

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: 2416

Manufacturer: MOORE

Model: 100 PSI

Nomenclature: PRESSURE GAUGE

Serial Number: 1593006

SwRI No: NONE

Cal interval 12 Mo.

Remarks

Accuracy: MFGR

Procedure: MFGR

ENVIRONMENT

Temperature: 0 Humidity: 0 Location: SWRI BLDG 145

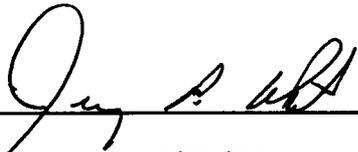
CONCLUSION

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

Standard Reading:	Unit Under Test:
20 psi	20- psi
40 psi	40+ psi
60 psi	60 psi
80 psi	80+ psi
100 psi	101 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: 06/09/93

Cal interval: 12 Months

Record Number: 00011498

Next Calibration Due: 06/09/94

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: 1593006

Calibration Date: 06/09/93

STANDARDS

Standard No: 1554 Manufacturer: AMETEK

Model: RK-300

Nomenclature: DEADWEIGHT TESTER

Serial No: 82167

Cal.Due: 03/26/94

Cal.Rec.No: 00010846

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: 2416

Manufacturer: MOORE

Model: 100 PSI

Nomenclature: PRESSURE GAUGE

Serial Number: 1593006

SwRI No: NONE

Cal interval 12 Mo.

Remarks

Accuracy: MFGR

Procedure: MFGR

ENVIRONMENT

Temperature:

Humidity:

Location: SWRI DIV04 BLDG. 145

CONCLUSION

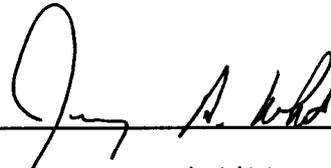
Tolerance/Remarks: Received in tolerance, no adjustments made

Room Temperature.

Standard Reading:	Unit Under Test:
100 psi	100.5 psi
80 psi	80.2 psi
60 psi	60.5 psi
40 psi	40.1 psi
20 psi	20.0 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: 00014380

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

Device Serial No: 1593006

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 GAUGE**
Serial Number: **1593006**
Notes:

Asset Number: **002416**
Model Number: **100 PSI**

SwRI/Div. I.D. #: **NONE**

ENVIRONMENTAL CONDITIONS

Temperature: **65.0F**

Relative Humidity: **65%**

CALIBRATION INFORMATION

Procedure Number: **MGFR**
Remarks: **ERROR LESS THAN +/-0.5PSI**

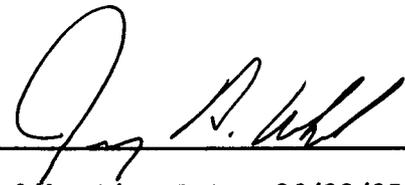
Accuracy: **MGFR SPECS**
Received IN **Tolerance**

**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#: **17781**

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 # 32678 ASSET # 002416 DATE 30 Dec 98

ITEM DATA:

Manufacturer Morre Model 0-100psi
Description pressure gauge Serial # 1593006
Accessories _____

ACTION REQUESTED cal

CUSTODIAN Div. 20, Dan 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 MMP Date 12/31/98

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 specification
_____ (S) Received into system, introduced or react

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

SWRI CALIBRATION LAB
(210) 522-5215
CAL ZASTAN 95 BY [Signature]
DUE 2 JAN 31 ID 3976
SN 757 3006

CAL ENVIRONMENT:
Temperature 68°F Humidity 36 %RH

CALIBRATED/REPAIRED:
By [Signature] Cal Procedure CLCP-P1-001
Date 1-6-99 Accuracy Grade A (1% - 2%)
Cal Interval 12 mo Reliability Code: _____
Next Cal due 1-6-00 Cal Time 1.5 Repair Time _____
Standards used (Asset#) 4163

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



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

7 January 1999

Issued to: RON GREEN DIV20 B57
Manufacturer/Model: MOORE PRODUCTS 0-100 PSI
Description: PRESSURE GAUGE
Serial Number: 1593006
Asset Number: 002416

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

Condition as Received: IN TOLERANCE

Condition as Released: IN TOLERANCE

Remarks:

Mack Wood / Technician

PRESSURE CALIBRATION DATA SHEET

Date 6-29-00 Work Order 35931 Technician [Signature]
 Inst Cust. Green Ext 5305 Charge # 20-00751-006 time 1.5

A) Unit Under Test Moore Press Gauge
 Model _____ Serial No. 1593006 Asset No. 2416
 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	
			MIN	MAX
UNITS: PSI	UNITS: PSI	UNITS: PSI	UNITS: PSI	
AS FOUND				
20	20	20.5	18	22
40	40.5	41	39	41
60	60.5	61	59	61
80	80.5	80.5	78	82
100	100.5	→	98	102
AS DELIVERED	<u>[Signature]</u>			

NOTES:



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: 1593006
Asset Number: 002416

This certifies the above item was calibrated in compliance with MIL-STD-45662A and ANSI/NCCL 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 # 39531

m:\a2la.rpt Rev date 22 May 00

Measurements performed by:

Mack Wood, Technician

Page 1 of 1

PRESSURE INDICATOR CALIBRATION DATA SHEET

WORK ORDER #: 444044685 DATE: 8/7/01 TECH. *[Signature]*

UUT: Moore Products pressure gauge Units Code 1
 ASN: 2416 LRP: 0 URP: 100 UNITS: PSI

RESOLUTION: 0.5 REPEATABILITY: 0 Grade ~~a~~ b

TOLERANCE +/-% : ~~0.5~~ n/a zero (y/n) n SPAN: 100 100

Grade tol 2 3 Analog or Digital? (a or d): a

CALIBRATION STANDARD Setability: 0.003

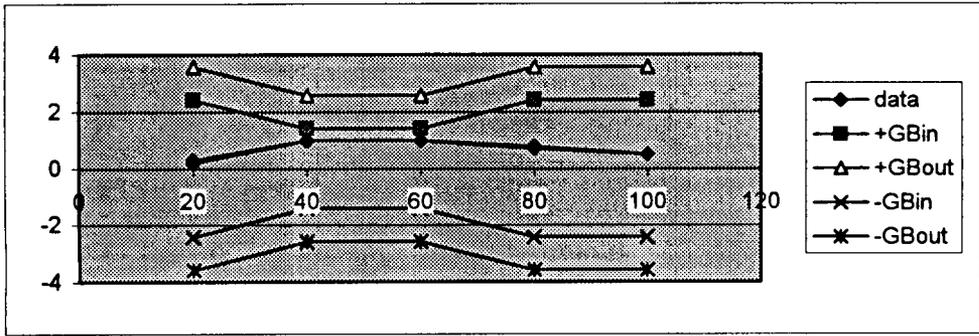
ASSET #: 4163 MFR: mensor tolerance 0.03 PSI

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= 66.7

TUR= 3.5

DATA		tolerance	2	3			
INPUT	READING	ERROR	UNCERT	GBin	GBout	PASS	FAIL
20	20.3	0.3	0.578399	2.421601	3.578399	P	
40	41	1	0.578399	1.421601	2.578399	P	
60	61	1	0.578399	1.421601	2.578399	P	
80	80.7	0.7	0.578399	2.421601	3.578399	P	
100	100.5	0.5	0.578399	2.421601	3.578399	P	
80	80.8	0.8	0.578399	2.421601	3.578399	P	
60	61	1	0.578399	1.421601	2.578399	P	
40	41	1	0.578399	1.421601	2.578399	P	
20	20.2	0.2	0.578399	2.421601	3.578399	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: 1593006
Asset Number: 002416
Work Order Number: 444044685

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

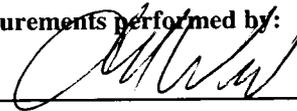
Remarks:

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: 1593006
Asset No: 002416
Procedure: CLCP-PI-001, 6/99

Work Order: 444051934
Date Issued: Jan 21, 2003
Calibration Date: Jan 21, 2003
****Calibration Due:** Jan 21, 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)
TUR=3.5

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

