



Trending Hot Bearings Messaging Guide



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Table of Contents

Welcome to Trending Hot Bearings Messaging	1
Overview.....	1
Getting Started	1
Example JSON Messages	2
JSON Schema: Alert Report and Response	2
JSON Sample Inbound: Alert Create	6
Input Data Definitions	7
JSON Sample Outbound: Alert Error Response	8
Output Data Definitions.....	9
JSON Sample Outbound: Alert Success Response	10
Output Data Definitions.....	11
Example XML Messages	12
XML Schema: Alert Report and Response.....	12
XML Sample Inbound: Alert Create.....	16
Input Data Definitions	17
XML Sample Outbound: Alert Error Response.....	18
Output Data Definitions.....	19
XML Sample Outbound: Alert Success Response.....	20
Output Data Definitions.....	21
Appendix A.....	22

Welcome to Trending Hot Bearings Messaging

Overview

The Trending Hot Bearings Messaging processes WM51.3 Alert messages from Railroads to Railinc. Alert criteria is referenced in the Industry Standard S-6001. Railinc will send response messages (outbound) to Railroads for each submitted alert message (inbound). Valid inbound messages received will be forwarded as Equipment Health Management System (EHMS) HBD_TRND Alerts to inform all who would handle or otherwise interact with the bearing of interest.

Getting Started

This section describes the information needed to start sending Trending Hot Bearings message requests to the Railinc system.

- The URL endpoints for the pre-prod and prod environments are:
 - **Pre-prod:** https://api.ehms.tst.railinc.com/rest/v1/alerts/report/hbd_trnd
 - **Prod:** https://api.ehms.railinc.com/rest/v1/alerts/report/hbd_trnd
- To submit requests, a valid SSO User ID that has the *Alert Reporter* role under your reporting mark is also a requirement. If you do not have an SSO User ID, [follow these steps](#) to register for a User ID in these environments:
 - **Pre-prod:** <https://login.tst.railinc.com/>
 - **Prod:** <https://login.railinc.com/>

See [Support](#) for more information.

Important: It is required that you use a separate User ID from your normal SSO User ID for this service. You should also request that this SSO user be set up as a System User, with a non-expiring password.

Example JSON Messages

JSON Schema: Alert Report and Response

Note: Maximum of one car.

```
{
  "$schema": "https://json-schema.org/draft/2020-12/schema",
  "type": "object",
  "definitions": {
    "reportAlert": {
      "required": [
        "alertInformation",
        "componentDetail",
        "detectorReading",
        "equipmentId",
        "itemKey"
      ],
      "type": "object",
      "properties": {
        "itemKey": {
          "type": "string",
          "maxLength": 36
        },
        "alertInformation": {
          "required": [
            "alertCreatedTimestamp",
            "alertType"
          ],
          "type": "object",
          "properties": {
            "alertCreatedTimestamp": {
              "format": "date-time",
              "type": "string"
            },
            "alertType": {
              "type": "string",
              "maxLength": 15
            }
          }
        },
        "equipmentId": {
          "required": [
            "equipmentInitial",
            "equipmentNumber"
          ],
          "type": "object",
          "properties": {
            "equipmentInitial": {
              "maxLength": 4,
              "minLength": 2,
              "pattern": "^[A-Z]*$",
              "type": "string"
            },
            "equipmentNumber": {
              "maxLength": 10,
              "minLength": 1,
              "pattern": "[0-9]*$",
              "type": "string"
            }
          }
        }
      }
    }
  },
  "required": [
    "reportAlert"
  ],
  "type": "object",
  "properties": {
    "reportAlert": {
      "$ref": "#/definitions/reportAlert"
    }
  }
}
```

```

    "componentDetail": {
      "required": [
        "equipmentOrientation",
        "aarAxleNumber",
        "aarSideOfEquipment"
      ],
      "type": "object",
      "properties": {
        "equipmentOrientation": {
          "enum": [
            "A",
            "B",
            "U"
          ]
        },
        "aarAxleNumber": {
          "pattern": "^(0[1-9]|1[0-9]|2[0-9]|3[0-6])$",
          "type": "string"
        },
        "aarSideOfEquipment": {
          "enum": [
            "L",
            "R"
          ]
        }
      }
    },
    "detectorReading": {
      "required": [
        "bearingKValueEquipmentBased",
        "bearingKValueTrainBased",
        "bearingTempDegF"
      ],
      "type": "object",
      "properties": {
        "bearingKValueEquipmentBased": {
          "type": "number"
        },
        "bearingKValueTrainBased": {
          "type": "number"
        },
        "bearingTempDegF": {
          "type": "number"
        },
        "hazmatFlagEquipmentLevel": {
          "enum": [
            "Y",
            "N"
          ]
        },
        "hottestBearingTempFDelta": {
          "type": "number"
        },
        "lastEventTimestamp": {
          "format": "date-time",
          "type": "string"
        }
      }
    }
  },
  "serviceContext": {
    "required": [
      "companyId",
      "messageId",

```

```

        "messageTimestamp"
      ],
      "type": "object",
      "properties": {
        "companyId": {
          "maxLength": 4,
          "minLength": 2,
          "pattern": "^[A-Z]*$",
          "type": "string"
        },
        "messageId": {
          "maxLength": 64,
          "type": "string"
        },
        "messageTimestamp": {
          "format": "date-time",
          "type": "string"
        }
      }
    },
    "responseDetailEntry": {
      "required": [
        "responseCode",
        "responseMessage"
      ],
      "type": "object",
      "properties": {
        "responseCode": {
          "maxLength": 15,
          "type": "string"
        },
        "responseMessage": {
          "maxLength": 2000,
          "type": "string"
        }
      }
    }
  },
  "required": [
    "serviceContext",
    "reportAlerts"
  ],
  "properties": {
    "serviceContext": {
      "$ref": "#/definitions/serviceContext"
    },
    "reportAlerts": {
      "type": "array",
      "minItems": 1,
      "maxItems": 500,
      "items": {
        "$ref": "#/definitions/reportAlert"
      }
    },
    "reportAlertsResponse": {
      "type": "object",
      "required": [
        "responseTimestamp",
        "responseStatus",
        "responseSummaries",
        "responseDetails"
      ],
      "properties": {
        "responseTimestamp": {
          "format": "date-time",

```

```

        "type": "string"
      },
      "responseStatus": {
        "enum": [
          "SUCCESS",
          "PARTIAL_SUCCESS",
          "ERROR"
        ]
      },
      "totalItemKeysSubmitted": {
        "type": "integer"
      },
      "totalItemKeysSuccess": {
        "type": "integer"
      },
      "totalItemKeysError": {
        "type": "integer"
      },
      "serviceContext": {
        "$ref": "#/definitions/serviceContext"
      },
      "responseSummaries": {
        "type": "array",
        "minItems": 1,
        "items": {
          "$ref": "#/definitions/responseDetailEntry"
        }
      },
      "responseDetails": {
        "type": "array",
        "minItems": 1,
        "items": {
          "type": "object",
          "required": [
            "itemKey",
            "reportStatus",
            "responseDetailEntries"
          ],
          "properties": {
            "itemKey": {
              "type": "string",
              "maxLength": 36
            },
            "reportStatus": {
              "enum": [
                "SUCCESS",
                "ERROR"
              ]
            },
            "responseDetailEntries": {
              "type": "array",
              "minItems": 1,
              "items": {
                "$ref": "#/definitions/responseDetailEntry"
              }
            }
          }
        }
      }
    }
  }
}

```

JSON Sample Inbound: Alert Create

Note: Maximum of one car.

```
{
  "serviceContext": {
    "companyId": "RAIL",
    "messageId": "MSG1234567890",
    "messageTimestamp": "2024-04-02T08:44:00Z"
  },
  "reportAlerts": [
    {
      "itemKey": "1",
      "alertInformation": {
        "alertCreatedTimestamp": "2024-04-02T08:43:23Z",
        "alertType": "HBD_TRND"
      },
      "equipmentId": {
        "equipmentInitial": "RAIL",
        "equipmentNumber": "0000000100"
      },
      "componentDetail": {
        "equipmentOrientation": "A",
        "aarAxleNumber": "02",
        "aarSideOfEquipment": "L"
      },
      "detectorReading": {
        "bearingKValueEquipmentBased": 2.338,
        "bearingKValueTrainBased": 4.21,
        "bearingTempDegF": 150,
        "hazmatFlagEquipmentLevel": "Y",
        "hottestBearingTempFDelta": 59,
        "lastEventTimestamp": "2024-04-02T08:42:23Z"
      }
    }
  ]
}
```

Input Data Definitions

Mandatory	Element Name	Restriction	Value	Description
Yes	companyId	String	4	ID of the company submitting the request matching the submitter's company mark.
Yes	messageId	String	64	ID that uniquely identifies the message for auditing and tracing. Each message sent should have a unique value.
Yes	messageTimestamp	Date Time	20	Time stamp of when the message was created. All time stamps must be reported in UTC.
Yes	itemKey	Numeric	1	Unique message identifier.
Yes	alertCreatedTimestamp	Date Time	20	Time stamp of when the Alert was created by road.
Yes	alertType	String	15	Type of Alert created by the road.
Yes	equipmentInitial	String	4	Basic type for the equipment initial; 2–4 uppercase alpha characters only.
Yes	equipmentNumber	Numeric	10	Basic type for the equipment number, up to 10 digits.
Yes	equipmentOrientation	String	1	Orientation of the equipment in relation to the train using AAR-recognized orientation codes for railcars.
Yes	aarAxleNumber	Integer	2	Axle number for the equipment starting with 1 at the B end of the equipment.
Yes	aarSideOfEquipment	String	1	AAR side of the equipment, these readings are for (L or R) as viewed from the B end of the equipment to the A end (left/right).
Yes	bearingKValueEquipmentBased	Decimal	10	Equipment-based K value for the bearing on this side of the train at this axle based on industry-standard calculations.
Yes	bearingKValueTrainBased	Decimal	10	Train-based K value for the bearing on this side of the train at this axle based on industry-standard calculations.
Yes	bearingTempDegF	Decimal	10	Recorded bearing temperature (above ambient) in degrees Fahrenheit.
No	hazmatFlagEquipmentLevel	String	1	Car contains hazardous material for date and time reported. (Hazmat STCC Code 48, 49).
No	hottestBearingTempFDelta	Numeric	10	The difference of the temperature of the hottest bearing and the next hottest bearing for this equipment.
No	lastEventTimestamp	Date Time	20	Time stamp of the last event that triggered the alert creation.

JSON Sample Outbound: Alert Error Response

```
{
  "responseTimestamp": "2024-06-26T00:40:47Z",
  "responseStatus": "ERROR",
  "totalItemKeysSubmitted": 1,
  "totalItemKeysSuccess": 0,
  "totalItemKeysError": 1,
  "serviceContext": {
    "companyId": "RAIL",
    "messageId": "MSG1234567890",
    "messageTimestamp": "2024-04-02T08:44:00Z"
  },
  "responseSummaries": [],
  "responseDetails": [
    {
      "itemKey": "1",
      "reportStatus": "ERROR",
      "responseDetailEntries": [
        {
          "responseCode": "422",
          "responseMessage": "componentDetail.aarSideOfEquipment does not have a value
in the enumeration [L, R] "
        },
        {
          "responseCode": "422",
          "responseMessage": "detectorReading.bearingKValueEquipmentBased is a required
property but it's missing"
        },
        {
          "responseCode": "422",
          "responseMessage": "componentDetail.aarAxleNumber is a required property but
it's missing"
        }
      ]
    }
  ]
}
```

Output Data Definitions

Mandatory	Element Name	Restriction	Value	Description
Yes	responseTimestamp	Date Time	20	Time stamp for when the response message was created in UTC.
Yes	responseStatus	String	15	State of the message transaction.
Yes	companyId	String	4	ID of the company submitting the request matching the submitter's company mark (from inbound message).
Yes	messageId	String	64	ID that uniquely identifies the message for auditing and tracing. Each message sent should have a unique value (from inbound message).
Yes	messageTimestamp	Date Time	20	Time stamp of when the message was created. All time stamps must be reported in UTC (from inbound message).
Yes	itemKey	Numeric	1	Unique message identifier (from inbound message).
Yes	responseCode	Numeric	15	Code identifying the response for system processing.
Yes	responseMessage	String	500	Human-readable message describing the response.

JSON Sample Outbound: Alert Success Response

```
{
  "responseTimestamp": "2024-06-20T12:50:30Z",
  "responseStatus": "SUCCESS",
  "totalItemKeysSubmitted": 1,
  "totalItemKeysSuccess": 1,
  "totalItemKeysError": 0,
  "serviceContext": {
    "companyId": "RAIL",
    "messageId": "MSG1234567890",
    "messageTimestamp": "2024-04-02T08:44:00Z"
  },
  "responseSummaries": [],
  "responseDetails": [
    {
      "itemKey": "1",
      "reportStatus": "SUCCESS",
      "responseDetailEntries": [
        {
          "responseCode": "200",
          "responseMessage": "Alert reported"
        }
      ]
    }
  ]
}
```

Output Data Definitions

Mandatory	Element Name	Restriction	Value	Description
Yes	responseTimestamp	Date Time	20	Time stamp for when the response message was created in UTC.
Yes	responseStatus	String	15	State of the message transaction.
Yes	companyId	String	4	ID of the company submitting the request matching the submitter's company mark (from inbound message).
Yes	messageId	String	64	ID that uniquely identifies the message for auditing and tracing. Each message sent should have a unique value (from inbound message).
Yes	messageTimestamp	Date Time	20	Time stamp of when the message was created. All time stamps must be reported in UTC (from inbound message).
Yes	itemKey	Numeric	1	Unique message identifier (from inbound message).
Yes	responseCode	Numeric	15	Code identifying the response for system processing.
Yes	responseMessage	String	500	Human-readable message describing the response.

Example XML Messages

XML Schema: Alert Report and Response

Note: Maximum of one car.

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
    targetNamespace="http://ehms.railinc.com/2024v1wm/xml/alertReportXmlSchema.xsd"
    xmlns:ns="http://ehms.railinc.com/2024v1wm/xml/alertReportXmlSchema.xsd"
    elementFormDefault="qualified">
    <xs:simpleType name="EquipmentInitialType">
        <xs:annotation>
            <xs:documentation>Basic type for an equipment initial, 2-4 upper case alpha
characters only</xs:documentation>
        </xs:annotation>
        <xs:restriction base="xs:string">
            <xs:minLength value="2"/>
            <xs:maxLength value="4"/>
            <xs:pattern value="[A-Z]*"/>
        </xs:restriction>
    </xs:simpleType>
    <xs:simpleType name="EquipmentNumberType">
        <xs:annotation>
            <xs:documentation>Basic type for an equipment number, up to 10 digits.
Optional left hand padding with 0's is acceptable but not required</xs:documentation>
        </xs:annotation>
        <xs:restriction base="xs:string">
            <xs:minLength value="1"/>
            <xs:maxLength value="10"/>
            <xs:pattern value="[0-9]*"/>
        </xs:restriction>
    </xs:simpleType>
    <!-- Alert Type -->
    <xs:simpleType name="AlertTypeType">
        <xs:restriction base="xs:string">
            <xs:minLength value="1"/>
            <xs:maxLength value="15"/>
        </xs:restriction>
    </xs:simpleType>
    <xs:simpleType name="aarSideOfEquipmentType">
        <xs:restriction base="xs:string">
            <xs:enumeration value="L"/>
            <xs:enumeration value="R"/>
        </xs:restriction>
    </xs:simpleType>
    <xs:simpleType name="aarAxleNumberType">
        <xs:restriction base="xs:string">
            <xs:pattern value="(0[1-9]|1[0-9]|2[0-9]|3[0-6])/>
        </xs:restriction>
    </xs:simpleType>
    <xs:simpleType name="EquipmentOrientationType">
        <xs:restriction base="xs:string">
            <xs:enumeration value="A"/>
            <xs:enumeration value="B"/>
            <xs:enumeration value="U"/>
        </xs:restriction>
    </xs:simpleType>
    <xs:simpleType name="ReportStatusType">
        <xs:restriction base="xs:string">
            <xs:enumeration value="SUCCESS"/>
            <xs:enumeration value="ERROR"/>
        </xs:restriction>
    </xs:simpleType>
```

```

        </xs:restriction>
    </xs:simpleType>
    <xs:simpleType name="hazmatFlagEquipmentLevelType">
        <xs:restriction base="xs:string">
            <xs:enumeration value="Y"/>
            <xs:enumeration value="N"/>
        </xs:restriction>
    </xs:simpleType>
    <xs:complexType name="EquipmentIdType">
        <xs:sequence>
            <xs:element name="equipmentInitial" type="ns:EquipmentInitialType"/>
            <xs:element name="equipmentNumber" type="ns:EquipmentNumberType"/>
        </xs:sequence>
    </xs:complexType>
    <xs:complexType name="ComponentDetailType">
        <xs:sequence>
            <xs:element name="equipmentOrientation"
type="ns:EquipmentOrientationType"/>
            <xs:element name="aarAxleNumber" type="ns:aarAxleNumberType"/>
            <xs:element name="aarSideOfEquipment" type="ns:aarSideOfEquipmentType"/>
        </xs:sequence>
    </xs:complexType>
    <xs:complexType name="DetectorReadingType">
        <xs:sequence>
            <xs:element name="bearingKValueEquipmentBased" type="xs:decimal"/>
            <xs:element name="bearingKValueTrainBased" type="xs:decimal"/>
            <xs:element name="bearingTempDegF" type="xs:decimal"/>
            <xs:element name="hazmatFlagEquipmentLevel"
type="ns:hazmatFlagEquipmentLevelType" minOccurs="0"/>
            <xs:element name="hottestBearingTempFDelta" type="xs:decimal"
minOccurs="0"/>
            <xs:element name="lastEventTimestamp" type="xs:dateTime" minOccurs="0"/>
        </xs:sequence>
    </xs:complexType>
    <xs:complexType name="AlertInformationType">
        <xs:sequence>
            <xs:element name="alertCreatedTimestamp" type="xs:dateTime"/>
            <xs:element name="alertType" type="ns:AlertTypeType"/>
        </xs:sequence>
    </xs:complexType>
    <xs:simpleType name="ResponseMessageType">
        <xs:restriction base="xs:string">
            <xs:maxLength value="2000"/>
        </xs:restriction>
    </xs:simpleType>
    <xs:complexType name="ResponseDetailEntryType">
        <xs:sequence>
            <xs:element name="responseCode" type="xs:string"/>
            <xs:element name="responseMessage" type="ns:ResponseMessageType"/>
        </xs:sequence>
    </xs:complexType>
    <xs:complexType name="ResponseDetailEntriesType">
        <xs:sequence>
            <xs:element name="ResponseDetailEntry" type="ns:ResponseDetailEntryType"
maxOccurs="unbounded"/>
        </xs:sequence>
    </xs:complexType>
    <xs:simpleType name="ItemKeyType">
        <xs:restriction base="xs:string">
            <xs:maxLength value="36"/>
        </xs:restriction>
    </xs:simpleType>
    <xs:complexType name="ResponseDetailType">
        <xs:sequence>
            <xs:element name="itemKey" type="ns:ItemKeyType"/>

```

```

        <xs:element name="reportStatus" type="ns:ReportStatusType"/>
        <xs:element name="responseDetailEntries"
type="ns:ResponseDetailEntriesType"/>
    </xs:sequence>
</xs:complexType>
<xs:complexType name="ResponseDetailsType">
    <xs:sequence>
        <xs:element name="responseDetail" type="ns:ResponseDetailType"
maxOccurs="unbounded"/>
    </xs:sequence>
</xs:complexType>
<xs:simpleType name="CompanyCodeType">
    <xs:restriction base="xs:string">
        <xs:minLength value="2"/>
        <xs:maxLength value="4"/>
        <xs:pattern value="[A-Z]*"/>
    </xs:restriction>
</xs:simpleType>
<xs:simpleType name="MessageIdType">
    <xs:restriction base="xs:string">
        <xs:maxLength value="64"/>
    </xs:restriction>
</xs:simpleType>
<xs:complexType name="BaseRequestType">
    <xs:sequence>
        <xs:element name="companyId" type="ns:CompanyCodeType">
            <xs:annotation>
                <xs:documentation>ID of the company submitting the
request.</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="messageId" type="ns:MessageIdType">
            <xs:annotation>
                <xs:documentation>Unique message ID to help trace and debug
this message.</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="messageTimestamp" type="xs:dateTime">
            <xs:annotation>
                <xs:documentation>Timestamp of when the request was
created.</xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
</xs:complexType>
<xs:simpleType name="SystemIdType">
    <xs:annotation>
        <xs:documentation>ID to identify a system or system component for
tracing/auditing and system identification.</xs:documentation>
    </xs:annotation>
    <xs:restriction base="xs:string">
        <xs:maxLength value="64"/>
    </xs:restriction>
</xs:simpleType>
<xs:simpleType name="SystemVersionType">
    <xs:annotation>
        <xs:documentation>Identify the specific version of a
system.</xs:documentation>
    </xs:annotation>
    <xs:restriction base="xs:string">
        <xs:maxLength value="24"/>
    </xs:restriction>
</xs:simpleType>
<xs:complexType name="ReportAlertsType">
    <xs:sequence>

```

```

        <xs:element name="reportAlert" type="ns:ReportAlertType"
maxOccurs="500"></xs:element>
    </xs:sequence>
</xs:complexType>
<xs:complexType name="ReportAlertType">
    <xs:sequence>
        <xs:element name="itemKey" type="ns:ItemKeyType"/>
        <xs:element name="alertInformation" type="ns:AlertInformationType"/>
        <xs:element name="equipmentId" type="ns:EquipmentIdType">
            <xs:annotation>
                <xs:documentation>Equipment ID of the end of train device if
available</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="componentDetail" type="ns:ComponentDetailType">
            <xs:annotation>
                <xs:documentation>Component details including aarAxleNumber,
aarSideOfEquipment, equipmentOrientation</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="detectorReading" type="ns:DetectorReadingType">
            <xs:annotation>
                <xs:documentation>Detector reading elements in
DetectorReadingType</xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
</xs:complexType>
<xs:simpleType name="ResponseStatusType">
    <xs:restriction base="xs:string">
        <xs:enumeration value="SUCCESS"/>
        <xs:enumeration value="ERROR"/>
        <xs:enumeration value="PARTIAL_SUCCESS"/>
    </xs:restriction>
</xs:simpleType>
<xs:complexType name="ResponseSummariesType">
    <xs:sequence>
        <xs:element name="responseDetailEntry" type="ns:ResponseDetailEntryType"
maxOccurs="unbounded"/>
    </xs:sequence>
</xs:complexType>
<xs:complexType name="ReportAlertsResponseType">
    <xs:sequence>
        <xs:element name="responseTimestamp" type="xs:dateTime"/>
        <xs:element name="responseStatus" type="ns:ResponseStatusType"/>
        <xs:element name="totalItemKeysSubmitted" type="xs:integer" minOccurs="0"/>
        <xs:element name="totalItemKeysSuccess" type="xs:integer" minOccurs="0"/>
        <xs:element name="totalItemKeysError" type="xs:integer" minOccurs="0"/>
        <xs:element name="serviceContext" type="ns:BaseRequestType" minOccurs="0"/>
        <xs:element name="responseDetails" type="ns:ResponseDetailsType"/>
        <xs:element name="responseSummaries" type="ns:ResponseSummariesType"/>
    </xs:sequence>
</xs:complexType>
<xs:complexType name="AlertReportType">
    <xs:sequence>
        <xs:element name="serviceContext" type="ns:BaseRequestType"/>
        <xs:element name="reportAlerts" type="ns:ReportAlertsType"/>
    </xs:sequence>
</xs:complexType>
<!-- AlertReport -->
<xs:element name="alertReport" type="ns:AlertReportType"/>
<xs:element name="reportAlertsResponse" type="ns:ReportAlertsResponseType"/>
</xs:schema>

```

XML Sample Inbound: Alert Create

Note: Maximum of one car.

```
<?xml version="1.0" encoding="UTF-8"?>
<ns:alertReport xmlns:ns="http://ehms.railinc.com/2024v1wm/xml/alertReportXmlSchema.xsd">
  <ns:serviceContext>
    <ns:companyId>RAIL</ns:companyId>
    <ns:messageId>MSG1234567890</ns:messageId>
    <ns:messageTimestamp>2024-04-02T08:44:00Z</ns:messageTimestamp>
  </ns:serviceContext>
  <ns:reportAlerts>
    <ns:reportAlert>
      <ns:itemKey>1</ns:itemKey>
      <ns:alertInformation>
        <ns:alertCreatedTimestamp>2024-04-02T08:43:23Z</ns:alertCreatedTimestamp>
        <ns:alertType>HBD_TRND</ns:alertType>
      </ns:alertInformation>
      <ns:equipmentId>
        <ns:equipmentInitial>RAIL</ns:equipmentInitial>
        <ns:equipmentNumber>0000000100</ns:equipmentNumber>
      </ns:equipmentId>
      <ns:componentDetail>
        <ns:equipmentOrientation>A</ns:equipmentOrientation>
        <ns:aarAxleNumber>02</ns:aarAxleNumber>
        <ns:aarSideOfEquipment>L</ns:aarSideOfEquipment>
      </ns:componentDetail>
      <ns:detectorReading>
        <ns:bearingKValueEquipmentBased>2.338</ns:bearingKValueEquipmentBased>
        <ns:bearingKValueTrainBased>4.21</ns:bearingKValueTrainBased>
        <ns:bearingTempDegF>150</ns:bearingTempDegF>
        <ns:hazmatFlagEquipmentLevel>Y</ns:hazmatFlagEquipmentLevel>
        <ns:hottestBearingTempFDelta>59</ns:hottestBearingTempFDelta>
        <ns:lastEventTimestamp>2024-04-02T08:42:23Z</ns:lastEventTimestamp>
      </ns:detectorReading>
    </ns:reportAlert>
  </ns:reportAlerts>
</ns:alertReport>
```

Input Data Definitions

Mandatory	Element Name	Restriction	Value	Description
Yes	companyId	String	4	ID of the company submitting the request matching the submitter's company mark.
Yes	messageId	String	64	ID that uniquely identifies the message for auditing and tracing. Each message sent should have a unique value.
Yes	messageTimestamp	Date Time	20	Time stamp of when the message was created. All time stamps must be reported in UTC.
Yes	itemKey	Numeric	1	Unique message identifier.
Yes	alertCreatedTimestamp	Date Time	20	Time stamp of when the Alert was created by road.
Yes	alertType	String	15	Type of Alert created by the road.
Yes	equipmentInitial	String	4	Basic type for the equipment initial; 2–4 uppercase alpha characters only.
Yes	equipmentNumber	Numeric	10	Basic type for the equipment number, up to 10 digits.
Yes	equipmentOrientation	String	1	Orientation of the equipment in relation to the train using AAR-recognized orientation codes for railcars.
Yes	aarAxleNumber	Integer	2	Axle number for the equipment starting with 1 at the B end of the equipment.
Yes	aarSideOfEquipment	String	1	AAR side of the equipment, these readings are for (L or R) as viewed from the B end of the equipment to the A end (left/right).
Yes	bearingKValueEquipmentBased	Decimal	10	Equipment-based K value for the bearing on this side of the train at this axle based on industry-standard calculations.
Yes	bearingKValueTrainBased	Decimal	10	Train-based K value for the bearing on this side of the train at this axle based on industry-standard calculations.
Yes	bearingTempDegF	Decimal	10	Recorded bearing temperature (above ambient) in degrees Fahrenheit.
No	hazmatFlagEquipmentLevel	String	1	Car contains hazardous material for date and time reported. (Hazmat STCC Code 48, 49).
No	hottestBearingTempFDelta	Numeric	10	The difference of the temperature of the hottest bearing and the next hottest bearing for this equipment.
No	lastEventTimestamp	Date Time	20	Time stamp of the last event that triggered the alert creation.

XML Sample Outbound: Alert Error Response

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ns:reportAlertsResponse
xmlns:ns="http://ehms.railinc.com/2024v1wm/xml/alertReportXmlSchema.xsd">
  <ns:responseTimestamp>2024-06-26T00:42:08Z</ns:responseTimestamp>
  <ns:responseStatus>ERROR</ns:responseStatus>
  <ns:totalItemKeysSubmitted>1</ns:totalItemKeysSubmitted>
  <ns:totalItemKeysSuccess>0</ns:totalItemKeysSuccess>
  <ns:totalItemKeysError>1</ns:totalItemKeysError>
  <ns:serviceContext>
    <ns:companyId>RAIL</ns:companyId>
    <ns:messageId>MSG1234567890</ns:messageId>
    <ns:messageTimestamp>2024-04-02T08:44:00Z</ns:messageTimestamp>
  </ns:serviceContext>
  <ns:responseSummaries/>
  <ns:responseDetails>
    <ns:responseDetail>
      <ns:itemKey>1</ns:itemKey>
      <ns:reportStatus>ERROR</ns:reportStatus>
      <ns:responseDetailEntries>
        <ns:responseDetailEntry>
          <ns:responseCode>422</ns:responseCode>
          <ns:responseMessage>componentDetail.aarSideOfEquipment does not have a value
in the enumeration [L, R] </ns:responseMessage>
        </ns:responseDetailEntry>
        <ns:responseDetailEntry>
          <ns:responseCode>422</ns:responseCode>
          <ns:responseMessage>detectorReading.bearingKValueEquipmentBased is a required
property but it's missing</ns:responseMessage>
        </ns:responseDetailEntry>
        <ns:responseDetailEntry>
          <ns:responseCode>422</ns:responseCode>
          <ns:responseMessage>componentDetail.aarAxleNumber is a required property but
it's missing</ns:responseMessage>
        </ns:responseDetailEntry>
      </ns:responseDetailEntries>
    </ns:responseDetail>
  </ns:responseDetails>
</ns:reportAlertsResponse>
```

Output Data Definitions

Mandatory	Element Name	Restriction	Value	Description
Yes	responseTimestamp	Date Time	20	Time stamp for when the response message was created in UTC.
Yes	responseStatus	String	15	State of the message transaction.
Yes	companyId	String	4	ID of the company submitting the request matching the submitter's company mark (from inbound message).
Yes	messageId	String	64	ID that uniquely identifies the message for auditing and tracing. Each message sent should have a unique value (from inbound message).
Yes	messageTimestamp	Date Time	20	Time stamp of when the message was created. All time stamps must be reported in UTC (from inbound message).
Yes	itemKey	Numeric	1	Unique message identifier (from inbound message).
Yes	responseCode	Numeric	15	Code identifying the response for system processing.
Yes	responseMessage	String	500	Human-readable message describing the response.

XML Sample Outbound: Alert Success Response

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ns:reportAlertsResponse
xmlns:ns="http://ehms.railinc.com/2024v1wm/xml/alertReportXmlSchema.xsd">
  <ns:responseTimestamp>2024-06-20T13:04:57Z</ns:responseTimestamp>
  <ns:responseStatus>SUCCESS</ns:responseStatus>
  <ns:totalItemKeysSubmitted>1</ns:totalItemKeysSubmitted>
  <ns:totalItemKeysSuccess>1</ns:totalItemKeysSuccess>
  <ns:totalItemKeysError>0</ns:totalItemKeysError>
  <ns:serviceContext>
    <ns:companyId>RAIL</ns:companyId>
    <ns:messageId>MSG1234567890</ns:messageId>
    <ns:messageTimestamp>2024-04-02T08:44:00Z</ns:messageTimestamp>
  </ns:serviceContext>
  <ns:responseSummaries/>
  <ns:responseDetails>
    <ns:responseDetail>
      <ns:itemKey>1</ns:itemKey>
      <ns:reportStatus>SUCCESS</ns:reportStatus>
      <ns:responseDetailEntries>
        <ns:responseDetailEntry>
          <ns:responseCode>200</ns:responseCode>
          <ns:responseMessage>Alert reported</ns:responseMessage>
        </ns:responseDetailEntry>
      </ns:responseDetailEntries>
    </ns:responseDetail>
  </ns:responseDetails>
</ns:reportAlertsResponse>
```

Output Data Definitions

Mandatory	Element Name	Restriction	Value	Description
Yes	responseTimestamp	Date Time	20	Time stamp for when the response message was created in UTC.
Yes	responseStatus	String	15	State of the message transaction.
Yes	companyId	String	4	ID of the company submitting the request matching the submitter's company mark (from inbound message).
Yes	messageId	String	64	ID that uniquely identifies the message for auditing and tracing. Each message sent should have a unique value (from inbound message).
Yes	messageTimestamp	Date Time	20	Time stamp of when the message was created. All time stamps must be reported in UTC (from inbound message).
Yes	itemKey	Numeric	1	Unique message identifier (from inbound message).
Yes	responseCode	Numeric	15	Code identifying the response for system processing.
Yes	responseMessage	String	500	Human-readable message describing the response.

Appendix A

HBD Trending Alert 51.3 (R19) - Message Format						
	Item / Element Name	Format	Size	M = Mandatory O = Optional	Content	Example(s)
Inbound Message (Roads)	companyId	String	4	M	2 - 4 Alpha (Mark)	NS, BNSF
	messageId	String	64	M	Alpha Numeric	edgf_202405_xyz
	messageTimestamp	Date Time	20	M	YYYY-MM-DDTHH:MM:SSZ	2024-04-02T08:43:23Z
	itemKey	Numeric	1	M	Default to 1	1
	alertCreatedTimestamp	Date Time	20	M	YYYY-MM-DDTHH:MM:SSZ	2024-04-02T08:43:23Z
	alertType	String	15	M	HBD_TRND	HBD_TRND
	equipmentInitial	String	4	M	2 - 4 Uppercase Alpha	CN, CSXT
	equipmentNumber	Numeric	10	M	1-10 digits only	4521, 0000004893
	equipmentOrientation	String	1	M	A, B, U	A, B, U
	aarAxleNumber	Integer	2	M	Positive Whole Number	01, 36
	aarSideOfEquipment	String	1	M	L, R	L, R
	bearingKValueEquipmentBased	Decimal	10	M	Valid Number	81, 65.152
	bearingKValueTrainBased	Decimal	10	M	Valid Number	74, 56.279
	bearingTempDegF	Decimal	10	M	Valid Temperature	61, 23
	hazmatFlagEquipmentLevel	String	1	O	Y, N	Y, N
	hottestBearingTempFDelta	Numeric	10	O	Valid Temperature	12, 89
	lastEventTimestamp	Date Time	20	O	YYYY-MM-DDTHH:MM:SSZ	2024-04-02T08:43:23Z
Outbound Message (Railinc)	responseTimestamp	Date Time	20	M	YYYY-MM-DDTHH:MM:SSZ	2024-04-02T08:43:23Z
	responseStatus	String	15	M	Success, Partial_Success, Error	SUCCESS, ERROR
	companyId	String	4	M	2 - 4 Alpha (mark)	NS, BNSF
	messageId	String	64	M	Alpha Numeric	edgf_202405_xyz
	messageTimestamp	Date Time	20	M	YYYY-MM-DDTHH:MM:SSZ	2024-04-02T08:43:23Z
	itemKey	Numeric	1	M	Default to 1	1
	responseCode	Numeric	15	M	Positive Whole Number	200, 404
	responseMessage	String	500	M	Alpha Numeric	Alert Processed Successfully

REST Endpoints	
Environment	Report 51.3 Alert
Pre-Production (Test)	https://api.ehms.tst.railinc.com/rest/v1/alerts/report/hbd_trnd
Production	https://api.ehms.railinc.com/rest/v1/alerts/report/hbd_trnd