

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: 2863

Manufacturer: MOORE

Model: 100 PSI

Nomenclature: PRESSURE GAUGE

Serial Number: 356307

SwRI No: NONE

Cal interval 12 Mo.

Remarks

Accuracy: +/- .5 PSI

Procedure: SWRI

ENVIRONMENT

Temperature:

Humidity:

Location: SWRI BLDG. 145

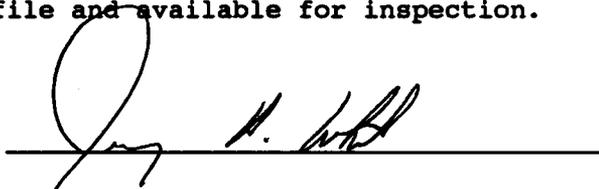
CONCLUSION

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: 00013024

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: 356307

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 DIV20 ,B51
Manufacturer: MOORE
Nomenclature: PRESSURE GAUGE
Serial Number: 356307

Asset Number: 002863
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 20.0,40PSI READ 40.0,60PSI READ
60.0,80PSI READ 79.9,100PSI READ 99.9.

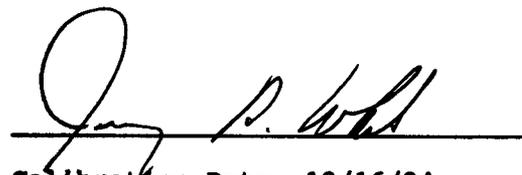
Technician: 7213
Accuracy: +/- .5 PSI
Received IN Tolerance

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#: 16023

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: **356307**
Asset Number: **002863**
Notes:

ENVIRONMENTAL CONDITIONS

Temperature: **74.0F**

Relative Humidity: **22%**

CALIBRATION INFORMATION

Procedure Number: **SWRI**
Remarks: **SEE ATTACHED DATA SHEET**

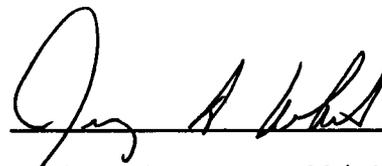
Accuracy: **+/- .5 PSI**
Received IN **Tolerance**

**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#: **20198**

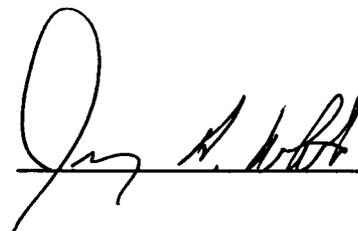
CALIBRATION CONTINUATION SHEET

Cert. #: 20198

REMARKS

Dial reading	Pressure increasing	Pressure decreasing
100 psi	100.208	xxxx
80	80.180	80.501
60	59.930	60.020
40	39.800	40.159
20	19.649	19.915

Certified by: _____



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

WORK ORDER

CERTIFICATE # 32681 ASSET # 002863 DATE 30 Dec 98

ITEM DATA:

Manufacturer Moore Products Co. Model 0-100psi
Description pressure gauge Serial # 356307
Accessories _____

ACTION REQUESTED cal

CUSTODIAN DUV. 20, Ron Green

Turned in by: _____ Phone 5305

CHARGE # 20-04 Date Required _____

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

COPY OF CALIBRATION CERTIFICATE (Yes) (No)

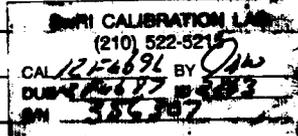
NEW WORK Yes No If yes, an evaluation shall be made to verify capabilities.

By _____ Date _____

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



CAL ENVIRONMENT:
Temperature 68°F Humidity 36 %RH

CALIBRATED/REPAIRED: [signature]
By _____ Cal Procedure CLCP-P1-001
Date 1-7-99 Accuracy Grade A (1% - 2%)
Cal Interval 12mo Reliability Code: _____
Next Cal due 1-7-00 Cal Time 1.5 Repair Time _____
Standards used (Asset#) 4163

DATE COMPLETED 1-7-99
DATE PICKED UP 1/11/99 PICKED UP BY Melvin E. Hill

32681

PRESSURE CALIBRATION CHECK FORM

Date 1-7-99 Work Order 32681 Technician DM Wood
 Inst Cust. Ron Green Est 5305 Charge # 20-0751-006 time 1.5

A) Unit Under Test Moore Press Gauge
 Model _____ Serial No. 356307 Asset No. 2863
 Range 100 psi Uncertainty Grade A (1% - 2%) Std Unc _____

B) Calibration Standard (1) Mansor
 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 TUR (Δ Unc/Comb Unc) 33/1

If less than 4.1, Total combined calibration Unc (kXrss) _____
 k = _____ Explanation _____
 Env: Room Temp. 68°F Humidity 36% Baro Press. 29.21" Hg
 Conversion Factor(s) N/A

STANDARD UNITS: PSI AS FOUND	INCREASING UNITS: PSI	DECREASING UNITS: PSI	TOLERANCE: ± 1/2	
			UNITS: PSI MIN	MAX
20	20.0	20.0	18	22
40	40.0	40.0	39	41
60	60.0	60.0	59	61
80	80.0	80.0	78	82
100	100.0	100.0 →	98	102
AS DELIVERED				



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 0-100 PSI
Description: PRESSURE GAUGE
Serial Number: 356307
Asset Number: 002863

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: 36 % RH

Calibration Date: 7 Jan 99 **Calibration Procedure:** CLCP-PI-001 1997

Condition as Received: IN TOLERANCE

Condition as Released: IN TOLERANCE

Remarks:

Mack Wood / Technician

WORK ORDER 39533

Date Received 6/21/00

Asset No. 002863 Manufacturer MOORE PRODUCTS Model 0-100 PSI
 Description PRESSURE GAUGE Serial Number 356307
 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

GAUGE CALIBRATION BY: M...
 CAL: 6/18/00 DUE: 6/18/00
 AM: 000003 SER: 900007
 1.000000 0.000000 0.000000

PARTS

Part Name	Part Number	Cost	Failure Description

39533

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



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

29 June 2000

Issued to: RON GREEN DIV20 B57
Manufacturer/Model: MOORE PRODUCTS 0-100 PSI
Description: PRESSURE GAUGE
Serial Number: 356307
Asset Number: 002863

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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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

Measurements performed by:



Mack Wood, Technician

Certificate # 39533
m\A2la.rpt Rev date 22 May 00

Page 1 of 1

SOUTHWEST RESEARCH INSTITUTE

Calibration Laboratory

WORK ORDER

Processed by RCRUZ at 1:26:30PM on 8/3/01

1 00011 0011 0010 1101 1101 1101 1101

Work Order 444044687

Arrived 8/3/01

Asset No. 002863 Manufacturer MOORE PRODUCTS

Model 0-100 PSI

Instrument Type/Class PRESSURE GAUGE

Serial No. 356307

Accessory No. Calibration Procedure CLCP-PI-001, 6/99

Location B57

Div/Client DIV20

Custodian RON GREEN

Mail Stop B57

Tel. 5305

Charge/Project No. 00751.006 1.20

Delivered By / Telephone TROY MAXWELL X

IN4CAL

Special Instructions _____

WORK NOTES

Date	Hours	Remarks/Notes
		<u>Meets AVS1 Grade A to L 8/23</u>

SWRI Cal-Lab By: cmw
CAL: Jun 29, 00 DUE: Jun 29, 01
AN: 000000 SN: 356307

REPAIR PARTS

Date	Hours	Part Name	Part Number	Failure Description	Cost

WORK SUMMARY

Failure Description _____

Repair Action _____

Calibration Procedure _____ Temp 60 F Hum. 38 %

Tech [Signature] Totals Cal Hours 1.0 Repair Hours _____ Parts Cost _____

Standards Used 4163

Date Picked Up 10-12-01

Picked Up By [Signature]

44687

PRESSURE INDICATOR CALIBRATION DATA SHEET

WORK ORDER #: 444044687 DATE: 8/7/01 TECH: *[Signature]*

UUT: Moore Products pressure gauge

Units Code
1

ASN: 2863 LRP: 0 URP: 100 UNITS: PSI

RESOLUTION: 0.5 REPEATABILITY: 0 Grade a

TOLERANCE +/-% : n/a zero (y/n) n SPAN: 100 100

Grade tol 1 2 Analog or Digital? (a or d): a

CALIBRATION STANDARD Setability: 0.003

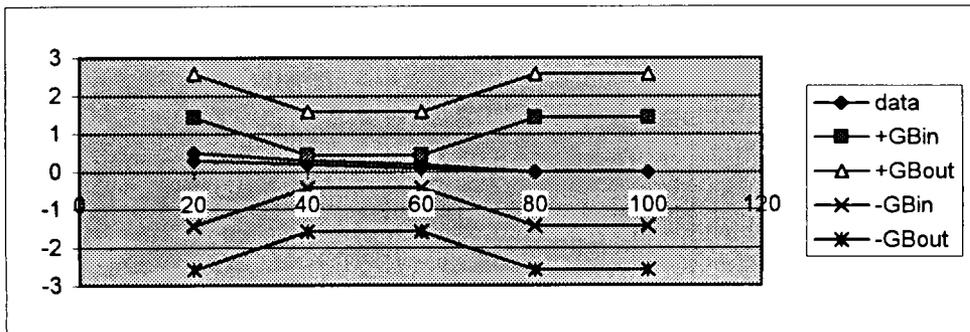
ASSET #: 4163 MFR: mensor tolerance 0.03 PSI

UNCERTAINTY BUDGET @ F.S.			
description	value	divisor	std unc
UUT resolution	0.5	1.73205	0.288675
UUT repeatability	0	1	0
Calibration standard	0.03	1.73205	0.017321
Cal Std Setability	0.003	1.73205	0.001732
combined uncertainty			2.9E-01
expanded uncertainty	k = 2		5.8E-01

TAR= 33.3

TUR= 1.7

DATA		tolerance		1	2		
INPUT	READING	ERROR	UNCERT	GBin	GBout	PASS	FAIL
20	20.3	0.3	0.578399	1.421601	2.578399	P	
40	40.2	0.2	0.578399	0.421601	1.578399	P	
60	60.1	0.1	0.578399	0.421601	1.578399	P	
80	80	0	0.578399	1.421601	2.578399	P	
100	100	0	0.578399	1.421601	2.578399	P	
80	80	0	0.578399	1.421601	2.578399	P	
60	60.2	0.2	0.578399	0.421601	1.578399	P	
40	40.3	0.3	0.578399	0.421601	1.578399	P	
20	20.5	0.5	0.578399	1.421601	2.578399	P	



*Instructions on Sheet 3



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

8 August 2001

Issued to: RON GREEN DIV20 B57
Manufacturer/Model: MOORE PRODUCTS 0-100 PSI
Description: PRESSURE GAUGE
Serial Number: 356307
Asset Number: 002863
Work Order Number: 444044687

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: 38 % RH

Calibration Date: 8 Aug 01 **Calibration Procedure:** CLCP-PI-001, 6/99

Condition as Received: IN TOLERANCE

Condition as Released: IN TOLERANCE

Remarks:

Approved by:



Walt Hill, Supervisor
Institute Calibration Laboratory

Measurements performed by:



Mack Wood, Technician



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: 356307

Asset No: 002863

Procedure: CLCP-PI-001, 6/99

Work Order: 444052059

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:\Nona21a1.rpt Rev date 15, August 02

Measurements by: Mack Wood

Metrology Technician

