



Road Usage Charge Program

Interface Control Document

For Road Usage Charge Implementation

Version 1.5

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Revision History

Name Of Person Responsible For Change	Date Of Revision	Reason For the Change and Short Summary of the Revisions Made	Version Number
ODOT	05/12/14	Procurement Document Released	1.0
ODOT	07/16/14	Updates to definitions and fields	1.1
ODOT	08/05/14	Corrections for Adjustments and Error codes Added return message for Daily report	1.1
ODOT	9/17/14	Corrected minor errors	1.2
ODOT	12/19/14	Corrected minor errors	1.3
ODOT	02/23/15	Update timestamp fields to use UTC	1.4
ODOT	06/05/15	Identify optional fields	1.5

1 Introduction

Purpose

To describe the specifications for interfaces between subsystems of the RUC system.

The introduction section presents a brief overview of the system and interface to which this Interface Control Document (ICD) applies to help the reader understand the document organization and how to interpret the document.

System Name: Oregon Road Usage Charging (RUC) System

System Acronym: RUC System

System Owner Information: ODOT OIPP

Interface Described: This ICD covers the interface between the Mileage Collection subsystem and RUC Processing subsystem which includes, the mileage message; and the interface between the RUC Processing subsystem and Road Usage Charging Accounting subsystem.

A diagram of the architecture is included below.

1.1 Document Overview

This document provides the specifications for the interfaces between the subsystems of the RUC system. The interface specifications may change over time, changes will be managed through an ODOT led Change Management process.

1.2 Definitions, Acronyms, and Abbreviations

AM – Account Manager, an entity certified by the State of Oregon to record the miles traveled by RUC eligible vehicles, collect the RUC due on behalf of the State, and provide RUC account management.

FIPS – Federal Information Processing Standard, which includes two-digit numerical codes for each U.S. state/territory.

HTTP – HyperText Transfer Protocol

ICD – Interface Control Document

IP – Internet Protocol

JSON – JavaScript Object Notation

MRD – Mileage Reporting Device

ODOT – Oregon Department of Transportation

OIPP - Oregon Innovative Partnerships Program

RCP – Road Usage Charge Processing Subsystem

REST – Representational State Transfer

RUC – Road Usage Charge

RUCA – Road Usage Charge Administration

RUCAS – Road Usage Charge Accounting Subsystem

RUCPP - Road Usage Charging Pilot Project

SRS - System Requirements Specification

TCP – Transmission Control Protocol

VIN – Vehicle Identification Number

1.3 System Interface Overview

This section describes project information as it relates to requirements.

1.4 Project Context

The Oregon Road Usage Charging System will implement a Road Usage Charge to provide road usage charging for a volunteer group of vehicles. This system will allow for automatic collection of road use charges from subject vehicles. This automatic collection uses a Mileage Collection subsystem, which is comprised of a Mileage Reporting Device (MRD) and a Data Collection component (which may be located in the MRD, or may be located on a server), that will send a “mileage message” to Road Usage Charge Processing servers run by Account Managers. The mileage message is defined in this document.

This system includes a Road Usage Charge Processing subsystem to administer customer accounts, collect information from vehicles, invoice customers, and send revenue to the Oregon State Treasury. The RUC system also includes a Road Usage Charge Administration Subsystem (RUCAS), internal to the agency. RUC administrative functions include audits and account reconciliations of Account Manager reports required for financial operation and monitoring of the entire system.

In addition to the mileage message as the primary interface between the Mileage Collection subsystem and the RUC Processing subsystem, this interface control document defines the interface between the Road Usage Charge Processing and Road Usage Charge Administrative subsystems as well.

1.5 Project Documents

The technical aspects of the project work are documented primarily in the following documents (business, administrative, and programmatic aspects of the work are documented elsewhere):

- System Overview that describes the functions and processes of the system at a high level.
- A System Requirements Specification (SRS) that provides the functional technical requirements for the component subsystems.
- A Business Requirements document that details the business process requirements.
- A Tool kit that contains schemas and sample data (under development).

1.6 Open Systems Objective

ODOT desires this system to be fully open. Firms will always be eligible for certification to provide hardware or services, and no hardware or service that is certified shall contain proprietary content that would limit the use of other hardware or services in the system, then or in the future. ODOT will certify any technology complying with the specifications, and ODOT will certify any service-providing firm complying with the specifications to be an Account Manager. Conformance to the interface specified in this document is mandatory for any technology and any Account Manager. The intent is that vendors can use proprietary components to meet the requirements of the subsystems (as defined in the SRS) but they must stay open at the system level by using the defined interfaces in the ICD which defines the connections between the subsystems.

1.7 Applicable Standards and Preferences

- REST
- JSON
- HTTP
- TCP

- IP

There is no standard/preference for over-the-air communication.

1.8 Interface Control Standardization

Having a standardized interface is vital to operating open systems. Having a standardized interface will allow MRDs from various technology providers to operate with various Account Managers and multiple Account Managers to work with the agency.

This interface control document embraces a cloud-based approach to communications from the Mileage Collection subsystem. This cloud-based approach may employ any communications medium permitting an Internet connection. This ICD provides a robust communications standard.

Within Internet communications, this interface control document employs JSON messages because they are an industry standard for human readable, yet relatively low overhead communications.

2 Interface for Mileage Message

2.1 Mileage Message overview

Between Mileage Collection subsystem to RCP subsystem, is a mileage message that is independent of communication channel, and specific hardware or software.

2.1.1 Data Transfer

Data will be sent from the Mileage Collection subsystem to the Account Manager using REST and JSON as defined in this document. The data is as specified in the mileage message below. The frequency of transmission is parameterized in the Mileage Collection subsystem, and set per the agency requirements.

2.1.2 Transactions

Transactions are comprised of one mileage message moving from Mileage Collection to RUC Processing. Transactions will be acknowledged by the Road Usage Charge Processing subsystem with a standard response from a REST transaction (HTTP 200) if the message can be parsed. If the message fails data validation, an HTTP 400 will be sent to the Mileage Collection subsystem from which it came with a failure message as the JSON payload. The failure message is specified in this section.

2.1.3 Interface Requirements and Security

The Mileage message is a means of transmitting mileage data from the Mileage Collection subsystem to the RUC Processing subsystem.

Application Layer: HTTP over TLS/SSL

Transport Layer: TCP

Internet Layer: IP

Web-services protocol: REST

Message definition: JSON

The REST endpoint is the URL of the RUC Processing subsystem server provided by the Account Manager.

2.1.4 Communication Methods

Any communications method that can employ the protocols specified above is appropriate. For example, Wi-Fi, 3G, 4G, and fixed-line Internet are all appropriate communication methods.

2.1.5 Interface Initiation

The Mileage Message is a push message from the Mileage Collection subsystem to the RUC Processing subsystem. The RUC Processing subsystem accepts the message at all times, whenever the Mileage Collection subsystem transmits it.

The message is sent by the Mileage Collection subsystem at an interval programmed into the Mileage Collection subsystem, as specified in the SRS.

The Mileage message contains data for only one vehicle (VIN). If an MRD determines it has been inserted into a new vehicle but still has unsent mileage days in its buffer, it shall send

these in one mileage message before it sends new mileage day records (for the new vehicle) in a new mileage message.

2.2 Mileage Message Pseudocode

<i>{MileageMessage</i>	
MRDID	
MRDIssuer	
MRDManufacturer	
	<i>{ MRDConfigVersion</i>
	HWModel
	HWMainRelease
	HWSubRelease
	SWMainRelease
	SWSubRelease
	MapMainRelease
	MapSubRelease
	<i>}</i>
FuelUseMethod	
VIN	
MsgID	
MsgType	
TransmittedTimestamp	

The following block of code is the mileage day record. For each mileage message, include a record for each day not yet transferred to transactions processor. All days shall be included, even if miles driven are 0.

<i>{MileageDetails</i>
ReportDate
TotalMilesOnDate
AccumMilesOnDate
FuelUsageOnDate
FuelAddedOnDate

Mileage Message Pseudocode

The following block of code is the mileage rule record. For each day (mileage day record), include one instance of this block for each Sub Rule ID in which the vehicle has traveled.

<i>{MileageSubRuleDetails</i>
RuleID
SubRuleID
MsgMileageInSubRuleID
MsgFuelUsagInSubRuleID
MsgFuelAddedInSubRuleID
}

The following block of code is the MRD Health error code for each error that occurs during a mileage day record.

<i>{MRDHealthDetails</i>
MRDHealth
MRDHealthTimestamp
}

}

}

2.3 Mileage Message Definitions

Data Element	Meaning
MRDID	<ul style="list-style-type: none"> • Required • Description: Unique identifier for MRD (such as serial number) • Data Type: String • Format: VARCHAR(64) • Calculation: N/A • Values: N/A • Special Rules: N/A
MRDIssuer	<ul style="list-style-type: none"> • Required • Description: Name of entity issuing MRD • Data Type: String • Format: VARCHAR(50) • Calculation: N/A • Values: N/A • Special Rules: N/A
MRDManufacturer	<ul style="list-style-type: none"> • Required • Description: Name of MRD Manufacturer • Data Type: String • Format: VARCHAR(50) • Calculation: N/A • Values: N/A • Special Rules: N/A
HWMModel	<ul style="list-style-type: none"> • Required • Description: HW Model number • Data Type: String • Format: VARCHAR(15) • Calculation: N/A • Values: N/A • Special Rules: N/A

Data Element	Meaning
HWMainRelease	<ul style="list-style-type: none"> • Required • Description: HW primary release number • Data Type: String • Format: VARCHAR(15) • Calculation: N/A • Values: N/A • Special Rules: N/A
HWSubRelease	<ul style="list-style-type: none"> • Required • Description: HW secondary release number • Data Type: String • Format: VARCHAR(15) • Calculation: N/A • Values: N/A • Special Rules: N/A
SWMainRelease	<ul style="list-style-type: none"> • Required • Description: SW primary release number • Data Type: String • Format: VARCHAR(10) • Calculation: N/A • Values: N/A • Special Rules: N/A
SWSubRelease	<ul style="list-style-type: none"> • Required • Description: SW secondary release number • Data Type: String • Format: VARCHAR(10) • Calculation: N/A • Values: N/A • Special Rules: N/A

Data Element	Meaning
MapMainRelease	<ul style="list-style-type: none"> • Required • Description: Map primary release number • Data Type: String • Format: VARCHAR(3) • Calculation: N/A • Values: N/A • Special Rules: N/A
MapSubRelease	<ul style="list-style-type: none"> • Required • Description: Map secondary release number • Data Type: String • Format: VARCHAR(3) • Calculation: N/A • Values: N/A • Special Rules: N/A
FuelUseMethod	<ul style="list-style-type: none"> • Required • Description: A value indicating which fuel consumption method is used to calculate fuel usage • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ul style="list-style-type: none"> • 1 = Fuel use not calculated • 2 =Fuel calculated from actual fuel use on the device • 3 = Fuel Use calculated using approved EPA methods (see Business Requirements Document) • 4 = Vehicle does not use taxable fuel • Special Rules: N/A

Data Element	Meaning
VIN	<ul style="list-style-type: none"> • Required • Description: The VIN of the vehicle in which the MRD is installed • Data Type: String • Format: VARCHAR (20) • Calculation: N/A • Values: N/A • Special Rules: N/A
MsgID	<ul style="list-style-type: none"> • Required • Description: Message identification number for sequencing of mileage messages • Data Type: Number • Format: Integer • Calculation: N/A • Values: N/A • Special Rules: N/A
MsgType	<ul style="list-style-type: none"> • Required • Description: A value to indicate the type of message from the MRD • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ul style="list-style-type: none"> ○ 1 = Normal message ○ 2 = First Message from vehicle ○ 3 = Last Message from vehicle • Special Rules: N/A

Data Element	Meaning
TransmittedTimestamp	<ul style="list-style-type: none"> • Required • Description: Timestamp provided by transmitting entity when message sent • Data Type: String • Format: The date / time is specified in the following form "YYYY-MM-DDT hh:mm:ss" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day ○ T indicates the start of the required time section ○ hh indicates the hour ○ mm indicates the minute ○ ss indicates the second • Calculation: N/A • Values: N/A • Special Rules: UTC
ReportDate	<ul style="list-style-type: none"> • Required • Description: The date of Mileage Day Record • Data Type: String • Format: The date is specified in the following form "YYYY-MM-DD" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day • Calculation: N/A • Values: N/A • Special Rules: N/A
TotalMilesOnDate	<ul style="list-style-type: none"> • Required • Description: Total Miles Reported for the VIN/MRD for a given day • Data Type: Number • Format: One decimal place - Miles to nearest tenth of a mile [0,0.1,0.2...10,000,000.0] • Calculation: N/A • Values: N/A • Special Rules: N/A

Data Element	Meaning
AccumMilesOnDate	<ul style="list-style-type: none"> • Required • Description: Cumulative miles of the MRD since installed in the VIN • Data Type: Number • Format: One decimal place - Miles to nearest tenth of a mile [0,0.1,0.2...10,000,000.0] • Calculation: N/A • Values: N/A • Special Rules: If no miles accumulated, set this field value to 0
FuelUsageOnDate	<ul style="list-style-type: none"> • Required • Description: Accumulated fuel usage on reporting date for the VIN/MRD • Data Type: Number • Format: Two decimal places - Gallons to hundredth of a gallon [0.01, 0.02, 99,999,999.99] • Calculation: Must reconcile with the following: SUM of "MsgFuelUsageInSubRuleID" for all Sub Rule IDs in reporting period • Values: N/A • Special Rules: N/A
FuelAddedOnDate	<ul style="list-style-type: none"> • Required • Description: The amount of fuel added on a given day for the VIN/MRD • Data Type: Number • Format: Gallons to hundredth of a gallon [0.01, 0.02, 99,999,999.99] • Calculation: Must reconcile with the following: SUM of "MsgFuelAddedInSubRuleID" for all Sub Rule IDs in reporting period • Values: N/A • Special Rules: Calculating fuel added to vehicle is not a required functionality at this time – if no data for this field, set field value to blank.

Data Element	Meaning
RuleID	<ul style="list-style-type: none"> • Required • Description: Rule ID An identifier associated with a geographic area, or zone, in which a specific rate per mile will be assessed for miles traveled. FIPS codes are used to identify states • Data Type: Number • Format: Integer • Calculation: N/A • Values: Rule ID codes and definitions are defined in the Agency provided RUC Rate Table • Special Rules: N/A
SubRuleID	<ul style="list-style-type: none"> • Required • Description: Sub Rule ID, numerical index for region of travel within given Rule ID • Data Type: Number • Format: Integer • Calculation: N/A • Values: Assigned by Agency as necessary, provided in RUC Rate Table • Special Rules: N/A
MsgMileageInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Miles Traveled in VIN/MRD Sub Rule ID on given date • Data Type: Number • Format: Miles to nearest tenth of a mile [0,0.1,0.2, 10,000.0] • Calculation: N/A • Values: N/A • Special Rules: N/A

Data Element	Meaning
MsgFuelUsageInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Amount of fuel consumed based on Fuel Use Method in given VIN/MRD Sub Rule ID on given day • Data Type: Number • Format: Gallons to hundredth of a gallon [0.01, 0.02, 99,999,999.99] • Calculation: N/A • Values: N/A • Special Rules: N/A
MsgFuelAddedInSubRuleID	<ul style="list-style-type: none"> • Required • Description: The amount of fuel added in given VIN/MRD Sub Rule ID on a given day. • Data Type: Number • Format: Two decimal places - Gallons to hundredth of a gallon [0.01, 0.02, 99,999,999.99] • Calculation: N/A • Values: N/A • Special Rules: Calculating fuel added to vehicle is not a required functionality at this time – if no data for this field, set field value to blank.

Data Element	Meaning
MRDHealth	<ul style="list-style-type: none"> • Required (if MRD error or event occurs during reporting period) • Description: Coding of each error and event that occurred for the given MRD on the given date, when the error was detected by the MRD • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ol style="list-style-type: none"> 1. Low Voltage 2. Anomalies in monitored vehicle functions and parameters which could compromise the collection and reporting of RUC data (e.g., MIL on - Check Engine light) 3. Storage full 4. Disconnects / reconnects 5. Connected to new vehicle 6. Vehicle interface communications failure 7. Location data degraded [advanced MRD only] 8. Incorrect date/time (conflict between date/time from vehicle interface and from wireless communications) 9. Software resets 10. Software updates 11. Degraded mileage data 12. Missed mileage 13. Vendor-specific • Special Rules: Numbers beyond #13 will be determined by the Agency

Data Element	Meaning
<p>MRDHealthTimestamp</p>	<ul style="list-style-type: none"> • Required (if MRD error or event occurs during reporting period) • Description: Date and time stamp that an MRD error or event occurs • Data Type: String • Format: The date / time is specified in the following form "YYYY-MM-DDT hh:mm:ss" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day ○ T indicates the start of the required time section ○ hh indicates the hour ○ mm indicates the minute ○ ss indicates the second • Calculation: N/A • Values: N/A • Special Rules: UTC

2.4 Mileage Message Failure Pseudocode

Note that the Failure Message shall only be transmitted by the RCP if the mileage message fails data validation checks.

<i>{MileageMessageResults</i>
FailureTimestamp
MsgID
FailedDate
MsgFailedCode
}

2.5 Mileage Message Failure Definitions

Data Element	Meaning
FailureTimestamp	<ul style="list-style-type: none"> • Required • Description: Timestamp provided by transmitting entity when message sent • Data Type: String • Format: The date/time is specified in the following form "YYYY-MM-DDT hh:mm:ss" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day ○ T indicates the start of the required time section ○ hh indicates the hour ○ mm indicates the minute ○ ss indicates the second • Calculation: N/A • Values: N/A • Special Rules: When message send fails, the Timestamp is updated to the current time (in UTC) when the message is resent
MsgID	<ul style="list-style-type: none"> • Required • Description: Message identification number for sequencing of mileage messages • Data Type: Number • Format: Integer • Calculation: N/A • Values: N/A • Special Rules: N/A

Data Element	Meaning
FailedDate	<ul style="list-style-type: none"> • Required • Description: The ReportDate. Used to match message to error • Data Type: String • Format: The date is specified in the following form "YYYY-MM-DD" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day • Calculation: N/A • Values: N/A • Special Rules: N/A
MsgFailedCode	<ul style="list-style-type: none"> • Required (if failed message occurs) • Description: A value indicating the reason that the message was not processed. • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ol style="list-style-type: none"> 1. Failed Authentication 2. Duplicate message (a mileage message with identical MRDID and MsgID has already been received) 3. Data Inconsistency (other data consistency check failed) • Special Rules: Numbers beyond #3 will be determined by the Agency

3 Interface between RUC Processing and RUC Administration subsystems

3.1 Overview

The interface between RUC processing (the account managers) and the RUC Administration subsystems (agency) has 4 defined flows and different technical interfaces.

There are two technical interfaces

1. **Formal tax reporting;** a person initiated interface, submitted through ODOT's commercially developed tax revenue management system website.
2. **Program monitoring;** an automated interface for exchanging critical RUC program data.

There are 4 defined reports or flows

1. **Mileage and RUC Revenue Report:** Transfer of Summary Mileage and RUC Revenue report to the Oregon Department of Transportation on a periodic basis (M&RR report).
2. **VIN Summary Report:** A summary of all VINs and related data managed by Account Managers to the Oregon Department of Transportation on a periodic basis (VIN Summary Report).
3. **Errors and Events Report:** An Errors and Events Report, which provides exception (or health) codes on Mileage Collection/Account Manager hardware or data gathering to monitor performance of the system.
4. **Account and VIN Update:** Report of all account attribute changes and status updates regarding status in the program. This flow also returns data to indicate status of the volunteers.

Each of the interfaces use select flows, as defined below.

3.2 Tax Reporting Interface Overview

The Tax Reporting Interface is used for submitting a formal tax report to the agency, which corresponds to the deposit made with the Treasury.

This flow requires logging on to the agency's vendor-supplied Tax Reporting system and uploading the following report data:

1. **Mileage and RUC Revenue Report**
2. **VIN Summary Report**
3. **Errors and Events Report**

Please refer to flow definitions for specifications on each flow.

3.2.1 Data Transfer

For Tax Reporting the RUC Processing subsystem will generate the appropriate files so that an account manager representative will upload to the RUC Administration Subsystem by logging on to the agency site and following the provided instruction.

3.2.2 Interface Requirements and Security

Security will be provided through the website which will use HTTPS and other secure methods.

3.2.3 Interface Initiation

The Account Manager shall initiate the interfaces with the RUCA.

3.3 Program Monitoring Overview

There are several data flows that are transmitted for Program Monitoring. The data flows are:

1. **Mileage and RUC Revenue Report;**
2. **VIN Summary Report;**
3. **Errors and Events Report;**
4. **Account and VIN Update**

3.3.1 Data Transfer

Program Monitoring is initiated by the RUC Processing subsystem by calling a REST/JSON interface implemented by the RUCA subsystem (agency). The Method will be mutually agreed to by Account Manager and the agency. The frequency of transmission is defined in the Service Level Agreement.

3.3.2 Interface Requirements and Security

This interface is a means of transmitting data from the RUC Processing (the account managers) and the RUC Administration subsystems (agency).

Application Layer: HTTP over TLS/SSL

Transport Layer: TCP

Internet Layer: IP

Web-services protocol: REST

Message definition: JSON

The REST endpoint is the URL of the RUC Processing subsystem server provided by the Account Manager.

3.3.3 Interface Initiation

The Account Manager shall initiate the interfaces with the RUCAS.

3.4 Mileage and RUC Revenue Report Overview

The Summary Mileage and RUC Revenue Report shall contain a record of the start and end times of the period, a list of all Rule IDs in which travel was recorded and a list of RUC due and fuel tax credit for that mileage traveled.

3.4.1 Mileage and RUC Revenue Report Pseudocode

{ <i>MileageAndRUCRevenueMessage</i>
AMID
TransmittedTimestamp
PeriodStartDate
PeriodEndDate

The following is the Rule ID totals. Include one for each Rule ID in the report. All totals are for the period defined in the header.

{ <i>MRRMRuleDetails</i>
RuleID
TotalMileageInRuleID
TotalNonTaxableMileageInRuleID
TotalTaxableMileageInRuleID
TotalADJMileageInRuleID
TotalADJRevenueInRuleID
TotalADJFuelUsageInRuleID
TotalADJFuelTaxCreditInRuleID
TotalADJBalanceInRuleID
TotalRevenueInRuleID
TotalFuelUsageInRuleID
TotalNonTaxableFuelUsageInRuleID
TotalTaxableFuelUsageInRuleID
TotalFuelTaxCreditInRuleID
TotalBalanceInRuleID

The following is the Sub Rule ID totals. Include one for each Sub Rule ID in the report. All totals are for the period defined in the header.

{ <i>MRRMSubRuleDetails</i>
SubRuleID
TotalMileageInSubRuleID
RateInSubRuleID
TotalADJMileageInSubRuleID
TotalADJRevenueInSubRuleID
TotalADJFuelUsageInSubRuleID
TotalADJFuelTaxCreditInSubRuleID
TotalADJBalanceInSubRuleID
TotalRevenueInSubRuleID
TotalFuelUsageInSubRuleID
FuelRateInSubRuleID
TotalFuelTaxCreditInSubRuleID
TotalBalanceInSubRuleID
}

}

The following is the totals for the report. All totals are for the period defined in the header.

TotalMileage
TotalRevenue
TotalFuelUsage
TotalFuelTaxCredit
TotalADJMileage
TotalADJRevenue
TotalADJFuelUsage
TotalADJFuelTaxCredit
TotalADJBalance
TotalBalance
}

3.5 Mileage and RUC Revenue Report Definitions

Data Element	Meaning
AMID	<ul style="list-style-type: none"> • Required • Description: The AM identifier number which is provided by the agency • Data Type: Number • Format: Integer • Calculation: N/A • Values: N/A • Special Rules: N/A
TransmittedTimestamp	<ul style="list-style-type: none"> • Required • Description: Timestamp provided by transmitting entity when message sent • Data Type: String • Format: The date / time is specified in the following form "YYYY-MM-DDT hh:mm:ss" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day ○ T indicates the start of the required time section ○ hh indicates the hour ○ mm indicates the minute ○ ss indicates the second • Calculation: N/A • Values: N/A • Special Rules: UTC

Data Element	Meaning
PeriodStartDate	<ul style="list-style-type: none"> • Required • Description: The start date of the reporting period • Data Type: String • Format: The date is specified in the following form "YYYY-MM-DD" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day • Calculation: N/A • Values: N/A • Special Rules: N/A
PeriodEndDate	<ul style="list-style-type: none"> • Required • Description: The Reporting period end date • Data Type: String • Format: The date is specified in the following form "YYYY-MM-DD" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day • Calculation: N/A • Values: N/A • Special Rules: N/A
RuleID	<ul style="list-style-type: none"> • Required • Description: Rule Identification. An identifier associated with a geographic area, or zone, in which a specific rate per mile will be assessed for miles traveled. FIPS codes are used to identify states • Data Type: Number • Format: Integer • Values: Rule ID codes and definitions are defined in the Agency provided RUC Rate Table • Special Rules: N/A

Data Element	Meaning
TotalMileageInRuleID	<ul style="list-style-type: none"> • Required • Description: Total Miles traveled in given Rule ID for given period • Data Type: Number • Format: One decimal place - Miles to nearest tenth of a mile [0,0.1,0.2...10,000,000.0] • Calculation: Must reconcile with the following: <ul style="list-style-type: none"> SUM of "TotalMileageInSubRuleID" for all Sub Rule IDs in Rule ID • Values: N/A • Special Rules: N/A
TotalNonTaxableMileageInRuleID	<ul style="list-style-type: none"> • Required • Description: Total miles traveled for all non-taxable Sub Rule IDs in given Rule ID for given period, per Agency provided RUC Rate Table • Data Type: Number • Format: One decimal place - Miles to nearest tenth of a mile [0,0.1,0.2...10,000,000.0] • Calculation: Must reconcile with the following: <ul style="list-style-type: none"> SUM of "TotalMileageInSubRuleID" for all non-taxable Sub Rule IDs in given Rule ID, per Agency provided RUC Rate Table • Values: N/A • Special Rules: N/A
TotalTaxableMileageInRuleID	<ul style="list-style-type: none"> • Required • Description: Total miles traveled for all taxable Sub Rule IDs in given Rule ID for given period, per Agency provided RUC Rate Table • Data Type: Number • Format: One decimal place - Miles to nearest tenth of a mile [0,0.1,0.2...10,000,000.0] • Calculation: Must reconcile with the following: <ul style="list-style-type: none"> SUM of "TotalMileageInSubRuleID" for all taxable Sub Rule IDs in given Rule ID, per Agency provided RUC Rate Table • Values: N/A • Special Rules: N/A

Data Element	Meaning
<p>TotalADJMileageInRuleID</p>	<ul style="list-style-type: none"> • Required • Description: Total adjusted miles in Rule ID for given period • Data Type: Number • Format: One decimal place - Miles to nearest tenth of a mile [0,0.1,0.2...10,000,000.0] • Calculation: Must reconcile with the following: <ul style="list-style-type: none"> SUM of "TotalADJMileageInSubRuleID" for all Sub Rule IDs in given Rule ID • Values: N/A • Special Rules: N/A
<p>TotalADJRevenueInRuleID</p>	<ul style="list-style-type: none"> • Required • Description: Total adjusted RUC revenue in Rule ID for given period • Data Type: Number • Format: Two decimal places - Dollars and cents: [0.01, 0.02, ... , 99,999,999.99] • Calculation: Must reconcile with the following: <ul style="list-style-type: none"> SUM of "TotalADJRevenueInSubRuleID" for all Sub Rule IDs in given Rule ID • Values: N/A • Special Rules: N/A
<p>TotalADJFuelUsageInRuleID</p>	<ul style="list-style-type: none"> • Required • Description: Total adjusted fuel usage in Rule ID for given period • Data Type: Number • Format: Two decimal places - Gallons to hundredth of a gallon [0.01, 0.02, 99,999,999.99] • Calculation: Must reconcile with the following: <ul style="list-style-type: none"> SUM of "TotalADJFuelUsageInSubRuleID" for all Sub Rule IDs in given Rule ID • Values: N/A • Special Rules: N/A

Data Element	Meaning
TotalADJFuelTaxCreditInRuleID	<ul style="list-style-type: none"> • Required • Description: Total adjusted Fuel Tax Credit in Rule ID for given period • Data Type: Number • Format: Two decimal places - Dollars and cents: [0.01, 0.02, ... , 99,999,999.99] • Calculation: Must reconcile with the following: <ul style="list-style-type: none"> SUM of "TotalADJFuelTaxCreditInSubRuleID" for all Sub Rule IDs in given Rule ID • Values: N/A • Special Rules: N/A
TotalADJBalancelnRuleID	<ul style="list-style-type: none"> • Required • Description: Total adjusted Balance in Rule ID for given period • Data Type: Number • Format: Two decimal places - Dollars and cents: [0.01, 0.02, ... , 99,999,999.99] • Calculation: Must reconcile with the following: <ul style="list-style-type: none"> SUM of "TotalADJBalancelnSubRuleID" for all Sub Rule IDs in given Rule ID • Values: N/A • Special Rules: N/A
TotalRevenueInRuleID	<ul style="list-style-type: none"> • Required • Description: Total RUC Revenue in all taxable Sub Rule IDs for given period • Data Type: Number • Format: Two decimal places - Dollars and cents: [0.01, 0.02, ... , 99,999,999.99] • Calculation: Must reconcile with the following: <ul style="list-style-type: none"> SUM of "MRDRevenueInSubRuleID" for all taxable Sub Rule IDs in given Rule ID • Values: N/A • Special Rules: Determination of taxable Sub Rule IDs can be found in the Agency provided RUC Rate Table

Data Element	Meaning
TotalFuelUsageInRuleID	<ul style="list-style-type: none"> • Required • Description: Total fuel usage in given Rule ID for given period • Data Type: Number • Format: Two decimal places - Gallons to hundredth of a gallon: [0.01, 0.02, 99,999,999.99] • Calculation: Must reconcile with the following: <div style="padding-left: 40px;">SUM of "TotalFuelUsageInSubRuleID" for all Sub Rule IDs in Rule ID</div> • Values: N/A • Special Rules: N/A
TotalNonTaxableFuelUsageInRuleID	<ul style="list-style-type: none"> • Required • Description: Total non-taxable fuel usage in given Rule ID for given period • Data Type: Number • Format: Two decimal places - Gallons to hundredth of a gallon: [0.01, 0.02, 99,999,999.99] • Calculation: Must reconcile with the following: <div style="padding-left: 40px;">SUM of "TotalFuelUsageInSubRuleID" for all non-taxable Sub Rule IDs in Rule ID</div> • Values: N/A • Special Rules: N/A
TotalTaxableFuelUsageInRuleID	<ul style="list-style-type: none"> • Required • Description: Total taxable fuel usage in given Rule ID for given period • Data Type: Number • Format: Two decimal places - Gallons to hundredth of a gallon: [0.01, 0.02, 99,999,999.99] • Calculation: Must reconcile with the following: <div style="padding-left: 40px;">SUM of "TotalFuelUsageInSubRuleID" for all taxable Sub Rule IDs in Rule ID</div> • Values: N/A • Special Rules: N/A

Data Element	Meaning
TotalFuelTaxCreditInRuleID	<ul style="list-style-type: none"> • Required • Description: Total Fuel Tax Credit in all taxable Sub Rule IDs in given Rule ID for given period • Data Type: Number • Format: Two decimal places - Dollars and cents: [0.01, 0.02 ... 99,999,999.99] • Calculation: Must reconcile with the following: <ul style="list-style-type: none"> SUM of "TotalFuelTaxCreditInSubRuleID" for all Sub Rule IDs in Rule ID • Values: N/A • Special Rules: Determination of taxable Sub Rule IDs can be found in Agency provided RUC Rate Table
TotalBalanceInRuleID	<ul style="list-style-type: none"> • Required • Description: Total amount to invoice/credit to RUC Payer in given Rule ID for given period • Data Type: Number • Format: Two decimal places - Dollars and cents: [0.01, 0.02, ... , 99,999,999.99] • Calculation: Must reconcile with the following: <ul style="list-style-type: none"> "TotalRevenueInRuleID" plus "TotalFuelTaxCreditInRuleID" plus "TotalADJBalanceInRuleID" • Values: N/A • Special Rules: N/A
SubRuleID	<ul style="list-style-type: none"> • Required • Description: Sub Rule ID, numerical index for region of travel within given Rule ID • Data Type: Number • Format: Integer • Calculation: N/A • Values: Assigned by Agency as necessary, provided in RUC Rate Table • Special Rules: N/A

Data Element	Meaning
<p>TotalMileageInSubRuleID</p>	<ul style="list-style-type: none"> • Required • Description: Total Miles traveled in given Sub Rule ID for all VIN/MRDs given period • Data Type: Number • Format: One decimal place - Miles to nearest tenth of a mile [0,0.1,0.2...10,000,000.0] • Calculation: Must reconcile with the following: <ul style="list-style-type: none"> SUM of “MRDMileageInSubRuleID” for all VIN/MRDs in reporting period for given Sub Rule ID • Values: N/A • Special Rules: N/A
<p>RateInSubRuleID</p>	<ul style="list-style-type: none"> • Required • Description: Mileage rate used in Sub Rule ID, provided by Agency in RUC Rate Table • Data Type: Number • Format: Three decimal places – Dollars and cents + tenth of a cent [0.015, 0.020, ... , 9,999.999] • Calculation: N/A • Values: Assigned by Agency as necessary, provided in RUC Rate Table • Special Rules: N/A
<p>TotalADJMileageInSubRuleID</p>	<ul style="list-style-type: none"> • Required • Description: Total adjusted Miles in for Sub Rule ID for all VIN/MRDs for given period • Data Type: Number • Format: Miles to nearest tenth of a mile [0,0.1,0.2...10,000,000.0] • Calculation: Must reconcile with the following: <ul style="list-style-type: none"> SUM of “MRDADJMileageInSubRuleID” for all VIN/MRDs in given Sub Rule ID • Values: N/A • Special Rules: N/A

Data Element	Meaning
TotalADJRevenueInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Total RUC revenue adjusted for Sub Rule ID for all VIN/MRDs for given period • Data Type: Number • Format: Two decimal places - Dollars and cents: [0.01, 0.02, ... , 99,999,999.99] • Calculation: Must reconcile with the following: <div style="padding-left: 40px;">SUM of "MRDADJRevenueInSubRuleID" for all VIN/MRDs in given Sub Rule ID</div> • Values: N/A • Special Rules: N/A
TotalADJFuelUsageInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Total adjusted fuel usage for Sub Rule ID for all VIN/MRDs for given period • Data Type: Number • Format: Two decimal places - Gallons to hundredth of a gallon [0.01, 0.02, 99,999,999.99] • Calculation: Must reconcile with the following: <div style="padding-left: 40px;">SUM of "MRDADJFuelUsageInSubRuleID" for all VIN/MRDs in given Sub Rule ID</div> • Values: N/A • Special Rules: N/A
TotalADJFuelTaxCreditInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Total fuel tax credit adjusted for Sub Rule ID for all VIN/MRDs for given period • Data Type: Number • Format: Two decimal places - Dollars and cents [0.01, 0.02 ... 99,999,999.99] • Calculation: Must reconcile with the following: <div style="padding-left: 40px;">SUM of "MRDADJFuelTaxCreditInSubRuleID" for all VIN/MRDs in given Sub Rule ID</div> • Values: N/A • Special Rules: N/A

Data Element	Meaning
<p>TotalADJBalanceInSubRuleID</p>	<ul style="list-style-type: none"> • Required • Description: Total amount of balance adjusted for Sub Rule ID for all VIN/MRDs for given period • Data Type: Number • Format: Two decimal places - Dollars and cents: [0.01, 0.02, ... , 99,999,999.99] • Calculation: Must reconcile with the following: <ul style="list-style-type: none"> SUM of “MRDADJBalanceInSubRuleID” for all VIN/MRDs in given Sub Rule ID • Values: N/A • Special Rules: N/A
<p>TotalRevenueInSubRuleID</p>	<ul style="list-style-type: none"> • Required • Description: Total RUC Revenue in given Sub Rule ID for given period • Data Type: Number • Format: Two decimal places - Dollars and cents: [0.01, 0.02, ... , 99,999,999.99] • Calculation: Must reconcile with the following: <ul style="list-style-type: none"> SUM of “MRDRevenueInSubRuleID” for all VIN/MRDs in reporting period for given Sub Rule ID • Values: N/A • Special Rules: N/A
<p>TotalFuelUsageInSubRuleID</p>	<ul style="list-style-type: none"> • Required • Description: Total fuel usage in given Sub Rule ID for all VIN/MRDs given period • Data Type: Number • Format: Two decimal places - Gallons to hundredth of a gallon: [0.01, 0.02, 99,999,999.99] • Calculation: Must reconcile with the following: <ul style="list-style-type: none"> SUM of “MRDFuelUsageInSubRuleID” for all VIN/MRDs in reporting period for given Sub Rule ID • Values: N/A • Special Rules: N/A

Data Element	Meaning
FuelRateInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Fuel Tax rate in dollars per gallon in given Sub Rule ID for given period • Data Type: Number • Format: Two decimal places - Dollars and cents [0.01, 0.02, ... , 2.55] • Calculation: N/A • Values: Assigned by Agency as necessary, provided in RUC Rate Table • Special Rules: N/A
TotalFuelTaxCreditInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Total Fuel Tax Credit in given Sub Rule ID for all VIN/MRDs given period • Data Type: Number • Format: Two decimal places - Dollars and cents: [0.01, 0.02, ... , 99,999,999.99] • Calculation: Must reconcile with the following: <div style="margin-left: 40px;">SUM of "MRDFuelTaxCreditInSubRuleID" for all VIN/MRDs in reporting period for given Sub Rule ID</div> • Values: N/A • Special Rules: N/A
TotalBalanceInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Total amount to invoice/credit to RUC Payer in given Sub Rule ID for given period for all VIN/MRDs • Data Type: Number • Format: Two decimal places - Dollars and cents: [0.01, 0.02, ... , 99,999,999.99] • Calculation: Must reconcile with the following: <div style="margin-left: 40px;">"TotalRevenueInSubRuleID"</div> <div style="margin-left: 40px;">plus</div> <div style="margin-left: 40px;">"TotalFuelTaxCreditInSubRuleID"</div> <div style="margin-left: 40px;">plus</div> <div style="margin-left: 40px;">"TotalADJBalanceInSubRuleID"</div> • Values: N/A • Special Rules: N/A

Data Element	Meaning
TotalMileage	<ul style="list-style-type: none"> • Required • Description: Total Miles traveled for all Rule IDs for given period • Data Type: Number • Format: One decimal place - Miles to nearest tenth of a mile [0,0.1,0.2...10,000,000.0] • Calculation: Must reconcile with the following: SUM of "TotalMileageInRuleID" for all Rule IDs • Values: N/A • Special Rules: N/A
TotalRevenue	<ul style="list-style-type: none"> • Required • Description: Total RUC Revenue for all Rule IDs for given period • Data Type: Number • Format: Two decimal places - Dollars and cents: [0.01, 0.02, ... , 99,999,999.99] • Calculation: Must reconcile with the following: SUM of "TotalRevenueInRuleID" for all Rule IDs • Values: N/A • Special Rules: N/A
TotalFuelUsage	<ul style="list-style-type: none"> • Required • Description: Total fuel usage for all Rule IDs for given period • Data Type: Number • Format: Two decimal places - Gallons to hundredth of a gallon: [0.01, 0.02, 99,999,999.99] • Calculation: Must reconcile with the following: SUM of "TotalFuelUsageInRuleID" for all Rule IDs • Values: N/A • Special Rules: N/A

Data Element	Meaning
TotalFuelTaxCredit	<ul style="list-style-type: none"> • Required • Description: Total Fuel Tax Credit for all Rule IDs for given period • Data Type: Number • Format: Two decimal places - Dollars and cents: [0.01, 0.02 ... 99,999,999.99] • Calculation: Must reconcile with the following: SUM of "TotalFuelTaxCreditInRuleID" for all Rule IDs • Values: N/A • Special Rules: N/A
TotalADJMileage	<ul style="list-style-type: none"> • Required • Description: Total adjusted miles for all Rule IDs for given period • Data Type: Number • Format: One decimal place - Miles to nearest tenth of a mile [0,0.1,0.2...10,000,000.0] • Calculation: Must reconcile with the following: SUM of "TotalADJMileageInRuleID" for all Rule IDs • Values: N/A • Special Rules: N/A
TotalADJRevenue	<ul style="list-style-type: none"> • Required • Description: Total adjusted RUC revenue for all Rule IDs for given period • Data Type: Number • Format: Two decimal places - Dollars and cents: [0.01, 0.02, ... , 99,999,999.99] • Calculation: Must reconcile with the following: SUM of "TotalADJRevenueInRuleID" for all Rule IDs • Values: N/A • Special Rules: N/A

Data Element	Meaning
TotalADJFuelUsage	<ul style="list-style-type: none"> • Required • Description: Total adjusted fuel usage for all Rule IDs for given period • Data Type: Number • Format: Two decimal places - Gallons to hundredth of a gallon [0.01, 0.02, 99,999,999.99] • Calculation: Must reconcile with the following: <ul style="list-style-type: none"> SUM of "TotalADJFuelUsageInRuleID" for all Rule IDs • Values: N/A • Special Rules: N/A
TotalADJFuelTaxCredit	<ul style="list-style-type: none"> • Required • Description: Total adjusted Fuel Tax Credit for all Rule IDs for given period • Data Type: Number • Format: Two decimal places - Dollars and cents: [0.01, 0.02, ... , 99,999,999.99] • Calculation: Must reconcile with the following: <ul style="list-style-type: none"> SUM of "TotalADJFuelTaxCreditInRuleID" for all Rule IDs • Values: N/A • Special Rules: N/A
TotalADJBalance	<ul style="list-style-type: none"> • Required • Description: Total adjusted Balance for all Rule IDs for given period • Data Type: Number • Format: Two decimal places - Dollars and cents: [0.01, 0.02, ... , 99,999,999.99] • Calculation: Must reconcile with the following: <ul style="list-style-type: none"> SUM of "TotalADJBalanceInRuleID" for all Rule IDs • Values: N/A • Special Rules: N/A

Data Element	Meaning
TotalBalance	<ul style="list-style-type: none"> • Required • Description: Total Amount to invoice/credit to RUC Payer for all Rule IDs for given period • Data Type: Number • Format: Two decimal places - Dollars and cents: [0.01, 0.02, ... , 99,999,999.99] • Calculation: Must reconcile with the following: <div style="margin-left: 40px;">SUM of "TotalBalanceInRuleID" for all Rule IDs in reporting period</div> • Values: N/A • Special Rules: N/A

Note: In the Mileage and RUC Revenue data element specifications, there are some references to data elements which are not within the MRR report but rather refer to data elements which are in the VIN Summary data file. An example of this is MRDADJBalanceInSubRuleID as referred to in the description for TotalADJBalanceInSubRuleID.

3.6 VIN Summary Report Overview

The VIN Summary report includes travel records for each vehicle/VIN registered with the Account Manager. In the VIN Summary Report, a VIN Status code is given for each vehicle, and the time that activity code was achieved.

3.7 VIN Summary Report Pseudocode

{ <i>VINSummaryMessage</i>
AMID
TransmittedTimestamp
PeriodStartDate
PeriodEndDate

The following block of code is the VIN record. Include one for each VIN in report. Totals for the period defined in header block.

{ <i>VSMDetails</i>
VIN
VINStatus
TotalVINMiles
TotalVINFuelUse
TotalVINBalance
NullMileageDays
LastDailyReportDate

Include this block for every MRDID used for this vehicle in the period.

{ <i>VSMDeviceDetails</i>
MRDID
CertID
FuelUseMethod

Include one block for each RuleID included for this VIN / MRDID combination. All totals are for the Reporting period specified in PeriodStartDate and PeriodEndDate.

{ <i>VSMRuleDetails</i>
RuleID
MRDMileageInRuleID

MRDNonTaxableMileageInRuleID
MRDTaxableMileageInRuleID
MRDRevenueInRuleID
MRDFuelUsageInRuleID
MRDNonTaxableFuelUsageInRuleID
MRDTaxableFuelUsageInRuleID
MRDFuelTaxCreditInRuleID
MRDADJMileageInRuleID
MRDADJRevenueInRuleID
MRDADJFuelUsageInRuleID
MRDADJFuelTaxCreditInRuleID
MRDADJBalanceInRuleID
MRDBalanceInRuleID
}

Include one block for each SubRuleID included for this VIN / MRDID / RuleID combination. All totals are for the Reporting period specified in PeriodStartDate and PeriodEndDate.

{ <i>VSMDSubRuleDetails</i>
SubRuleID
MRDMileageInSubRuleID
MRDRevenueInSubRuleID
MRDFuelUsageInSubRuleID
MRDFuelTaxCreditInSubRuleID
MRDADJMileageInSubRuleID
MRDADJRevenueInSubRuleID
MRDADJFuelUsageInSubRuleID
MRDADJFuelTaxCreditInSubRuleID
MRDADJBalanceInSubRuleID
MRDBalanceInSubRuleID

The following are the adjustment details for this VIN, MRD, RuleID and SubRuleID combination. Include one for each adjustment.

{ <i>VSMADjustedSubRuleDetails</i>
ADJMileage
ADJRevenue

ADJFuelUsage
ADJFuelTaxCredit
ADJBalance
ADJDateTime
ADJCode
ADJReasonDescription
}

}

}

}

}

3.8 VIN Summary Report Definitions

Data Element	Meaning
AMID	<ul style="list-style-type: none"> • Required • Description: The AM identifier number which is provided by the agency. • Data Type: Number • Format: Integer • Calculation: N/A • Values: N/A • Special Rules: N/A

Data Element	Meaning
TransmittedTimestamp	<ul style="list-style-type: none"> • Required • Description: Timestamp provided by transmitting entity when message sent • Data Type: String • Format: The date / time is specified in the following form "YYYY-MM-DDT hh:mm:ss" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day ○ T indicates the start of the required time section ○ hh indicates the hour ○ mm indicates the minute ○ ss indicates the second • Calculation: N/A • Values: N/A • Special Rules: UTC
PeriodStartDate	<ul style="list-style-type: none"> • Required • Description: The date of start of the reporting period for the data file • Data Type: String • Format: The date is specified in the following form "YYYY-MM-DD" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day • Calculation: N/A • Values: N/A • Special Rules: N/A

Data Element	Meaning
PeriodEndDate	<ul style="list-style-type: none"> • Required • Description: The reporting period end date • Data Type: String • Format: The date is specified in the following form "YYYY-MM-DD" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day • Calculation: N/A • Values: N/A • Special Rules: N/A
VIN	<ul style="list-style-type: none"> • Required • Description: The VIN of the vehicle in which the MRD is installed • Data Type: String • Format: VARCHAR(20) • Calculation: N/A • Values: N/A • Special Rules: N/A
VINStatus	<ul style="list-style-type: none"> • Required • Description: An integer value indicating the reason for the status of a given VIN at the period end date of the report • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ul style="list-style-type: none"> ○ 1 = Pending – If the VIN has been submitted for approval and is not yet approved by the agency ○ 2 = Started - If the VIN is first appearing on the report ○ 3 = Active - if the VIN has previously appeared ○ 4 = Discontinued – has exited the program • Special Rules: N/A

Data Element	Meaning
TotalVINMiles	<ul style="list-style-type: none"> • Required • Description: Actual Miles Traveled in all Rule IDs for given VIN • Data Type: Number • Format: One decimal place - Miles to nearest tenth of a mile [0,0.1,0.2...10,000,000.0] • Calculation: Must reconcile with the following: <ul style="list-style-type: none"> SUM of "TotalMilesOnDate" (from Mileage Message) for all MRDs for given VIN • Values: N/A • Special Rules: N/A
TotalVINFuelUse	<ul style="list-style-type: none"> • Required • Description: Actual Fuel Usage in gallons for all Rule IDs for given VIN • Data Type: Number • Format: Two decimal places - Gallons to hundredth of a gallon [0.01, 0.02, 9,999.99] • Calculation: Must reconcile with: <ul style="list-style-type: none"> SUM of all "FuelUsageOnDate" (from Mileage Message) for all MRDs for given VIN • Values: N/A • Special Rules: N/A
TotalVINBalance	<ul style="list-style-type: none"> • Required • Description: Amount to invoice/credit to RUC Payer for all Rule IDs for given period for given VIN • Data Type: Number • Format: Two decimal places - Dollars and cents accuracy: [0.01, 0.02, ... , 9,999.99] • Calculation: Must reconcile with the following: <ul style="list-style-type: none"> SUM of "MRDBalanceInRuleID" for all Rule IDs for all MRDs for a given VIN • Values: N/A • Special Rules: N/A

Data Element	Meaning
NullMileageDays	<ul style="list-style-type: none"> • Required (if no Null Mileage Days, set this value to 0) • Description: The cumulative count of null mileage days (as defined in SRS) in the reporting period for a given VIN • Data Type: Number • Format: Integer • Calculation: N/A • Values: N/A • Special Rules: This count resets at the end of each reporting period
LastDailyReportDate	<ul style="list-style-type: none"> • Required • Description: The last date this VIN reported miles for this reporting period • Data Type: String • Format: The date is specified in the following form "YYYY-MM-DD" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day • Calculation: N/A • Values: N/A • Special Rules: N/A
MRDID	<ul style="list-style-type: none"> • Required • Description: Unique identifier for MRD (such as serial number) • Data Type: String • Format: VARCHAR(64) • Calculation: N/A • Values: N/A • Special Rules: N/A

Data Element	Meaning
CertID	<ul style="list-style-type: none"> • Required • Description: Certification ID number assigned by Agency – indicates the issuer and manufacturer of an MRD • Data Type: Number • Format: Integer • Calculation: N/A • Values: Agency assigned values • Special Rules: N/A
FuelUseMethod	<ul style="list-style-type: none"> • Required • Description: A value indicating which fuel consumption method is used to calculate fuel usage • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ul style="list-style-type: none"> • 1 = Fuel use not calculated • 2 =Fuel calculated from actual fuel use on the device • 3 = Fuel Use calculated using approved EPA methods (see Business Requirements Document) • 4 = Vehicle does not use taxable fuel. • Special Rules: N/A
RuleID	<ul style="list-style-type: none"> • Required • Description: Rule ID, An identifier associated with a geographic area, or zone, in which a specific rate per mile will be assessed for miles traveled. FIPS codes are used to identify states • Data Type: Number • Format: Integer • Calculation: N/A • Values: Rule ID codes and definitions are defined in the Agency provided RUC Rate Table • Special Rules: N/A

Data Element	Meaning
MRDMileageInRuleID	<ul style="list-style-type: none"> • Required • Description: Miles Traveled in Rule IDs for given VIN/MRD for given period • Data Type: Number • Format: Miles to nearest tenth of a mile [0,0.1,0.2...10,000,000.0] • Calculation: Must reconcile with the following: SUM of "MRDMileageInSubRuleID" for all Sub Rule IDs in given Rule ID for given VIN/MRD • Values: N/A • Special Rules: N/A
MRDNonTaxableMileageInRuleID	<ul style="list-style-type: none"> • Required • Description: The count of non-taxable miles in a Rule ID for a given VIN/MRD • Data Type: Number • Format: Miles to nearest tenth of a mile [0,0.1,0.2...10,000,000.0] • Calculation: This must reconcile with the following: SUM of "MRDMileageInSubRuleID" for all non-taxable Sub Rule IDs within given Rule ID • Values: N/A <p>Special Rules: Determination of taxable Sub Rule IDs can be found in Agency provided RUC Rate Table</p>
MRDTaxableMileageInRuleID	<ul style="list-style-type: none"> • Required • Description: The count of taxable miles in a Rule ID for a given VIN/MRD • Data Type: Number • Format: Miles to nearest tenth of a mile [0,0.1,0.2...10,000,000.0] • Calculation: This must reconcile with the following: SUM of "MRDMileageInSubRuleID" for all taxable Sub Rule IDs within given Rule ID • Values: N/A • Special Rules: Determination of taxable Sub Rule IDs can be found in Agency provided RUC Rate Table

Data Element	Meaning
MRDRevenueInRuleID	<ul style="list-style-type: none"> • Required • Description: Amount of RUC Revenue for given Rule IDs for VIN/MRD for given period • Data Type: Number • Format: Two decimal places - Dollars and cents [0.01, 0.02, ... , 9,999.99] • Calculation: Must reconcile with the following: <ul style="list-style-type: none"> SUM of “MRDRevenueInSubRuleID” for all taxable Sub Rule IDs in given Rule ID for given VIN/MRD • Values: N/A • Special Rules: Determination of taxable Sub Rule IDs can be found in Agency provided RUC Rate Table
MRDFuelUsageInRuleID	<ul style="list-style-type: none"> • Required • Description: Fuel Usage in Rule ID for given VIN/MRD for given period • Data Type: Number • Format: Two decimal places - Gallons to hundredth of a gallon [0.01, 0.02, 9,999.99] • Calculation: Must reconcile with the following: <ul style="list-style-type: none"> SUM of “MRDFuelUsageInSubRuleID” for all Sub Rule IDs in given Rule ID for given VIN/MRD • Values: N/A • Special Rules: N/A
MRDNonTaxableFuelUsageInRuleID	<ul style="list-style-type: none"> • Required • Description: The count of non-taxable gallons in a Rule ID for a given VIN/MRD • Data Type: Number • Format: Gallons to hundredth of a gallon [0.01, 0.02, 99,999,999.99] • Calculation: Must reconcile with the following: <ul style="list-style-type: none"> SUM of “MRDFuelUsageInSubRuleID” for all non-taxable Sub Rule IDs within given Rule ID • Values: N/A • Special Rules: Determination of taxable Sub Rule IDs can be found in Agency provided RUC Rate Table

Data Element	Meaning
MRDTaxableFuelUsageInRuleID	<ul style="list-style-type: none"> • Required • Description: The count of taxable gallons in a Rule ID for a given VIN/MRD • Data Type: Number • Format: Gallons to hundredth of a gallon [0.01, 0.02, 99,999,999.99] • Calculation: Must reconcile with the following: SUM of "MRDFuelUsageInSubRuleID" for all taxable Sub Rule IDs within given Rule ID • Values: N/A • Special Rules: Determination of taxable Sub Rule IDs can be found in Agency provided RUC Rate Table
MRDFuelTaxCreditInRuleID	<ul style="list-style-type: none"> • Required • Description: Fuel Tax Credit in Rule IDs for given VIN/MRD for given period • Data Type: Number • Format: Two decimal places - Dollars and cents [0.01, 0.02, ... , 9,999.99] • Calculation: Must reconcile with the following: SUM of "MRDFuelTaxCreditInSubRuleID" for all taxable Sub Rule IDs in given Rule ID for given VIN/MRD • Values: N/A • Special Rules: Determination of taxable Sub Rule IDs can be found in Agency provided RUC Rate Table
MRDADJMileageInRuleID	<ul style="list-style-type: none"> • Required • Description: The miles adjusted for a given VIN/MRD in a Rule ID • Data Type: Number • Format: One decimal place - Miles to nearest tenth of a mile [0,0.1,0.2...10,000,000.0] • Calculation: Must reconcile with the following: SUM of "MRDADJMileageInSubRuleID" for all Sub Rule IDs in given Rule ID for given VIN/MRD • Values: N/A • Special Rules: N/A

Data Element	Meaning
MRDADJRevenueInRuleID	<ul style="list-style-type: none"> • Required • Description: The revenue amount adjusted for a given VIN/MRD in a Rule ID • Data Type: Number • Format: Two decimal places - Dollars and cents [0.01, 0.02, ... , 9,999.99] • Calculation: Must reconcile with the following: <div style="padding-left: 40px;">SUM of “MRDADJRevenueInSubRuleID” for all Sub Rule IDs in given Rule ID for given VIN/MRD</div> • Values: N/A • Special Rules: N/A
MRDADJFuelUsageInRuleID	<ul style="list-style-type: none"> • Required • Description: The gallons count adjusted for a given VIN/MRD in a Rule ID • Data Type: Number • Format: Two decimal places - Gallons to hundredth of a gallon [0.01, 0.02, 9,999.99] • Calculation: Must reconcile with the following: <div style="padding-left: 40px;">SUM of “MRDADJFuelUsageInSubRuleID” for all Sub Rule IDs in given Rule ID for given VIN/MRD</div> • Values: N/A • Special Rules: N/A
MRDADJFuelTaxCreditInRuleID	<ul style="list-style-type: none"> • Required • Description: The fuel tax credit amount adjusted for a given VIN/MRD in a Rule ID • Data Type: Number • Format: Two decimal places - Dollars and cents accuracy [0.01, 0.02, ... , 9,999.99] • Calculation: Must reconcile with the following: <div style="padding-left: 40px;">SUM of “MRDADJFuelTaxCreditInSubRuleID” for all Sub Rule IDs in given Rule ID for given VIN/MRD</div> • Values: N/A • Special Rules: N/A

Data Element	Meaning
MRDADJBalancelnRuleID	<ul style="list-style-type: none"> • Required • Description: Balance adjusted for this VIN/MRD in given Rule ID for given period • Data Type: Number • Format: Two decimal places - Dollars and cents accuracy [0.01, 0.02, ... , 9,999.99] • Calculation: Must reconcile with the following: <div style="margin-left: 40px;">SUM of all “MRDAdjBalanceInSubRuleID” for all Sub Rule IDs in given Rule ID for given VIN/MRD</div> • Values: N/A • Special Rules: N/A
MRDBalancelnRuleID	<ul style="list-style-type: none"> • Required • Description: The amount to invoice/credit to RUC Payer calculated for the Rule IDs for given VIN/MRD • Data Type: Number • Format: Two decimal places - Dollars and cents [0.01, 0.02, ... , 9,999.99] • Calculation: Must reconcile with the following: <div style="margin-left: 40px;">“MRDRevenueInRuleID” plus “MRDFuelTaxCreditInRuleID” plus “MRDADJBalancelnRuleID”</div> • Values: N/A • Special Rules: N/A
SubRuleID	<ul style="list-style-type: none"> • Required • Description: Sub Rule ID, numerical index for region of travel within given Rule ID • Data Type: Number • Format: Integer • Calculation: N/A • Values: Assigned by Agency as necessary, provided in RUC Rate Table • Special Rules: N/A

Data Element	Meaning
MRDMileageInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Miles traveled in Sub Rule ID for given VIN/MRD for given period • Data Type: Number • Format: One decimal place - Miles to nearest tenth of a mile [0,0.1,0.2...10,000,000.0] • Calculation: Must reconcile with the following: <div style="padding-left: 40px;">SUM of "MsgMileageInSubRuleID" from Mileage Messages during reporting period</div> • Values: N/A • Special Rules: N/A
MRDRevenueInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Amount of RUC Revenue in Sub Rule ID for given VIN/MRD for given period • Data Type: Number • Format: Two decimal places - Dollars and cents accuracy [0.01, 0.02, ... , 9,999.99] • Calculation: Must reconcile with the following: <div style="padding-left: 40px;">SUM of "MsgMileageInSubRuleID" from Mileage Messages during reporting period</div> <div style="padding-left: 40px;">multiplied by</div> <div style="padding-left: 40px;">"RateInSubRuleID" (per Agency provided rate table)</div> • Values: N/A • Special Rules: N/A
MRDFuelUsageInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Fuel Usage in given Sub Rule ID for given VIN/MRD for given period • Data Type: Number • Format: Two decimal places - Gallons to hundredth of a gallon [0.01, 0.02, 9,999.99] • Calculation: Must reconcile with the following: <div style="padding-left: 40px;">SUM of "MsgFuelUsageInSubRuleID" from Mileage Messages during reporting period</div> • Values: N/A • Special Rules: N/A

Data Element	Meaning
MRDFuelTaxCreditInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Fuel Tax Credit in given Sub Rule ID for given VIN/MRD for given period • Data Type: Number • Format: Two decimal places - Dollars and cents accuracy [0.01, 0.02, ... , 9,999.99] • Calculation: Must reconcile with the following: <ul style="list-style-type: none"> (SUM of all "MsgFuelUsageInSubRuleID" from Mileage Messages for given VIN/MRD during reporting period) multiplied by "FuelRateInSubRuleID" (per Agency provided rate table) • Values: N/A • Special Rules: N/A
MRDADJMileageInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Miles adjusted for this VIN/MRD in given Sub Rule ID for given period • Data Type: Number • Format: One decimal place - Miles to nearest tenth of a mile [0,0.1,0.2...10,000,000.0] • Calculation: Must reconcile with the following: <ul style="list-style-type: none"> SUM of all "ADJMileage" for given VIN/MRD in given Sub Rule ID • Values: N/A • Special Rules: N/A
MRDADJRevenueInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Revenue adjusted for this VIN/MRD in given Sub Rule ID for given period • Data Type: Number • Format: Two decimal places - Dollars and cents accuracy [0.01, 0.02, ... , 9,999.99] • Calculation: Must reconcile with the following: <ul style="list-style-type: none"> SUM of all "ADJRevenue" for given VIN/MRD in given Sub Rule ID • Values: N/A • Special Rules: N/A

Data Element	Meaning
MRDADJFuelUsageInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Fuel Usage adjusted for this VIN/MRD in given Sub Rule ID for given period • Data Type: Number • Format: Gallons to hundredth of a gallon [0.01, 0.02, 9,999.99] • Calculation: Must reconcile with the following: SUM of all “ADJFuelUsage” for given VIN/MRD in given Sub Rule ID • Values: N/A • Special Rules: N/A
MRDADJFuelTaxCreditInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Fuel Tax Credit adjusted for this VIN/MRD in given Sub Rule ID for given period • Data Type: Number • Format: Two decimal places - Dollars and cents accuracy [0.01, 0.02, ... , 9,999.99] • Calculation: Must reconcile with the following: SUM of all “ADJFuelTaxCredit” for given VIN/MRD in given Sub Rule ID • Values: N/A • Special Rules: N/A
MRDADJBalanceInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Balance adjusted for this VIN/MRD in given Sub Rule ID for given period • Data Type: Number • Format: Two decimal places - Dollars and cents accuracy [0.01, 0.02, ... , 9,999.99] • Calculation: Must reconcile with the following: SUM of all “ADJBalance” for given VIN/MRD in given Sub Rule ID • Values: N/A • Special Rules: N/A

Data Element	Meaning
MRDBalanceInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Amount to invoice/credit RUC Payer in Sub Rule ID for given VIN/MRD for given period • Data Type: Number • Format: Two decimal places - Dollars and cents accuracy [0.01, 0.02, ... , 9,999.99] • Calculation: Must reconcile with the following: "MRDRevenueInSubRuleID" plus "MRDFuelTaxCreditInSubRuleID" plus "MRDADJBalanceInSubRuleID" • Values: N/A • Special Rules: N/A
ADJMileage	<ul style="list-style-type: none"> • Required (if adjustment activity occurs in Sub Rule ID for given VIN/MRD during reporting period) • Description: Miles adjusted for the individual adjustment – entered manually by Account Manager • Data Type: Number • Format: One decimal place - Miles to nearest tenth of a mile [0,0.1,0.2...10,000,000.0] • Calculation: N/A • Values: N/A • Special Rules: Manual adjustment must be made at an Account Manager level

Data Element	Meaning
ADJRevenue	<ul style="list-style-type: none"> • Required (if adjustment activity occurs in Sub Rule ID for given VIN/MRD during reporting period) • Description: Adjusted RUC revenue amount for the adjustment – entered manually by Account Manager • Data Type: Number • Format: Two decimal places - Dollars and cents [0.01, 0.02, ... , 2.55] • Calculation: Must reconcile with the following: “ADJMileage” multiplied by “RateInSubRuleID” • Values: N/A • Special Rules: Calculation is to be used, unless Revenue is the manual adjustment made at an Account Manager level
ADJFuelUsage	<ul style="list-style-type: none"> • Required (if adjustment activity occurs in Sub Rule ID for given VIN/MRD during reporting period) • Description: Adjusted Fuel Usage amount for the adjustment – entered manually by Account Manager • Data Type: Number • Format: Two decimal places - Gallons to hundredth of a gallon [0.01, 0.02, 99,999,999.99] • Calculation: N/A • Values: N/A • Special Rules: Manual adjustment must be made at an Account Manager level – may be an estimated fuel usage based on miles adjusted

Data Element	Meaning
ADJFuelTaxCredit	<ul style="list-style-type: none"> • Required (if adjustment activity occurs in Sub Rule ID for given VIN/MRD during reporting period) • Description: Adjusted Fuel Tax Credit for this adjustment – entered manually by Account Manager • Data Type: Number • Format: Two decimal places (negative numbers) - Dollars and cents [0.01, 0.02, ... , 2.55] • Calculation: Must reconcile with the following: “ADJFuelUsage” multiplied by “FuelRateInSubRuleID” for given Sub Rule ID • Values: N/A • Special Rules: Calculation is to be used, unless Fuel Tax Credit is the manual adjustment made at an Account Manager level
ADJBalance	<ul style="list-style-type: none"> • Required (if adjustment activity occurs in Sub Rule ID for given VIN/MRD during reporting period) • Description: Adjusted balance for this adjustment – entered manually by Account Manager • Type: Number • Format: Two decimal places - Dollars and cents [0.01, 0.02, ... , 2.55] • Calculation: Must reconcile with the following: “ADJRevenue” plus “ADJFuelTaxCredit” • Values: N/A • Special Rules: N/A

Data Element	Meaning
ADJDateTime	<ul style="list-style-type: none"> • Required (if adjustment activity occurs in Sub Rule ID for given VIN/MRD during reporting period) • Description: Timestamp of when the transaction was added to the account. (Not the date the miles are applied to) • Data Type: String • Format: The date / time is specified in the following form "YYYY-MM-DDT hh:mm:ss" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day ○ T indicates the start of the required time section ○ hh indicates the hour ○ mm indicates the minute ○ ss indicates the second • Calculation: N/A • Values: N/A • Special Rules: UTC
ADJCode	<ul style="list-style-type: none"> • Required (if adjustment activity occurs in Sub Rule ID for given VIN/MRD during reporting period) • Description: indicator of what adjustment was conducted on the account – entered manually by Account Manager • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ul style="list-style-type: none"> 0 (Zero) = Other 1 = MRD installed in the wrong vehicle 2 = Miles self-reported by RUC payer 3 = MRD assigned to the wrong driver 4 = Daily Assessed Mileage Other codes to be assigned by Agency • Special Rules: N/A

Data Element	Meaning
ADJReasonDescription	<ul style="list-style-type: none">• Required (if adjustment activity occurs in Sub Rule ID for given VIN/MRD during reporting period)• Description: Sentence describing why adjustment was made – entered manually by Account Manager• Data Type: String• Format: VARCHAR(100)• Calculation: N/A• Values: N/A• Special Rules: N/A

3.9 Errors and Events Report Overview

The Error and Events Report shall contain the codes detected and attached to transaction records. These codes include health codes for the MRD, anomalies detected during Account Manager processing or Vehicle Status (or activity) codes for participants of each Account Manager.

3.10 Errors and Events Report Pseudocode

{ <i>ErrorsAndEventsMessage</i>
AMID
TransmittedTimestamp
PeriodStartDate
PeriodEndDate

The following block of code is the VIN record. Include one for each VIN in report.

{ EEMDevices
VIN
MRDID
CertID

The following block of code is the VIN day error and event record. Include one for each error or event.

{ EEMDetails
ErrorEventDate
ErrorEventCode
TotalMilesOnDate
}

}

}

3.11 Errors and Events Report Definitions

Data Element	Meaning
AMID	<ul style="list-style-type: none"> • Required • Description: The AM identifier number which is provided by the agency • Data Type: Number • Format: Integer • Calculation: N/A • Values: N/A • Special Rules: N/A
TransmittedTimestamp	<ul style="list-style-type: none"> • Required • Description: Timestamp provided by transmitting entity when message sent • Data Type: String • Format: The date / time is specified in the following form "YYYY-MM-DDT hh:mm:ss" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day ○ T indicates the start of the required time section ○ hh indicates the hour ○ mm indicates the minute ○ ss indicates the second • Calculation: N/A • Values: N/A • Special Rules: UTC

Data Element	Meaning
PeriodStartDate	<ul style="list-style-type: none"> • Required • Description: The date of start of the reporting period for the data file • Data Type: String • Format: The date is specified in the following form "YYYY-MM-DD" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day • Calculation: N/A • Values: N/A • Special Rules: N/A
PeriodEndDate	<ul style="list-style-type: none"> • Required • Description: The date of end of the reporting period for the data file • Data Type: String • Format: The date is specified in the following form "YYYY-MM-DD" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day • Calculation: N/A • Values: N/A • Special Rules: N/A
VIN	<ul style="list-style-type: none"> • Required • Description: The VIN of the vehicle in which the MRD is installed • Data Type: String • Format: VARCHAR(20) • Calculation: N/A • Values: N/A • Special Rules: N/A

Data Element	Meaning
MRDID	<ul style="list-style-type: none"> • Required • Description: Unique identifier for MRD (such as serial number) • Data Type: String • Format: VARCHAR(64) • Calculation: N/A • Values: N/A • Special Rules: N/A
CertID	<ul style="list-style-type: none"> • Required • Description: Certification ID number assigned by Agency – indicates the issuer and manufacturer of an MRD • Data Type: Number • Format: Integer • Calculation: N/A • Values: Agency assigned values • Special Rules: N/A
ErrorEventDate	<ul style="list-style-type: none"> • Required • Description: date and time of error or event • Data Type: String • Format: The date / time is specified in the following form "YYYY-MM-DDT hh:mm:ss" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day ○ T indicates the start of the required time section ○ hh indicates the hour ○ mm indicates the minute ○ ss indicates the second • Calculation: N/A • Values: N/A • Special Rules: N/A

Data Element	Meaning
ErrorEventCode	<ul style="list-style-type: none"> • Required • Description: Coding of each error or event that occurred for the given MRD or VIN on the given date when the error was detected by the MRD or the RCP • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ul style="list-style-type: none"> From MRDHealth code <ol style="list-style-type: none"> 1. Low Voltage 2. Anomalies in monitored vehicle functions and parameters which could compromise the collection and reporting of RUC data (e.g., MIL on - Check Engine light) 3. Storage full 4. Disconnects / reconnects 5. Connected to new vehicle 6. Vehicle interface communications failure 7. Location data degraded [advanced MRD only] 8. Incorrect date/time (conflict between date/time from vehicle interface and from wireless communications) 9. Software resets 10. Software updates 11. Degraded mileage data 12. Missed mileage 13. Vendor-specific Generated at the RUC Processing Subsystem <ol style="list-style-type: none"> 100. No message received from MRD 101. Unreadable Message from MRD / Checksum failure 102. MessageIDs from MRD not correctly incrementing 103. VIN - MRD ID mismatch 104. Date/time not increasing from last message 105. Accumulated Mileage decreased from last message 106. New total mileage does not equal sum of mileage in zones 107. InvalidRule ID ("Zone") • Special Rules: Any additional error/event codes will be determined by Agency

Data Element	Meaning
TotalMilesOnDate	<ul style="list-style-type: none"> • Required • Description: Total Miles Reported for the vehicle for the day on which the error or event occurred • Data Type: Number • Format: One decimal place - Miles to nearest tenth of a mile[0,0.1,0.2...10,000,000.0] • Calculation: N/A • Values: N/A • Special Rules: N/A

3.12 Account and VIN Update Report Overview

The Account and VIN Update report exchanges the appropriate account attributes and participation status of the accounts and VINs in the RUC Program.

3.13 Account and VIN Update Report Pseudocode

<i>{ AccountAndVINUpdateMessage</i>
AMID
TransmittedTimestamp

Repeat for each day being reported.

<i>{ AVMDetails</i>
ReportDate

The following block of code is the VIN record. Include one for each VIN that has had new or changed data values since the last report.

<i>{ AVMVINDetails</i>
VIN
AccountFirstName
AccountMiddleName
AccountLastName
MailingAddressLine1
MailingAddressLine2
MailingAddressCity
MailingAddressState
MailingAddressPostalCode
MailingAddressCounty
MailingAddressCountry
ResidentialAddressLine1
ResidentialAddressLine2
ResidentialAddressCity
ResidentialAddressState
ResidentialAddressPostalCode
ResidentialAddressCounty
ResidentialAddressCountry
CompanyName
AccountEmail

AccountPhone
PreferredContactMethod
VehicleEPARating
VehicleMake
VehicleModel
VehicleYear
LicensePlate
MRDID
CertID
{ <i>MRDConfigVersion</i>
HWModel
HWMainRelease
HWSubRelease
SWMainRelease
SWSubRelease
MapMainRelease
MapSubRelease
}
FuelUseMethod
VINStatus
VINStatusDate
VINExitReason
ProgramEsignTime
ProgramEsignVersion
BeginningOdometer
EndingOdometer
VINExitDate
AccountCloseDate
AMCustomerNumber
}
}
}

3.14 Account and VIN Update Definitions

Data Element	Meaning
AMID	<ul style="list-style-type: none"> • Required • Description: The AM identifier number which is provided by the agency • Data Type: Number • Format: Integer • Calculation: N/A • Values: N/A • Special Rules: N/A
TransmittedTimestamp	<ul style="list-style-type: none"> • Required • Description: Timestamp provided by transmitting entity when message sent • Data Type: String • Format: The date / time is specified in the following form "YYYY-MM-DDT hh:mm:ss" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day ○ T indicates the start of the required time section ○ hh indicates the hour ○ mm indicates the minute ○ ss indicates the second • Calculation: N/A • Values: N/A • Special Rules: UTC

Data Element	Meaning
ReportDate	<ul style="list-style-type: none"> • Required • Description: The date of the report submission • Data Type: String • Format: The date is specified in the following form "YYYY-MM-DD " where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day • Calculations: N/A • Values: N/A • Special Rules: N/A
VIN	<ul style="list-style-type: none"> • Required • Description: The VIN of the vehicle in which the MRD is installed • Data Type: String • Format: VARCHAR(20) • Calculation: N/A • Values: N/A • Special Rules: N/A
AccountFirstName	<ul style="list-style-type: none"> • Required • Description: The first name of the account holder • Data Type: String • Format: VARCHAR(20) • Calculation: N/A • Values: N/A • Special Rules: N/A
AccountMiddleName	<ul style="list-style-type: none"> • Required • Description: The middle name of the account holder • Data Type: String • Format: VARCHAR(20) • Calculation: N/A • Values: N/A • Special Rules: N/A

Data Element	Meaning
AccountLastName	<ul style="list-style-type: none"> • Required • Description: The last name of the account holder • Data Type: String • Format: VARCHAR(36) • Calculation: N/A • Values: N/A • Special Rules: N/A
MailingAddressLine1	<ul style="list-style-type: none"> • Required • Description: The first line of the street of the address of the account holder • Data Type: String • Format: VARCHAR(36) • Calculation: N/A • Values: N/A • Special Rules: N/A
MailingAddressLine2	<ul style="list-style-type: none"> • Required • Description: The second line of the street of the address of the account holder • Data Type: String • Format: VARCHAR(36) • Calculation: N/A • Values: N/A • Special Rules: N/A
MailingAddressCity	<ul style="list-style-type: none"> • Required • Description: The city of the address of the account holder • Data Type: String • Format: VARCHAR(30) • Calculation: N/A • Values: N/A • Special Rules: N/A

Data Element	Meaning
MailingAddressState	<ul style="list-style-type: none"> • Required • Description: The U.S. state of the address of the account holder • Data Type: String • Format: VARCHAR(2) • Calculation: N/A • Values: N/A • Special Rules: N/A
MailingAddressPostalCode	<ul style="list-style-type: none"> • Required • Description: The U.S. postal code of the address of the account holder • Data Type: String • Format: VARCHAR(10) • Calculation: N/A • Values: N/A • Special Rules: 5 characters required, additional 4 characters optional
MailingAddressCounty	<ul style="list-style-type: none"> • Optional • Description: The county of the address of the account holder • Data Type: String • Format: VARCHAR(20) • Calculation: N/A • Values: N/A • Special Rules: Account Manager not required to capture or derive county from address – if no county available, omit field from report.
MailingAddressCountry	<ul style="list-style-type: none"> • Optional • Description: The country of the address of the account holder • Data Type: String • Format: VARCHAR(20) • Calculation: N/A • Values: N/A • Special Rules: Account Manager not required to capture or derive country from address – if no country available, omit field from report.

Data Element	Meaning
ResidentialAddressLine1	<ul style="list-style-type: none"> • Required • Description: The first line of the street the vehicle is registered to • Data Type: String • Format: VARCHAR(36) • Calculation: N/A • Values: N/A • Special Rules: N/A
ResidentialAddressLine2	<ul style="list-style-type: none"> • Required • Description: The second line of the street of the address the vehicle is registered to • Data Type: String • Format: VARCHAR(36) • Calculation: N/A • Values: N/A • Special Rules: N/A
ResidentialAddressCity	<ul style="list-style-type: none"> • Required • Description: The city of the address the vehicle is registered to • Data Type: String • Format: VARCHAR(30) • Calculation: N/A • Values: N/A • Special Rules: N/A
ResidentialAddressState	<ul style="list-style-type: none"> • Required • Description: The U.S. state of the address the vehicle is registered to • Data Type: String • Format: VARCHAR(2) • Calculation: N/A • Values: N/A • Special Rules: N/A

Data Element	Meaning
ResidentialAddressPostalCode	<ul style="list-style-type: none"> • Required • Description: The U.S. postal code of the address the vehicle is registered to • Data Type: String • Format: VARCHAR(10) • Calculation: N/A • Values: N/A • Special Rules: 5 characters required, additional 4 characters optional
ResidentialAddressCounty	<ul style="list-style-type: none"> • Optional • Description: The county of the address the vehicle is registered to • Data Type: String • Format: VARCHAR(20) • Calculation: N/A • Values: N/A • Special Rules: Account Manager not required to capture or derive county from address – if no county available, omit field from report.
ResidentialAddressCountry	<ul style="list-style-type: none"> • Optional • Description: The country of the address the vehicle is registered to • Data Type: String • Format: VARCHAR(20) • Calculation: N/A • Values: N/A • Special Rules: Account Manager not required to capture or derive country from address – if no country available, omit field from report.

Data Element	Meaning
CompanyName	<ul style="list-style-type: none"> • Required • Description: The company name if it is the registered owner of the vehicle • Data Type: String • Format: VARCHAR(50) • Calculation: N/A • Values: N/A • Special Rules: If no Company Name available, set this field value to blank
AccountEmail	<ul style="list-style-type: none"> • Required • Description: The e-mail address of the account holder • Data Type: String • Format: VARCHAR(100) • Calculation: N/A • Values: N/A • Special Rules: N/A
AccountPhone	<ul style="list-style-type: none"> • Required • Description: The phone number of the account holder • Data Type: String • Format: VARCHAR(22) • Calculation: N/A • Values: N/A • Special Rules: N/A
PreferredContactMethod	<ul style="list-style-type: none"> • Required • Description: Preferred contact method for the RUC Payer • Data Type: String • Format: VARCHAR(20) • Calculation: N/A • Values: <ul style="list-style-type: none"> ○ PHONE ○ EMAIL ○ (Other values as assigned by Agency) • Special Rules: N/A

Data Element	Meaning
VehicleEPARating	<ul style="list-style-type: none"> • Required • Description: Combined MPG rating for the vehicle • Data Type: Number • Format: One decimal place - Number in tenth of miles [0,1.1,2.1...999.9] • Calculation: N/A • Values: N/A • Special Rules: See the agency Business Requirements Document for correct EPA values for this field
VehicleMake	<ul style="list-style-type: none"> • Required • Description: The Make of the vehicle associated with the VIN • Data Type: String • Format: VARCHAR(5) • Calculation: N/A • Values: N/A • Special Rules: N/A
VehicleModel	<ul style="list-style-type: none"> • Required • Description: The Model of the vehicle associated with the VIN • Data Type: String • Format: VARCHAR(15) • Calculation: N/A • Values: N/A • Special Rules: N/A
VehicleYear	<ul style="list-style-type: none"> • Required • Description: The Year of the vehicle associated with the VIN • Data Type: Number • Format: Integer • Calculation: N/A • Values: N/A • Special Rules: N/A

Data Element	Meaning
LicensePlate	<ul style="list-style-type: none"> • Required • Description: License plate of vehicle with the VIN associated with the issued MRD • Data Type: String • Format: VARCHAR(9) • Calculation: N/A • Values: N/A • Special Rules: N/A
MRDID	<ul style="list-style-type: none"> • Required • Description: Unique identifier for MRD (such as serial number) • Data Type: String • Format: VARCHAR(64) • Calculation: N/A • Values: N/A • Special Rules: If no MRD is assigned at time of report, omit this field from the report.
CertID	<ul style="list-style-type: none"> • Required • Description: Certification ID number assigned by Agency – indicates the issuer and manufacturer of an MRD • Data Type: Number • Format: Integer • Calculation: N/A • Values: Agency assigned values • Special Rules: If no MRD is assigned at time of report, omit this field from the report.
HWModel	<ul style="list-style-type: none"> • Required • Description: HW Model number • Data Type: String • Format: VARCHAR(15) • Calculation: N/A • Values: N/A • Special Rules: If no MRD is assigned at time of report, omit this field from the report.

Data Element	Meaning
HWMMainRelease	<ul style="list-style-type: none"> • Required • Description: HW primary release number • Data Type: String • Format: VARCHAR(15) • Calculation: N/A • Values: N/A • Special Rules: If no MRD is assigned at time of report, omit this field from the report.
HWSubRelease	<ul style="list-style-type: none"> • Required • Description: HW secondary release number • Data Type: String • Format: VARCHAR(15) • Calculation: N/A • Values: N/A • Special Rules: If no MRD is assigned at time of report, omit this field from the report.
SWMainRelease	<ul style="list-style-type: none"> • Required • Description: SW primary release number • Data Type: String • Format: VARCHAR(10) • Calculation: N/A • Values: N/A • Special Rules: If no MRD is assigned at time of report, omit this field from the report.
SWSubRelease	<ul style="list-style-type: none"> • Required • Description: SW secondary release number • Data Type: String • Format: VARCHAR(10) • Calculation: N/A • Values: N/A • Special Rules: If no MRD is assigned at time of report, omit this field from the report.

Data Element	Meaning
MapMainRelease	<ul style="list-style-type: none"> • Required • Description: Map primary release number • Data Type: String • Format: VARCHAR(3) • Calculation: N/A • Values: N/A • Special Rules: If no MRD is assigned at time of report, omit this field from the report.
MapSubRelease	<ul style="list-style-type: none"> • Required • Description: Map secondary release number • Data Type: String • Format: VARCHAR(3) • Calculation: N/A • Values: N/A • Special Rules: If no MRD is assigned at time of report, omit this field from the report.
FuelUseMethod	<ul style="list-style-type: none"> • Required • Description: A value indicating which fuel consumption method is used to calculate fuel usage • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ul style="list-style-type: none"> • 1 = Fuel use not calculated • 2 = Fuel calculated from actual fuel use on the device • 3 = Fuel Use calculated using approved EPA methods (see Business Requirements Document) • 4 = Vehicle does not use taxable fuel • Special Rules: N/A

Data Element	Meaning
VINStatus	<ul style="list-style-type: none"> • Required • Description: Reason for the status of a given VIN at the period end date of the report • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ul style="list-style-type: none"> ○ 1 = Pending – If the VIN has been submitted for approval and is not yet approved by the agency ○ 2 = Started - If the VIN is first appearing on the report ○ 3 = Active - if the VIN has previously appeared ○ 4 = Discontinued – VIN has exited the program ○ 5 = Not Approved – VIN has not been approved for the program • Special Rules: N/A
VINStatusDate	<ul style="list-style-type: none"> • Required • Description: date upon which VIN status (new or deleted) was effective • Data Type: String • Format: The date is specified in the following form "YYYY-MM-DD" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day • Calculation: N/A • Values: N/A • Special Rules: N/A
VINExitReason	<ul style="list-style-type: none"> • Required • Description: The reason given by the driver for exiting the given Account Manager • Data Type: String • Format: VARCHAR(100) • Calculation: N/A • Values: N/A • Special Rules: If account still active, set this field value to blank

Data Element	Meaning
ProgramEsignTime	<ul style="list-style-type: none"> • Required • Description: Date and Time program terms were accepted • Data Type: String • Format: The date / time is specified in the following form "YYYY-MM-DDT hh:mm:ss" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day ○ T indicates the start of the required time section ○ hh indicates the hour ○ mm indicates the minute ○ ss indicates the second • Calculations: N/A • Values: N/A • Special Rules: N/A
ProgramEsignVersion	<ul style="list-style-type: none"> • Required • Meaning: Description of the version of the agreement(s) and process used to sign the volunteer agreement • Data Type: String • Format: VARCHAR(10) • Calculations: N/A • Values: N/A • Special Rules: N/A
BeginningOdometer	<ul style="list-style-type: none"> • Required, If not provided set value to zero • Description: Initial odometer reading of the vehicle • Data Type: Number • Format: One decimal place - Miles to nearest tenth of a mile [0,0.1,0.2, 10,000.0] • Calculation: N/A • Values: N/A • Special Rules: N/A

Data Element	Meaning
EndingOdometer	<ul style="list-style-type: none"> • Required (if VINStatus is 'discontinued') • Description: Odometer reading when the VIN exits the program • Data Type: Number • Format: One decimal place - Miles to nearest tenth of a mile [0,0.1,0.2, 10,000.0] • Calculation: N/A • Values: N/A • Special Rules: If account is still active, set this field value to 0
VINExitDate	<ul style="list-style-type: none"> • Required • Description: Date a vehicle (VIN) exited a RUC Payer account • Data Type: String • Format: The date is specified in the following form "YYYY-MM-DD " where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day • Calculation: N/A • Values: N/A • Special Rules: If account still active, set this field value to blank
AccountCloseDate	<ul style="list-style-type: none"> • Required (when account is closed) • Description: Date account is closed with the account manager • Data Type: String • Format: The date is specified in the following form "YYYY-MM-DD " where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day • Calculation: N/A • Values: N/A • Special Rules: If account is still active, set this field value to blank

Data Element	Meaning
AMCustomerNumber	<ul style="list-style-type: none">• Required• Description: Account Manager unique reference number to the customer• Data Type: String• Format: VARCHAR(100)• Calculation: N/A• Values: N/A• Special Rules: N/A

3.15 Account and VIN Update Return Data Pseudocode

The return message will include information that will indicate to the account manager the status of volunteer approvals. The rules for what is returned are below;

- The list will include all VINs just submitted, plus
- All Newly Approved VINs from previous submissions, plus
- All Newly Denied VINs from previous submissions, plus
- All VINs in a pending status

{ <i>AccountAndVINUpdateResult</i>
{ <i>AVMRDetails</i>
VIN
ApprovalStatus
DenialReasonCode
DenialReasonDescription
AgencyCustomerNumber
AMCustomerNumber
}
}

3.16 Account and VIN Update Return Data Definitions

Data Element	Meaning
VIN	<ul style="list-style-type: none"> • Required • Description: The VIN of the vehicle in which the MRD is installed • Data Type: String • Format: VARCHAR(20) • Calculation: N/A • Values: N/A • Special Rules: N/A
ApprovalStatus	<ul style="list-style-type: none"> • Required • Description: Status of a given VIN in the volunteer program • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ul style="list-style-type: none"> ○ 1 = Approved ○ 2 = Pending ○ 3 = Denied • Special Rules: N/A

Data Element	Meaning
DenialReasonCode	<ul style="list-style-type: none"> • Required if status is denied, otherwise not used • Description: Reason for not being allowed in the volunteer program • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ul style="list-style-type: none"> ○ 1 = Over Program limit ○ 2 = Over MPG Category limit ○ 3 = Volunteer information does not match owner DMV records ○ 4 = Vehicle not registered in Oregon ○ 5 = Vehicle already in the program ○ 6 = Ineligible volunteer ○ 7 = Ineligible vehicle <p style="margin-left: 40px;">Codes can only be assigned by the agency</p> • Special Rules: N/A
DenialReasonDescription	<ul style="list-style-type: none"> • Required • Description: Description of why vehicle was denied • Data Type: String • Format: VARCHAR(255) • Calculation: N/A • Values: N/A • Special Rules: N/A
AgencyCustomerNumber	<ul style="list-style-type: none"> • Required • Description: The agency number used to uniquely identify a volunteer • Data Type: Number • Format: Integer • Calculation: N/A • Values: N/A • Special Rules: N/A

Data Element	Meaning
AMCustomerNumber	<ul style="list-style-type: none">• Required• Description: Account Manager unique reference number to the customer• Data Type: String• Format: VARCHAR(100)• Calculation: N/A• Values: N/A• Special Rules: N/A