

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 B51 KRISTI MEYER

Device No: 2862

Manufacturer: MOORE

Model: 100 PSI

Nomenclature: PRESSURE GAUGE

Serial Number: 356305

SwRI No: NONE

Cal interval 12 Mo.

Remarks

Accuracy: +/- .5 PSI

Procedure: SWRI

ENVIRONMENT

Temperature:

Humidity:

Location: SWRI BLDG. 145

CONCLUSION

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

Room Temperature.

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: 12/22/93

Cal interval: 12 Months

Record Number: 00013025

Next Calibration Due: 12/22/94

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: 356305

Calibration Date: 12/22/93

STANDARDS

Standard No: 1554 Manufacturer: AMETEK

Model: RK-300

Nomenclature: DEADWEIGHT TESTER

Serial No: 82167

Cal.Due: 03/26/94

Cal.Rec.No: 00010846

SOUTHWEST RESEARCH INSTITUTE

**Department of Quality Assurance
Calibration Laboratory**

**CERTIFICATE OF CALIBRATION
12/19/94**

Issued to: KRISTI MEYER
Manufacturer: MOORE
Nomenclature: PRESSURE GAUGE
Serial Number: 356305

DIV20 ,B51

Asset Number: 002862
Model Number: 100 PSI
SwRI Capital Number:

ENVIRONMENTAL CONDITIONS

Temperature: 69.0F

Relative Humidity: 75 %

CALIBRATION INFORMATION

Location: B184
Procedure Number: SWRI
Remarks: 20PSI READ 20.1,60PSI READ 60.0,100PSI READ 99.8.

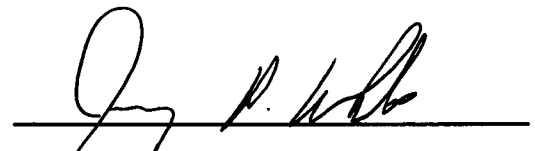
Technician: 7213
Accuracy: +/- .5 PSI
Received IN Tolerance

Calibration was in accordance 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.

STANDARDS USED FOR CERTIFICATION

Asset #	Serial #	Mfg	Model #	Nomenclature	Cal Date	Int.	Cal Due
001554	82167	AMETE	RK-300	DEADWEIGHT TESTER	02/18/94	12	02/18/95

Certified by :



Certificate#: 16028

Calibration Date: 12/16/94
Interval: 12 months
Next Calibration Due: 12/16/95

SOUTHWEST RESEARCH INSTITUTE

**Department of Quality Assurance
Calibration Laboratory**

**CERTIFICATE OF CALIBRATION
02/14/96**

Issued to: RON GREEN DIV20 ,B57
Manufacturer/Model: MOORE/100 PSI
Nomenclature: PRESSURE GAUGE
Serial Number: 356305
Asset Number: 002862
Notes:

ENVIRONMENTAL CONDITIONS

Temperature: 72.0F

Relative Humidity: 22%

CALIBRATION INFORMATION

Procedure Number: SWRI
Remarks: SEE DATA SHEET

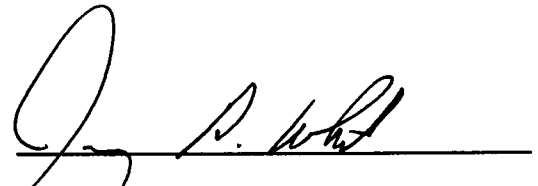
Accuracy: +/- .5 PSI
Received IN Tolerance

**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
004163	340119	MENSO	5000	FIELD PRESSURE STANDARD	12/06/95	3	03/06/96

Certified by :



Calibration Date: 02/12/96
Interval: 12 months
Next Calibration Due: 02/12/97

Certificate#: 20197

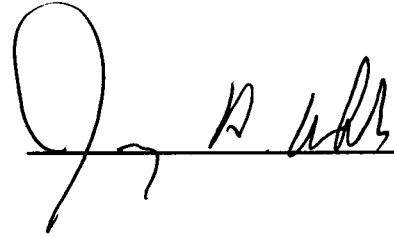
CALIBRATION CONTINUATION SHEET

#: 20197

REMARKS

Dial reading	Pressure increasing	Pressure decreasing
100 psi	100.407	xxxx
80	80.260	80.300
60	59.975	60.009
40	39.520	39.625
20	19.401	19.445

Certified by: _____

A handwritten signature in black ink, consisting of a large loop followed by several vertical strokes, is written over a horizontal line.

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

WORK ORDER

CERTIFICATE # 24216 ASSET # 2862 DATE 04 FEB 97

ITEM DATA:
Manufacturer Waco Products Co. Model 100 PSI
Description Pressure Gauge Serial # 356305
Accessories _____

ACTION REQUESTED cal

CUSTODIAN DIV. 20, Don Green

Turned in by: Melissa Hill Phone 8012

CHARGE # 70-9998-001 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 internal
_____ Realibility code

SWRI CALIBRATION LAB
(210) 522-5215
CAL 2 Feb 97 BY DHW
DUE 2 Feb 97 ID 2862
SN 356305

ACTION TAKEN: (Calibration/Repair/Parts) Spot Cal

Excellent Condition

CAL ENVIRONMENT:
Temperature 71°F Humidity 35%RH

CALIBRATED/REPAIRED:
By AM Wood Cal Procedure T033KL-4-427-1
Date 2-6-97 Accuracy Grade B 17-23-1396 (3 1/2 dial 2 psi inc)
Cal Interval 12 mo Time to complete: _____
Next Cal due 2-6-98 Cal 1.5 hr Repair _____
Standards used (Asset#) 4163 5242

DATE COMPLETED 2-6-97
DATE PICKED UP 11/2/97 PICKED UP BY Melissa Hill

24216

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

WORK ORDER

CERTIFICATE # 28589 ASSET # 002962 DATE 11 Feb 98

ITEM DATA:
Manufacturer Moon Products Co. Model P111 0-100 psi
Description pressure gauge Serial # 356305
Accessories _____

ACTION REQUESTED cal

CUSTODIAN Dr. D. Don P. Co.

Turned in by: Missy Hill Phone 2018

CHARGE # 20.04 Date Required _____

INSTRUMENT USED ON: DOD/NASA NUCLEAR GLP SPPE ISO
OTHER _____

COPY OF CALIBRATION CERTIFICATE Yes No

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

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

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

28589

SWRI CALIBRATION LAB
(210) 522-5215
CAL 2-6-97 BY CMW
DUE 2-6-98 ID 2862
SN 356305

CAL ENVIRONMENT:
Temperature 72°F Humidity 42%RH

CALIBRATED/REPAIRED:
By CMW Cal Procedure CLCP-PI-001
Date 2-17-98 Accuracy Grade A (1% - 2%)
Cal Interval 12mo Reliability Code: _____
Next Cal due 2-17-99 Cal Time 1.5 Repair Time _____
Standards used (Asset#) 4103

DATE COMPLETED _____
DATE PICKED UP 2/20/98 PICKED UP BY Melvin Hill

PRESSURE CALIBRATION CHECK FORM

Date 2-17-98 Work Order 28589 Technician CMW
 Inst Cust. Ron Green Ext _____ Charge # 20-0751-006 time 1.5

A) Unit Under Test Moore Pressure Gage
 Model _____ Serial No. 356305 Asset No. 2862
 Range 0-100 Uncertainty Grade A (1%-2%) Std Unc _____
(rect)

B) Calibration Standard (1) Mensor Dig ind
 Model 5014 Serial No. 4163 Asset No. 4163
 Uncertainty ±0.03 psi (rect) 340119A 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) 33/1

If less than 4:1, Total combined calibration Unc (kXrss) _____
 k= _____ Explanation _____
 Env: Room Temp. 72°F Humidity 42% Baro Press. 29.13" Hg
 Conversion Factor(s) N/A

STANDARD	INCREASING	DECREASING	TOLERANCE: ± 1/2	
UNITS: <u>PSIG</u>	UNITS: <u>PSIG</u>	UNITS: <u>PSIG</u>	UNITS: <u>PSIG</u>	
AS FOUND			MIN	MAX
20	20.5	20.7	18	22
40	40.5	40.5	39	41
60	60.3	60.2	59	61
80	80.0	80.0	78	82
100	100.0	↗	98	102
AS DELIVERED	<u>TATOL</u>			



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

Certificate of Calibration

18 February 1998

Issued to: RON GREEN DIV20 B57
 Manufacturer/Model: MOORE PRODUCTS CO. 0-100 PSI
 Description: PRESSURE GAUGE
 Serial Number: 356305
 Asset Number: 002862

Environmental Conditions

Temperature: 72.00 Deg. F Humidity: 42 % RH

Calibration Information

Calibration was in accordance with requirements of MIL-STD-45662A and ANSI/NCSL 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.

The uncertainty of the calibration was sufficient to determine that the instrument met the manufacturer's specifications.

Calibration Date: 17 Feb 98 Calibration Procedure: CLCP-PI-001
 Interval: 12 months
 Next Calibration Due: 17 Feb 99 Received: In Tolerance

Remarks:

Standards Used

Asset	MFR	Model	Description	Serial No.	Due Cal
004163	MENSOR	5014	FIELD PRESSURE STANDARD (3	340119A	18 Mar 98

Signed: *[Signature]*

Title: *Cal Tech*

LAST PAGE OF REPORT
 Total Pages Printed: 1

Certificate # 28589

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

WORK ORDER

CERTIFICATE # 33155 ASSET # 2862 DATE 03 FEB 99

ITEM DATA:

Manufacturer MOORE PRODUCTS Model 0-100 PSI
Description PRESSURE GAUGE Serial # 356305
Accessories _____

ACTION REQUESTED _____

CUSTODIAN DIV 20 RON GREEN

Turned in by: _____ Phone _____

CHARGE # 20-0H Date Required _____

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

COPY OF CALIBRATION CERTIFICATE (Yes) (No)

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

By _____ Date _____

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

ACTION TAKEN: (Calibration/Repair/Parts) 5 Point Cal
2-17-98

SWRI CALIBRATION LAB
(210) 522-5215
CAL 2-17-98 BY AMW
DUE 2-17-99 ID 2862
SN 356305

CAL ENVIRONMENT:
Temperature 68 °F Humidity 41 %RH

CALIBRATED/REPAIRED:
By AMW Cal Procedure QCP-D1-001
Date 2-3-99 Accuracy Grade A
Cal Interval 12 mo Reliability Code: _____
Next Cal due 2-3-00 Cal Time 1.5 Repair Time _____
Standards used (Asset#) 4163

DATE COMPLETED 2-3-99
DATE PICKED UP 2/4/99 PICKED UP BY Melissa Hill

33155



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

3 February 1999

Issued to: RON GREEN DIV20 B57
Manufacturer/Model: MOORE PRODUCTS 0-100 PSI
Description: PRESSURE GAUGE
Serial Number: 356305
Asset Number: 002862

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: 41 % RH

Calibration Date: 3 Feb 99 **Calibration Procedure:** CLCP-PI-001 1997

Condition as Received: IN TOLERANCE

Condition as Released: IN TOLERANCE

Remarks:


Mack Wood / Technician

WORK ORDER 39526

Date Received 6/21/00

Asset No. 002862 Manufacturer MOORE PRODUCTS Model 0-100 PSI
Description PRESSURE GAUGE Serial Number 356305
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

PARTS

Part Name	Part Number	Cost	Failure Description

39526

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 Carl
Standards Used 4163
Date Cal 6-29-00 Int. 12 Mo. Date Due 6-29-01 Reliability Code _____
Date Picked Up 6-30-00 Picked Up By [Signature]

PRESSURE CALIBRATION DATA SHEET

Date 6-29-00 Work Order 39526 Technician [Signature]
 Inst Cust. Green Ext 5305 Charge # 20-00751-006 time 1.0

A) Unit Under Test Moore Press Gauge
 Model _____ Serial No. 356305 Asset No. 2867
 Range 100 PSI Uncertainty Grade A Std Unc _____

B) Calibration Standard (1) Mensor
 Model SD14 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) 0.003 PSI TUR (A Unc/Comb Unc) 33/1

If less than 4:1, Total combined calibration Unc ($k \times \text{rss}$) _____
 k= _____ Explanation _____
 Env: Room Temp. 68°F Humidity 46% Baro Press. 29.18" Hg
 Conversion Factor(s) N/A

STANDARD	INCREASING	DECREASING	TOLERANCE: ± 1/2	
			UNITS: PSI	UNITS: PSI
AS FOUND	UNITS: PSI	UNITS: PSI	MIN	MAX
20	21	21	18	22
40	40.5	40.5	39	41
60	60.5	60.5	59	61
80	80.0	80	78	82
100	100.0	100	98	102
AS DELIVERED				

NOTES:



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

Accredited



Certificate #
0972-01

Certificate of Calibration

29 June 2000

Issued to: RON GREEN DIV20 B57
Manufacturer/Model: MOORE PRODUCTS 0-100 PSI
Description: PRESSURE GAUGE
Serial Number: 356305
Asset Number: 002862

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.

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: 68.0 Degrees Fahrenheit Humidity: 46 % RH

Calibration Date: 29 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 # 39526

m:\a2la.rpt Rev date 22 May 00

Measurements performed by:

Mack Wood, Technician

Page 1 of 1



Southwest Research Institute
6220 Culebra Road
San Antonio, TX 78238
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Certificate #
0972-01

Certificate of Calibration

29 June 2000

Issued to: RON GREEN DIV20 B57
Manufacturer/Model: MOORE PRODUCTS 0-100 PSI
Description: PRESSURE GAUGE
Serial Number: 356305
Asset Number: 002862

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: 29 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 # 39526

m:\a2la.rpt Rev date 22 May 00

Measurements performed by:

Mack Wood, Technician

Page 1 of 1



SOUTHWEST RESEARCH INSTITUTE™

6220 Culebra Road, P.O. Drawer 28510
Institute Quality Systems
Institute Calibration Laboratory
Phone: 210-522-5215 Fax 210-522-3692

Certificate of Calibration

Submitted By: DIV20

Address: T1

Contact: RON GREEN

Manufacturer Model: MOORE PRODUCTS 0-100 PSI

Description: PRESSURE GAUGE

Serial No: 356305

Asset No: 002862

Procedure: CLCP-PI-001, 6/99

Work Order: 444052058

Date Issued: Jan 28, 2003

Calibration Date: Jan 28, 2003

****Calibration Due:** Jan 28, 2004

Calibration Location: N/A

Environment: Temp. 68.0°F Hum. 40 %RH

***As Found:** IN TOLERANCE

***As Left:** IN TOLERANCE

This certificate documents traceability to the National Institute of Standards and Technology (NIST) and the International System of Units (SI). The Laboratory quality system conforms to ISO/IEC 17025, 1999 and ANSI/NCSL Z540-1-1994 which are equivalent to relevant requirements of the ISO 9000-1994 series of standards. This certificate may not be reproduced, except in full, without the written approval of the Southwest Research Institute Calibration Laboratory. The results of this calibration relate only to the individual instrument described above. This certificate shall not be used to claim product endorsement by the American Association for Laboratory Accreditation (A2LA) or any agency of the U. S. Government.

Uncertainty evaluation includes the item under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement" (GUM). The uncertainty represents an expanded uncertainty using a coverage factor of $k=2$ to approximate a 95% confidence level. The calibration process provides a Test Uncertainty Ratio (TUR) of less than or equal to 25% (4:1) of the test limit unless otherwise stated in remarks or an attachment.

*The client has sole responsibility for determination of in/out of tolerance or compliance/noncompliance. An in/out of tolerance opinion is provided for your convenience based only on the Test Instrument (TI) reading(s) and limits as reported. The reported uncertainty relates only to the results at the time of calibration and does not imply any short or long term stability of the TI.

**Calibration interval is determined by the client and does not assure the instrument will remain within tolerance until this date. Any number of factors may cause the instrument to be out of tolerance before the next calibration date.

Remarks: MEETS ANSI GRADE B TOLERANCE (2% MIDDLE HALF, 3% FIRST AND LAST QUARTER OF DIAL)

Standards Used

Asset	Manufacturer	Model	Description	Cal Due
004163	MENSOR	5014	PRESSURE CALIBRATOR	Apr 15, 03

Approved by: Walt Hill
Metrology Group Leader
m:\Nona2\al.rpt Rev date 15, August 02

Measurements by: Mack Wood
Metrology Technician

