

S O U T H W E S T R E S E A R C H I N S T I T U T E

Department of Quality Assurance
Calibration Laboratory

CERTIFICATE OF CALIBRATION

Issued to: DIV20 B57 NARASI SRIDHAR

Device No: 2243

Manufacturer: MOORE

Model: 0-60-165

Nomenclature: PRESSURE GAGE

Serial Number: 0623002

SwRI No: NONE

Remarks

Accuracy: MFGR

Procedure: MFGR

ENVIRONMENT

Temperature: 72 Humidity: 34 Location: ROTHE DEVELOPMENT

CONCLUSION

Tolerance/Remarks: Received into the system, introduced or reactivated

Rothe Development Calibration Certificate #29321

Calibration was in accord with requirements of MIL-STD-45662A. Measurements are traceable to the National Institute of Standards and Technology. Inspection and test data are on file and available for inspection.

Signed _____

Calibration Date: 03/17/93

Record Number: 00010838

Next Calibration Due: 09/17/93





Rothe Development Inc.

Metrology Services Division

4614 SINCLAIR RD., SAN ANTONIO, TEXAS 78222 210-648-3131 FAX 210-648-4091

Certificate of Calibration

29321

CAL DATE: 03/17/93

DUE DATE: 03/17/94

ISSUED TO: Southwest Research Institute
6220 Culebra, Bldg. 68/Division 5
San Antonio, TX 78284
684-5111 * 2702

(5)

MFG Moore

MODEL 0-60 PSI

SERIAL # 0623002

CONTROL: 114 - 16440

TYPE Pressure Gauge

PROCEDURE/TOL: MFG PROCEDURE/MFG SPECS

WORK ORDER #: 36907

CUSTOMER PO #103602/ST#214563/20-0760

RECEIVED IN-SPECS
OUT-OF-SPECS

All Calibration measurements performed at ROTHE DEVELOPMENT INC. METROLOGY SERVICES meet the requirements of MIL-STD-45662A, and are traceable to the National Institute of Standards and Technology through Primary NIST Calibration or Secondary Calibration performed by other Metrological facilities. Ambient conditions: temperature 72°F, Relative Humidity 34%

Test Report Number and Calibration Standards Used

Ref #	Model #	Mfr	Serial #	Description	Cal Date	Int	Cal Due
TR 216	2545C	Ashcroft	9215038	DIGITEST	06/10/92	12	06/10/93

Test Report Numbers

DCV FLUKE CERT# DH70
ACV FLUKE CERT# DP30
NIST TEST# 250839
NIST TEST# 248798
Hz MWB Transmission

INSPECTED BY
COMMENTS:

José A Mendoga



Rothe Development, Inc.

4614 SINCLAIR RD. SAN ANTONIO, TEXAS 78222-2099

512-648-3131 FAX: 512-648-4091

METROLOGY SERVICES DIVISION
PRECISION MEASUREMENT EQUIPMENT LABORATORY
TRACEABLE TO NIST

CHARGE # 107

CONTROL # 114 - 16440

WORK ORDER # 36907

CUSTOMER REF

RECEIVED FROM **Southwest Research Institute** (5) DATE **03/11/93**

ADDRESS **6220 Culebra, Blds. 68/Division 5** PHONE# **684-5111 + 2702**
San Antonio, TX 78284

CONTACT (NAME) **Mr. Jim Patterson** FAX# **684-3133**

PURCHASE ORDER # **03602/ST#214563/20-0760**

CUSTOMER COMMENTS **N/T BEFORE & AFTER DATA OUT OF SPEC ITEM**

MFG **Moore**

MODEL **0-60 PSI**

SERIAL # **0623002**

TYPE **Pressure Gauge**

ACCES. RCVD.

- REPAIR
- OPERATIONAL CHECK
- CALIBRATION

CALIBRATION DATE 17 MAR 93

DATE DUE 17 MAR 94

CALIBRATION INTERVAL 12 mo.

- RECEIVED IN SPECS.
- RECEIVED INOPERATIVE
- RECEIVED OUT OF SPECS.

CKT REF #	QTY.	MFG PART #	DESCRIPTION	COST	ROTHER TECH.	OUR P.O. #
					JAM	
					REPAIR LABOR HRS.	SERVICE CODE
						J
					PARTS TOTAL	
					REPAIR LABOR	
					SHIPPING	
					TEAR DOWN CHARGE	
					CALIBRATION	34 00
					TAX	00 00
					TOTAL	34 00

THIS IS NOT AN INVOICE

TR #'s **216**

COMMENTS

WORK PERFORMED:

CALIBRATED

**** Need Manual ****

TEMP 72 °F

R.H. 34 %

Victor Moore

3/11/93

RDI 2002

SHIP VIA: _____ DATE: _____

RECEIVED BY: _____

S O U T H W E S T R E S E A R C H I N S T I T U T E

Department of Quality Assurance
Calibration Laboratory

CERTIFICATE OF CALIBRATION

Issued to: DIV20 B57 RON GREEN

Device No: 2243

Manufacturer: MOORE

Model: 0-60-165

Nomenclature: PRESSURE GAGE

Serial Number: 0623002

SwRI No: NONE

Cal interval 12 Mo.

Remarks

Accuracy: MFGR

Procedure: MFGR

ENVIRONMENT

Temperature:

Humidity:

Location: SWRI DIV04 BLDG. 145

CONCLUSION

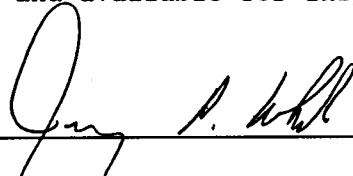
Tolerance/Remarks: Received in tolerance, no adjustments made

Room Temperature.

Standard Reading:	Unit Under Test:
60 psi	60.0 psi
50 psi	50.0 psi
40 psi	40.0 psi
30 psi	30.0 psi
20 psi	20.0 psi
10 psi	10.0 psi

Calibration was in accord with requirements of MIL-STD-45662A. Measurements are traceable to the National Institute of Standards and Technology. Inspection and test data are on file and available for inspection.

Signed



Calibration Date: 06/16/94

Cal interval: 12 Months

Record Number: 00014381

Next Calibration Due: 06/16/95

S O U T H W E S T R E S E A R C H I N S T I T U T E

Department of Quality Assurance
Calibration Laboratory

CERTIFICATE OF CALIBRATION

0623002

S O U T H W E S T R E S E A R C H I N S T I T U T E

Department of Quality Assurance
Calibration Laboratory

Device Serial No: 0623002

Calibration Date: 06/16/94

STANDARDS

Standard No: 1554 Manufacturer: AMETEK

Model: RK-300

Nomenclature: DEADWEIGHT TESTER

Serial No: 82167

Cal.Due: 02/18/95

Cal.Rec.No: 00013739

SOUTHWEST RESEARCH INSTITUTE

**Department of Quality Assurance
Calibration Laboratory**

**CERTIFICATE OF CALIBRATION
06/21/95**

Issued to: RON GREEN DIV20 ,B57
Manufacturer: MOORE
Nomenclature: PRESSURE GAGE
Serial Number: 0623002
Notes: AS PER KRISTI MEYER ON 12/16/9

Asset Number: 002243
Model Number: 0-60-165

SwRI/Div. I.D. #: NONE

ENVIRONMENTAL CONDITIONS

Temperature: 65.0F

Relative Humidity: 65%

CALIBRATION INFORMATION

Procedure Number: MFGR
Remarks: ERROR LESS THAN +/-0.2PSI

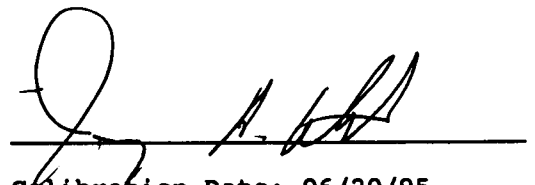
Accuracy: MFGR SPECS
Received IN Tolerance

**Calibration was in accordance with requirements of MIL-STD-45662A.
Measurements are traceable to the National Institute of Standards and Tech-
nology. Inspection and test data are on file and available for inspection.**

STANDARDS USED FOR CERTIFICATION

Asset #	Serial #	Mfg	Model #	Nomenclature	Cal Date	Int.	Cal Due
001554	82167	AMETE	RK-300	DEADWEIGHT TESTER	03/02/95	12	03/02/96

Certified by :



Certificate#: 17782

Calibration Date: 06/20/95
Interval: 12 months
Next Calibration Due: 06/20/96

SOUTHWEST RESEARCH INSTITUTE

Department of Quality Assurance

Calibration Laboratory • 522-5215

WORK ORDER

CERTIFICATE # 24368 ASSET # 002243 DATE 18 FEB 97

ITEM DATA:

Manufacturer Morre Products Co. Model 0-60 PSI 951

Description Pressure Gauge Serial # 062002

Accessories _____

ACTION REQUESTED Cal

CUSTODIAN Dr. R. Ron Green

Turned in by: Melissa Hill Phone _____

CHARGE # 20-005708-661 Date Required _____

INSTRUMENT USED ON: NUCLEAR DOD NASA GLP SPPE
 OTHER _____

COPY OF CALIBRATION CERTIFICATE Yes No

CONDITION RECEIVED: _____ Out of tolerance, repaired to specifications
_____ In tolerance, minor adjustments/repairs made
 In tolerance, no adjustments/repairs
_____ Out of tolerance, adjusted to specifications
_____ Received into system, introduced or reactivated
_____ Calibration interval
_____ Reliability code

ACTION TAKEN: (Calibration/Repair/Parts) 5 point Cal

SwRI CALIBRATION LAB
(210) 522-5215
CAL 20 JUN 95 BY JHO
DUE 20 SEP 96 ID 2293
S/N 0623002

24368

CAL ENVIRONMENT:
Temperature 72 °F Humidity 41 %RH

CALIBRATED/REPAIRED MLW
By _____ Cal Procedure T033K6-4-407-1
Date 2-24-97 Accuracy Grade A ± 0.6 psi
Cal Interval 12 mo Time to complete: _____
Next Cal due 2-24-98 Cal 2 hr Repair _____
Standards used (Asset#) 4167 5242

DATE COMPLETED 2-25-97
DATE PICKED UP 2/27/97 PICKED UP BY Melissa Hill

PRESSURE CALIBRATION CHECK FORM

Date 2-24-97 Work Order 24368 Technician AM Wood
 Melrose Hill 20-5708-561 2 hr

A) Unit Under Test Gage
 Manufacturer Moire Model Serial No. 0623002
 Asset No. 2243 Range 0-60psig Uncertainty Grade A 1%-2%
 (Unc/4)

B) Calibration Standard (1) Dig Ind
 Manufacturer Mensor Model 5014 Serial No. 340119A
 Asset No(s). 4163 Uncertainty ±0.01% FS (rect)
±0.05% of 60

C) Calibration Standard (2) N/A TVR 20:1
 Manufacturer Model Serial No.
 Asset No. Uncertainty

Env: Room Temp. 72°F Humidity 41% Baro Press. 29.35" Hg
 Conversion Factor(s) N/A

STANDARD	INCREASING	DECREASING	TOLERANCE 0.6 - 1.2	
UNITS:	UNITS:	UNITS:	UNITS:	
AS FOUND			MIN	MAX
12	12.1	12.1	10.8	13.2
24	24.2	24.2	23.4	24.6
36	36.0	36.0	35.4	36.6
48	47.9	47.9	46.8	49.2
60	60.0	60.0	58.8	61.2
	Intol			
AS DELIVERED				

NOTES:



Southwest Research Institute
6220 Culebra Road
San Antonio, TX 78238
Department of Quality Assurance
Calibration Laboratory

Certificate of Calibration

25 February 1997

Issued to: RON GREEN DIV20 B57
Manufacturer/Model: MOORE PRODUCTS 9151
Description: PRESSURE GAUGE
Serial Number: 0623002
Asset Number: 002243

Environmental Conditions

Temperature: 72.0 Deg. F Humidity: 41%

Calibration Information

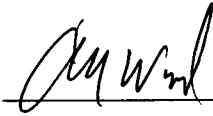
Calibration was in accordance with requirements of MIL-STD-45662A and ANSI/NC SL Z540-1-1994. Measurements are traceable to the National Institute of Standards and Technology (NIST). This report may not be reproduced except in full without written approval of the originator. Inspection and test data are on file and available for inspection.

Calibration Date: 24 Feb 97 Calibration Procedure: TO33K6-4-427-1
Interval: 12 months Accuracy: GRADE A
Next Calibration Due: 24 Feb 98 Received: In Tolerance
Remarks: STD/GAGE (PSI) 12/12.1 24/24.2 36/36.0
48/47.9 60/60.0

Standards Used

Asset	MFR	Model	Description	Serial No.	Due Cal
004163	MENSOR	5014	FIELD PRESSURE STAND	340119A	17 Jul 97
005242	DICKSON	THDX	TEMPERATURE/HUMIDITY	6313680	27 Jul 97

Certificate # 24368

Signed: 



Southwest Research Institute
6220 Culebra Road
San Antonio, TX 78238
(210) 522-5215
Department of Quality Assurance
Calibration Laboratory

Accredited



Certificate #
0972-01

Certificate of Calibration

7 January 1999

Issued to: RON GREEN DIV20 B57
Manufacturer/Model: MOORE PRODUCTS 0-60 PSI
Description: PRESSURE GAUGE
Serial Number: 0623002
Asset Number: 002243

This certifies the above item was calibrated in compliance with MIL-STD-45662A and ANSI/NCSL Z540-1-1994. Standards used in this calibration, described in the referenced calibration procedure with associated uncertainties or tolerances, are traceable to the National Institute of Standards and Technology (NIST). Supporting documentation relative to traceability is on file and is available for examination upon request. This certificate is not to be reproduced, except in full, without the written approval of the Southwest Research Institute Department of Quality Assurance Calibration Laboratory.

This laboratory is accredited by the American Association for Laboratory Accreditation (A2LA) and the results of this calibration certificate were determined in accordance with the terms of accreditation unless stated otherwise below.

The uncertainty of the calibration was sufficient to determine that the item met the manufacturer's published specifications unless stated otherwise below.

Ambient Conditions: Temperature: 68. Degrees Fahrenheit Humidity: 45 % RH

Calibration Date: 6 Jan 99 **Calibration Procedure:** CLCP-PI-001 1997

Condition as Received: IN TOLERANCE

Condition as Released: IN TOLERANCE

Remarks:

Mack Wood / Technician



Southwest Research Institute
6220 Culebra Road
San Antonio, TX 78238
(210) 522-5215
Department of Quality Assurance
Calibration Laboratory



Certificate #
0972-01

Certificate of Calibration

28 June 2000

Issued to: RON GREEN DIV20 B57
Manufacturer/Model: MOORE PRODUCTS 0-60 PSI
Description: PRESSURE GAUGE
Serial Number: 0623002
Asset Number: 002243

This certifies the above item was calibrated in compliance with MIL-STD-45662A and ANSI/NC SL Z540-1-1994. The results of this calibration relate only to the individual item as described above. Standards used in this calibration, described in the referenced calibration procedure with associated uncertainties or tolerances, are traceable to the National Institute of Standards and Technology (NIST). Supporting documentation relative to traceability is on file and available for examination upon request. This certificate is not to be reproduced, except in full, without the written approval of the Southwest Research Institute Department of Quality Assurance Calibration Laboratory.

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The uncertainty of the calibration was sufficient to determine that the item met the manufacturer's published specifications unless stated otherwise below.

Ambient Conditions: Temperature: 68.0 Degrees Fahrenheit Humidity: 46 % RH

Calibration Date: 28 Jun 00 **Calibration Procedure:** CLCP-PI-001, 6/99

Condition as Received: In Tolerance

Remarks:

Approved by:

Jim Patterson, Supervisor, or Walt Hill, Metrologist

Certificate # 39536

m:\a2la.rpt - Rev date 22 May 00

Measurements performed by:

Mack Wood, Technician

Page 1 of 1

SOUTHWEST RESEARCH INSTITUTE
Department of Quality Assurance
Calibration Laboratory • 522-5215

WORK ORDER

CERTIFICATE # 32679 ASSET # 002243 DATE 30 Dec 98

ITEM DATA:

Manufacturer Wheeler Model 6-60 ps
Description Pressure Gauge Serial # 0623002
Accessories _____

ACTION REQUESTED Cal

CUSTODIAN Div. 20, Ron Green

Turned in by: _____ Phone 5305

CHARGE # 20-01 Date Required _____

INSTRUMENT USED ON: (DOD/NASA) (NUCLEAR) (GLP) (SPPE) (MIL)
 OTHER _____

COPY OF CALIBRATION CERTIFICATE (Yes) (No)

NEW WORK Yes No If yes, an evaluation shall be made to verify capabilities.

By MMW Date 12/30/98

Work involves proprietary/confidential information or equipment (Yes) (No)

CONDITION RECEIVED: _____ (F) Out of tolerance, repaired to specifications
_____ (G) In tolerance, minor adjustments/repairs made
 (J) In tolerance, no adjustments/repairs
_____ (K) Out of tolerance, adjusted to specifications
_____ (S) Received into system, introduced or reactivated

CALIBRATION OVERDUE

ACTION TAKEN: (Calibration/Repair/Parts) 5 Point Cal

SWRI CALIBRATION LAB
(210) 522-5215
CAL 2-24-97 BY MMW
DUE 2-24-98 ID 2243
S/N 0623002

CAL ENVIRONMENT:
Temperature 68°F Humidity 45%RH

CALIBRATED/REPAIRED:
By MMW Cal Procedure CCCP-PI-001
Date 1-6-99 Accuracy Grade A (1% - 2%)
Cal Interval 12mo Reliability Code: _____
Next Cal due 1-6-00 Cal Time 1.5h Repair Time _____
Standards used (Asset#) 4163

DATE COMPLETED 1-6-99
DATE PICKED UP 1/11/99 PICKED UP BY Melvin E. Hill

PRESSURE CALIBRATION CHECK FORM

Date 1-6-99 Work Order 32679 Technician [Signature]
 Inst Cust. RGreen Ext. _____ Charge # 20-0751-006 time 1.5 h

A) Unit Under Test Moore Press Gage
 Model _____ Serial No. 0623002 Asset No. 2243
 Range 60 psi Uncertainty Grade A (17-22) Std Unc _____

B) Calibration Standard (1) Menor
 Model 5014 Serial No. 340119A Asset No. 4163
 Uncertainty ±0.03 psi Std Unc _____

C) Calibration Standard (2) N/A
 Model _____ Serial No. _____ Asset No. _____
 Uncertainty _____ Std Unc _____
 Comb Unc (rss B&C) 0.03 psi TUR (A Unc/Comb Unc) 20/1

If less than 4:1, Total combined calibration Unc (kXrss) _____
 k= _____ Explanation _____
 Env: Room Temp. 68°F Humidity 45% Baro Press. 29.18" Hg
 Conversion Factor(s) N/A

STANDARD	INCREASING UNITS: psi	DECREASING UNITS: psi	TOLERANCE: ±0.6/1.2	
			UNITS: psi MIN	MAX
AS FOUND				
12	12	12	10.8	13.2
24	24	24	23.4	24.6
36	36	36	35.4	36.6
48	48	48	46.8	49.2
60	60	60	58.8	61.2
AS DELIVERED	Tol			

NOTES:

WORK ORDER 39536

Date Received 6/21/00

Asset No. 002243 Manufacturer MOORE PRODUCTS Model 0-60 PSI
 Description PRESSURE GAUGE Serial Number 0623002
 Accessory Received/Required NONE
 Div/CC ID NONE Accessory to Asset No. N/A
 Div/CC DIV20 Location B57 Custodian RON GREEN Tel. 5305
 Charge/Project No. 20.00751.006 Proprietary/Confidential N Date Required ROUTINE
 Work Requested CALIBRATION
 Receiving Inspection O.K.
 Delivered By TROY MAXWELL Tel. 2012

WORK HISTORY

Date	Start Time	Stop Time	Notes

Serial CALIBRATION BY: MM
 CAL: 01/06/99 DUE: 01/06/00
 AN: 002243 SN: 0623002
 I KNOW WHAT I'M DOING AND I'M NOT ASKING FOR HELP

PARTS

Part Name	Part Number	Cost	Failure Description

39536

WORK SUMMARY

Failure Description _____
 Repair Action _____
 Cal Procedure CLCP-PI-001, 6/99 Temp 68 F Hum 46 %
 Tech [Signature] Cal Hrs. 1.5 Repair Hrs. _____ Part Cost _____
 Action Taken Cal
 Standards Used 4163
 Date Cal 6-28-00 Int. 12 Mo. Date Due 6-28-01 Reliability Code _____
 Date Picked Up _____ Picked Up By [Signature]

PRESSURE CALIBRATION DATA SHEET

Date 6-28-00 Work Order 39536 Technician *[Signature]*
 Inst Cust. RanGreen Ext 5305 Charge # 20-00751-006 time 1.5

A) Unit Under Test Moore Press Gauge
 Model _____ Serial No. 0623002 Asset No. 2243
 Range 60 PSI Uncertainty Grade A Std Unc _____

B) Calibration Standard (1) Mensor
 Model 5014 Serial No. 340119A Asset No. 4163
 Uncertainty _____ ± 0.03 PSI Std Unc _____

C) Calibration Standard (2) N/A
 Model _____ Serial No. _____ Asset No. _____
 Uncertainty _____ Std Unc _____
 Comb Unc (rss B&C) 0.03 PSI TUR (A Unc/Comb Unc) 20/1

If less than 4:1, Total combined calibration Unc (kXrss) _____
 k= _____ Explanation _____
 Env: Room Temp. 68°F Humidity 46% Baro Press. 27.18" Hg
 Conversion Factor(s) N/A

STANDARD	INCREASING	DECREASING	TOLERANCE: $\pm 0.6/1.2$	
			MIN	MAX
UNITS: PSI	UNITS: PSI	UNITS: PSI	UNITS: PSI	
AS FOUND				
12	12	12.0	10.8	13.2
24	24.1	24.1	23.4	24.6
36	36	36	35.4	36.6
48	48	48	46.8	49.2
60	60	→	58.8	61.2
AS DELIVERED	<u>± 0.12</u>			

NOTES:



Southwest Research Institute
6220 Culebra Road
San Antonio, TX 78238
(210) 522-5215
Department of Quality Assurance
Calibration Laboratory

Accredited



Certificate #
0972-01

Certificate of Calibration

28 June 2000

Issued to: RON GREEN DIV20 B57
Manufacturer/Model: MOORE PRODUCTS 0-60 PSI
Description: PRESSURE GAUGE
Serial Number: 0623002
Asset Number: 002243

This certifies the above item was calibrated in compliance with MIL-STD-45662A and ANSI/NCSL Z540-1-1994. The results of this calibration relate only to the individual item as described above. Standards used in this calibration, described in the referenced calibration procedure with associated uncertainties or tolerances, are traceable to the National Institute of Standards and Technology (NIST). Supporting documentation relative to traceability is on file and available for examination upon request. This certificate is not to be reproduced, except in full, without the written approval of the Southwest Research Institute Department of Quality Assurance Calibration Laboratory.

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The uncertainty of the calibration was sufficient to determine that the item met the manufacturer's published specifications unless stated otherwise below.


Ambient Conditions: Temperature: 68.0 Degrees Fahrenheit Humidity: 46 % RH

Calibration Date: 28 Jun 00 **Calibration Procedure:** CLCP-PI-001, 6/99

Condition as Received: In Tolerance

Remarks:

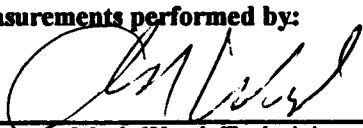
Approved by:



Jim Patterson, Supervisor, or Walt Hill, Metrologist

Certificate # 39536
m:\a2la.rpt Rev date 22 May 00

Measurements performed by:



Mack Wood, Technician

Page 1 of 1