

Equipment Health Management System Overview

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Agenda



- **What is EHMS?**
- How does EHMS work?
- What are the different alert types and alert levels?
- Walkthrough of EHMS
 - Permissions & Accessing EHMS
 - Querying Cars
 - Closing Alerts
- EHMS Notifications Overview
- Related Tools
- Helpful Tips
- Reference Links

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What is EHMS?



Detector Network

- EHMS receives and processes over 36 million train passes per year from a network of roughly 10,000 wayside detectors across North America.



Equipment Repairs

- EHMS allows car owners, railroads, and equipment maintenance providers to report equipment repairs and view repair histories.



Data Security

- As a trusted steward of industry data, Railinc secures all applications, including EHMS, to allow access to only authorized users.



Safety & Efficiency

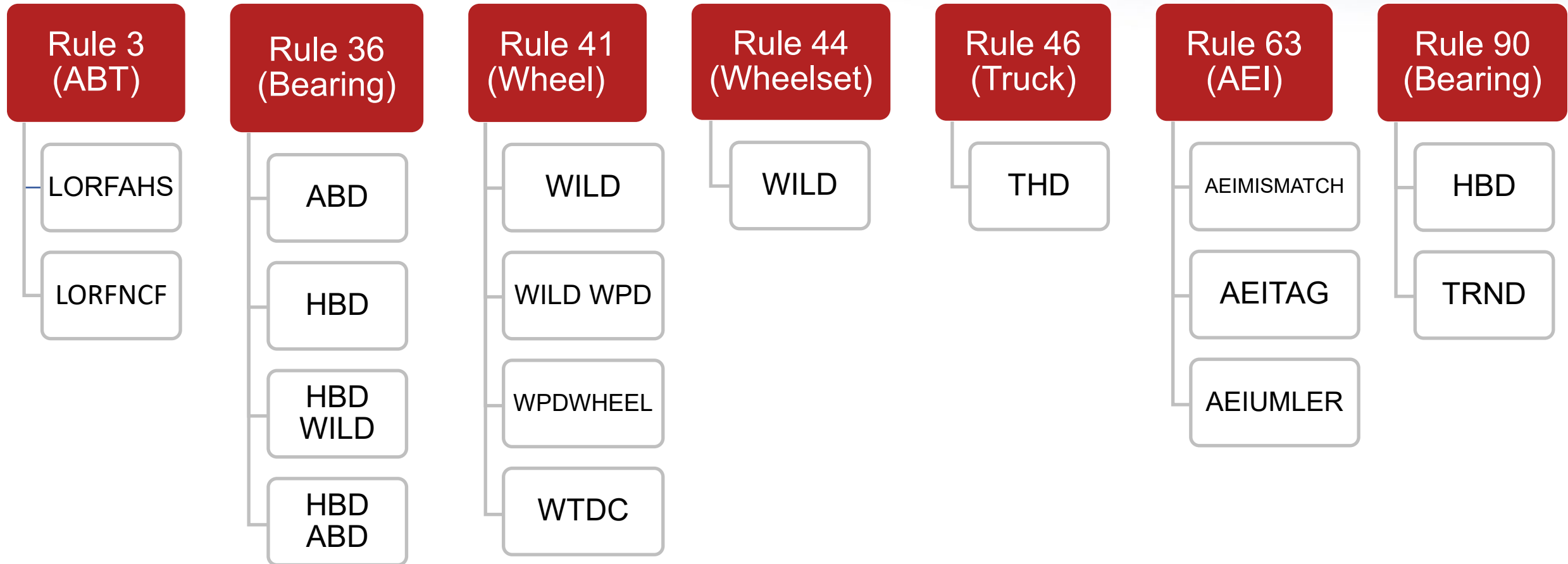
- EHMS enhances safety and asset utilization by enabling proactive repairs, damage prevention, and data-driven trend analysis.

Why use EHMS?



- Alert and repair information is contained for all equipment types (excluding containers and trailers).
- A repository for WILD calibration records (per AAR Field Manual Appendix F).
- EHMS was developed to support the Equipment Health Management Committee (EHMC) and is helpful to ensure:
 - Safety
 - Damage Prevention
 - Maintenance Opportunities
 - Repair History
 - Reduce costly repairs

What AAR Rules apply to EHMS?



Essential EHMS Workflows



Detector Reads

Information from wayside detectors are sent to Railinc's EHMS platform for evaluation and validation.



Data Summaries

Detector Reads within set thresholds create or update Data Summaries, providing a longer-term view of measurements.



EHMS Events

Detector read(s) that meet alert thresholds as defined by AAR Committees are recorded in EHMS as Events.



EHMS Alerts

EHMS opens a new alert only when thresholds are met for a unique alert type, car, and component location combination.

EHMS Alert Levels



W Window Open (W)

This lowest-level alert advises that some degradation has started. An alert at this level is primarily a notice to the car owner/operator that a potential problem exists on the car and to allow the car owner to get the car into the shop of their choice.

A2 AAR A2 (O)

This mid-level alert offers the equipment owner a chance to schedule repairs before damage starts. Units with an AAR A2 level fall under AAR rules and may be repaired if they are in the shop for any other reason.

A1 AAR A1 (C)

This high-level alert notifies shops that wheels need to be replaced. Units with alerts at this level may be pulled into the shop specifically for this repair.

M Mandatory (M)

This severe-level alert advises railroads and car owners that high stresses are being placed on rails requiring immediate action. A unit with a Mandatory Alert should be immediately reviewed by a shop and repaired.

EHMS Alert Types



Acoustic Bearing
Detector (ABD)

Wheel Impact
Load Detector
(WILD)

Truck Hunting
Detector (THD)

Automatic
Equipment
Identification (AEI)

Line of Road
Failure No Cause
Found
(LORFNCF)

Wheel Profile
(WILD_WPD &
WPDWHEEL)

Hot Bearing
Detector (HBD)

Line of Road
Failure Air Hose
Separation
(LORFAHS)

Wheel
Temperature
Detector – Cold
(WTDC)

EHMS Alert Types



Acoustic Bearing Detector (ABD)

- **ABD alerts** (A1) are opened from detectors that measure defects by using microphones to listen to the wheel bearing noise levels. The readings must be from validated detectors to ensure that the alerts accurately reflect the condition of the bearing in question and identify cup, cone, roller, or a large area spall defects.
- ABD Alerts can only be closed by reporting a repair.
- Data from validated and non-validated detectors are used to create the **Acoustic Bearing Combined Data Summary**. In the combined ABD data summary, a level 1 severity is always the most severe.

EHMS Alert Types



Automatic Equipment Identification (AEI)

- AEI readers equipped with RFI (radio frequency) technology wirelessly identify tags on railroad equipment while enroute.
- EHMS uses AEI data to identify issues with the tag and creates the AEI data summary. Identifying tag issues helps improve AEI accuracy and wayside detector component identification.
 - **AEIMISMATCH** (A2) – Mismatched equipment information between left and right tags
 - **AEITAG** (A2) – The tag on left or right side of equipment was unable to be read and is presumed to be missing or no longer functional.
 - **AEIUMLER** (W) – Inconsistencies between AEI Train Pass and Umler registry.

EHMS Alert Types



Hot Bearing Detector (HBD)

- HBD identify bearing issues by capturing the bearing temperature above ambient, using the variation of the temperature on the side of the train (Kt) and both sides of the equipment (Ke).
- There are no data summaries for HBDs.
- There are four HBD Alert Types defined by the MSRP F S-6001, Why Made (WM) Codes 51 and 52. All are opened at an AAR A1 level.
 - **HBD** (WM51)
 - **HBD_TRND** (WM51)
 - **HBD_ABD** (WM52)
 - **HBD_WILD** (WM52)

EHMS Alert Types



Line of Road Failure Air Hose Separation (LORFAHS)

- A LORF Air Hose Separation event occurs when a train unexpectedly goes into emergency braking due to an air hose separating between two cars. In these cases, railroads report the cars involved in the separation.
- **LORFAHS** (W or A1) – An uncoupling of two air hoses at the gladhand not attributable to other causes (such as a train separation), 3 or more events within 12 months.

EHMS Alert Types



Line of Road Failure No Cause Found (LORFNCF)

- A LORF No Cause Found (NCF) event occurs when a train goes into emergency braking for an unknown reason not triggered by the operator. In these cases, the full train consist is sent to Railinc's E-Train system, where an algorithm calculates an index based on the car's history in similar events. A higher index suggests a greater likelihood the car has brake-related issues.
- **LORFNCF** (A1) – 3 or more counts of LORF NCF events within 90 days.

EHMS Alert Types



Wheel Impact Load Detector (WILD)

- WILD detectors measure vertical forces imparted by wheels on the rails. Vertical forces above nominal are typically due to wheel out-of-round (OOR) conditions. As the OOR section of the wheel rolls over the rail, it produces a higher impact force. WILD detectors report the forces in kips units – 1 Kip is 1,000 pounds of force.
 - **WILD (W)** – >65 kips
 - **WILD (A2)** – >80 kips
 - **WILD (A1)** – >90 kips
 - **WILD (M)** – >140 kips

EHMS Alert Types



Truck Hunting Detector (THD)

- Truck Hunting is condition where the freight car's trucks exhibit a dynamic instability. This is measured through the lateral strain gages on the wheel impact load detectors. The lateral forces and their frequency of occurrence are combined into a unitless measure called Truck Hunting Index (HI).
- **THD (W)** – The hunting index is greater than or equal to 0.2
- **THD (A1)** – 1 reading at $\geq .5$ or 2 readings $\geq .35$ (in twelve months)

EHMS Alert Types



Wheel Profile (WILD_WPD & WPDWHEEL)

- Wheel Profile Detectors are wayside systems that measure wheel profiles of moving trains using laser and optical scanning devices to take images of the flange, tread, etc.
- The goal of the WPD data summary is to get an aggregate view of these measurements. The data summary can be used to perform wheel trend analysis and determine wheel wear and condition. When worn beyond limits, the wheels can be scheduled for replacement.
- **WPDWHEEL** (W) – any Flange Height, Flange Thickness, Rim Thickness, or Hollow Tread measurement is out of the optimal range.
- **WILD_WPD** (W) – the Rim Thickness is very low and Max Dynamic is ≥ 50 kips.

EHMS Alert Types



Wheel Temperature Detector – Cold (WTDC)

- HBDs are also utilized to measure the wheel temperature by pointing the detector in the direction of the wheel. Temperature readings are analyzed and evaluated to determine if a data summary should be opened.
- Currently, Brake Health data summaries do not close with a repair, inspection, or autoclose process.
- **WTDC (W)** - The Cold Wheel alert identifies wheels that are cold on a braking train more than 6 times. Brake Health Indicators (BHI) are tracked in the Brake Health data summaries (Car or Truck).

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Available EHMS Roles



The Equipment Health Management System (EHMS) supports the Advanced Technology Safety Initiative (ATSI). The purpose of EHMS is to proactively detect, report, and alert carriers, car owners and equipment maintenance providers of potential safety problems.

1 Select Roles ————— 2 Confirm ————— 3 Done

☐ EHMS Car Repair History (MARK required)

Allows user to view/report inspections or repairs in EHMS and EHV. This will also allow user to view historical information for your respective equipment.

☐ EHMS Generic Access (MARK required)

Allows users to view alert and data summary information to EHMS and EHV. This must be granted to view to view EHMS and EHV information.

☐ EHMS Road Admin (MARK required)

Company Administrator who will manage the assignment of EHMS related roles for their company. This user will receive emails for requested permissions for their respective company and must grant permission as determined by their respective company.

EHMS Homepage



EHMS

MXG01 : RAIL

Launch Pad ▼

Sign Out

[Home](#) [Alert Management ▼](#) [EHMS Query ▼](#) [Detector ▼](#) [Equipment ▼](#) [Admin](#) [Documentation ▼](#) [Equipment Health View](#)

Welcome

EHMS takes advantage of the North American network of equipment defect detectors and other technologies to proactively detect, report, and alert carriers, car owners and equipment maintenance providers of potential safety problems. EHMS communicates this information so the carriers, car owners and equipment maintenance providers can plan for repair of the equipment before damage is done to the rail infrastructure or equipment.

News & Updates

EHMS and EHV Resources Available

Visit the [EHMS](#) or [EHV](#) resource pages for more information and resources.

EHMS Query



RAILINC

EHMS

MXG01 : RAIL Launch

Management ▾EHMS Query ▾Detector ▾Equipment ▾AdminDocumentation ▾Equipment Health View

Equipment Status

Equipment History

Latest ABT

...vantage of the North American network of equipment defect detectors and other technologies to proactively detect, report, and alert carrier maintenance providers of potential safety problems. EHMS communicates this information so the carriers, car owners and equipment maintainers can be aware of the equipment before damage is done to the rail infrastructure or equipment.

Updates

Resources Available

or [EHV](#) resource pages for more information and resources.

Equipment History Query



Equipment History Search

Equipment ID *
RAIL 12

☒ Alert Type:

ABD
AEIMISMATCH
AEITAG
AEIUMLER

☐ Component Type:

Select

Date Range:

From Date



To Date



Alert Level:

ATSI Window Open
AAR A2
AAR A1
ATSI Mandatory

Reporting System

All

Data Set:

☐ All ☒ Closures ☒ Alerts ☐ Detail Events ☐ Home Shop Dispositions ☐ EA Data
☐ Data Summaries

Report Format:

☐ Equipment View ☒ Event View

Train Date:

From Date



To Date



Alert Status

All Alerts

Print All

Clear

Reset

Search

Equipment History Search Results



Alerts

Export

Total items: 5 [Clear Filters](#)

Equipment ID	Alert Type	Open Date	Location	Alert Date	Alert Status	Closed Date	Alert Level	Opening Reason	Closing Reason	Reported Closed...	Reported Closed...	Close Alert
RAIL-0000000012	WILD	11-08-2021	AXLE=01; SIDE=L	11-08-2021	OPEN		C	ALERT_EVENT				
RAIL-0000000012	WILD	10-19-2018	AXLE=01; SIDE=R	10-19-2018	CLOSE	10-19-2018	O	ALERT_EVENT	AUTOCLOSE			
RAIL-0000000012	WILD	10-19-2018	AXLE=01; SIDE=R	10-19-2018	CLOSE	10-19-2018	O	ALERT_EVENT	AUTOCLOSE			
RAIL-0000000012	WILD	10-19-2018	AXLE=01; SIDE=R	10-19-2018	CLOSE	10-19-2018	O	ALERT_EVENT	AUTOCLOSE			
RAIL-0000000012	WILD	10-19-2018	AXLE=01; SIDE=R	10-19-2018	CLOSE	10-19-2018	O	ALERT_EVENT	AUTOCLOSE			

30 100 500 1000 5000

Closures

Export

Total items: 13 [Clear Filters](#)

Equipme...	Event Date	Location	Performer	Reporter	SPLC	Closure Type	Job Code	Why Made...	Insp. Reason	Insp. Type	Reported Tim...	Report System	Delete Closure
RAIL-0000000012	03-24-2026	AXLE=12	RAIL	BSJX	411657000	Repair	3399				03-24-2026 14:46	WSR	
RAIL-0000000012	03-24-2026	AXLE=12; SIDE=R	RAIL	BSJX	411657000	Repair	2814	11			03-24-2026 14:51	CRH	
RAIL-0000000012	12-04-2018	AXLE=06	TTX	SHOPTS	123456000	Repair	3338				12-04-2018 14:37	CRH	N/A
RAIL-0000000012	12-04-2018	AXLE=02; SIDE=L	A012	SHOPTS	1234536	Repair	2848				12-04-2018 08:54	CRH	N/A
RAIL-0000000012	10-19-2018	AXLE=01; SIDE=R	RAIL	RAIL	123456	Inspection			MK	WILD	10-19-2018 14:14	IQ	

Alert Closure Reporting



Alert Closure Reporting

Notes

- Only an inspection can close a LORFNCF, THD, AEIUMLER, MVECOUPLER, MVFCOUPLER, TPDG or TPDJ alert. Repairs do not close these alerts.
- An ME inspection will not close an alert.
- Submitting an ABT requires that the user have proper permissions within the Umler application.
- Component Tag ID should only be entered once per axle location and Equipment ID.

1	☐	☒	RAIL	0000000012	RAIL	RAIL	05/07/2026	411657000	☐	ABT Performer	ABT Reporter	Select
		☒	Repair	☐	Non AAR Repair	☐	Inspection	3328	09	01	Component Tag Id	

☐ Select All

[Return to Search Results](#) [Clear](#) [Reset](#) [Delete](#) [+ Add](#) [✓ Save](#)

Alert Closure Successful



The closure record(s) reported was/were accepted into EHMS successfully

The closure record(s) reported closed 1 alerts

Alert Closure Reporting

1

☐

☒

RAIL

Equipment Initial

Equipment Number

0000000012

Closure Made By

RAIL

Closure Rptd By

RAIL

Closure Date

05/07/2026

SPIC

411657000

☐

ABT Performer

ABT Reporter

ABT Device

Select

☒ Repair

☐ Non AAR Repair

☐ Inspection

Job Code

3328

Why Made Code

09

Axle

01

Component Tag Id

Done

Return to Search Results

Enter Additional Alert Closures

Closure Reporting Successful, No Alert Closed



The closure record(s) reported was/were accepted into EHMS successfully

The closure record(s) reported closed 0 alerts

Alert Closure Reporting

1

Equipment Initial

RAIL

Equipment Number

0000000012

Closure Made By

RAIL

Closure Rptd By

RAIL

Closure Date

05/07/2026

SPLC

411657000

ABT Performer

ABT Reporter

ABT Device

Select

Repair

Non AAR Repair

Inspection

Job Code

3328

Why Made Code

09

Axle

02

Component Tag Id

Done

Enter Additional Alert Closures

Alert Closure Reporting Error



Alert Closure Reporting

Notes

- Only an inspection can close a LORFNCF, THD, AEIUMLER, MVECOUPLER, MVFCOUPLER, TPDG or TPDL alert. Repairs do not close these alerts.
- An ME inspection will not close an alert.
- Submitting an ABT requires that the user have proper permissions within the Umler application.
- Component Tag ID should only be entered once per axle location and Equipment ID.

1

☐

Equipment Initial *

RAIL

Equipment Number *

0000000012

Closure Made By *

RAIL

Closure Rptd By

RAIL

Closure Date *

05/07/2026

SPLC *

411657000

ABT Performer

ABT Reporter

ABT Device

Select

☒ Repair

☐ Non AAR Repair

☐ Inspection

Job Code *

3328

Why Made Code

09

Axle *

0L

Component Tag Id

The following errors need to be corrected before you proceed.

- WSVLD000313 - Invalid Component location.

☐ Select All

Clear

Reset

Delete

Add

Save

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27

Return to Equipment History Search Results



Alerts

[Export](#)

Total items: 1

[Clear Filters](#)

Equipment ID	Alert Type	Open Date	Location	Alert Date	Alert Status	Closed Date	Alert Level	Opening Reason	Closing Reason ▾	Reported Closed...	Reported Closed...	Close Alert
RAIL-0000000012	WILD	11-08-2021	AXLE=01; SIDE=L	11-08-2021	CLOSE	05-07-2026	C	ALERT_EVENT	REPAIR	RAIL	05-07-2026 14:23	

30

100

500

1000

5000

Closures

[Export](#)

Total items: 1

[Clear Filters](#)

Equipme...	Event Date	Location	Performer	Reporter	SPLC	Closure Type	Job Code	Why Made... ▾	Insp. Reason	Insp. Type	Reported Tim...	Report System	Delete Closure
RAIL-0000000012	05-07-2026	AXLE=01	RAIL	JXL05-RAIL	411657000	Repair	3328	09			05-07-2026 14:22	CRH	×

EHMS Status Query



 | EHMS MXG01 : RAIL Launch

Management ▾ EHMS Query ▾ Detector ▾ Equipment ▾ Admin Documentation ▾ Equipment Health View

Equipment Status

Equipment History

Latest ABT

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ntenance providers of potential safety problems. EHMS communicates this information so the carriers, car owners and equipment mainten
of the equipment before damage is done to the rail infrastructure or equipment.

Updates

resources Available
or [EHV](#) resource pages for more information and resources.

Equipment Status Query



Equipment Status

Equipment ID *

RAIL12

Date Range:

From Date

01/01/2026

To Date

Clear

Reset

Search

Equipment Status Search Results



Alerts

Print Export

Total items: 2

Equipment ID	Alert Type	Event Name	Location	Home Shop	Date	Alert Level	Clear Alert
RAIL-0000000012	ABD		WHEELBEARING 22R	No	03-23-2026 00:00	AAR A1	
RAIL-0000000012	ABD		WHEELBEARING 11R	No	03-23-2026 00:00	AAR A1	

30 100 500 1000 5000

Data Summaries

Print Export

Total items: 0 Clear Filters

Equipment ID	Data Summary Type	Owner	Location	Report View	Earliest Open Date	Latest Event Date	Report Repair / Inspection	Opened In Error
No Results Found								

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- Walkthrough of EHMS
- **EHMS Notifications Overview**
- Related Tools
- Helpful Tips
- Reference Links

EHMS Notifications Overview



- EHMS Notifications inform subscribers of changes in the health of equipment. This message process provides alert and data summary information on equipment.
- Available EHMS Notification delivery methods:
 - MQ (Message Queue)
 - FTP (File Transfer Protocol)
 - Email

Agenda



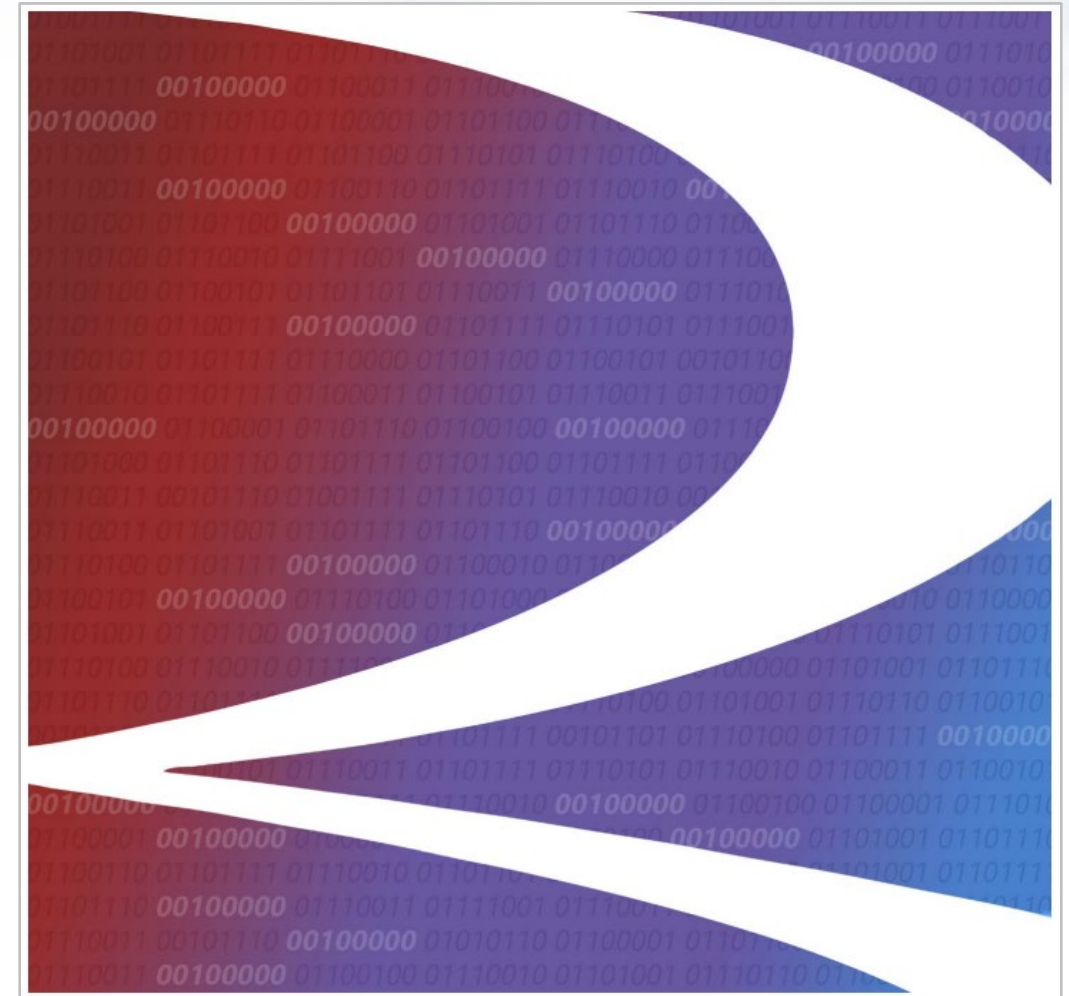
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EHMS Services and System Integrations



- **EHMS Web Services**

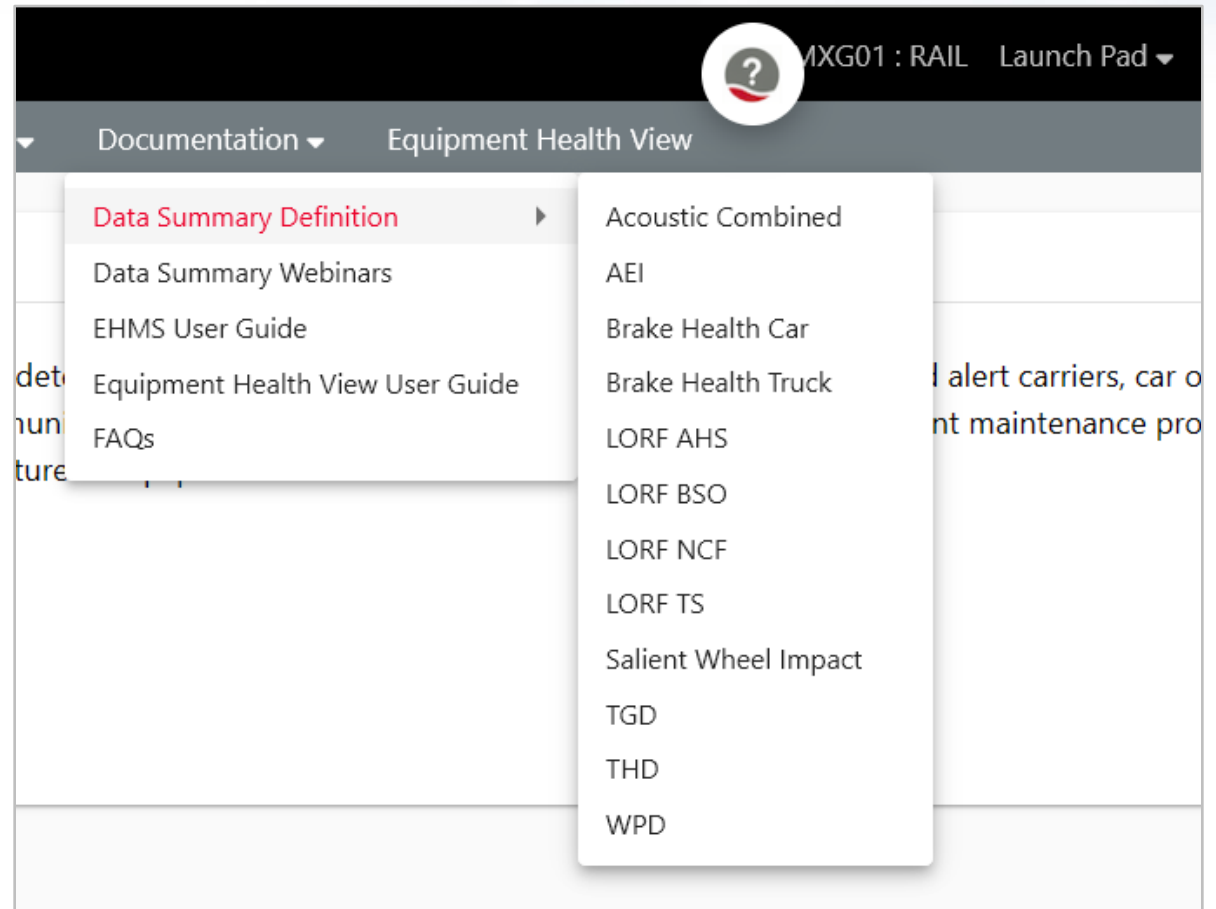
- Utilizes a standard format for querying or reporting to EHMS and connects systems to Umler, EA, CRB, LMIS, EHMS, and CarLogix.



Helpful Tips



- Helpful documents are in the “Documentation” tab on the EHMS Menu.
- The Help widget can be moved anywhere on screen.



Guides and References



- [Equipment Health Management System Product Page](#)
- [EHMS User Guide](#)
- [EHMS Notification Message Format](#)
- [Notification Flow Chart](#)
- [2026 Railinc Price List](#)

A screenshot of the Railinc Equipment Health Management System (EHMS) product page. The page has a dark blue header with the Railinc logo and navigation links: Products & Services, Resources, Support, About Railinc, Careers, and Contact Us. A search bar is on the right. Below the header, a breadcrumb trail reads: Home > Products & Services > Equipment Health Management System. The main content area is titled "Equipment Health Management System" and contains a paragraph about the system's purpose, a list of features, and a section for "EHMS Demos". On the right side, there are two sidebars. The top sidebar is titled "EHMS User Group Site" and contains text about the site's content and a link to the "Railinc Customer Success Center (CSC)". The bottom sidebar is titled "Related Support Documents" and contains a list of links: EHMS User Guide, EHMS Notification User Guide, EHMS FAQs, EHMS Notification Flow Chart, EHMS Message Format, EHV User Guide, LORF NCF Alert FAQ, and LORF NCF Alert Overview. The Railinc logo is visible in the bottom right corner of the page.

Questions?

Upcoming Survey

• June 1st – June 15th



RAILINC | EHMS

HomeAlert Management ▾EHMS Query ▾Notifications ▾Detector ▾Documentation ▾Equipment Health View

Welcome

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EHMS and EHV Resources Available
Visit the [EHMS](#) or [EHV](#) resource pages for more information.

Equipment Health Management System (EHMS) Customer Satisfaction Survey

We value your feedback. Railinc will donate \$1 to St. Jude Children's Research Hospital for every survey we receive.

Question 1*

How satisfied are you with the usability of EHMS?

☐

Very Satisfied

☐

Satisfied

☐

Neither Satisfied nor Dissatisfied

☐

Dissatisfied

☐

Very Dissatisfied

Question 2*

How satisfied are you with the reliability of EHMS?

Railinc Keeps You Moving.

John Linge

Product Support Specialist

Email: csc@railinc.com

