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## Giving You More

LTI is one of the largest full-service labs in North America providing all services at one convenient location. This is a timesaver and makes coordination and delivery of orders easy for customers.

Occasionally we hear about a need for another service that LTI can offer to make our package of services even more complete. Many of you

have asked and we're responding with three new services.

On-site Electrical and Pressure Calibration services were introduced this summer. The following should be available to order by year end:

- Ultrasonic Testing on Welds
- High Cycle Fatigue Testing

*Read more on page 2.*

## In This Issue

Steam Engine Undergoes Nondestructive Testing.....	1
Are You Waiting For These New Services?.....	2
Trusted Testing For Additive Manufacturing .....	2
Visit Our Show Booths.....	3
Quality Magazine Runs New LTI Article .....	3
Steam Engine Undergoes Nondestructive Testing (continued) .....	3
Giving You More .....	4
Holiday Hours .....	4

## Holiday Hours

LTI will be closed the following days for end-of-year holidays:

Thursday - November 24th  
Friday - November 25th  
Friday - December 23  
Monday - December 26  
Monday - January 2, 2017

**Enjoy the Holidays!**

## Contact LTI

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Steam locomotive engine No. 2102

## Steam Engine Undergoes Nondestructive Testing

The Reading Blue Mountain and Northern Railroad (RBMN), headquartered in Port Clinton, PA, currently serves businesses in nine Eastern Pennsylvania counties by handling freight transported throughout the United States, as well as import/export traffic. In addition, around a hundred thousand guests each year

take narrated passenger excursions along the Lehigh Gorge Scenic Railway in the company's vintage coaches and participate in a number of their special events.

### A Story of Expansion and New Opportunities

The railroad began its operations in 1983 as a 13-mile short line providing freight services in Berks County, PA. Due to numerous acquisitions over the years, the railroad now owns tracks covering more than 400 miles in PA. They span from Reading to Mifflintown in Wyoming County, from Towanda to Monroe in Bradford County, and through other regions. Reading Blue Mountain and Northern Railroad connects to both Norfolk Southern and Canadian Pacific Class I railroads.

RBMN was known in its early days for handling coal shipments, but now transports plastics, wine, lumber, paper, wood pulp, grains, chemicals, metals, sand and other materials. To meet the demands of a growing

business, RBMN has purchased over 1,000 rail cars and 30 locomotives over the years. Andy Muller, Jr., owner and CEO of the rail company, has a personal interest in collecting and restoring vintage engines and rail cars. The purchases included some historic steam and diesel engines that were renovated for RBMN's expanding passenger excursion business.

### Restoring Steam Engine No. 2102

One of the railroad's latest projects is the restoration of steam locomotive engine No. 2102 that was built by Baldwin in 1923 and converted to T-1 Class by the Reading Railroad in 1945. No. 2102 ran various excursions in Pennsylvania, Ohio and Maryland from 1966 to 1985 while under the ownership of a few different groups.

Andy Muller, Jr. purchased the engine in late 1985. After running excursions for RBMN into the early 1990's, it was in need of an overhaul and taken out of service. The engine was on display at the RBMN headquarters for much of the time since then.



Inspecting the firebox

Long-time plans for a rebuild and restoration were launched in January 2016, fueled by increased ridership on excursions and a team of determined employees. Before any restoration work could begin, the condition of the engine needed to be fully assessed.

*Continued on page 3*

LAB NEWS

## Are You Waiting For These New Services?

### On-site Electronic and Pressure Calibration

Our Calibration Lab, LTI Metrology, continues to grow and invest in new capabilities. Our focus these past few months has been on expanding on-site services.

Most of these new services are also performed at LTI, but customers find calibration at their facilities to be more convenient:

Pressure Calibration to 600 PSI

Electronic Calibration:

- Arc Welders
- Frequency Counters
- Function / Signal Generators
- Optical Tachometers
- Oscilloscopes
- Digital Voltmeters/Multimeters

### Ultrasonic Testing on Welds

Our Nondestructive Testing Department is expanding its capabilities in Ultrasonic Testing. We will soon be offering UT inspection on welds, starting with flat weld inspections in the next few months.

We've had many requests for this test from customers receiving slow turnaround and unsatisfactory service from their current weld inspector. LTI is committed to working with



customers to support their requirements and scheduling needs.

### High Cycle Fatigue Testing

As the name implies, a high cycle fatigue test runs through many load cycles, typically 10,000 to 10,000,000. Our Fracture Mechanics Lab has increased the number of servo hydraulic machines in order to accommodate orders for this long-running test.

In the 4th quarter of 2016, we expect to be offering two test types:

- Axial Fatigue
- Fastener Fatigue

Testing will be offered to the following specifications:

- ASTM E466
- EN 6072
- NASM 1069
- NASM 1312-11



Our team currently performs routine fatigue crack growth and fracture toughness testing, as well as customized testing to meet unique requirements. Contact us for a quote.

## Trusted Testing for Additive Manufacturing



With the growing demand for more complex products produced by Additive Manufacturing or 3D printing processes, it is imperative that businesses have a reliable testing partner to help meet

product quality requirements and tight deadlines.

LTI's comprehensive array of services support clients at all stages of the production cycle. Our destructive and nondestructive testing methods provide reliable test results on all of the following:

- Input materials
- Prototypes
- Finished products

- Comparisons of 3D printed materials with those produced by traditional methods.

A broad-range of testing services is offered to accomplish the following and more:

- Identify material composition, trace elements, impurities
- Measure apparent density
- Verify mechanical properties and heat treat upgrade
- Evaluate microscopic product features such as grain size and surface contamination
- Identify flaws and discontinuities
- Determine corrosion susceptibility
- Conduct a root cause failure analysis

The Machine Shop at LTI is fully capable of preparing precision specimens and samples for all testing.

Ask for a quote or more information today.

## Visit our Show Booths

Look for LTI at these upcoming trade shows. Tell us about your testing and calibration requirements.

### National Industrial Fastener

National Industrial Fastener & Mill Supply Expo  
October 25-27, 2016  
Las Vegas, NV  
Booth: 936

Fabtech  
FABTECH  
November 16-18, 2016  
Las Vegas, NV  
Booth: N3707

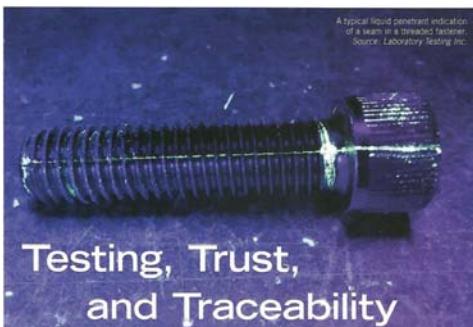
### Power-Gen International

POWER-GEN  
December 13-15, 2016  
Orlando, FL  
Booth: 5214

NACE Corrosion  
NACE INTERNATIONAL  
March 27-30, 2017  
New Orleans, LA  
Booth: 1025

Guests of LTI can receive free or discounted admission to some of these trade shows. Send an email to [sbentzley@labtesting.com](mailto:sbentzley@labtesting.com), if you would like to find out more.

## Quality Magazine Runs New LTI Article



A typical liquid penetrant inspection of a seam in a threaded fastener.  
Source: Laboratory Testing Inc.

### Testing, Trust, and Traceability

"Testing, Trust, and Traceability" is an article explaining the steps taken at Laboratory Testing to maintain traceability during NDT Testing. Co-authors NDT Manager Rich Goodwin and NDT Technology Coordinator Phil Trach explain that traceability is important and necessary because it is often the only evidence that a nondestructive test was performed.

At LTI, maintaining traceability begins when the order is received and doesn't end until the tested parts are returned to the customer. The co-authors discuss the steps required to preserve traceability through four different Nondestructive Testing processes:

- Liquid Penetrant Inspection
- Magnetic Particle Inspection
- Ultrasonic Inspection
- Radiographic Inspection

Quality Magazine published this article in the August 2016 issue. You can also read the complete article on our website at <http://www.labtesting.com/category/articles/>.

## Steam Engine Undergoes Nondestructive Testing (continued)

One of the first critically important steps was to completely inspect the boiler and firebox using a very reliable and non-destructive technique called Ultrasonic Thickness Inspection. This type of inspection measures the amount of time it takes for a sound wave to travel from the test probe, through the material, and reflect back to the probe. The amount of time is converted to a thickness measurement, with less time signifying thinner material.

ASNT Level II and Level III certified technicians from Laboratory Testing Inc. performed the Ultrasonic Thickness Inspection. The testing was completed on-site in Port Clinton, PA in just about a week's time.

The engine's front end and cab, along with all jacketing, piping, superheater units, tubes and flues, were removed in order to perform the ultrasonic testing. The boiler and firebox were thoroughly needle-scaled and prepared for inspection by an RBMN crew that outlined and numbered one-foot square sections.

The test probe was manually positioned at over 6000 individual measurement locations on both the inside and outside surfaces of the boiler and firebox. Each measurement was recorded and catalogued in the final report to the railroad. RBMN's engineering staff will review the results and determine if



Boiler inspection

any reinforcements or repairs are necessary to bring the engine back into service.