Department of Labor & Industry ♦ Weights and Measures Program
Metrology Laboratory
2801 North Cooke Street ♦ Helena ♦ Montana ♦ 59601
Office (406) 449-2582 ♦ Fax (406) 841-2060 ♦ e-mail: kreimund@mt.gov

Report of Calibration #: 2015-V037

Calibration Date: June 23, 2015 *Calibration Due Date: June 23, 2017*

Artifact

Test Item.....: 25 Gallon LPG Prover
Volume.....: 25 gal
Serial Number: 2105
Date Received: June 22, 2015

Manufacture.: Gas Services Supply
Material.....: Steel, Pressure Vessel, Low Carbon
Specification.: NIST HB 105-4

Submitted By

Travis Thompson
T & T Measurements
10621 43rd Street Northwest
Newtown, ND 58763

Purchase Order #:
Point of Contact..: Travis Thompson
Phone #.....: (701) 675-2373

Artifact Calibration Results

Nominal Volume (at zero mark on gauge)	Prover Volume As Found @ 60 °F and 100 psig (gal)	Prover Volume As Left @ 60 °F and 100 psig (gal)	Specification Tolerance ± (gal)	Uncertainty k=2 ± (gal)
25 gal	**25.004**	**25.004**	0.013	0.031

Table 1 - LPG Prover Corrections @ 60 °F

psig	Prover Scale Reading (gal)	Pressure Correction (Pcorr) (gal)**	Prover Error (gal)	Prover Volume (gal)
0	0.320	-0.323	-0.319	24.681
10	0.268	-0.272	-0.268	24.732
20	0.216	-0.220	-0.217	24.783
30	0.164	-0.169	-0.165	24.835
40	0.112	-0.118	-0.114	24.886
50	0.060	-0.067	-0.063	24.937
60	0.046	-0.053	-0.050	24.950
70	0.032	-0.040	-0.036	24.964
80	0.018	-0.027	-0.023	24.977
90	0.004	-0.013	-0.010	24.990
100	-0.010	0.000	0.004	25.004

Department of Labor & Industry ♦ Weights and Measures Program
Metrology Laboratory
2801 North Cooke Street ♦ Helena ♦ Montana ♦ 59601
Office (406) 449-2582 ♦ Fax (406) 841-2060 ♦ e-mail: kreimund@mt.gov

Report of Calibration #: 2015-V037

Calibration Date: June 23, 2015 *Calibration Due Date: June 23, 2017*

110	-0.014	0.003	0.007	25.007
120	-0.018	0.007	0.010	25.010
130	-0.022	0.010	0.014	25.014
140	-0.026	0.013	0.017	25.017
150	-0.030	0.017	0.020	25.020
160	-0.034	0.020	0.023	25.023
170	-0.038	0.023	0.027	25.027
180	-0.042	0.026	0.030	25.030
190	-0.046	0.030	0.033	25.033
200	-0.050	0.033	0.037	25.037

* Gauge scale was adjusted for nominal volume at 100 psig.

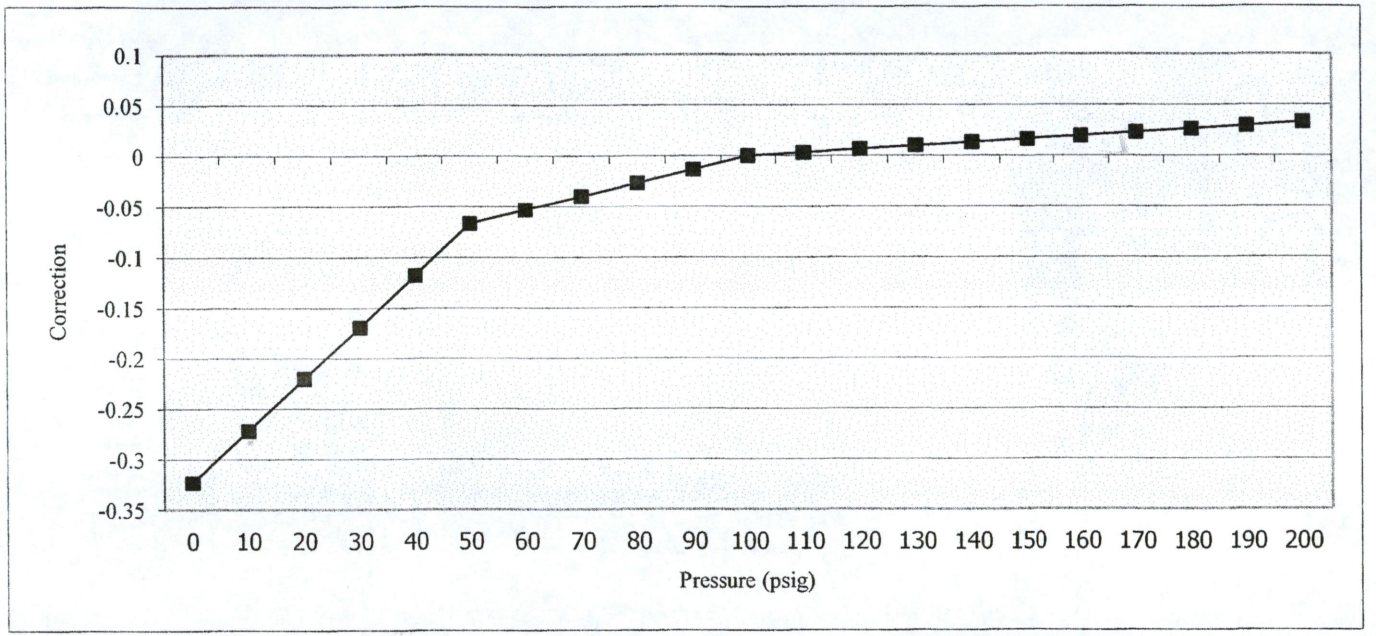
** Gauge scale could not be adjusted or did not need to be adjusted.

Department of Labor & Industry ♦ Weights and Measures Program
Metrology Laboratory
2801 North Cooke Street ♦ Helena ♦ Montana ♦ 59601
Office (406) 449-2582 ♦ Fax (406) 841-2060 ♦ e-mail: kreimund@mt.gov

Report of Calibration #: 2015-V037

Calibration Date: June 23, 2015 *Calibration Due Date: June 23, 2017*

Chart 1 - LPG Pressure Corrections (gal) @ 60 °F



Calibration Notes

- A prover is considered in-tolerance when the prover error is equal to or less than the specified tolerance minus the measurement uncertainty. **Bold print** indicates an out-of-tolerance reading.
- The prover 'As Left' volume is 'In-Tolerance', the prover may be used in meter testing without a correction.
- The Neck Scale Calibration Value (NSCV) = 1.0
- To use the Neck Scale Plate Calibration Factor, multiply the reading you see on the neck scale plate times the calibration factor. The result is the reading you would use. A Neck Scale Plate Calibration Factor of 1.0 means the neck scale can be read directly.
- Enter the Pressure Correction from Table 1 that corresponds with the pressure being tested on your LPG Meter Test form.

Department of Labor & Industry ♦ Weights and Measures Program
Metrology Laboratory
2801 North Cooke Street ♦ Helena ♦ Montana ♦ 59601
Office (406) 449-2582 ♦ Fax (406) 841-2060 ♦ e-mail: kreimund@mt.gov

Report of Calibration #: 2015-V037

Calibration Date: June 23, 2015 *Calibration Due Date: June 23, 2017*

- The calibration item was calibrated in a "wet down" condition using water. The calibration data above applies when the prover is drained for a 30 (± 5) second period after cessation of the main flow.
- The Bottom Securty Seal Number is .

Calibration Conditions

Procedure: NIST HB 145, SOP 21

Technician.....: Dave Fraser
Condition of Artifact: Excellent Conditon
Temperature.....: 20.0 °C

Humidity: 50.0 % RH

Water Temperature: 12.9 °C

Laboratory Volume Standard(s) Used

Description	Serial Number	Report Number	Date Calibrated	Date Calibration Due
25 gal Prover	3505	60405001	4/7/2006	4/6/2011

Department of Labor & Industry ♦ Weights and Measures Program
Metrology Laboratory
2801 North Cooke Street ♦ Helena ♦ Montana ♦ 59601
Office (406) 449-2582 ♦ Fax (406) 841-2060 ♦ e-mail: kreimund@mt.gov

Report of Calibration #: 2015-V037

Calibration Date: June 23, 2015 *Calibration Due Date: June 23, 2017*

Laboratory Temperature Standard(s) Used

Description	Serial Number	Report Number	Date Calibrated	Date Calibration Due
Digital Thermometer	G97006199	92335	4/6/2005	4/6/2009
Digital Thermometer	G97006199	92335	4/6/2005	4/6/2009

Relevant Information

- In-accordance-with ISO/IEC FDIS 17025, *General Requirements for the Competence of Testing and Calibration Laboratories,* paragraph 5.10.4.4 'A calibration certificate (or calibration label) shall not contain any recommendation on the calibration interval except where this has been agreed with the client. This requirement may be superseded by legal regulations.'
- In-accordance-with Administrative Rules of Montana (ARM), Rule Number: 24.351.1115, paragraph 2, "A registered serviceperson and a registered service agency shall submit, at least biennially, to the bureau for examination and certification, any standards and testing equipment that are used, or are to be used, in the performance of the service and testing functions with respect to weighing and measuring devices for which competence is registered...."
- The results listed in this report relate only to the artifacts described and extent of calibrations performed.

Traceability Statement

The item(s) listed above have been compared to the Standards of the State of Montana. The Standards of the State of Montana are traceable to the National Institute of Standards and Technology (NIST) and are part of a comprehensive measurement assurance program for ensuring continued accuracy and measurement traceability within the level of uncertainty reported by this laboratory. The report of calibration number identified in the title of this report is the unique report number to be used in referencing measurement traceability for the artifact(s) identified in this report only.

Uncertainty Statement

The combined standard uncertainty includes uncertainties reported for the standard, uncertainties associated with the measurement process, uncertainties for any observed deviations from reference values which are less than surveillance limits, and other uncertainties associated with the particular artifact (i.e., reading meniscus, air buoyancy corrections, etc.). A component for viscosity is not included in the uncertainty budget. The combined standard uncertainty is multiplied by k, a coverage factor of 2, to give the expanded uncertainty (which defines an interval with an approximate 95 percent level of confidence). The expanded uncertainty presented in this report is consistent with NIST Technical Note 1297

Certification Statement

Department of Labor & Industry ♦ Weights and Measures Program
Metrology Laboratory
2801 North Cooke Street ♦ Helena ♦ Montana ♦ 59601
Office (406) 449-2582 ♦ Fax (406) 841-2060 ♦ e-mail: kreimund@mt.gov

Report of Calibration #: 2015-V037

Calibration Date: June 23, 2015 *Calibration Due Date: June 23, 2017*

This laboratory meets the requirements of ISO/IEC 17025 and ANSI/NCSL Z540-1. This report may not be used to claim product endorsement by NIST or any other government agency, and may not be reproduced, except in full, without written approval from the laboratory.

Dave Fraser, State Metrologist

Department of Labor & Industry ♦ Weights and Measures Program
Metrology Laboratory
2801 North Cooke Street ♦ Helena ♦ Montana ♦ 59601
Office (406) 449-2582 ♦ Fax (406) 841-2060 ♦ e-mail: kreimund@mt.gov

Report of Calibration #: 2015-V036

Calibration Date: June 23, 2015 *Calibration Due Date: June 23, 2017*

Artifact

Test Item.....: LPG testing pressure vessel
Volume.....: 100 gal
Serial Number: 2096
Date Received: June 22, 2015

Manufacture.: Gas Services Supply
Material.....: Steel, Pressure Vessel, Low Carbon
Specification.: NIST HB 105-4

Submitted By

Travis Thompson
T & T Measurements
10621 43rd Street Northwest
Newtown, ND 58763

Purchase Order #:
Point of Contact..: Travis Thompson
Phone #.....: (701) 675-2373

Artifact Calibration Results

Nominal Volume (at zero mark on gauge)	Prover Volume As Found @ 60 °F and 100 psig (gal)	Prover Volume As Left @ 60 °F and 100 psig (gal)	Specification Tolerance ± (gal)	Uncertainty k=2 ± (gal)
100 gal	**100.018**	**100.018**	0.050	0.037

Table 1 - LPG Prover Corrections @ 60 °F

psig	Prover Scale Reading (gal)	Pressure Correction (Pcorr) (gal)**	Prover Error (gal)	Prover Volume (gal)
0	0.050	-0.102	-0.084	99.916
10	0.042	-0.097	-0.079	99.921
20	0.034	-0.092	-0.074	99.926
30	0.026	-0.086	-0.068	99.932
40	0.018	-0.081	-0.063	99.937
50	0.010	-0.076	-0.058	99.942
60	-0.008	-0.061	-0.043	99.957
70	-0.026	-0.046	-0.028	99.972
80	-0.044	-0.030	-0.012	99.988
90	-0.062	-0.015	0.003	100.003
100	-0.080	0.000	0.018	100.018

Department of Labor & Industry ♦ Weights and Measures Program
Metrology Laboratory
2801 North Cooke Street ♦ Helena ♦ Montana ♦ 59601
Office (406) 449-2582 ♦ Fax (406) 841-2060 ♦ e-mail: kreimund@mt.gov

Report of Calibration #: 2015-V036

Calibration Date: June 23, 2015 *Calibration Due Date: June 23, 2017*

110	-0.096	0.013	0.031	100.031
120	-0.112	0.026	0.044	100.044
130	-0.128	0.040	0.058	100.058
140	-0.144	0.053	0.071	100.071
150	-0.160	0.066	0.084	100.084
160	-0.174	0.077	0.095	100.095
170	-0.188	0.088	0.106	100.106
180	-0.202	0.100	0.118	100.118
190	-0.216	0.111	0.129	100.129
200	-0.230	0.122	0.140	100.140

* Gauge scale was adjusted for nominal volume at 100 psig.

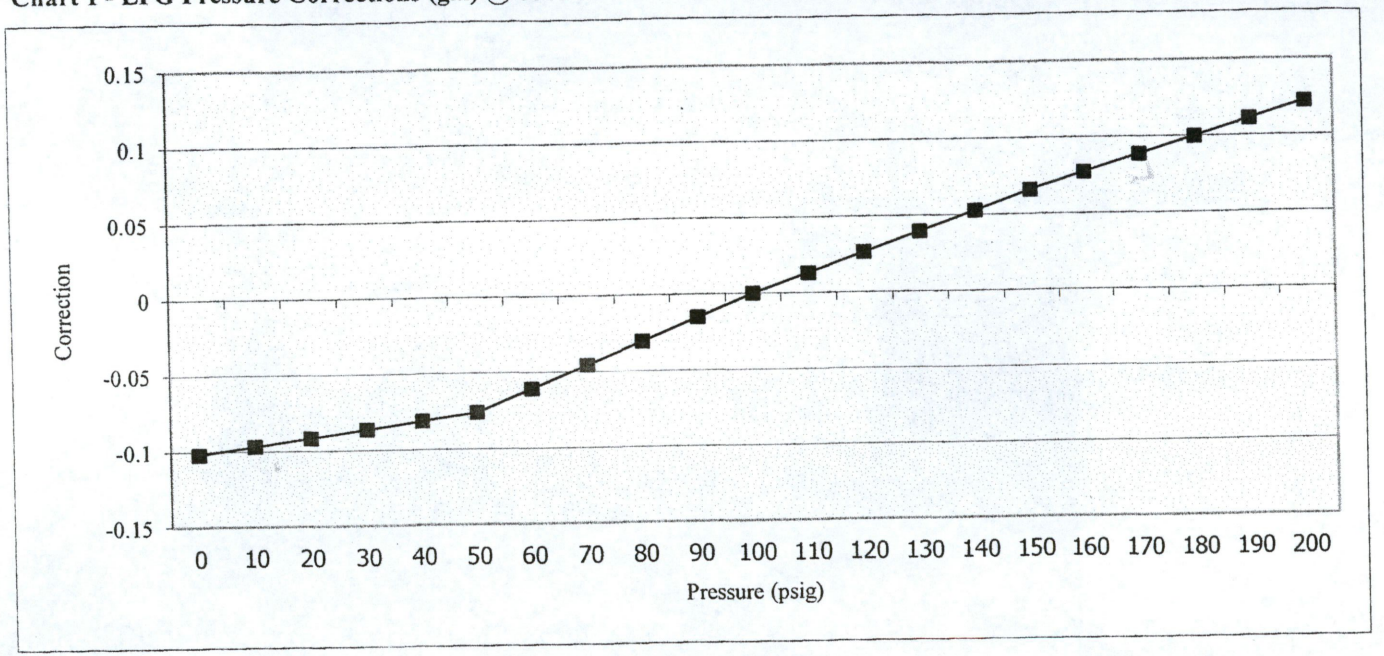
** Gauge scale could not be adjusted or did not need to be adjusted.

Department of Labor & Industry ♦ Weights and Measures Program
Metrology Laboratory
2801 North Cooke Street ♦ Helena ♦ Montana ♦ 59601
Office (406) 449-2582 ♦ Fax (406) 841-2060 ♦ e-mail: kreimund@mt.gov

Report of Calibration #: 2015-V036

Calibration Date: June 23, 2015 *Calibration Due Date: June 23, 2017*

Chart 1 - LPG Pressure Corrections (gal) @ 60 °F



Calibration Notes

- A prover is considered in-tolerance when the prover error is equal to or less than the specified tolerance minus the measurement uncertainty. **Bold print** indicates an out-of-tolerance reading.
- The prover 'As Left' volume is 'Out-of-Tolerance', the user must use a correction for all meter testing.
- The Neck Scale Calibration Value (NSCV) = 1.0
- To use the Neck Scale Plate Calibration Factor, multiply the reading you see on the neck scale plate times the calibration factor. The result is the reading you would use. A Neck Scale Plate Calibration Factor of 1.0 means the neck scale can be read directly.
- Enter the Pressure Correction from Table 1 that corresponds with the pressure being tested on your LPG Meter Test form.

Department of Labor & Industry ♦ Weights and Measures Program
Metrology Laboratory
2801 North Cooke Street ♦ Helena ♦ Montana ♦ 59601
Office (406) 449-2582 ♦ Fax (406) 841-2060 ♦ e-mail: kreimund@mt.gov

Report of Calibration #: 2015-V036

Calibration Date: June 23, 2015 *Calibration Due Date: June 23, 2017*

- The calibration item was calibrated in a "wet down" condition using water. The calibration data above applies when the prover is drained for a 30 (± 5) second period after cessation of the main flow.
- The Top Securty Seal Number is and the Bottom Security Seal Number is .

Calibration Conditions

Technician.....: Dave Fraser Procedure: NIST HB 145, SOP 21

Condition of Artifact: Great condition, prepared properly for testing.

Temperature.....: 20.5 °C Humidity: 25.9 % RH Water Temperature: 13.0 °C

Laboratory Volume Standard(s) Used

Description	Serial Number	Report Number	Date Calibrated	Date Calibration Due
100 gal Prover	34768-2	60405001	4/7/2006	4/6/2011

Department of Labor & Industry ♦ Weights and Measures Program
Metrology Laboratory
2801 North Cooke Street ♦ Helena ♦ Montana ♦ 59601
Office (406) 449-2582 ♦ Fax (406) 841-2060 ♦ e-mail: kreimund@mt.gov

Report of Calibration #: 2015-V036

Calibration Date: June 23, 2015 *Calibration Due Date: June 23, 2017*

Laboratory Temperature Standard(s) Used

Description	Serial Number	Report Number	Date Calibrated	Date Calibration Due
Digital Thermometer	G97006199	92335	4/6/2005	4/6/2009
Digital Thermometer	G97006199	92335	4/6/2005	4/6/2009

Relevant Information

- In-accordance-with ISO/IEC FDIS 17025, *General Requirements for the Competence of Testing and Calibration Laboratories,* paragraph 5.10.4.4 'A calibration certificate (or calibration label) shall not contain any recommendation on the calibration interval except where this has been agreed with the client. This requirement may be superseded by legal regulations.'
- In-accordance-with Administrative Rules of Montana (ARM), Rule Number: 24.351.1115, paragraph 2, "A registered serviceperson and a registered service agency shall submit, at least biennially, to the bureau for examination and certification, any standards and testing equipment that are used, or are to be used, in the performance of the service and testing functions with respect to weighing and measuring devices for which competence is registered...."
- The results listed in this report relate only to the artifacts described and extent of calibrations performed.

Traceability Statement

The item(s) listed above have been compared to the Standards of the State of Montana. The Standards of the State of Montana are traceable to the National Institute of Standards and Technology (NIST) and are part of a comprehensive measurement assurance program for ensuring continued accuracy and measurement traceability within the level of uncertainty reported by this laboratory. The report of calibration number identified in the title of this report is the unique report number to be used in referencing measurement traceability for the artifact(s) identified in this report only.

Uncertainty Statement

The combined standard uncertainty includes uncertainties reported for the standard, uncertainties associated with the measurement process, uncertainties for any observed deviations from reference values which are less than surveillance limits, and other uncertainties associated with the particular artifact (i.e., reading meniscus, air buoyancy corrections, etc.). A component for viscosity is not included in the uncertainty budget. The combined standard uncertainty is multiplied by k, a coverage factor of 2, to give the expanded uncertainty (which defines an interval with an approximate 95 percent level of confidence). The expanded uncertainty presented in this report is consistent with NIST Technical Note 1297

Certification Statement

Department of Labor & Industry ♦ Weights and Measures Program
Metrology Laboratory
2801 North Cooke Street ♦ Helena ♦ Montana ♦ 59601
Office (406) 449-2582 ♦ Fax (406) 841-2060 ♦ e-mail: kreimund@mt.gov

Report of Calibration #: 2015-V036

Calibration Date: June 23, 2015 *Calibration Due Date: June 23, 2017*

This laboratory meets the requirements of ISO/IEC 17025 and ANSI/NCSL Z540-1. This report may not be used to claim product endorsement by NIST or any other government agency, and may not be reproduced, except in full, without written approval from the laboratory.

Dave Fraser, State Metrologist

Certificate of Volume Calibration

Montana Department of Labor & Industry Metrology Laboratory
2801 N Cooke St. Helena, Montana 59601
(406)449-2582 FAX (406)443-8163

Company Name & Address:	Date of Test:	Test Number:
Travis Thompson	6/23/2015	2015-V035
T & T Measurements		
10621 43rd Street Northwest	Prover #: 34768-2	
Newtown, ND 58763	MT Cal Report #: 060405001	

All results contained within this report only relate to the item(s) listed in this report. This calibration report must not be used to claim product endorsement by the State of Montana or any other government agency.

Date these weights were received: 6/22/2015

Description and condition of artifacts received: Item was in good shape and clean.

Environmental Conditions at Time of Test:

Temperature °C	Relative Humidity %
23.89	26.8

Final Volume at 60 °F: Material: ***Stainless Steel*** CCE of Test Measure: ***0.000 0186***

Nominal	Serial No.	As Found (gallons)	As Left (gallons)	Uncertainty ± (gallons)	NIST 105-3 Tolerance ± (gallons)	*k factor*
100 gallon	12872105-2	99.975	99.975	0.010	0.05	2.00

Standards and Procedures used for testing:

The Standards used for this comparison are continuously monitored by a measurement control program for ensuring continued accuracy and traceability within the level of uncertainty reported. These standards were calibrated by a nationally accredited laboratory on 10/2009 (Reports on File) and are traceable to the SI. The test number listed above is traceable to National Standards through an unbroken chain of comparison each having stated uncertainties. This information is on file and available upon request.

Procedure Used: SOP-19 (To Deliver)

All procedures used in this laboratory are in accordance to National Institute of Standards and Technology Intermediate Report (NISTIR) 6969, issue February 2012, and the *Quality Assurance of Metrological Measurements*.

Traceability Statement:

The equipment in this report has been compared to the standards of the State of Montana. The States equipment complies with the specifications and tolerances listed in NIST 105-3. The standards of the State of Montana are traceable to the SI through the National Institute of Standards and Technology.

Uncertainty Statement:

The expanded uncertainty presented in this report is consistent with the 1993 *ISO Guide to Expression of Uncertainty in Measurement* and follows *NISTIR 6969,* issue February 2012, SOP-29. The reported uncertainty is calculated by combining the uncertainty of the standard used, with the uncertainty of the measurement process in a root sum square formula using a calculated *k* factor, for a confidence level of 95.45%.

State Metrologist: ***Dave Fraser***

David Fraser

Email: dafraser@mt.gov

Certificate of Volume Calibration

Montana Department of Labor & Industry Metrology Laboratory
2801 N Cooke St. Helena, Montana 59601
(406)449-2582 FAX (406)443-8163

Company Name & Address:

Travis Thompson
T & T Measurements
10621 43rd Street Northwest
Newtown, ND 58763

Date of Test: 6/24/2015

Test Number: 2015-V034

Slicker Plate: 179363
MT Cal Report #: 060405001

All results contained within this report only relate to the item(s) listed in this report. This calibration report must not be used to claim product endorsement by the State of Montana or any other government agency.

Date these weights were received: 6/22/2015

Description and condition of artifacts received: Items were in good condition.

Environmental Conditions at Time of Test:

Temperature °C	Relative Humidity %
23	28

Final Volume at 60 °F: Material: ***Stainless Steel*** CCE of Test Measure: ***0.000 0265***

Nominal	Serial No.	As Found (gallons)	As Left (gallons)	Uncertainty ± (gallons)	NIST 105-3 Tolerance ± (gallons)	*k* factor
5 gal	1427	5.0048	5.0004	0.0013	0.0025	2.00
5 gal	1428	5.0000	5.0000	0.0013	0.0025	2.00
5 gal	1429	5.0043	5.0000	0.0013	0.0025	2.00

Standards and Procedures used for testing:

The Standards used for this comparison are continuously monitored by a measurement control program for ensuring continued accuracy and traceability within the level of uncertainty reported. These standards were calibrated by a nationally accredited laboratory on 10/2009 (Reports on File) and are traceable to the SI. The test number listed above is traceable to National Standards through an unbroken chain of comparison each having stated uncertainties. This information is on file and available upon request.

Procedure Used: SOP-19 (To Deliver)

All procedures used in this laboratory are in accordance to National Institute of Standards and Technology Intermediate Report (NISTIR) 6969, issue February 2012, and the *Quality Assurance of Metrological Measurements*.

Traceability Statement:

The equipment in this report has been compared to the standards of the State of Montana. The States equipment complies with the specifications and tolerances listed in NIST 105-3. The standards of the State of Montana are traceable to the SI through the National Institute of Standards and Technology.

Uncertainty Statement:

The expanded uncertainty presented in this report is consistent with the 1993 *ISO Guide to Expression of Uncertainty in Measurement* and follows *NISTIR 6969,* issue February 2012, SOP-29. The reported uncertainty is calculated by combining the uncertainty of the standard used, with the uncertainty of the measurement process in a root sum square formula using a calculated *k* factor, for a confidence level of 95.45%.

State Metrologist: ***Dave Fraser***

David Fraser

Email: dafraser@mt.gov

Wyoming Department of Agriculture
Weights and Measures Laboratory
6607 Campstool Rd
Cheyenne, WY 82002
(307)777-7556

REPORT OF CALIBRATION

Issued To:
T&T Measurements Inc.
10671 23rd St Northwest
Newtown, ND 58763

Point of Contact:
Travis Thompson
Ph. 701-421-1352

Purchase Order Number:
N/A

Report Number:
15048

Calibration Date: June 2, 2015

This is to certify that the information contained in this report is true and correct as of the date of calibration.

Robert Weidler, State Metrologist

6-2-15
Date of Issue

WDA Weights and Measures Metrology Laboratory

Report Number: 15048

Calibration Date: June 2, 2015

Artifact(s) Description

Test Item: 100 gal LPG Prover
Serial Number: 2075
Material: Steel, Pressure Vessel, Low Carbon
Condition: Good

Date Received: June 1, 2015
Manufacture: Gas Service and Supply
Material CCE: 0.000016 / °F
Specification: NIST HB 105-4

Calibration Information

Job Order #: N/A
Metrologist: Robert Weidler
Procedure: NISTIR 7383, SOP 21

Temperature: 21.2 °C
Humidity: 54.6 % RH
Water Temperature: 21.8 °C

Laboratory Reference Standards Used

Description	Serial Number	Cert. Number	Cal Date	Cal Due
100 gallon Slicker Plate	11-53192	NC1203-117-GV	3/23/2012	3/23/2022

Traceability Statement

The artifact(s) described in this report have been compared to the Standards of the State of Wyoming. The Standards of the State of Wyoming are traceable to the National Institute of Standards and Technology (NIST) and are part of a comprehensive measurement assurance program for ensuring continued accuracy and measurement traceability within the level of uncertainty reported by this laboratory. The International System of Units (SI) for volume is the cubic meter (m^3) (see Conversion Factors on page 3). The report number for this report is the only unique report number to be used in referencing measurement traceability for the artifact(s) described in this report.

Uncertainty Statement

The combined standard uncertainty includes uncertainties reported for the standard, uncertainties associated with the measurement process, uncertainties for any observed deviations from reference values which are less than surveillance limits, and other uncertainties associated with the particular artifact (i.e., material cubical coefficient of expansion, reading meniscus, etc.). The combined standard uncertainty is multiplied by k, a coverage factor of 2, to give the expanded uncertainty (which defines an interval with an approximate 95 percent level of confidence). The expanded uncertainty presented in this report is consistent with NIST Technical Note 1297.

Pertinent Information

- In-accordance-with ISO/IEC FDIS 17025, General Requirements for the Competence of Testing and Calibration Laboratories, paragraph 5.10.4.4 'A calibration certificate (or calibration label) shall not contain any recommendation on the calibration interval except where this has been agreed with the client. This requirement may be superseded by legal regulations.'
- The artifact is considered in-tolerance when the error is equal to or less than the specified tolerance minus the measurement uncertainty. RED print indicates an out-of-tolerance reading.
- The LPG Prover 'As Left' volume is 'In-Tolerance', the LPG Prover may be used in meter testing without a correction.
- Enter the Pressure Correction from Table 1 that corresponds with the pressure being tested on your LPG Meter Test form.
- The calibration item was calibrated in a "wet down" condition using water. The calibration data above applies when the prover is drained for a 30 (± 5) second period after cessation of the main flow.
- The results listed in this report relate only to the artifacts described and extent of calibrations performed.

Conversion Factors

From NIST Special Publication 811, *Guide for the Use of the International System of Units (SI)*

Factors in **boldface** are exact

To convert from	to	multiply by
gallon (U.S.) (gal)	to cubic meter (m^3)	3.875 412 E-03
cubic inch (in^3)	to cubic meter (m^3)	**1.638 706 4 E-05**
liter (L)	to cubic meter (m^3)	**1.0 E-03**

WDA Weights and Measures Metrology Laboratory

Report Number: 15048

Calibration Date: June 2, 2015

Calibration Results

Nominal Volume (at zero mark on gauge)	Prover Volume As Found @ 60 °F and 100 psig (gal)	Prover Volume As Left @ 60 °F and 100 psig (gal)	NIST HB 105-4 Specification Tolerance ± (gal)	Uncertainty k=2 ± (gal)
100 gal	99.995	99.995	0.200	0.023

Table 1 - LPG Prover Corrections @ 60 °F

psig	Prover Scale Reading (gal)	Pressure Correction (Pcorr) (gal)[2]	Prover Error (gal)	Prover Volume (gal)
0	0.125	-0.074196283	-0.078928577	99.92107142
10	0.11	-0.061776655	-0.066508948	99.93349105
20	0.095	-0.049357027	-0.05408932	99.94591068
30	0.08	-0.036937398	-0.041669692	99.95833031
40	0.065	-0.02451777	-0.029250063	99.97074994
50	0.05	-0.012098142	-0.016830435	99.98316957
60	0.045	-0.009678513	-0.014410807	99.98558919
70	0.04	-0.007258885	-0.011991178	99.98800882
80	0.035	-0.004839257	-0.00957155	99.99042845
90	0.03	-0.002419628	-0.007151922	99.99284808
100	0.025	0	-0.004732293	99.99526771
110	0.015	0.007419628	0.002687335	100.0026873
120	0.005	0.014839257	0.010106963	100.010107
130	-0.005	0.022258885	0.017526592	100.0175266
140	-0.015	0.029678513	0.02494622	100.0249462
150	-0.025	0.037098142	0.032365848	100.0323658
160	-0.035	0.04451777	0.039785477	100.0397855
170	-0.045	0.051937398	0.047205105	100.0472051
180	-0.055	0.059357027	0.054624733	100.0546247
190	-0.065	0.066776655	0.062044362	100.0620444
200	-0.075	0.074196283	0.06946399	100.069464

[1]Gauge scale was adjusted for nominal volume at 100 psig.

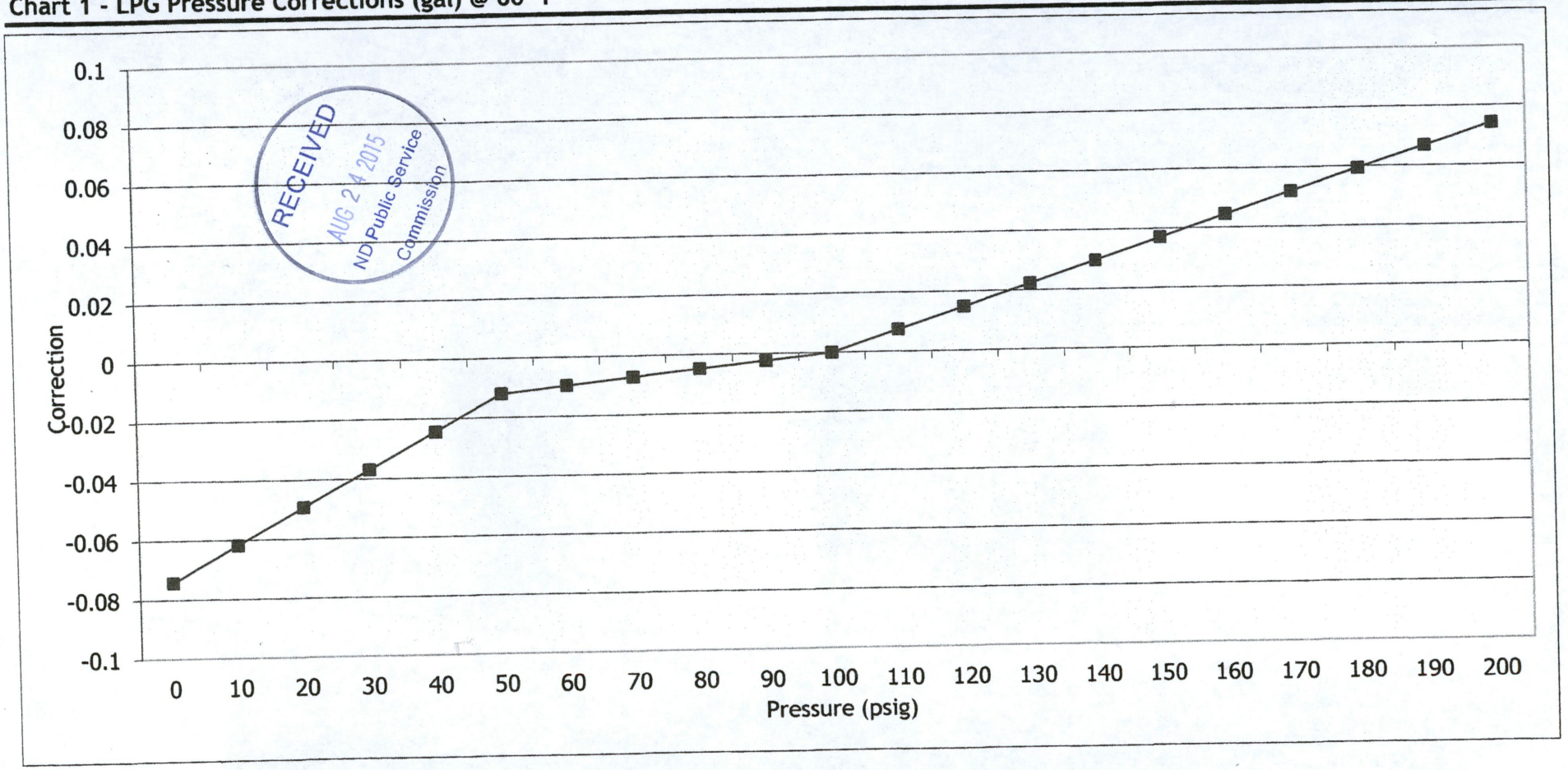
[2]Gauge scale could not be adjusted or did not need to be adjusted.

WDA Weights and Measures Metrology Laboratory

Report Number: 15048

Calibration Date: June 2, 2015

Chart 1 - LPG Pressure Corrections (gal) @ 60 °F



Wyoming Department of Agriculture
Weights and Measures Laboratory
6607 Campstool Rd
Cheyenne, WY 82002
(307)777-7556

Wyoming Agriculture

Calibration Certificate
For

Six – 50 lb Class F Test Weights

Manufacturer: Various
Serial No.: Listed on Following Table

Submitted by
T&T Measurements Inc.
10671 23rd St Northwest
Newtown, ND 58763
(701)421-1352

Serial Number	Nominal (lb)	Conventional Mass Correction (mg)		Tolerance (g)	Expanded Uncertainty (g)
		As Found	As Left		
1	50	-0.56	-0.56	2.3	0.20
2	50	-0.44	-0.44	2.3	0.20
3	50	-0.66	-0.66	2.3	0.20
4	50	-0.29	-0.29	2.3	0.20
5	50	-0.75	-0.75	2.3	0.20
6	50	-0.99	-0.99	2.3	0.20

The data in this table applies only to those items specifically listed on this report.

Uncertainty Statement:
The combined standard uncertainty includes the standard uncertainty reported for the standard and the standard uncertainty for the measurement process. The combined standard uncertainty is multiplied by a coverage factor of 2.02 to give an expanded uncertainty, which defines and interval having a level of confidence of approximately 95 percent. The expanded uncertainty presented in this report is consistent with the 1993 ISO Guide to the Expression of Uncertainty in Measurement. The expanded uncertainty is not to be confused with a tolerance limit for the user during application.

Traceability Statement:
Standards used for comparison are traceable to United States national standards at NIST and are part of a comprehensive measurement assurance program for ensuring continued accuracy and traceability reported by this laboratory. The laboratory test number identified above is the unique report number to be used in referencing measurement traceability for artifacts identified in this report only. Traceability is maintained to the SI using the following conversion: 1 lb = 0.45359237 kg.

Supplemental Information

Description of artifacts submitted for testing:
Six-50 lb Class F Cast Iron Test Weights with and assumed density of 7.20 g/cm^3.

Conditions of artifacts submitted for testing:
Artifacts were in fair condition for the type and class.

Treatment of artifacts prior to testing:
Artifacts were clean upon arrival with no further treatment needed.

Equipment and Standards:

Balance	Range	Standards Used
Mettler XP5003	0 kg – 32.1 kg	WY WS

Procedure used:
Single Substitution Method (NISTIR 6969, SOP 7)

Environmental conditions are maintained within the following parameters:

Temperature	Relative Humidity
18 °C to 27 °C	40.0% to 60%

Date Artifacts Received: June 1, 2015

Date of test: June 2, 2015

Test performed by: _____ Date of Report Preparation: June 2, 2015

Robert Weidler
WDA State Metrologist

Wyoming Department of Agriculture
Weights and Measures Laboratory
6607 Campstool Road
Cheyenne, WY 82002
(307)777-7556

Wyoming Agriculture

Calibration Certificate

For

One-500 gallon Stainless Steel Prover,
One-100 gallon Carbon Steel Provers,
and
Two-5 gallon Test Measures

Manufacturer: Listed on Following Table
Serial No.: Listed on Following Table

Submitted by
T&T Measurements Inc.
10671 23rd St Northwest
Newtown, ND 58763
(701)421-1352

Manufacturer	Model Number	Serial Number	Nominal (gal)	Prover Volume (gal)	Prover Error (gal)	Expanded Uncertainty (gal)
Gas Service and Supply	GSB500	1430	500	499.993*	-0.007	0.041
Gas Service and Supply	100USG	12872105-2	100	100.0124*	0.0124	0.0053
Ellisco	FS282-5D	16970	5	4.9998**	-0.0002	0.0012
Seraphin	E3	11-88455	5	4.9999**	-0.0001	0.0012
The data in this table applies only to those items specifically listed on this report.						

** Prover Volume is Volume to Deliver after the cessation of flow and 30 second drain time at a reference temperature of 60° F.*
***Prover Volume is Volume to Deliver after a 30 second pour and 10 second drain time at a reference temperature of 60° F.*

Uncertainty Statement:
The combined standard uncertainty includes the standard uncertainty reported for the standard and the standard uncertainty for the measurement process. The combined standard uncertainty is multiplied by a coverage factor of 2.02 to 2.25 to give an expanded uncertainty, which defines and interval having a level of confidence of approximately 95 percent. The expanded uncertainty presented in this report is consistent with the 1993 ISO Guide to the Expression of Uncertainty in Measurement. The expanded uncertainty is not to be confused with a tolerance limit for the user during application.

Traceability Statement:
Standards used for comparison are traceable to United States national standards at NIST and are part of a comprehensive measurement assurance program for ensuring continued accuracy and traceability reported by this laboratory. The laboratory test number identified above is the unique report number to be used in referencing measurement traceability for artifacts identified in this report only. Traceability to the SI is maintained using the conversion factor: 1 gallon = 231 in^3 = 3.785412 L = 0.003785412 m^3.

Supplemental Information

Description of artifacts submitted for testing:
One-500 gallon Stainless Steel Prover, One-100 gallon Carbon Steel Prover, One-5 gallon Carbon Steel Test Measure and One-5 gallon Stainless Steel Test Measure; assumed Cubical Coefficient of Thermal Expansion for Stainless Steel 0.0000265/°F and for Carbon Steel 0.0000186/°F.

Conditions of artifacts submitted for testing:
Artifacts were in good condition for the type and class; no adjustments were made.

Treatment of artifacts prior to testing:
Artifacts were degreased and thoroughly rinsed prior to calibration.

Equipment and Standards:

Standard	Range
SP100	100 gallons
NBS4214	5 gallons

Procedure used:
Volume Transfer Method (NISTIR 7383, SOP 19)

Environmental conditions are maintained within the following parameters:

Temperature	Relative Humidity
18 °C to 27 °C	40.0% to 60%

Date Artifacts Received: June 1, 2015

Date of test: June 1, 2015 and June 2, 2015

Test performed by: _____

Robert Weidler
WDA State Metrologist

Date of Report Preparation: June 2, 2015

North Dakota nd.gov Official Portal for North Dakota State Government

SECRETARY OF STATE
NORTH DAKOTA

Home | Business Records Search

T & T MEASUREMENTS, INC.

Corporation Details

System ID: 24873500
Phone: (701) 675-2373
Type: BUSINESS CORPORATION
Status: Active & Good Standing
Original File Date: 05/30/2008
Effective Date: 07/01/2008
State of Origin: North Dakota

Nature of Business

CERTIFICATION OF REPAIR OF METERS, LIQUID & GAS

Principal Office

10671 43RD ST NW NEW TOWN, ND 58763-9027

Registered Agent

TRAVIS THOMPSON
10671 43RD ST NW
NEW TOWN, ND 58763-9027
Established Date: Jul 01, 2008

Authorized Shares

Class	Number	Par Value
	50000.000000	$.000000

Generate an Annual Report To File

To Generate a Annual Report form to be filed with the Secretary of State, select the appropriate year of the report you intend to file. This report does not contain details of a report previously filed with the Secretary of State. The annual report years reflected are an indication of the various report forms available in this site and is not an indication that an entity needs to file reports for all years. Missing years indicate that the forms for the missing year have not yet been deployed to the website, or have already been removed, and can be obtained by contacting the Secretary of State.

2015 (generates a forms-fillable pdf in a new pop-up window)

Return to Search Results

United States Department of Commerce

National Institute of Standards and Technology

Certificate of Metrological Traceability For:

Wyoming

This laboratory has demonstrated evidence of an unbroken chain of metrological traceability of its standards to the international system of units (SI), documented measurement uncertainties, uses documented measurement procedures, successfully completed training and proficiency tests, documented calibration intervals, submitted a quality management system, and demonstrated suitable measurement assurance for the Scope listed on this certificate.

The Office of Weights and Measures Program assesses laboratories to NIST Handbook 143 - Program Handbook for State Weights and Measures Laboratories and ISO/IEC 17025:2005.

Scope

Mass Echelon III

3000 lb to 0.001 lb
8 oz to 0.03125 oz

Weight Carts
4500 lb to 2000 lb

Volume Transfer, II

1000 gal to 5 gal
100 gal to 25 gal LPG

2014 - 2015

Carol T. Hockert, Chief
NIST Office of Weights and Measures

Effective Dates: 2014-01-01 to 2015-12-31

Amended: 2014-03-01

Expanded Scope to increase lower Mass Echelon III Weight Cart limit to 2000 lb.

(Rev.: March 2013)

United States Department of Commerce

National Institute of Standards and Technology

Certificate of Metrological Traceability For:

Montana

This laboratory has demonstrated evidence of an unbroken chain of metrological traceability of its standards to the international system of units (SI), documented measurement uncertainties, uses documented measurement procedures, successfully completed training and proficiency tests, documented calibration intervals, submitted a quality management system, and demonstrated suitable measurement assurance for the Scope listed on this certificate.

The Office of Weights and Measures Program assesses laboratories to NIST Handbook 143 - Program Handbook for State Weights and Measures Laboratories and ISO/IEC 17025:2005.

2015

Scope

Mass Echelon III

30 kg to 1 mg

3000 lb to 0.001 lb

8 oz to 0.03125 oz

Weight Carts

5000 lb to 2000 lb

Volume Transfer, II

1500 gal to 5 gal

100 gal LPG to 25 gal LPG

Carol T. Hockert, Chief
NIST Office of Weights and Measures

Effective Dates: 2015-01-01 to 2015-12-31

(Rev.: March 2013)