

Progress Rail

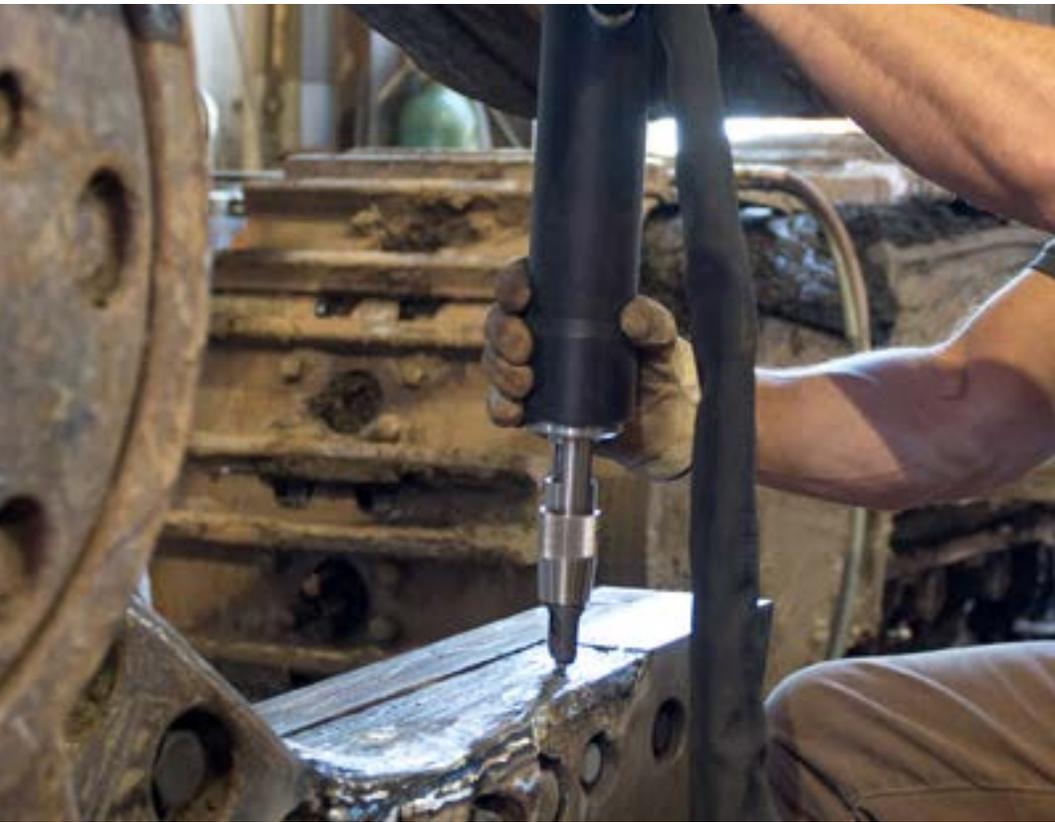
A Caterpillar Company

ULTRASONIC IMPACT TECHNOLOGY
INDUSTRY LEADING PROPRIETARY MAGNETOSTRICTIVE TECHNOLOGY



Ultrasonic Impact Technology imparts ultrasonic energy and mechanical impact plus compressive residual stress, resulting in improvement of the fatigue life, localized stress mitigation, distortion control, and reduced total ownership cost.

UIT SYSTEMS FOR ALL APPLICATIONS



Progress Rail's UIT Systems

delivers repeatable and proven ultrasonic peening and ultrasonic stress relief process. Operating at the industry's highest ultrasonic frequency, 25-27 kHz, Featuring Color Touch Screen (HMI), Water Cooling System, Water Filter, Flow Meter, Water Level Indicator, Recirculating Pump, Quick Disconnect Water Fittings, Power Cable with GFCI Circuit, Over Load Circuit Breaker, Quick Disconnect Electrical Connectors.



UIT-6000



UIT-1005

UIT System Controller/Generator

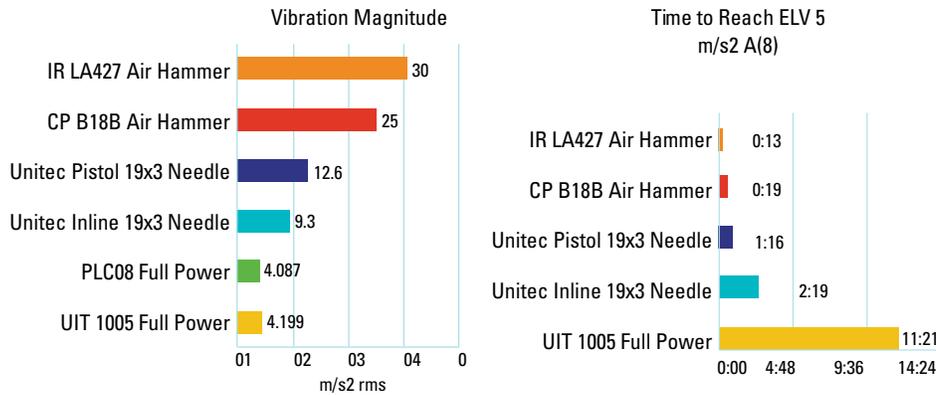
UIT Generator Frequency	25 ~ 27 kHz
Programmable Power Output	20-100%
Input Voltage	110/220 VAC
Input Frequency	50/60 Hz
Input Current Requirement (minimum)	15 amps
Max Supply Power Required	1.5 kW
Water Cooler Flow	.25 GPM (minimum)
Coolant Medium	Distilled Water

Hand Tool

Hand Tool Frequency	25 ~ 27 kHz
Amplitude (programmable)	15 ~ 30 microns
Transducer Type Magnetostrictive	110/220 VAC
Indenter Style	1 ~ 4 Pins
Indenter Diameters	3mm, 3/16", 1/4"
Head Styles	Straight, Side, Front
Manual Hand Tool Weight	6 Lbs.
Hand Tool Size (L X Dia)	18.0" X 3.0"

SAFETY

UIT Vibration vs. Other Impact Tools



Reference: UK regulation and standards "Control of Vibration at Work Regulations 2005"

Ultrasonic Impact Technology

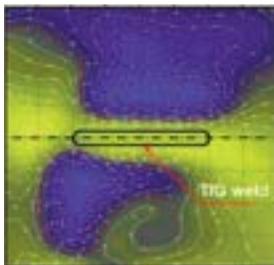


PRODUCTION

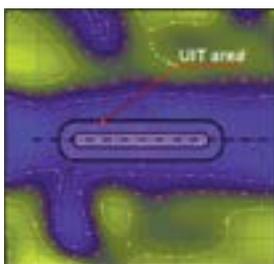
Weld Life Improvement Technique	(in/min)	(mm/min)
Burr Grinding	2-4	50-100
Disc Grinding	0.5-1.5	10-40
TIG Toe Dressing	3-6	75-150
Ultrasonic Impact Treatment (UIT)	20	500

Source: NTIS # PB97-19031 SSC-400 Weld Detail Fatigue Life Improvement Techniques

QUALITY



Stress chart for a steel specimen after argon-arc welding (in the specimen center)



Stress chart for a steel specimen after UIT of the welding area.

- Undesirable tensile stresses are introduced throughout the manufacturing process and repairs; i.e. forming, welding, machining, and cutting.
- UIT eliminates detrimental tensile stresses(+).
- UIT imparts beneficial residual compressive (-) stresses in fabricated and machined components.

Note: Yellow indicates tensile stress and blue indicates compressivestress

Benefits

- Significant fatigue strength/ life improvement through the imparting of deep residual compressive stresses.
- Residual compressive stresses achieved to a controlled depth of 0.040-0.240" based on material type/ thickness.
- Improved Weld Geometry minimizes the notch effect at fillet weld toes.
- Grain structure modification mitigates crack propagation.
- Localized distortion control/dimensional stability of critical weldments and high tolerance machined parts.
- Mitigates Stress Corrosion Cracking (SCC).
- Highly portable, non-thermal stress relief equipment, easily mobilized to remote job sites.

Put Progress to Work for You

INDUSTRIES WE SERVE



NAVY AND MARITIME

The United States Navy and the commercial maritime industry have successfully utilized UIT to address a wide range of needs. Progress Rail's UIT has a proven successful track record with the U.S. Navy saving the Navy millions of dollars in repairs while improving availability.



RAIL INDUSTRY

Progress Rail's UIT serves as a powerful tool to aid rail customers extending product life and reliability. Progress Rail has employed UIT in rolling stock, freight cars, and infrastructure, witnessing first-hand the value, cost savings and peace of mind Progress Rail's proprietary Magnetostrictive technology provides.



OIL AND GAS

In an industry where downtime can rapidly lead to millions of dollars of losses, Progress Rail's UIT offers an exceptional opportunity to increase availability and uptime, increasing profits. By incorporating Progress Rail's UIT Technology into the repair process a customer gained an additional fifteen years of service from their deep-water, semi-submersible drilling rig by resetting the fatigue life-cycle that was at the end of its certified life-after receiving recertification from the governing body.



MINING & CONSTRUCTION

Mining and construction industries deal with some of the harshest operating environments in the world, and put equipment through some of the toughest challenges. Progress Rail's UIT technology has proven its value on shovels, draglines, dozers, haul trucks, and many more by extending equipment life through extending the fatigue life of welds, improving availability while reducing maintenance cost across the globe.

Progress Rail UIT: What We Do

Progress Rail can provide immediate, on-site service, training, support, and equipment through rental, lease or purchase. We can tailor a program to fit your metal and welded component needs, saving time and funding needed for more costly repairs and even replacement. Utilizing either a portable system or a shop designed system for shop operations, our team employs proprietary Magnetostrictive ultrasonic energy designed to work around the clock, coupled with mechanical impact to modify the grain structure of metals, extending asset life and increasing overall reliability to satisfy your needs. Applications include bridges, infrastructure, rail, marine, oil and gas, aerospace and defense, heavy equipment, industrial process equipment and more.

Who We Are

Progress Rail acquired Applied Ultrasonics in 2015 after becoming their largest customer. We understand first-hand the value of Magnetostrictive ultrasonic energy. Progress Rail's UIT Technology is endorsed by the American Association of State and Highway Transportation Officials (AASHTO), American Bureau of Shipping (ABS), Det Norske Veritas Germanischer Lloyd (DNV-GL), Lloyd's Register (LLOYD'S). Ultrasonic Impact Technology (UIT) extends the life of in-service infrastructure. This proven technology can reset the clock on aging infrastructure subjected to years of fatigue exposure. Additionally, for new construction, Progress Rail's UIT improves fatigue performance of critical structural connections. In both circumstances, life cycle costs are substantially reduced, allowing infrastructure funding to be stretched and maximized.

Progress Rail, a Caterpillar company, is one of the largest integrated and diversified providers of rolling stock and infrastructure solutions and technologies for global rail customers, with nearly 200 facilities in 16 countries. Progress Rail delivers advanced EMD® locomotives and engines, railcars, trackwork, fasteners, signaling, rail welding and Kershaw® Maintenance-of-Way equipment, along with dedicated locomotive and freight car repair services, aftermarket parts support and recycling operations. The company also offers advanced rail technologies, including data acquisition and asset protection equipment, as well as other innovations, such as our Ultrasonic Impact Technology to enhance the structural strength of infrastructure around the world. Our deep industry expertise, together with the support of Caterpillar, ensures a commitment to quality through innovative solutions for the rail industry.

Our business mission is to deliver superior value in a cost-effective manner. Our team works hard to create lifelong customer relationships, supplying comprehensive rolling stock and infrastructure solutions for the global rail industry and setting the standard for excellence. We care about fostering the sustainable movement of goods and people for generations to come, and we know our customers care, too. Our strategic footprint ensures responsive, quality customer support all day, every day.

Progress Rail

A Caterpillar Company

+1 800-476-8769 • +1 256-505-5057

UIT@progressrail.com • progressrail.com

@progressrail • @Progress_Rail • Progress Rail • Progress Rail