

## Track Imaging Systems



High speed and superior quality track imaging systems provide comprehensive track inspection and evaluation through advanced machine-vision processing

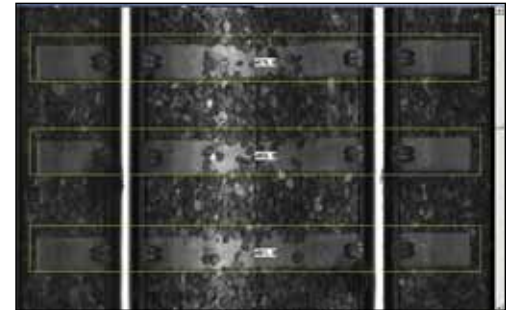
**R**ailway imaging systems are at the forefront of the ENSCO, Inc. technology focus. ENSCO's expertise with high resolution camera systems and advanced image processing algorithms results in systems with extremely reliable image acquisition and processing capabilities. This approach has been successfully applied to the inspection of a range of track components, including joint bars (fish plates), ties, fasteners, rail heads and overhead wire as well as track rights-of-way (ROW). All ENSCO railway imaging systems can operate either day or night to reduce operational interruptions.

### Joint Bar (Fish Plate) Inspection System (JBIS)

The JBIS employs patented vision inspection technology and methods to perform automated crack detection on joint bars (fish plates), measure rail gap and deliver joint bar inventory reports. The system generates real-time exception reports, including continuous line scan images of suspect joint bars, and automatically inventories all joint bars and cracks in a permanent database. The JBIS, developed in partnership with the Federal Railroad Administration's (FRA) Office of Research and Development, increases inspection efficiency by reducing labor costs associated with traditional methods of joint bar evaluation.

### Track Component Imaging System (TCIS)

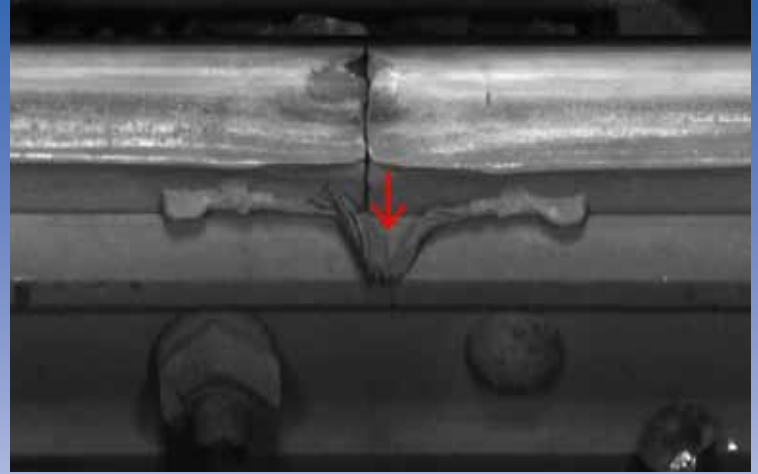
ENSCO's TCIS employs patented line scan imaging methods to collect and record continuous high-resolution images of the track roadbed from a moving vehicle. The system includes software that automatically identifies track components of interest such as ties, fasteners or ballast for further review from the safety of an office environment. ENSCO's TCIS can not only provide essential information for track maintenance planning, but it can also play an important role in the improvement of inspection practices through a reduction in traditional inspection costs and enhancement of worker safety.



*ENSCO track imaging systems identify and inspect track components.*



*ENSCO's track imaging systems can be installed on full-sized track inspection cars.*



*ENSCO patented machine-vision technology distinguishes defects from normal track features.*

### **Driver View Imaging System (DVIS)**

The DVIS provides driver point-of-view, progressive scan color images of the track ROW, allowing the railroad to capture essential information about their track structure and surroundings. Each recorded image is tagged with GPS, milepost or kilometer post location and date/time. An optional lighting system is available for enhanced visualization at night or in tunnels. ENSCO's DVIS can deliver crucial information for track/tunnel inspection program, operational planning, and accident/incident investigations.

### **Overhead Wire Imaging System (OWIS)**

The Overhead Wire Imaging System (OWIS) delivers progressive scan color images of the overhead (catenary) wire that can be used for wire infrastructure evaluations. Image capture rates are distance-based and settable by system operators. Optional lighting packages increase visual information available at night or in tunnels. Offline software included with the system allows the user to replay the images for manual review and evaluation of maintenance conditions. The system can be used in conjunction ENSCO's Overhead Wire Geometry System, used to determine wire height and stagger, to provide operators with a fully comprehensive assessment of overhead wire location and conditions.

ENSCO's Track Imaging Systems offer:

- Patented machine-vision inspection technology and techniques
- Employing patented vision-inspection technology and techniques
- Continuous, high resolution track images
- Intelligent machine-vision algorithms for review and identification of anomalies
- Automatic image archiving and component inventorying
- Integration with full-sized track inspection cars as well as hi-rail vehicles



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