PRESS: X TEMP: X VACUUM  
 TSG JOB & ITEM #: 3773  
 MODEL: 1BT00  
 UNITS: DEG RESOLUTION: 3  
 CASE SIZE: 12"  
 MFG: AMATEK EUTECNICS  
 MODEL: DM-T-150 139200-1.2  
 CERTIFICATE NO.: 2405296  
 CAL BY: J.P.  
 RATED ACCURACY, % FULL SCALE: 1.00 %  
 STANDARDS USED: S/N 8681 10049  
 CAL DATE: 8/25/2016  
 MFG S/N: 04351  
 2ND S/N: N/A  
 CONN. LOCATION: BACK  
 RECAL: 3/27/2018 9/10/2016  
 CAL DUE: 2/25/2017  
 THREAD TYPE: NPT  
 N.I.S.T #: 49467.001 S00012

### CALIBRATION DETAIL

% SPAN	APPLIED VALUE	OBSERVED INDICATION		ERROR		% DEVIATION		PASS / FAIL	
		AS FOUND	AS LEFT	AS FOUND	AS LEFT	AS FOUND	AS LEFT	AS FOUND	AS LEFT
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	PASS	PASS
25	37.50	37.50	37.50	0.00	0.00	0.00	0.00	PASS	PASS
50	75.00	75.00	75.00	0.00	0.00	0.00	0.00	PASS	PASS
75	112.50	112.50	112.50	0.00	0.00	0.00	0.00	PASS	PASS
100	150.00	150.00	150.00	0.00	0.00	0.00	0.00	PASS	PASS



IMPACT / NOTES :

TECHNICAL SERVICES GROUP CERTIFIES THAT THIS INSTRUMENT HAS BEEN CALIBRATED TRACEABLE TO THE NATIONAL INSTITUTE OF STANDARDS & TECHNOLOGY AND CONFORMS TO ISO 10012 AND ANSI / NCSL Z-540. UNLESS OTHERWISE SPECIFIED MEASUREMENT UNCERTAINTIES ARE LESS THAN 1/4 OF TOLERANCE OR 1 MINOR DIVISION. LABRATORY CONDITIONS AT TECHNICAL SERVICES GROUP 68-72 DEG F. < 40% R.H.

TSG CALIBRATION / Q.A. SUPERVISOR





2900 Main St Alameda CA 94501 Phone (510)522-8326 Fax (510)522-3136

## Certificate of Calibration

ARB, INC. PITTSBURG  
1875 LOVRIDGE ROAD  
PITTSBURG  
CALIFORNIA 94565

Customer ID #	3773	Certificate Number:	2405297
File #	1329	Rated Accuracy	1%
Instrument Type	RECORDER, TEMPERATURE	Pass/Fail as Found	PASS
Range	0-150	Pass/Fail as Left	PASS
Units	DEG F	1st (Mfg) S/N	04350
Resolution	3	2nd S/N	N/A
Mfg.	J.P.		
Model	1BT00		
Cal By	J.P.		
Curent Cal Cycle (Months)	6	Cal Date	8/25/2016
Previous Cal Cycle	6	Cal Due	2/25/2017
Standards Used	EUTECHNICS 139200-1.2 S/N 100049 DUE 9/10/2016 NIST S00012		

**TECHNICAL SERVICES GROUP CERTIFIES THAT THIS INSTRUMENT HAS BEEN CALIBRATED TRACEABLE TO THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY AND CONFORMS TO ISO 10012 AND ANSI / NCSL Z-540. UNLESS OTHERWISE SPECIFIED MEASUREMENT UNCERTAINTIES ARE LESS THAN 1/4 OF TOLERANCE OR 1 MINOR DIVISION.**





# CALIBRATION DATA SHEET PRESSURE / TEMPERATURE

2900 MAIN ST ALAMEDA, CA 94501 PHONE (510) 522-8326 FAX (510) 522-3136

CUSTOMER

ARB

TSG JOB & ITEM #

3773

CERTIFICATE NO.

2405297

CAL DATE

8/25/2016

CAL DUE

2/25/2017

MFG.

TECHCAL

MODEL

1BT00

CAL BY

J.P.

MFG S/N

04350

RANGE

MIN

0

MAX

150

UNITS

DEG

RESOLUTION

3

RATED ACCURACY, % FULL SCALE

1.00 %

2ND S/N

N/A

INSTRUMENT DISCIPTION

PRESS.

TEMP.

VACUUM

CASE SIZE

12"

CONN. SIZE

PROBE

CONN. LOCATION

BACK

THREAD TYPE

NPT

X

MFG.

MODEL

S/N

RECAL

N.I.S.T #

X

AMATEK

DM-T-150

8681

3/27/2018

49467.001

X

EUTECHNICS

139200-1.2

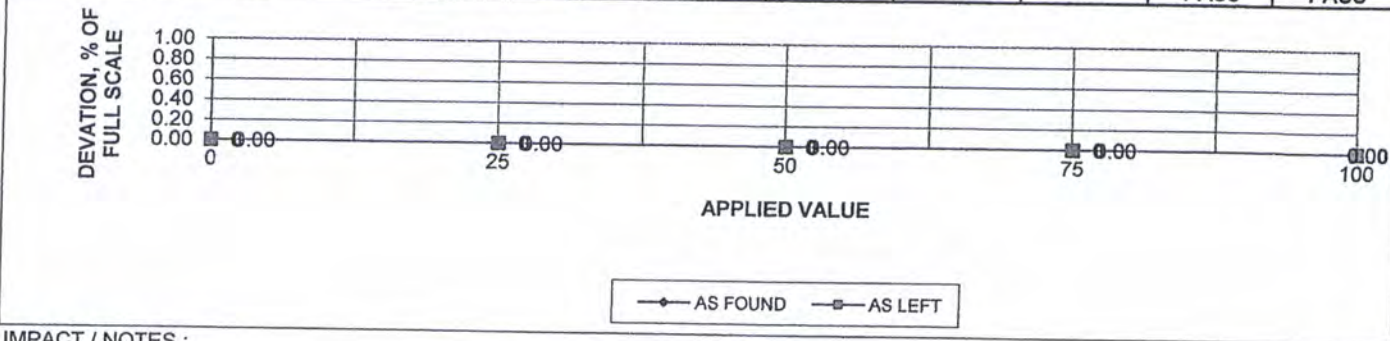
10049

9/10/2016

S00012

## CALIBRATION DETAIL

% SPAN	APPLIED VALUE	OBSERVED INDICATION		ERROR		% DEVIATION		PASS / FAIL	
		AS FOUND	AS LEFT	AS FOUND	AS LEFT	AS FOUND	AS LEFT	AS FOUND	AS LEFT
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	PASS	PASS
25	37.50	37.50	37.50	0.00	0.00	0.00	0.00	PASS	PASS
50	75.00	75.00	75.00	0.00	0.00	0.00	0.00	PASS	PASS
75	112.50	112.50	112.50	0.00	0.00	0.00	0.00	PASS	PASS
100	150.00	150.00	150.00	0.00	0.00	0.00	0.00	PASS	PASS



IMPACT / NOTES :

TECHNICAL SERVICES GROUP CERTIFIES THAT THIS INSTRUMENT HAS BEEN CALIBRATED TRACEABLE TO THE NATIONAL INSTITUTE OF STANDARDS & TECHNOLOGY AND CONFORMS TO ISO 10012 AND ANSI / NCSL Z-540. UNLESS OTHERWISE SPECIFIED MEASUREMENT UNCERTAINTIES ARE LESS THAN 1/4 OF TOLERANCE OR 1 MINOR DIVISION. LABRATORY CONDITIONS AT TECHNICAL SERVICES GROUP 68-72 DEG F. < 40% R.H.

*J.P.*

TSG CALIBRATION / Q.A. SUPERVISOR





2900 Main St Alameda CA 94501 Phone (510)522-8326 Fax (510)522-3136

## Certificate of Calibration

ARB, INC. PITTSBURG  
1875 LOVRIDGE ROAD  
PITTSBURG  
CALIFORNIA 94565

Customer ID # 3773  
File # 1329  
Instrument Type DEAD WEIGHT  
TESTER  
Range 25-3025  
Units PSIG  
Resolution N/A  
Mfg. AMETEK  
Model HL-36  
Cal By MIKE MCCONNELL  
90765  
Current Cal Cycle (Months) 12  
Previous Cal Cycle 12  
Standards Used AMETEK DM-T-150 S/N 8681  
DUE 3/29/2016 NIST 45204.001

Certificate Number: **2404544**

Rated Accuracy .25%

Pass/Fail as Found **PASS**

Pass/Fail as Left **PASS**

1st (Mfg) S/N **HL-6406**

2nd S/N **N/A**

Cal Date **3/2/2016**

Cal Due **3/2/2017**

Notes

**TECHNICAL SERVICES GROUP CERTIFIES THAT THIS INSTRUMENT  
HAS BEEN CALIBRATED TRACEABLE TO THE NATIONAL INSTITUTE  
OF STANDARDS AND TECHNOLOGY AND CONFORMS TO ISO 10012  
AND ANSI/NCSL Z-540. UNLESS OTHERWISE SPECIFIED  
MEASUREMENT UNCERTAINTIES ARE LESS THAN 1/4 OF TOLERANCE  
OR 1 MINOR DIVISION.**





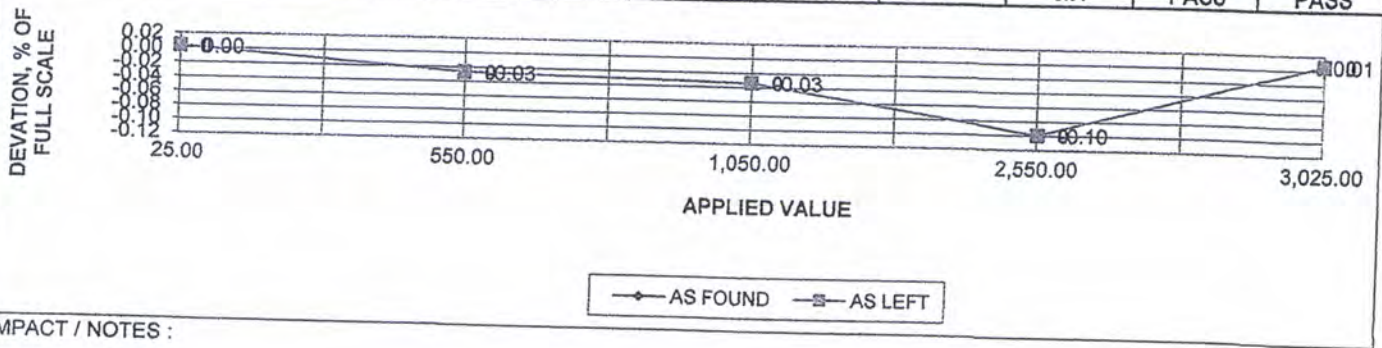
# CALIBRATION DATA SHEET PRESSURE / TEMPERATURE

2900 MAIN ST ALAMEDA, CA 94501 PHONE (510) 522-8326 FAX (510) 522-3136

CUSTOMER: ARB  
 MFG: AMETEK  
 RANGE: MIN 25 MAX 3,025  
 PRESS. X TEMP. VACUUM  
 TSG JOB & ITEM #: 3773  
 MODEL: HL-36  
 UNITS: PSIG  
 RESOLUTION: N/A  
 RATED ACCURACY, % FULL SCALE: 0.25 %  
 INSTRUMENT DESCRIPTION: CASE SIZE DEAD WEIGHT  
 CONN. SIZE: 1/4"  
 STANDARDS USED: MODEL DM-T-150, S/N 8681, 139200-1.2, 10049  
 CERTIFICATE NO.: 2404544  
 CAL BY: Mike McConnell  
 CAL DATE: 3/2/2016  
 CAL DUE: 3/2/2017  
 MFG S/N: HL-6406  
 2ND S/N: N/A  
 CONN. LOCATION: N/A  
 THREAD TYPE: NPT  
 RECAL: 3/29/2016, 9/10/2016  
 N.I.S.T #: 4520.001, S00012

### CALIBRATION DETAIL

% SPAN	APPLIED VALUE	OBSERVED INDICATION		ERROR		% DEVIATION		PASS / FAIL	
		AS FOUND	AS LEFT	AS FOUND	AS LEFT	AS FOUND	AS LEFT	AS FOUND	AS LEFT
0	25.00	25.10	25.10	0.10	0.10	0.00	0.00	PASS	PASS
18	550.00	549.20	549.20	-0.80	-0.80	-0.03	-0.03	PASS	PASS
35	1,050.00	1049.00	1049.00	-1.00	-1.00	-0.03	-0.03	PASS	PASS
85	2,550.00	2547.00	2547.00	-3.00	-3.00	-0.10	-0.10	PASS	PASS
101	3,025.00	3025.20	3025.20	0.20	0.20	0.01	0.01	PASS	PASS



IMPACT / NOTES :

TECHNICAL SERVICES GROUP CERTIFIES THAT THIS INSTRUMENT HAS BEEN CALIBRATED TRACEABLE TO THE NATIONAL INSTITUTE OF STANDARDS & TECHNOLOGY AND CONFORMS TO ISO 10012 AND ANSI / NCSL Z-540. UNLESS OTHERWISE SPECIFIED MEASUREMENT UNCERTAINTIES ARE LESS THAN 1/4 OF TOLERANCE OR 1 MINOR DIVISION

*[Signature]*  
 TSG CALIBRATION / Q.A. SUPERVISOR



# TECHNICAL SERVICES GROUP

2900 Main St Alameda CA 94501 Phone (510)532-4324 Fax (510)532-3135

## Certificate of Calibration

ARB, INC. PITTSBURG  
1875 LOVRIDGE ROAD  
PITTSBURG  
CALIFORNIA 94565

Customer ID# 3773

File # 1328

Instrument Type RECORDER,  
PRESSURE

Range 0-2000

Units PSIG

Resolution 20

Mfg TECHCAL

Model 1B200

Cal By J.P.

Current Cal Cycle (Months) 6

Previous Cal Cycle 6

Standards Used AMETEK DM-T-150 S/N 8681  
DUE 3/27/2018 NIST 49-67.001

Certificate Number: 2405288

Rated Accuracy 1%

Pass/Fail as Found PASS

Pass/Fail as Left PASS

1st (Adj) S/N 04345

2nd S/N N/A

Cal Due 8/25/2016

Cal Due 2/25/2017

Notes

TECHNICAL SERVICES GROUP CERTIFIES THAT THIS INSTRUMENT HAS BEEN CALIBRATED TRACEABLE TO THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY AND CONFORMS TO ISO 10012 AND ANSI/NCSL Z-540. UNLESS OTHERWISE SPECIFIED MEASUREMENT UNCERTAINTIES ARE LESS THAN 1/4 OF TOLERANCE OR 1 MINOR DIVISION.





# CALIBRATION DATA SHEET PRESSURE / TEMPERATURE

2900 MAIN ST ALAMEDA, CA 94501 PHONE (510) 522-8326 FAX (510) 522-3136

CAL DUE  
2/25/2017

CUSTOMER

ARB

TSG JOB & ITEM #

3773

CERTIFICATE NO.

2405288

CAL DATE

8/25/2016

MFG S/N

04345

MFG.

TECHCAL

MODEL

1B200

CAL BY

J.P.

RANGE

MIN

MAX

UNITS

RESOLUTION

RATED ACCURACY, % FULL SCALE

2ND S/N

N/A

0

2,000

PSIG

40

1.00 %

PRESS.

TEMP.

VACUUM

CASE SIZE

CONN. SIZE

CONN. LOCATION

THREAD TYPE

X

12"

1/4"

BACK

NPT

STANDARDS USED

MFG.

MODEL

S/N

RECAL

N.I.S.T #

X

AMATEK

DM-T-150

8681

3/27/2018

49467.001

X

EUTECNICS

139200-1.2

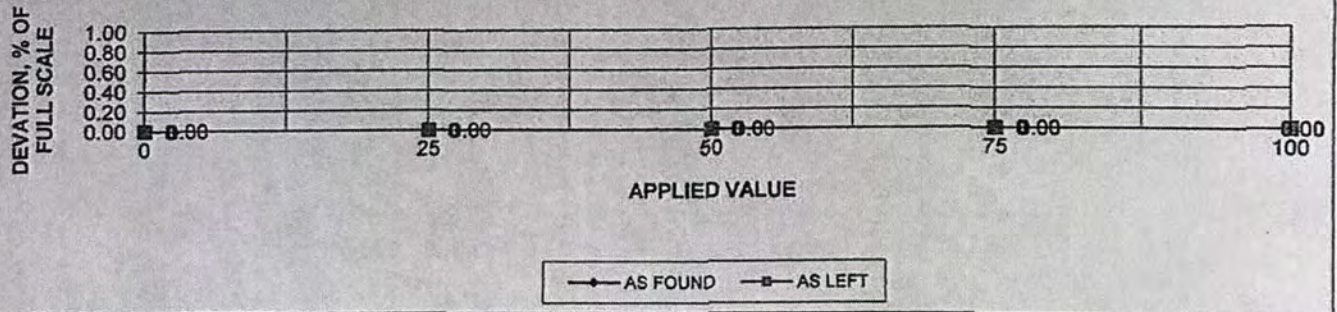
10049

9/10/2016

S00012

## CALIBRATION DETAIL

% SPAN	APPLIED VALUE	OBSERVED INDICATION		ERROR		% DEVIATION		PASS / FAIL	
		AS FOUND	AS LEFT	AS FOUND	AS LEFT	AS FOUND	AS LEFT	AS FOUND	AS LEFT
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	PASS	PASS
25	500.00	500.00	500.00	0.00	0.00	0.00	0.00	PASS	PASS
50	1,000.00	1000.00	1000.00	0.00	0.00	0.00	0.00	PASS	PASS
75	1,500.00	1500.00	1500.00	0.00	0.00	0.00	0.00	PASS	PASS
100	2,000.00	2000.00	2000.00	0.00	0.00	0.00	0.00	PASS	PASS



IMPACT / NOTES : CALIBRATED WIT CHART # MCI MI 0-2000-12

TECHNICAL SERVICES GROUP CERTIFIES THAT THIS INSTRUMENT HAS BEEN CALIBRATED TRACEABLE TO THE NATIONAL INSTITUTE OF STANDARDS & TECHNOLOGY AND CONFORMS TO ISO 10012 AND ANSI / NCSL Z-540. UNLESS OTHERWISE SPECIFIED MEASUREMENT UNCERTAINTIES ARE LESS THAN 1/4 OF TOLERANCE OR 1 MINOR DIVISION. LABORATORY CONDITIONS AT TECHNICAL SERVICES GROUP 68-72 DEG F, < 40% R.H.

*J.P.*  
TSG CALIBRATION / Q.A. SUPERVISOR