



Road Usage Charge Program

Interface Control Document

For Road Usage Charge Implementation

Version 2.4

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Table of Contents

1	Introduction	6
1.1	Document Overview	6
1.2	Definitions, Acronyms, and Abbreviations	7
1.3	Context	8
1.4	Documents	8
1.5	Open Architecture with Standardized Communication Objective.....	8
1.6	Applicable Standards and Preferences	9
1.7	Scope and Identification of Systems	9
1.7.1	Mileage Reporting Option	10
1.7.2	Data Collection Subsystem	10
1.7.3	Transaction Processor Subsystem.....	10
1.7.4	Account Management Subsystem.....	10
1.7.5	Administrator Subsystem	10
2	Interface between the Data Collection to the Transaction Processor subsystems ...	11
2.1	Data Collection Overview.....	11
2.1.1	Data Transfer.....	11
2.1.2	Transactions and Responses.....	11
2.1.3	Interface Requirements and Security	11
2.1.4	Communication Methods	12
2.1.5	Interface Initiation	12
2.2	Mileage Message Overview.....	13
2.2.1	Mileage Message JSON Structure	13
2.2.2	Mileage Message Definitions	15
2.2.3	Mileage Message Failure JSON Structure	24
2.2.4	Mileage Message Failure Definitions	25
3	Interface between Account Management subsystem and the Administrator subsystems	27
3.1	Program Monitoring Overview	27
3.1.1	Data Transfer.....	27
3.1.2	Transactions and Responses.....	27
3.1.3	Interface Requirements and Security	28
3.1.4	Interface Initiation	28
3.2	Mileage and RUC Revenue Message Overview	29
3.2.1	Mileage and RUC Revenue Message JSON Structure	29
3.2.2	Mileage and RUC Revenue Message Definitions.....	30
3.2.3	Mileage and RUC Revenue Message Response JSON Structure	43

3.2.4	Mileage and RUC Revenue Message Response Definitions.....	43
3.3	VIN Summary Message Overview	44
3.3.1	VIN Summary Message JSON Structure	44
3.3.2	VIN Summary Message Definitions.....	47
3.3.1	VIN Summary Message Response Data JSON Structure	62
3.3.2	VIN Summary Message Response Data Definitions	63
3.4	Errors and Events Message Overview.....	63
3.4.1	Errors and Events Message JSON Structure	63
3.4.2	Errors and Events Report Definitions	65
3.4.3	Errors and Events Report Response Data JSON Structure.....	69
3.4.1	Errors and Events Report Response Data Definitions.....	69
3.5	Account and VIN Update Message Overview	69
3.5.1	Account and VIN Update Message JSON Structure	69
3.5.2	Account and VIN Update Definitions	71
3.5.3	Account and VIN Update Response Data JSON Structure	86
3.5.4	Account and VIN Update Return Data Definitions	87
3.6	Quarterly Tax Report Overview.....	88
3.6.1	Data Transfer.....	89
3.6.2	Interface Requirements and Security	89
3.6.3	Interface Initiation	89

Revision History

Date Of Revision	Reason For the Change and Short Summary of the Revisions Made	Version Number
05/12/14	Procurement Document Released	1.0
07/16/14	Updates to definitions and fields	1.1
08/05/14	Corrections for Adjustments and Error codes Added return message for Daily report	1.1
09/17/14	Corrected minor errors	1.2
12/19/14	Corrected minor errors	1.3
02/23/15	Update timestamp fields to use UTC	1.4
06/05/15	Identify optional fields	1.5
12/01/15	Revisions for general cleanup and mutually agreed upon changes during development and implementation	1.6
03/01/19	Added AMCustomerNumber as required in the VIN Summary and Errors and Events reports	1.7
08/22/19	Added requirements related to HB 2881	1.8
11/06/19	Removed the (if less than 0, then 0) note from the ADJBalance definition.	1.9
08/16/21	Added requirements from research and development projects. New fields, removed fields, changed field names. Revised and new validations. Introduced max number of records per message and the 206 Partial Content response.	2.0
08/30/21	Account and VIN Update Response Message: revised fields	2.1
12/14/21	Mileage Message Response: Replaced FailedDate with FailedReportingPeriodStart and FailedReportingPeriodEnd, Revised definitions for VIN Status	2.2
01/12/22	Revised error detail in the response messages	2.3
04/27/22	Updated section 3.4.2 correcting error codes requiring a timestamp in Errors and Events messages, updated section 3.5.2 to include new MRO Status 3 = Non Compliant, updated section 3.5.4 with new definition for EnrollmentStatusCode	2.4

1 Introduction

Purpose

The purpose of this document is to describe the specifications for interfaces between subsystems of the Oregon Road Usage Charge System.

The introduction section presents a brief overview of the system and interfaces 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 Charge (RUC) System

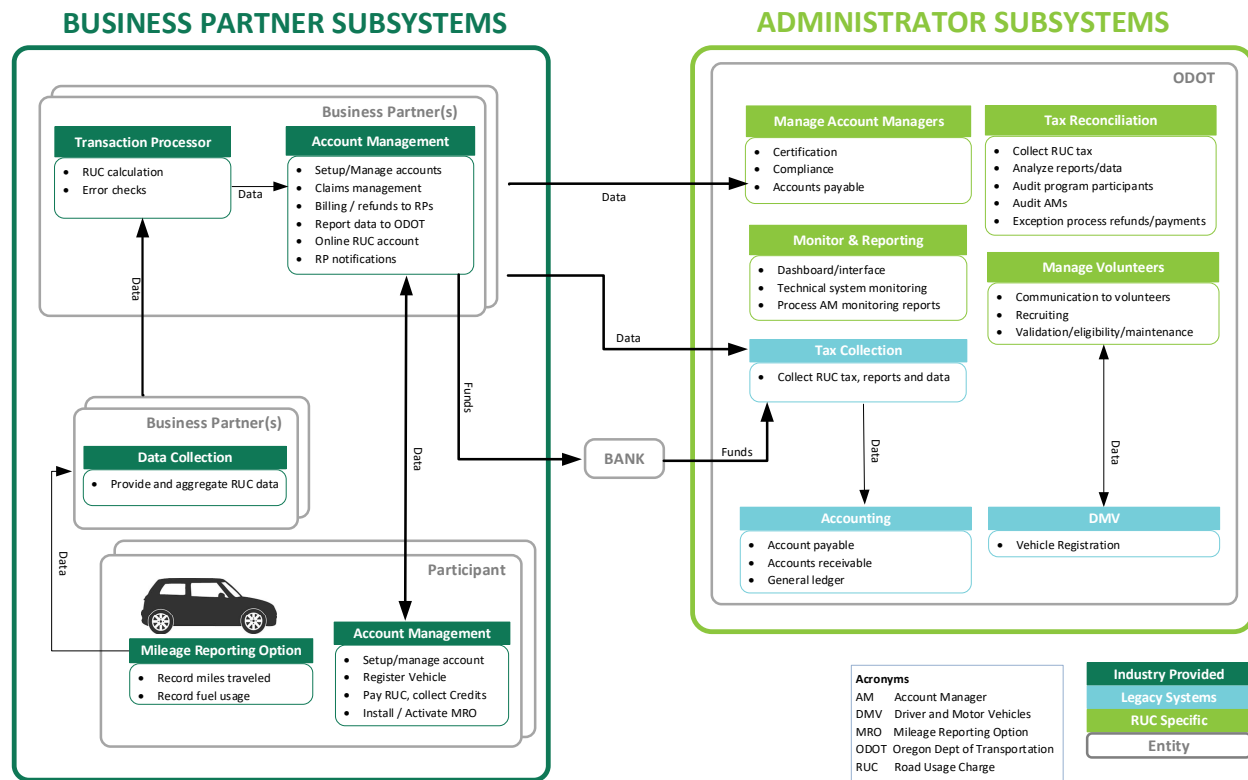
System Acronym: RUC System

System Owner: Administrator

Interfaces Described: This ICD covers the interfaces between

- the Data Collection subsystem and Transaction Processor subsystem
- the Account Management subsystem and the Road Usage Charging Administrator subsystem

A diagram of the architecture is included below.



1.1 Document Overview

This document provides the specifications for the standardized 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

Administrator – A government agency administering a RUC Program. For example, ODOT would be considered the Administrator for the OReGO Program.

AM – Account Manager, A type of business partner specifically responsible for participant service, account management, and account operations

BP – Business Partner, An entity that provides a service that supports the RUC system. An entity providing account management services is an Account Manager. An Account Manager is a type of business partner. A Transaction Processor and Data Collector are also types of business partners

DC – Data Collection Subsystem, A system that is operated by a business partner that receives and stores raw travel data from the MRO and sends the travel data to the Transactions Processor subsystem

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

GPS – Global Positioning System, provides vehicle location details to the system

HTTP – HyperText Transfer Protocol.

ICD – Interface Control Document, provides technical specifications for communication interfaces within the RUC system

IP – Internet Protocol

JSON – JavaScript Object Notation

MRO – Mileage Reporting Option, an interface with the vehicle to collect travel data

ODOT – Oregon Department of Transportation

PRD – Program Requirements Document

REST – Representational State Transfer

RUC – Road Usage Charge

STSFA – Surface Transportation Systems Funding Alternatives

TCP – Transmission Control Protocol

TP – Transaction Processor Subsystem, A system that is operated by a business partner receives and stores the raw travel data sent from the DC. The RUC is also calculated in this system.

Travel data – Total miles traveled and, if available, total fuel used. May include vehicle location for location-based MROs.

VIN – Vehicle Identification Number

1.3 Context

The OReGO Program, ODOT's operational road usage charge (RUC) program, was enacted by Senate Bill 810 (2013). This system will allow for automatic collection of road use charges from subject vehicles.

1. This automatic collection uses a Mileage Reporting Option (MRO) and a Data Collection subsystem, that sends a standardized "mileage message" to the Transaction Processor subsystem.
2. The Transaction Processor subsystem sends the travel data to the Account Management system to administer customer accounts and invoice customers.
3. The Account Management subsystem administers customer accounts, collects information from vehicles, invoice customers, and sends revenue to the Oregon State Treasury.
4. The Account Management subsystem reports the aggregated data to the Administrator subsystem

These subsystems are administered by business partners.

5. The Administrator subsystem audits and reconciles accounts from business partner reports required to monitor the program. Administrator functions include audits and account reconciliations of Account Manager reports required for financial operation and monitoring of the entire system.

The purpose of this document is to define all interfaces between the various systems and maintain standardized messaging. These interfaces are:

- Data Collection subsystem to the Transaction Processor subsystem
- Account Management subsystem to the Administrator subsystem

1.4 Documents

The technical aspects of the work are documented primarily in the following documents:

- Data Reporting Process Flow Document that describes the data flow between subsystems at a high level.
- This ICD that provides the specifications necessary to support the required communications between system interfaces.
- The data validations are included in 21Q3_AppendixC_Data_Validations_Table.docx

The business and administrative aspects of the program are documented in:

- Program Requirements Document (PRD)

1.5 Open Architecture with Standardized Communication Objective

The Administrator designed this system to be fully open. Business partners will be eligible for certification to provide hardware or services. No hardware or service that is certified shall contain proprietary content that would limit the use of other hardware or services in the system. The Administrator will certify any technology or service providing the business partner complies with the specifications. Conformance to the interface standards specified in this document is mandatory for any technology and any business partner. Vendors can use proprietary components to meet the requirements of the systems (as defined in the PRD) but they must stay open at the system level by using the defined interfaces in the ICD which standardizes the connections between the systems.

Utilizing standardized interfaces is vital to operating a system with open architecture. It allows for MROs from various technology providers to operate with various Data Collectors,

Transaction Processors, and Account Managers. It also will allow multiple Account Managers to operate with the Administrator.

The communications approach may employ any communications medium permitting an internet connection. This ICD provides a robust communications standard. Within internet communications, this ICD indicates usage of JSON messages.

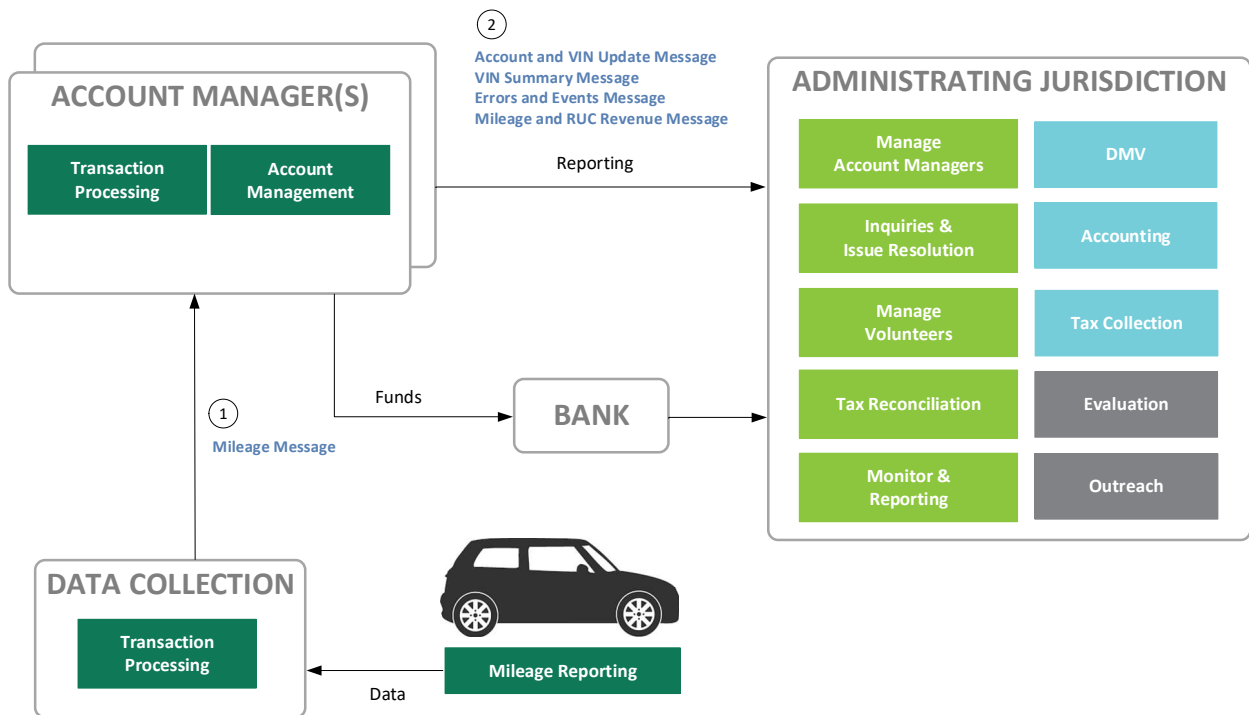
1.6 Applicable Standards and Preferences

- REST
- JSON
- HTTP
- TCP
- IP

1.7 Scope and Identification of Systems

This ICD specifies the interface between:

1. The Data Collection subsystem and the Transaction Processor subsystem
2. The Account Management subsystem and the Administrator subsystem



1.7.1 Mileage Reporting Option

The Mileage Reporting Option (MRO) interfaces with vehicles that are subject to the Road Usage Charge to collect raw travel data. The travel data is reported by the MRO to the Data Collection subsystem for communications formatting.

1.7.2 Data Collection Subsystem

The Data Collection subsystem is designed to collect travel data from multiple types of MRO technology and store the data for later communication and audits. The Data Collection subsystem also creates and transmits a standardized formatted mileage message to the Transaction Processor subsystem.

1.7.3 Transaction Processor Subsystem

The Transactions Processor subsystem receives and stores mileage messages from the Data Collection subsystem, calculates the RUC, and transmits this information and the mileage message to the Account Management subsystem.

1.7.4 Account Management Subsystem

The Account Management subsystem receives and stores all travel data and associated RUC data sent by the Transaction Processor subsystem. The Account Manager is responsible for communicating the reported information to the Administrator subsystem through the defined system reports, with specifications defined below. The Account Management subsystem develops four required reports:

- Mileage and RUC Revenue message
- VIN Summary message
- Errors and Events message
- Account and VIN Update message
- Quarterly Tax Report

1.7.5 Administrator Subsystem

The Administrator uses the RUC Administrator subsystem (RUCAS) to oversee operations of all RUC subsystems (Account Managers and the Administrator). The Administrator audits, edits and verifies the completeness and correctness of the mileage and revenue data. The Administrator confirms revenue transfers to the appropriate state treasurer and provides accounting posting information. The Administrator develops operational and statistical reports for verification of monthly operations, revenue forecasting and for program evaluation.

2 Interface between the Data Collection to the Transaction Processor subsystems

2.1 Data Collection Overview

The interface between the Data Collection subsystem and the Transaction Processing subsystem has one defined report that is used transfer the travel data.

1. Mileage Message: The mileage message contains the details for travel data per reporting period for each VIN/MRO.

2.1.1 Data Transfer

Data will be sent from the Data Collection subsystem to the Transaction Processor subsystem using REST and JSON, utilizing the format as defined in this document. The frequency of transmission is parameterized in the Data Collection subsystem, and set per the Administrator requirements.

2.1.2 Transactions and Responses

Transactions are comprised of one mileage message moving from the Data Collection subsystem to the Transaction Processor subsystem. Transactions are acknowledged by the Transaction Processor subsystem with a standard responses from a REST transaction. The processor shall execute the following validations:

1. Model Validation: The message can be parsed
2. Data Validation: The elements have valid values and are in the expected type and format
3. Validation Rules: The values pass any additional validation rules detailed in the definitions below

HTTP 200 – OK: Returned to the Data Collection subsystem when the message passes all validations.

HTTP 400 – Bad Request: Returned to the Data Collection subsystem when the message fails one or more validations types listed above. A failure message accompanies all HTTP 400 responses, containing validation details as specified in the Mileage Message Failure section below.

2.1.3 Interface Requirements and Security

The mileage message is a means of transmitting mileage data from the Data Collection subsystem to the Transaction Processor 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 Transaction Processor subsystem server provided by the business partner.

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 Data Collection subsystem to the Transaction Processor subsystem. The Transaction Processor subsystem accepts the message at all times, whenever the Data Collection subsystem transmits it.

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

2.2 Mileage Message Overview

The mileage message is sent from the Data Collection subsystem to the Transaction Processor subsystem. It is independent of communication channel, and specific hardware or software. The mileage message shall contain a record of the start and end times of a period, list all the Rule IDs in which travel was recorded.

2.2.1 Mileage Message JSON Structure

<i>MileageMessage</i> {	
VIN	
MsgID	
MsgType	
TransmittedTimestamp	
FuelUseMethod	
MROID	
MROIssuer	
MROManufacturer	
	<i>MROConfigVersion</i> {
	HWModel
	HWMainRelease
	HWSubRelease
	SWMainRelease
	SWSubRelease
	MapMainRelease
	MapSubRelease
	}

The following block of code is the mileage reporting period record. For each mileage message, include a record for each full reporting period collected by the Data Collection component not yet transferred to the Transactions Processing component. All full reporting periods shall be included, even if miles driven are 0 (zero).

<i>MileageDetails</i> [{
ReportingPeriodStart
ReportingPeriodEnd
TotalMilesInPeriod
AccumMilesInPeriod
FuelUsageInPeriod
FuelAddedInPeriod

The following block of code is the mileage Rule record. For each reporting period, include one instance of this block for each Rule ID in which the vehicle has traveled.

<i>{MileageRuleDetails [{</i>
RuleID
MsgMileageInRuleID
MsgFuelUsageInRuleID
MsgFuelAddedInRuleID

The following block of code is the mileage SubRule record. For each reporting period, include one instance of this block for each SubRule ID in which the vehicle has traveled.

<i>MileageSubRuleDetails [{</i>
SubRuleID
MsgMileageInSubRuleID
MsgFuelUsageInSubRuleID
MsgFuelAddedInSubRuleID
<i>}]</i>

<i>}]</i>

The following block of code is the MRO Health error code for each error that occurs during a mileage reporting period record.

<i>MROHealthDetails [{</i>
MROHealth
MROHealthTimestamp
<i>}]</i>

<i>}]</i>

<i>}</i>

2.2.2 Mileage Message Definitions

Data Element	Meaning
<i>Mileage Message</i>	<ul style="list-style-type: none"> • Required • Description: Segment name • Does not repeat
VIN	<ul style="list-style-type: none"> • Required • Description: The VIN of the vehicle reporting information through the MRO is installed • Data Type: String • Format: VARCHAR (20) • Calculation: N/A • Values: N/A • Conditional 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 • Conditional Rules: N/A
MsgType	<ul style="list-style-type: none"> • Required • Description: A value to indicate the type of message from the MRO • 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 • Conditional Rules: N/A • Validation Rules: Must be valid value from list above.

Data Element	Meaning
TransmittedTimestamp	<ul style="list-style-type: none"> • Required • Description: Timestamp of when the mileage collection subsystem sent the mileage message to the transaction processor. • 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 • Conditional Rules: UTC
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 = Actual fuel use expected but not captured, calculated by using EPA ○ 2 = Actual fuel use captured and used for calculation ○ 3 = Fuel use calculated by using EPA ○ 4 = Fuel not taxable • Conditional Rules: N/A • Validation Rules: Must be valid value from list above.
MROID	<ul style="list-style-type: none"> • Required • Description: Unique identifier for MRO (such as serial number) • Data Type: String • Format: VARCHAR(64) • Calculation: N/A • Values: N/A • Conditional Rules: N/A

Data Element	Meaning
MROIssuer	<ul style="list-style-type: none"> • Required • Description: Name of entity issuing MRO • Data Type: String • Format: VARCHAR(50) • Calculation: N/A • Values: N/A • Conditional Rules: N/A
MROManufacturer	<ul style="list-style-type: none"> • Required • Description: Name of MRO Manufacturer • Data Type: String • Format: VARCHAR(50) • Calculation: N/A • Values: N/A • Conditional Rules: N/A
<i>MROConfigVersion</i>	<ul style="list-style-type: none"> • Required • Description: Segment name • Does not repeat
HWModel	<ul style="list-style-type: none"> • Required • Description: HW Model number • Data Type: String • Format: VARCHAR(15) • Calculation: N/A • Values: N/A • Conditional Rules: N/A
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 • Conditional 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 • Conditional 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 • Conditional Rules: N/A

Data Element	Meaning
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 • Conditional Rules: N/A
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 • Conditional 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 • Conditional Rules: N/A
<i>MileageDetails</i>	<ul style="list-style-type: none"> • Required • Description: Segment name • Optionally repeats
ReportingPeriodStart	<ul style="list-style-type: none"> • Required • Description: The start date and time, in UTC, of the period during which the miles being reported were traveled in. • 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 • Conditional Rules: N/A

Data Element	Meaning
ReportingPeriodEnd	<ul style="list-style-type: none"> • Required • Description: The end date and time, in UTC, of the period during which the miles being reported were traveled in. • 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 • Conditional Rules: N/A
TotalMilesInPeriod	<ul style="list-style-type: none"> • Required • Description: Total Miles Reported for the VIN/MRO for a given reporting 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 “MsgMileageInSubRuleID” for all SubRule IDs in reporting period • Values: N/A • Conditional Rules: N/A • Validation Rules: Must be equal to the sum of “MsgMileageInRuleID” for all RuleIDs
AccumMilesInPeriod	<ul style="list-style-type: none"> • Required • Description: Cumulative miles of the MRO since activated to report for 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 • Conditional Rules: If no miles accumulated, set this field value to 0 (zero).

Data Element	Meaning
FuelUsageInPeriod	<ul style="list-style-type: none"> • Required • Description: Accumulated fuel usage during the reporting period for the VIN/MRO • 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 SubRule IDs in reporting period • Values: N/A • Conditional Rules: N/A • Validation Rules: Must be equal to the sum of "MsgFuelUsageInRuleID" for all RuleIDs
FuelAddedInPeriod	<ul style="list-style-type: none"> • Optional • Description: The amount of fuel added during a given period for the VIN/MRO • 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 SubRule IDs in reporting period • Values: N/A • Conditional 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. • Validation Rules: Must be equal to the sum of "MsgFuelAddedInRuleID" for all RuleIDs
<i>MileageRuleDetails</i>	<ul style="list-style-type: none"> • Required • Description: Segment name • Optionally repeats

Data Element	Meaning
RuleID	<ul style="list-style-type: none"> • Required • Description: An identifier associated with a geographic area 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 Administrator provided RUC Rate Table • Conditional Rules: N/A • Validation Rules: Must be a valid RuleID from RUC Rate Table.
MsgMileageInRuleID	<ul style="list-style-type: none"> • Required • Description: Miles Traveled in given VIN/MRO Rule ID in the given period • Data Type: Number • Format: Miles to nearest tenth of a mile [0,0.1,0.2,10,000.0] • Calculation: Sum of "MsgMileageInSubRuleID" for all SubRuleIDs within the given RuleID, for the given period, for the VIN/MRO. • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal the sum of "MsgMileageSubRuleID" for all the SubRuleIDs for the given RuleID
MsgFuelUsageInRuleID	<ul style="list-style-type: none"> • Required • Description: Amount of fuel consumed based on Fuel Use Method in given VIN/MRO Rule ID in the given period. • Data Type: Number • Format: Gallons to hundredth of a gallon [0.01, 0.02, 99,999,999.99] • Calculation: Sum of "MsgFuelUsageSubRuleID" for all SubRuleIDs within the given RuleID, for the given period, for the VIN/MRO. • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal the sum of "MsgFuelUsageSubRuleID" for all the SubRuleIDs for the given RuleID

Data Element	Meaning
MsgFuelAddedInRuleID	<ul style="list-style-type: none"> • Optional • Description: Amount of fuel added in given VIN/MRO Rule ID in the given period. • Data Type: Number • Format: Gallons to hundredth of a gallon [0.01, 0.02, 99,999,999.99] • Calculation: Sum of “MsgFuelAddedSubRuleID” for all SubRuleIDs within the given RuleID, for the given period, for the VIN/MRO. • Values: N/A • Conditional 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. • Validation Rules: Must equal the sum of “MsgFuelAddedSubRuleID” for all the SubRuleIDs for the given RuleID
<i>MileageSubRuleDetails</i>	<ul style="list-style-type: none"> • Required • Description: Segment name • Optionally repeats
SubRuleID	<ul style="list-style-type: none"> • Required • Description: Numerical index for region of travel within given Rule ID. • Data Type: Number • Format: Integer • Calculation: N/A • Values: Assigned by The Administrator as necessary, provided in RUC Rate Table • Conditional Rules: N/A • Validation Rules: Must be a valid SubRuleID for given RuleID from RUC Rate Table.
MsgMileageInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Miles Traveled in VIN/MRO Sub Rule ID in the given period • 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 • Conditional 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/MRO Sub Rule ID in the given period. • Data Type: Number • Format: Gallons to hundredth of a gallon [0.01, 0.02, 99,999,999.99] • Calculation: N/A • Values: N/A • Conditional Rules: N/A
MsgFuelAddedInSubRuleID	<ul style="list-style-type: none"> • Optional • Description: The amount of fuel added in given VIN/MRO Sub Rule ID in the given period. • 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 • Conditional 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.
<i>MROHealthDetails</i>	<ul style="list-style-type: none"> • Optional • Description: Segment name • Optionally repeats
MROHealth	<ul style="list-style-type: none"> • Required (if MRO error or event occurs during reporting period) • Description: Coding of each error and event that occurred for the given MRO during the given period, when the error was detected by the MRO. • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ol style="list-style-type: none"> 3. Disconnects 4. Reconnects 5. Connected to new vehicle • Special Rules: N/A

Data Element	Meaning
MROHealthTimestamp	<ul style="list-style-type: none"> • Required (if MRO error or event occurs during reporting period) • Description: Reporting period that an MRO error or event occurred • Data Type: String • Format: The reporting period 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

2.2.3 Mileage Message Failure JSON Structure

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

<i>{MileageMessageResults</i>
FailureTimestamp
MsgID
FailedReportingPeriodStart
FailedReportingPeriodEnd
MsgFailedCode
msgErrorsDetails
[[
msgErrorDetail
]]
}

2.2.4 Mileage Message Failure Definitions

Data Element	Meaning
<i>MileageMessageResults</i>	<ul style="list-style-type: none"> • Required • Description: Segment name • Does not repeat
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 • Conditional 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 • Conditional Rules: N/A
FailedReportingPeriodStart	<ul style="list-style-type: none"> • Required • Description: The 'ReportingPeriodStart' from the mileage message. Used to match message to error. • 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 • Conditional Rules: N/A

Data Element	Meaning
FailedReportingPeriodEnd	<ul style="list-style-type: none"> • Required • Description: The 'ReportingPeriodEnd' from the mileage message. Used to match message to error. • 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 • Conditional Rules: N/A
MsgFailedCode	<ul style="list-style-type: none"> • Required • 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 MROID and MsgID has already been received) 3. Data Inconsistency (other data consistency check failed) • Conditional Rules: Additional failure codes will be determined by the Administrator
msgErrorsDetails	<ul style="list-style-type: none"> • Optional • Description: Array of validation errors for the associated VIN • Does not repeat
msgErrorDetail	<ul style="list-style-type: none"> • Optional • Description: validation errors for the associated VIN • Data Type: String • Format: VARCHAR(MAX) • Calculation: N/A • Values: N/A • Conditional Rules: N/A

3 Interface between Account Management subsystem and the Administrator subsystems

3.1 Program Monitoring Overview

The interface between Account Management subsystem and the Administrator subsystem has five defined messages that are used for program monitoring.

1. **Mileage and RUC Revenue message:** A summary Mileage and RUC Revenue (MRR) message sent to the Administrator on a regularly scheduled basis.
2. **VIN Summary message:** A summary of all VINs and RUC data managed by Account Managers sent to the Administrator on a regularly scheduled basis.
3. **Errors and Events message:** A summary of errors and events sent to the Administrator provides exception and/or health codes on travel data collection and validation across the business partner systems. This is used to monitor system performance.
4. **Account and VIN Update message:** A report of all account attribute changes and status updates regarding participant status in the program sent to the Administrator. This flow also returns data (from the Administrator subsystem to the Account Management subsystem to indicate enrollment status of the participant(s).)
5. **Quarterly Tax Report:** A report that combines the three travel data summaries mentioned above into a single report: the Mileage and RUC Revenue message, the VIN Summary message, and the Errors and Events message. This is submitted to the Administrator by a person-initiated interface, submitted through the Administrator's commercially developed tax revenue management system website.

3.1.1 Data Transfer

Program Monitoring is initiated by the Account Management subsystem, by calling a REST/JSON interface implemented by the Administrator subsystem.

3.1.2 Transactions and Responses

Transactions are comprised of one message moving from the Account Management subsystem Administrator subsystem. Transactions are acknowledged by the Administrator subsystem with a standard responses from a REST transaction. The processor shall execute the following validations:

1. **Model Validation:** Checks that the message can be parsed as all required fields are present, structure is complete, and the parent level data elements validate against defined format and if defined, have valid values
2. **Data Validation:** Checks that the data elements have valid value and are in the expected type and format
3. **Validation Rules:** Checks that the data element values pass any additional validation rules detailed in the definitions below

HTTP 200 – OK: Returned to the Account Management subsystem when the message passes all validations.

HTTP 206 – Partial Content: Returned to the Account Management subsystem when the message passes all the model and data validations, but doesn't pass one or more of the defined data validations or validation rules for a particular MRO/VIN. In this case, the message is accepted but is considered incomplete as some of the data provided didn't pass validation. Note, this response applies only to VIN Level records as are provided in the VIN Summary, Errors and Events and the Account and VIN Update messages. Since the Mileage and RUC

Revenue message doesn't report data by VIN, the 206 response doesn't apply. A partial content message accompanies all HTTP 206 responses, containing validation details. The BP shall investigate and/or resolve errors and resubmit the message to ensure proper processing for account and travel data.

HTTP 400 – Bad Request: Returned to the Account Management subsystem when the message fails the model and/or data validations. A failure message accompanies all HTTP 400 responses, containing validation details. The BP shall investigate and/or resolve errors and resubmit the message to ensure proper processing for account and travel data.

3.1.3 Interface Requirements and Security

This interface is a means of transmitting data from the Account Management subsystem to the Administrator subsystem.

Application Layer: HTTP over TLS/SSL

Transport Layer: TCP

Internet Layer: IP

Web-services protocol: REST

Message definition: JSON

Each message has its own endpoint. The URLs will be provided by the Administrator.

3.1.4 Interface Initiation

Each of these message are a push message from the Account Manager subsystem to the Administrator subsystem. The Administrator subsystem accepts the message at all times, whenever the Account Manager subsystem transmits it.

3.2 Mileage and RUC Revenue Message Overview

The Mileage and RUC Revenue message contains the reported data from recurring periods. It is important that all monitoring reports are based on the data reported during the period and not the date traveled. The business partners are required to ensure all required data is sent, and none are skipped because of date filtering issues. The Mileage and RUC Revenue message 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 Road Usage Charge due and fuel tax credit for that travel.

3.2.1 Mileage and RUC Revenue Message JSON Structure

The following lists the totals for the message. All totals are for the period defined.

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

The following lists the totals for the message. All totals are for the period defined.

TotalMileage
TotalRevenue
TotalFuelUsage
TotalCalculatedFuelTaxCredit
TotalAppliedFuelTaxCredit
TotalADJMileage
TotalADJRevenue
TotalADJFuelUsage
TotalADJFuelTaxCredit
TotalADJBalance
TotalBalance

The following is the Rule ID totals. Include one for each Rule ID in the message.

<i>MRRMRuleDetails</i> [{
RuleID
TotalMileageInRuleID
TotalADJMileageInRuleID
TotalADJRevenueInRuleID
TotalADJFuelUsageInRuleID
TotalADJFuelTaxCreditInRuleID

TotalADJBalanceInRuleID
TotalRevenueInRuleID
TotalFuelUsageInRuleID
TotalCalculatedFuelTaxCreditInRuleID
TotalAppliedFuelTaxCreditInRuleID
TotalBalanceInRuleID

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

<i>MRRMSubRuleDetails</i> { [
SubRuleID
TotalMileageInSubRuleID
RateInSubRuleID
TotalADJMileageInSubRuleID
TotalADJRevenueInSubRuleID
TotalADJFuelUsageInSubRuleID
TotalADJFuelTaxCreditInSubRuleID
TotalADJBalanceInSubRuleID
TotalRevenueInSubRuleID
TotalFuelUsageInSubRuleID
FuelRateInSubRuleID
TotalCalculatedFuelTaxCreditInSubRuleID
TotalAppliedFuelTaxCreditInSubRuleID
TotalBalanceInSubRuleID
}]

}]

}

3.2.2 Mileage and RUC Revenue Message Definitions

Data Element	Meaning
<i>MileageAndRUCRevenueMessage</i>	<ul style="list-style-type: none"> • Required • Description: Segment name • Does not repeat

Data Element	Meaning
AMID	<ul style="list-style-type: none"> • Required • Description: The account manager identifier number which is provided by the Administrator • Data Type: Number • Format: Integer • Calculation: N/A • Values: N/A • Conditional Rules: N/A
TransmittedTimestamp	<ul style="list-style-type: none"> • Required • Description: Time and date, in UTC, that the message is sent to the Administrator. • 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 • Conditional Rules: N/A
PeriodStartDate	<ul style="list-style-type: none"> • Required • Description: The start date, in UTC, 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 ○ Conditional Rules: N/A
PeriodEndDate	<ul style="list-style-type: none"> • Required • Description: The Reporting period end date, in UTC • 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 • Conditional Rules: N/A

TotalMileage	<ul style="list-style-type: none"> • Required • Description: Total Miles reported 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 • Conditional Rules: N/A • Validation Rules: Must equal the sum of "TotalMileageInRuleID" for all RuleIDs
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 • Conditional Rules: N/A • Validation Rules: Must equal the sum of "TotalRevenueInRuleID" for all RuleIDs
TotalFuelUsage	<ul style="list-style-type: none"> • Required • Description: Total fuel usage reported 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 • Conditional Rules: N/A • Validation Rules: Must equal the sum of "TotalFuelUsageInRuleID" for all RuleIDs
TotalCalculatedFuelTaxCredit	<ul style="list-style-type: none"> • Required • Description: Total <i>Calculated</i> 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 "TotalCalculatedFuelTaxCreditInRuleID" for all Rule IDs • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal the sum of "TotalCalculatedFuelTaxCreditInRuleID" for all RuleIDs

<p>TotalAppliedFuelTaxCredit</p>	<ul style="list-style-type: none"> • Required • Description: Total <i>Applied</i> 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 "TotalAppliedFuelTaxCreditInRuleID" for all Rule IDs • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal the sum of "TotalAppliedFuelTaxCreditInRuleID" for all RuleIDs
<p>TotalADJMileage</p>	<ul style="list-style-type: none"> • Required • Description: Total adjusted miles reported 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 • Conditional Rules: N/A • Validation Rules: Must equal the sum of "TotalADJMileageInRuleID" for all RuleIDs
<p>TotalADJRevenue</p>	<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 • Conditional Rules: N/A • Validation Rules: Must equal the sum of "TotalADJRevenueInRuleID" for all RuleIDs

<p>TotalADJFuelUsage</p>	<ul style="list-style-type: none"> • Required • Description: Total adjusted fuel usage reported 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 "TotalADJFuelUsageInRuleID" for all Rule IDs <ul style="list-style-type: none"> • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal the sum of "TotalADJFuelUsageInRuleID" for all RuleIDs
<p>TotalADJFuelTaxCredit</p>	<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: SUM of "TotalADJFuelTaxCreditInRuleID" for all Rule IDs <ul style="list-style-type: none"> • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal the sum of "TotalADJFuelTaxCreditInRuleID" for all RuleIDs
<p>TotalADJBalance</p>	<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: SUM of "TotalADJBalanceInRuleID" for all Rule IDs <ul style="list-style-type: none"> • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal the sum of "TotalADJBalanceInRuleID" for all RuleIDs

<p>TotalBalance</p>	<ul style="list-style-type: none"> • Required • Description: Total Amount to invoice to the participant 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 "TotalBalanceInRuleID" for all Rule IDs in reporting period • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal the sum of "TotalBalanceInRuleID" for all RuleIDs
<p><i>MRRMRuleDetails</i></p>	<ul style="list-style-type: none"> • Required • Description: Segment • Optionally repeats
<p>RuleID</p>	<ul style="list-style-type: none"> • Required • Description: Rule Identification. An identifier associated with a geographic area, 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 Administrator provided RUC Rate Table • Conditional Rules: N/A • Validation Rules: must be a valid RuleID in the RUC Rate Table.
<p>TotalMileageInRuleID</p>	<ul style="list-style-type: none"> • Required • Description: Total Miles reported 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: SUM of "TotalMileageInSubRuleID" for all Sub Rule IDs in Rule ID • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal the sum of TotalMileageInSubRuleID for each SubRuleID within the given RuleID

<p>TotalADJMileageInRuleID</p>	<ul style="list-style-type: none"> • Required • Description: Total adjusted miles reported 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: SUM of "TotalADJMileageInSubRuleID" for all Sub Rule IDs in given Rule ID • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal the sum of TotalADJMileageInSubRuleID for all SubRuleIDs within the given RuleID
<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: SUM of "TotalADJRevenueInSubRuleID" for all Sub Rule IDs in given Rule ID • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal the sum of TotalADJRevenueInSubRuleID for all SubRuleIDs within the given RuleID
<p>TotalADJFuelUsageInRuleID</p>	<ul style="list-style-type: none"> • Required • Description: Total adjusted fuel usage reported 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: SUM of "TotalADJFuelUsageInSubRuleID" for all Sub Rule IDs in given Rule ID • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal the sum of TotalADJFuelUsageInSubRuleID for all SubRuleIDs within the given RuleID

<p>TotalADJFuelTaxCreditInRuleID</p>	<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: SUM of "TotalADJFuelTaxCreditInSubRuleID" for all Sub Rule IDs in given Rule ID • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal the sum of TotalADJFuelTaxCreditInSubRuleID for all SubRuleIDs within the given RuleID
<p>TotalADJBalanceInRuleID</p>	<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: SUM of "TotalADJBalanceInSubRuleID" for all Sub Rule IDs in given Rule ID • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal the sum of TotalADJBalanceInSubRuleID for all SubRuleIDs within the given RuleID
<p>TotalRevenueInRuleID</p>	<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: SUM of "MRORRevenueInSubRuleID" for all taxable Sub Rule IDs in given Rule ID • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal the sum of TotalRevenueInSubRuleID for all SubRuleIDs within the given RuleID

TotalFuelUsageInRuleID	<ul style="list-style-type: none"> • Required • Description: Total fuel usage reported 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: SUM of "TotalFuelUsageInSubRuleID" for all Sub Rule IDs in Rule ID • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal the sum of TotalFuelUsageInSubRuleID for all SubRuleIDs within the given RuleID
TotalCalculatedFuelTaxCreditInRuleID	<ul style="list-style-type: none"> • Required • Description: Total <i>Calculated</i> 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: SUM of "TotalCalculatedFuelTaxCreditInSubRuleID" for all Sub Rule IDs in Rule ID • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal the sum of TotalCalculatedFuelTaxCreditInSubRuleID for all SubRuleIDs in the RuleID
TotalAppliedFuelTaxCreditInRuleID	<ul style="list-style-type: none"> • Required • Description: Total <i>Applied</i> 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: SUM of "TotalAppliedFuelTaxCreditInSubRuleID" for all Sub Rule IDs in Rule ID • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal the sum of TotalAppliedFuelTaxCreditInSubRuleID for all SubRuleIDs in the RuleID

<p>TotalBalanceInRuleID</p>	<ul style="list-style-type: none"> • Required • Description: Total amount to invoice to the participants 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: SUM of all "TotalBalanceInSubRuleID" for all Sub Rule IDs in given Rule ID • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal the sum of TotalBalanceInSubRuleID for all SubRuleIDs within the given RuleID
<p><i>MRRMSubRuleDetails</i></p>	<ul style="list-style-type: none"> • Require • Description: Segment name • Optionally repeats
<p>SubRuleID</p>	<ul style="list-style-type: none"> • Required • Description: Numerical index for region of travel within given Rule ID • Data Type: Number • Format: Integer • Calculation: N/A • Values: Assigned by the Administrator as necessary, provided in RUC Rate Table • Conditional Rules: N/A • Validation Rules: Must be a valid SubRuleID in the RUC Rate Table.
<p>TotalMileageInSubRuleID</p>	<ul style="list-style-type: none"> • Required • Description: Total Miles reported in given Sub Rule ID for all VIN/MROs 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 "MROMileageInSubRuleID" (from the VIN Summary data) for all VIN/MROs in reporting period for given Sub Rule ID • Values: N/A • Conditional Rules: N/A

<p>RateInSubRuleID</p>	<ul style="list-style-type: none"> • Required • Description: Mileage rate used in SubRuleID, provided by the Administrator 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 the Administrator as necessary, provided in RUC Rate Table • Conditional Rules: N/A • Validation Rules: Must match the rate provided in the RUC Rate Table for given SubRuleID.
<p>TotalADJMileageInSubRuleID</p>	<ul style="list-style-type: none"> • Required • Description: Total adjusted Miles reported in for Sub Rule ID for all VIN/MROs 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 “MROADJMileageInSubRuleID” (from the VIN Summary data) for all VIN/MROs in given Sub Rule ID • Values: N/A • Conditional Rules: N/A
<p>TotalADJRevenueInSubRuleID</p>	<ul style="list-style-type: none"> • Required • Description: Total RUC revenue adjusted for Sub Rule ID for all VIN/MROs 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 “MROADJRevenueInSubRuleID” (from the VIN Summary data) for all VIN/MROs in given Sub Rule ID • Values: N/A • Conditional Rules: N/A • Validation Rules: N/A
<p>TotalADJFuelUsageInSubRuleID</p>	<ul style="list-style-type: none"> • Required • Description: Total adjusted fuel usage reported for Sub Rule ID for all VIN/MROs 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 “MROADJFuelUsageInSubRuleID” (from the VIN Summary data) for all VIN/MROs in given Sub Rule ID • Values: N/A • Conditional Rules: N/A

<p>TotalADJFuelTaxCreditInSubRuleID</p>	<ul style="list-style-type: none"> • Required • Description: Total fuel tax credit adjusted for Sub Rule ID for all VIN/MROs 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 "MROADJFuelTaxCreditInSubRuleID" (from the VIN Summary data) for all VIN/MROs in given Sub Rule ID • Values: N/A • Conditional Rules: N/A • Validation Rules: N/A
<p>TotalADJBalanceInSubRuleID</p>	<ul style="list-style-type: none"> • Required • Description: Total amount of balance adjusted for Sub Rule ID for all VIN/MROs 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 "MROADJBalanceInSubRuleID" (from the VIN Summary data) for all VIN/MROs in given Sub Rule ID • Values: N/A • Conditional Rules: N/A • Validation 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: SUM of "MRORevenueInSubRuleID" (from the VIN Summary data) for all VIN/MROs in reporting period for given Sub Rule ID • Values: N/A • Conditional Rules: N/A • Validation Rules: N/A

TotalFuelUsagelnSubRuleID	<ul style="list-style-type: none"> • Required • Description: Total fuel usage reported in given Sub Rule ID for all VIN/MROs 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 "MROFuelUsagelnSubRuleID" (from the VIN Summary data) for all VIN/MROs in reporting period for given Sub Rule ID • Values: N/A • Conditional Rules: N/A
FuelRateInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Fuel Tax rate in dollars per gallon in given SubRuleID 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 the Administrator as necessary, provided in RUC Rate Table • Conditional Rules: N/A • Validation Rules: Must match the rate provided in the RUC Rate Table for given SubRuleID.
TotalCalculatedFuelTaxCreditInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Total <i>Calculated</i> Fuel Tax Credit in given Sub Rule ID for all VIN/MROs 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 "MROCalculatedFuelTaxCreditInSubRuleID" (from the VIN Summary data) for all VIN/MROs in reporting period for given Sub Rule ID • Values: N/A • Conditional Rules: N/A • Validation Rules: N/A

<p>TotalAppliedFuelTaxCreditInSubRuleID</p>	<ul style="list-style-type: none"> • Required • Description: Total <i>Applied</i> Fuel Tax Credit in given Sub Rule ID for all VIN/MROs 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 "MROAppliedFuelTaxCreditInSubRuleID" (from the VIN Summary data) for all VIN/MROs in reporting period for given Sub Rule ID • Values: N/A • Conditional Rules: N/A • Validation Rules: N/A
<p>TotalBalanceInSubRuleID</p>	<ul style="list-style-type: none"> • Required • Description: Total amount to invoice to the participants in given Sub Rule ID for given period for all VIN/MROs • Data Type: Number • Format: Two decimal places - Dollars and cents: [0.01, 0.02, ... , 99,999,999.99] • Calculation: Must reconcile with the following: Must equal the sum of "TotalBalanceInSubRuleID" (from the VIN Summary data) for all SubRuleIDs in the RuleID • Values: N/A • Conditional Rules: N/A • Validation Rules: N/A

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

3.2.3 Mileage and RUC Revenue Message Response JSON Structure

{
msgErrorsDetails
[{
msgErrorDetail
}]
}

3.2.4 Mileage and RUC Revenue Message Response Definitions

msgErrorsDetails	<ul style="list-style-type: none"> • Optional • Description: Array of validation errors for the associated VIN • Does not repeat
msgErrorDetail	<ul style="list-style-type: none"> • Optional • Description: validation errors for the associated VIN • Data Type: String • Format: VARCHAR(MAX) • Calculation: N/A • Values: N/A • Conditional Rules: N/A

3.3 VIN Summary Message Overview

The VIN Summary message includes travel records for each vehicle/VIN registered with the Account Manager. In the VIN Summary message, a VIN Status code is given for each vehicle, and the time that activity code was achieved. The VIN Summary message contains the reported data from recurring periods. It is important that all monitoring reports are based on the data reported during the period and not the date traveled. The business partners are required to ensure all required data is sent, and none are skipped because of date filtering issues.

The number of VIN records included in the VIN Summary message shall not exceed 500.

3.3.1 VIN Summary Message JSON Structure

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

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

<i>VSMDetails</i> [{
TransactionsDateRangeStart
TransactionsDateRangeEnd
AMCustomerNumber
VIN
VINStatus
TotalVINMiles
TotalVINFuelUse
TotalVINBalance
LastDailyReportDate

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

<i>VSMDeviceDetails</i> [{
MROID
CertID
FuelUseMethod

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

<i>VSMRuleDetails</i> [{
RuleID
MROMileageInRuleID
MRORevenueInRuleID
MROFuelUsageInRuleID
MROCalculatedFuelTaxCreditInRuleID
MROAppliedFuelTaxCreditInRuleID
MROADJMileageInRuleID
MROADJRevenueInRuleID
MROADJFuelUsageInRuleID
MROADJFuelTaxCreditInRuleID
MROADJBalanceInRuleID
MROBalanceInRuleID
}

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

<i>VSMSubRuleDetails</i> [{
SubRuleID
MROMileageInSubRuleID
MRORevenueInSubRuleID
MROFuelUsageInSubRuleID
MROCalculatedFuelTaxCreditInSubRuleID
MROAppliedFuelTaxCreditInSubRuleID
MROADJMileageInSubRuleID
MROADJRevenueInSubRuleID
MROADJFuelUsageInSubRuleID
MROADJFuelTaxCreditInSubRuleID
MROADJBalanceInSubRuleID
MROBalanceInSubRuleID

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

{ VSMDAdjustedSubRuleDetails
ADJMileage
ADJRevenue
ADJFuelUsage
ADJFuelTaxCredit
ADJBalance
ADJDateTime
ADJTransactionsDateRangeStart
ADJTransactionsDateRangeEnd
ADJCode
ADJReasonDescription
}]

}]

}]

}]

}]

}

3.3.2 VIN Summary Message Definitions

Data Element	Meaning
<i>VINSummaryMessage</i>	<ul style="list-style-type: none"> • Required • Description: Segment name • Does not repeat
AMID	<ul style="list-style-type: none"> • Required • Description: The account manager identifier number which is provided by the Administrator. • Data Type: Number • Format: Integer • Calculation: N/A • Values: N/A • Conditional Rules: N/A
TransmittedTimestamp	<ul style="list-style-type: none"> • Required • Description: Time and date, in UTC, that the message is sent to the Administrator. • 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 • Conditional Rules: N/A
PeriodStartDate	<ul style="list-style-type: none"> • Required • Description: The date, in UTC, 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 • Conditional Rules: N/A • Validation Rules: Considering the 'PeriodEndDate' must be a valid reporting period as defined by the Administration.

Data Element	Meaning
PeriodEndDate	<ul style="list-style-type: none"> • Required • Description: The reporting period end date, in UTC. • 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 • Conditional Rules: N/A • Validation Rules: Considering the 'PeriodStartDate' must be a valid reporting period as defined by the Administration.
<i>VSMDetails</i>	<ul style="list-style-type: none"> • Required • Description: Segment name • Optionally repeats
TransactionsDateRangeStart	<ul style="list-style-type: none"> • Required • Description: Start date, in UTC, of the date range in which the miles being reported were traveled. • 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 • Conditional Rules: N/A
TransactionsDateRangeEnd	<ul style="list-style-type: none"> • Required • Description: End date, in UTC, of the date range in which the miles being reported were traveled. • 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 • Conditional 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 • Conditional Rules: N/A • Validation Rules: Must be a valid AMCustomerNumber for the given VIN
VIN	<ul style="list-style-type: none"> • Required • Description: The VIN of the vehicle in which the MRO is installed • Data Type: String • Format: VARCHAR(20) • Calculation: N/A • Values: N/A • Conditional Rules: N/A • Validation Rules: Must be a valid VIN for the given AMCustomerNumber
VINStatus	<ul style="list-style-type: none"> • Required • Description: Reason for the status of a given VIN at the period end date of the message • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ul style="list-style-type: none"> ○ 2 = Started – new VIN enrollment or re-enrollment ○ 3 = Active – approved VIN is provisioned to report travel data ○ 4 = Discontinued – VIN has exited the program • Conditional Rules: Send VIN Status = 2 until approval or denial is received • Validation Rules: Must be a valid value from list above.

Data Element	Meaning
TotalVINMiles	<ul style="list-style-type: none"> • Required • Description: Actual Miles reported 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: SUM of "TotalMilesOnDate" (from mileage message) for all MROs for given VIN received during reporting period • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal the sum of "MROMileageInRuleID" for all RuleIDs for all MROIDs for the given VIN
TotalVINFuelUse	<ul style="list-style-type: none"> • Required • Description: Actual Fuel Usage reported 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: SUM of all "FuelUsageOnDate" (from mileage message) for all MROs for given VIN received during reporting period • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal the sum of "MROFuelUsageInRuleID" for all RuleIDs for all MROIDs for the given VIN
TotalVINBalance	<ul style="list-style-type: none"> • Required • Description: Amount to invoice to the participant 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: SUM of "MROBalanceInRuleID" for all Rule IDs for all MROs for a given VIN • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal the sum of "MROBalanceInRuleID" for all RuleIDs for all MROIDs for the given VIN

Data Element	Meaning
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 • Conditional Rules: N/A
<i>VSMDeviceDetails</i>	<ul style="list-style-type: none"> • Required • Description: Segment name • Optionally repeats
MROID	<ul style="list-style-type: none"> • Required • Description: Unique identifier for MRO (such as serial number) • Data Type: String • Format: VARCHAR(64) • Calculation: N/A • Values: N/A • Conditional Rules: N/A
CertID	<ul style="list-style-type: none"> • Required • Description: Certification ID number assigned by the Administrator – indicates the issuer and manufacturer of an MRO • Data Type: Number • Format: Integer • Calculation: N/A • Values: Administrator assigned values • Conditional 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 = Actual fuel use expected but not captured, calculated by using EPA ○ 2 = Actual fuel use captured and used for calculation ○ 3 = Fuel use calculated by using EPA ○ 4 = Fuel not taxable • Conditional Rules: N/A • Validation Rules: Must be valid value from list above.

Data Element	Meaning
<i>VSMDRuleDetails</i>	<ul style="list-style-type: none"> • Required • Description: Segment name • Optionally repeats
RuleID	<ul style="list-style-type: none"> • Required • Description: An identifier associated with a geographic area, 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 Administrator provided RUC Rate Table • Conditional Rules: N/A • Validation Rules: Must be valid RuleID from RUC Rate Table.
MROMileageInRuleID	<ul style="list-style-type: none"> • Required • Description: Miles reported in Rule IDs for given VIN/MRO 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 "MROMileageInSubRuleID" for all Sub Rule IDs in given Rule ID for given VIN/MRO • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal the sum of all "MROMileageInSubRuleID" within the given RuleID
MRORevenueInRuleID	<ul style="list-style-type: none"> • Required • Description: Amount of RUC Revenue for given Rule IDs for VIN/MRO 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 "MRORevenueInSubRuleID" for all taxable Sub Rule IDs in given Rule ID for given VIN/MRO • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal the sum of "MRORevenueInSubRuleID" for all SubRuleIDs within the given RuleID

Data Element	Meaning
MROFuelUsageInRuleID	<ul style="list-style-type: none"> • Required • Description: Fuel Usage reported in Rule ID for given VIN/MRO 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: SUM of “MROFuelUsageInSubRuleID” for all Sub Rule IDs in given Rule ID for given VIN/MRO • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal the sum of “MROFuelUsageInSubRuleID” for all SubRuleIDs within the given RuleID
MROCalculatedFuelTaxCreditInRuleID	<ul style="list-style-type: none"> • Required • Description: <i>Calculated</i> Fuel Tax Credit in Rule ID for given VIN/MRO 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 “MROCalculatedFuelTaxCreditInSubRuleID” for all taxable Sub Rule IDs in given Rule ID for given VIN/MRO • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal the sum of “MROCalculatedFuelTaxCreditInSubRuleID” for all SubRuleIDs within the given RuleID
MROAppliedFuelTaxCreditInRuleID	<ul style="list-style-type: none"> • Required • Description: <i>Applied</i> Fuel Tax Credit in Rule ID for given VIN/MRO 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 “MROAppliedFuelTaxCreditInSubRuleID” for all taxable Sub Rule IDs in given Rule ID for given VIN/MRO • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal the sum of “MROAppliedFuelTaxCreditInSubRuleID” for all SubRuleIDs within the given RuleID

Data Element	Meaning
MROADJMileageInRuleID	<ul style="list-style-type: none"> • Required • Description: The miles adjusted for a given VIN/MRO 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 "MROADJMileageInSubRuleID" for all Sub Rule IDs in given Rule ID for given VIN/MRO • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal the sum of "MROADJMileageInSubRuleID" for all SubRuleIDs within the given RuleID.
MROADJRevenueInRuleID	<ul style="list-style-type: none"> • Required • Description: The revenue amount adjusted for a given VIN/MRO 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: SUM of "MROADJRevenueInSubRuleID" for all Sub Rule IDs in given Rule ID for given VIN/MRO • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal the sum of "MROADJRevenueInSubRuleID" for all SubRuleIDs within the given RuleID.
MROADJFuelUsageInRuleID	<ul style="list-style-type: none"> • Required • Description: The gallons count adjusted for a given VIN/MRO 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: SUM of "MROADJFuelUsageInSubRuleID" for all Sub Rule IDs in given Rule ID for given VIN/MRO • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal the sum of "MROADJFuelUsageInSubRuleID" for all SubRuleIDs within the given RuleID.

Data Element	Meaning
MROADJFuelTaxCreditInRuleID	<ul style="list-style-type: none"> • Required • Description: The fuel tax credit amount adjusted for a given VIN/MRO 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: SUM of "MROADJFuelTaxCreditInSubRuleID" for all Sub Rule IDs in given Rule ID for given VIN/MRO • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal the sum of "MROADJFuelTaxCreditInSubRuleID" for all SubRuleIDs within the given RuleID.
MROADJBalanceInRuleID	<ul style="list-style-type: none"> • Required • Description: Balance adjusted for this VIN/MRO 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: SUM of all "MROADJBalanceInSubRuleID" for all Sub Rule IDs in given Rule ID for given VIN/MRO • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal the sum of "MROADJBalanceInSubRuleID" for all SubRuleIDs within the given RuleID.
MROBalanceInRuleID	<ul style="list-style-type: none"> • Required • Description: The amount to invoice to the participant calculated for the Rule IDs for given VIN/MRO • 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 all "MROBalanceInSubRuleID" for all Sub Rule IDs in given Rule ID for given VIN/MRO • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal the sum of "MROBalanceInSubRuleID" for all SubRuleIDs within the given RuleID.
<i>VSMDSubRuleDetails</i>	<ul style="list-style-type: none"> • Required • Description: Segment name • Optionally repeats

Data Element	Meaning
SubRuleID	<ul style="list-style-type: none"> • Required • Description: Numerical index for region of travel within given Rule ID • Data Type: Number • Format: Integer • Calculation: N/A • Values: Assigned by the Administrator as necessary, provided in RUC Rate Table • Conditional Rules: N/A • Validation Rules: Must be a valid SubRuleID from the RUC Rate Table.
MROMileageInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Miles reported in Sub Rule ID for given VIN/MRO 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 "MsgMileageInSubRuleID" from mileage messages received during reporting period • Values: N/A • Conditional Rules: N/A
MRORevenueInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Amount of RUC Revenue in Sub Rule ID for given VIN/MRO 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 "MsgMileageInSubRuleID" from mileage messages received during reporting period multiplied by "RateInSubRuleID" (per the Administrator provided rate table) • Values: N/A • Conditional Rules: N/A • Validation Rules: N/A
MROFuelUsageInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Fuel Usage reported in given Sub Rule ID for given VIN/MRO 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: SUM of "MsgFuelUsageInSubRuleID" from mileage messages received during reporting period • Values: N/A • Conditional Rules: N/A

Data Element	Meaning
MROCalculatedFuelTaxCreditInSubRuleID	<ul style="list-style-type: none"> • Required • Description: <i>Calculated</i> Fuel Tax Credit in given Sub Rule ID for given VIN/MRO 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 "MsgFuelUsageInSubRuleID" from mileage messages for given VIN/MRO received during reporting period) multiplied by "FuelRateInSubRuleID" (per the Administrator provided rate table) • Values: N/A • Conditional Rules: N/A
MROAppliedFuelTaxCreditInSubRuleID	<ul style="list-style-type: none"> • Required • Description: <i>Applied</i> Fuel Tax Credit in given Sub Rule ID for given VIN/MRO for given period • Data Type: Number • Format: Two decimal places - Dollars and cents accuracy [0.01, 0.02, ... , 9,999.99] • Calculation: Must represent the actual 'applied' fuels tax credit. Includes instances when the 'calculated' fuels tax credit exceeds the amount of RUC owed where the full fuels tax credit cannot be applied, but only credited to zero. See reference in the PRD requirements related to RUC calculations. • Values: N/A • Conditional Rules: N/A
MROADJMileageInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Miles adjusted for this VIN/MRO 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: SUM of all "ADJMileage" for given VIN/MRO in given SubRuleID • Values: N/A • Conditional Rules: N/A • Validation Rules: Sum of all ADJMileage for given SubRuleID

Data Element	Meaning
MROADJRevenueInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Revenue adjusted for this VIN/MRO 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 "ADJRevenue" for given VIN/MRO in given SubRuleID • Values: N/A • Conditional Rules: N/A • Validation Rules: Sum of all ADJRevenue for given SubRuleID
MROADJFuelUsageInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Fuel Usage adjusted for this VIN/MRO 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/MRO in given SubRuleID • Values: N/A • Conditional Rules: N/A • Validation Rules: Sum of all ADJFuelUsage for given SubRuleID RuleID
MROADJFuelTaxCreditInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Fuel Tax Credit adjusted for this VIN/MRO 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/MRO in given SubRuleID • Values: N/A • Conditional Rules: N/A • Validation Rules: Sum of all ADJFuelTaxCredit for given SubRuleID

Data Element	Meaning
MROADJBalanceInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Balance adjusted for this VIN/MRO 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/MRO in given SubRuleID • Values: N/A • Conditional Rules: N/A • Valuation Rules: Sum of all ADJBalance for given SubRuleID
MROBalanceInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Amount to invoice the participant in Sub Rule ID for given VIN/MRO 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: ("MRORevenueInSubRuleID" plus "MROAppliedFuelTaxCreditInSubRuleID" plus "MROADJBalanceInSubRuleID" • Values: N/A • Conditional Rules: N/A • Validation Rules: Must equal: ("MRORevenueInSubRuleID" plus "MROAppliedFuelTaxCreditInSubRuleID" plus "MROADJBalanceInSubRuleID"
<i>VSMDAdjustedSubRuleDetails</i>	<ul style="list-style-type: none"> • Optional • Description: Segment name • Optionally repeats
ADJMileage	<ul style="list-style-type: none"> • Conditional • 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 • Conditional Rules: required when adjustment activity occurs in SubRuleID for given VIN/MRO during reporting period

Data Element	Meaning
ADJRevenue	<ul style="list-style-type: none"> • Conditional (if adjustment activity occurs in SubRuleID for given VIN/MRO 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 • Conditional Rules: Required when adjustment activity occurs in SubRuleID for given VIN/MRO during reporting period. Calculation is to be used, unless Revenue is the manual adjustment made at an Account Manager level.
ADJFuelUsage	<ul style="list-style-type: none"> • Conditional • 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 • Conditional Rules: Required when adjustment activity occurs in SubRuleID for given VIN/MRO during reporting period
ADJFuelTaxCredit	<ul style="list-style-type: none"> • Conditional • 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 SubRuleID • Values: N/A • Conditional Rules: Required when adjustment activity occurs in SubRuleID for given VIN/MRO during reporting period. Calculation is to be used, unless Fuel Tax Credit is the manual adjustment made at an Account Manager level

Data Element	Meaning
ADJBalance	<ul style="list-style-type: none"> • Conditional • 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 • Conditional Rules: Required when adjustment activity occurs in SubRuleID for given VIN/MRO during reporting period)
ADJDateTime	<ul style="list-style-type: none"> • Conditional • Description: Timestamp, in UTC, 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 • Conditional Rules: Required when adjustment activity occurs in SubRuleID for given VIN/MRO during reporting period)
ADJTransactionsDateRangeStart	<ul style="list-style-type: none"> • Conditional • Description: Start date, in UTC, of the date range of transactions to which the adjustment applies. • Data Type: String • Format: The date / time 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 • Conditional Rules: Required when adjustment activity occurs in SubRuleID for given VIN/MRO during reporting period.

Data Element	Meaning
ADJTransactionsDateRangeEnd	<ul style="list-style-type: none"> • Conditional • Description: End date, in UTC, of the date range of transactions for which the adjustment applies to. • Data Type: String • Format: Format: The date / time 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 • Conditional Rule: Required when adjustment activity occurs in SubRuleID for given VIN/MRO during reporting period.
ADJCode	<ul style="list-style-type: none"> • Conditional • 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 = MRO installed in the wrong vehicle ○ 2 = Miles self-reported by participant ○ 3 = MRO assigned to the wrong vehicle ○ 4 = AM-specific (note, this requires detailed ADJReasonDescription) ○ 6 = EPA value adjustment • Conditional Rules: Required when if adjustment activity occurs in SubRuleID for given VIN/MRO during reporting period • Validation Rules: Must be a valid value from list above
ADJReasonDescription	<ul style="list-style-type: none"> • Conditional Description: Sentence describing why adjustment was made – entered manually by Account Manager • Data Type: String • Format: VARCHAR(100) • Calculation: N/A • Values: N/A • Conditional Rules: Required when adjustment activity occurs in SubRuleID for given VIN/MRO during reporting period)

3.3.1 VIN Summary Message Response Data JSON Structure

{
msgErrorsDetails
{
msgErrorDetail
}
}

3.3.2 VIN Summary Message Response Data Definitions

msgErrorsDetails	<ul style="list-style-type: none"> • Optional • Description: Array of validation errors for the associated VIN • Does not repeat
msgErrorDetail	<ul style="list-style-type: none"> • Optional • Description: validation errors for the associated VIN • Data Type: String • Format: VARCHAR(MAX) • Calculation: N/A • Values: N/A • Conditional Rules: N/A

3.4 Errors and Events Message Overview

The Error and Events message shall contain the codes detected and attached to transaction records. These codes include health codes for the MRO, anomalies detected during business partner processing or vehicle status (or activity) codes for participants. The Errors and Events message contains the reported data from recurring periods. It is important that all monitoring reports are based on the data reported during the reporting period and not the date traveled. The business partners are required to ensure all required data is sent, and none are skipped because of date filtering issues.

The number of VIN records included in the Errors and Events message shall not exceed 250.

3.4.1 Errors and Events Message JSON Structure

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

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

<i>EEMDevices</i> [{
AMCustomerNumber
VIN

MROID
CertID

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

<i>EEMDetails</i> [{
ErrorEventDate
ErrorEventCode
}]

}]

}

3.4.2 Errors and Events Report Definitions

Data Element	Meaning
ErrorsAndEventsMessage	<ul style="list-style-type: none"> • Required • Description: Segment name • Does not repeat
AMID	<ul style="list-style-type: none"> • Required • Description: The account manager identifier number which is provided by the Administrator • Data Type: Number • Format: Integer • Calculation: N/A • Values: N/A • Conditional Rules: N/A
TransmittedTimestamp	<ul style="list-style-type: none"> • Required • Description: Time and date that the message is sent to the Administrator. • 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 • Conditional 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 • Conditional Rules: N/A

Data Element	Meaning
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 • Conditional Rules: N/A
EEMDevices	<ul style="list-style-type: none"> • Optional • Description: Segment name • Optionally repeats
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 • Conditional Rules: Must be a valid AMCustomerNumber for the given VIN
VIN	<ul style="list-style-type: none"> • Required • Description: The VIN of the vehicle in which the MRO is installed • Data Type: String • Format: VARCHAR(20) • Calculation: N/A • Values: N/A • Conditional Rules: Must be a valid VIN for the provided AMCustomerNumber
MROID	<ul style="list-style-type: none"> • Required • Description: Unique identifier for MRO (such as serial number) • Data Type: String • Format: VARCHAR(64) • Calculation: N/A • Values: N/A • Conditional Rules: N/A

Data Element	Meaning
CertID	<ul style="list-style-type: none"> • Required • Description: Certification ID number assigned by the Administrator – indicates the issuer and manufacturer of an MRO • Data Type: Number • Format: Integer • Calculation: N/A • Values: Administrator assigned values • Conditional Rules: N/A
EEMDetails	<ul style="list-style-type: none"> • Required • Description: Segment name • Optionally repeats
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 • Conditional Rules: ErrorEventCode 3, 4 and 5 require date and time. ErrorEventCode 12 and 100 only require date (time represented as 00:00:00).

Data Element	Meaning
ErrorEventCode	<ul style="list-style-type: none"> • Required • Description: Coding of each error or event that occurred for the given MRO or VIN on the given date when the error was detected by the Data Collection subsystem or Transaction Processor subsystem • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ul style="list-style-type: none"> From MROHealth code: <ul style="list-style-type: none"> 3. Disconnect 4. Reconnect 5. Connected to new vehicle Generated at the Transaction Processor Subsystem <ul style="list-style-type: none"> 100. No mileage received from VIN for given date 101. Unreadable Message from MRO / Checksum failure 102. MessageIDs from MRO not correctly incrementing 103. VIN - MRO 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. Invalid Rule ID ("Zone") • Conditional Rules: Any additional error/event codes will be determined by the Administrator

3.4.3 Errors and Events Report Response Data JSON Structure

{
msgErrorsDetails
{
msgErrorDetail
}
}

3.4.1 Errors and Events Report Response Data Definitions

msgErrorsDetails	<ul style="list-style-type: none"> • Optional • Description: Array of validation errors for the associated VIN • Does not repeat
msgErrorDetail	<ul style="list-style-type: none"> • Optional • Description: validation errors for the associated VIN • Data Type: String • Format: VARCHAR(MAX) • Calculation: N/A • Values: N/A • Conditional Rules: N/A

3.5 Account and VIN Update Message Overview

The Account and VIN Update message exchanges the participant account and vehicle attributes for the accounts and VINs in the RUC Program.

The number of VIN records included in the Account and VIN Update message shall not exceed 500.

3.5.1 Account and VIN Update Message JSON Structure

<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 message.

<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
MROID
MROStatus
MROStatusDate
CertID
<i>MROConfigVersion</i> {
HWModel
HWMainRelease
HWSubRelease
SWMainRelease

SWSUBRelease
MapMainRelease
MapSubRelease
}
FuelUseMethod
VINStatus
VINStatusDate
VINExitReason
ProgramEsignTime
ProgramEsignVersion
BeginningOdometer
EndingOdometer
VINExitDate
AccountCloseDate
AMCustomerNumber

Repeat the following block of code when adding or updating pilot details for a VIN.

```

    PilotDetails [ {
        PilotID
        VehicleEntryDate
        VehicleExitDate
        VehicleExitReason
    } ]
} ]
} ]
}
    
```

3.5.2 Account and VIN Update Definitions

Data Element	Meaning
<i>AccountAndVINUpdateMessage</i>	<ul style="list-style-type: none"> • Required • Description: Segment name • Does not repeat

Data Element	Meaning
AMID	<ul style="list-style-type: none"> • Required • Description: The account manager identifier number which is provided by the Administrator • Data Type: Number • Format: Integer • Calculation: N/A • Values: N/A • Conditional Rules: N/A
TransmittedTimestamp	<ul style="list-style-type: none"> • Required • Description: Time and date that the message is sent to the Administrator. • 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 • Conditional Rules: UTC
<i>AVMDetails</i>	<ul style="list-style-type: none"> • Required • Description: Segment name • Optionally repeats for each Report Date
ReportDate	<ul style="list-style-type: none"> • Required • Description: The date of the message 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 • Conditional Rules: N/A
<i>AVMVINDetails</i>	<ul style="list-style-type: none"> • Optional • Description: Segment name • Optionally repeats

Data Element	Meaning
VIN	<ul style="list-style-type: none"> • Required • Description: The VIN of the vehicle to which the MRO is registered • Data Type: String • Format: VARCHAR(20) • Calculation: N/A • Values: N/A • Conditional Rules: N/A • Validation Rules: Can only be reported once for this Report Date
AccountFirstName	<ul style="list-style-type: none"> • Required • Description: The first name of the participant as shown on the vehicle registration • Data Type: String • Format: VARCHAR(20) • Calculation: N/A • Values: N/A • Conditional Rules: First and Last Name are required if the Company name is not provided
AccountMiddleName	<ul style="list-style-type: none"> • Optional • Description: The middle name of the participant as shown on the vehicle registration • Data Type: String • Format: VARCHAR(20) • Calculation: N/A • Values: N/A • Conditional Rules: N/A
AccountLastName	<ul style="list-style-type: none"> • Required • Description: The last name of the participant as shown on the vehicle registration • Data Type: String • Format: VARCHAR(36) • Calculation: N/A • Values: N/A • Conditional Rules: First and Last Name are required if the Company name is not provided
MailingAddressLine1	<ul style="list-style-type: none"> • Required • Description: The first line of the street of the address of the Data Type: String • Format: VARCHAR(36) • Calculation: N/A • Values: N/A • Conditional Rules: N/A

Data Element	Meaning
MailingAddressLine2	<ul style="list-style-type: none"> • Optional • Description: The second line of the street of the address of the participant • Data Type: String • Format: VARCHAR(36) • Calculation: N/A • Values: N/A • Conditional Rules: N/A
MailingAddressCity	<ul style="list-style-type: none"> • Required • Description: The city of the address of the participant • Data Type: String • Format: VARCHAR(30) • Calculation: N/A • Values: N/A • Conditional Rules: N/A
MailingAddressState	<ul style="list-style-type: none"> • Required • Description: The USPS two letter abbreviation for the U.S. state of the address of the participant • Data Type: String • Format: VARCHAR(2) • Calculation: N/A • Values: N/A • Conditional Rules: N/A
MailingAddressPostalCode	<ul style="list-style-type: none"> • Required • Description: The U.S. postal code of the address of the participant • Data Type: String • Format: VARCHAR(10) • Calculation: N/A • Values: N/A • Conditional Rules: 5 characters required, additional 4 characters optional
MailingAddressCounty	<ul style="list-style-type: none"> • Optional • Description: The county of the address of the participant • Data Type: String • Format: VARCHAR(20) • Calculation: N/A • Values: N/A • Conditional Rules: Account Manager not required to capture or derive county from address – if no county available, omit field from message.

Data Element	Meaning
MailingAddressCountry	<ul style="list-style-type: none"> • Optional • Description: The country of the address of the participant • Data Type: String • Format: VARCHAR(20) • Calculation: N/A • Values: N/A • Conditional Rules: Account Manager not required to capture or derive country from address – if no country available, omit field from message.
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 • Conditional Rules: N/A
ResidentialAddressLine2	<ul style="list-style-type: none"> • Optional • 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 • Conditional 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 • Conditional 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 • Conditional 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 • Conditional 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 • Conditional Rules: Account Manager not required to capture or derive county from address – if no county available, omit field from message.
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 • Conditional Rules: Account Manager not required to capture or derive country from address – if no country available, omit field from message.
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 • Conditional Rules: If no Company Name available, set this field value to blank. Company Name is required if the First and Last Name is not provided
AccountEmail	<ul style="list-style-type: none"> • Required • Description: The e-mail address of the participant • Data Type: String • Format: VARCHAR(100) • Calculation: N/A • Values: N/A • Conditional Rules: N/A

Data Element	Meaning
AccountPhone	<ul style="list-style-type: none"> • Required • Description: The phone number of the participant • Data Type: String • Format: VARCHAR(22) <ul style="list-style-type: none"> ○ Minimum length: 10 • Calculation: N/A • Values: N/A • Conditional Rules: N/A
PreferredContactMethod	<ul style="list-style-type: none"> • Required • Description: Preferred contact method for the participant • Data Type: String • Format: VARCHAR(20) • Calculation: N/A • Values: <ul style="list-style-type: none"> ○ PHONE ○ EMAIL ○ (Other values as assigned by the Administrator) • Conditional Rules: N/A
VehicleEPARating	<ul style="list-style-type: none"> • Required • Description: Combined EPA 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 <ul style="list-style-type: none"> • Conditional Rules: See the Program 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 • Conditional 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 • Conditional Rules: N/A

Data Element	Meaning
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 • Conditional Rules: N/A
MROID	<ul style="list-style-type: none"> • Conditionally Required • Description: Unique identifier for MRO (such as serial number) • Data Type: String • Format: VARCHAR(64) • Calculation: N/A • Values: N/A • Conditional Rules: Required only for VIN Status = 3
MROStatus	<ul style="list-style-type: none"> • Conditionally Required • Description: Activation status of the MRO at time of reporting period end. • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ul style="list-style-type: none"> ○ 0 = Pending - MRO not activated ○ 1 = Active - MRO is capable of or is actively reporting travel data as expected ○ 2 = Deactivated - MRO cannot or should not report travel data ○ 3 = Non-Compliant - If someone doesn't submit an entry for the entire quarter • Conditional Rules: Required only when VIN Status = 3 or 4. Also required when MROStatusDate is provided. • Validation Rules: must be a valid value from list above.
MROStatusDate	<ul style="list-style-type: none"> • Conditionally Required • Description: Date of the MROStatus change reported by the VM • 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 • Conditional Rules: Required only when VIN Status = 3 or 4. Also required when MROStatus is provided.

Data Element	Meaning
CertID	<ul style="list-style-type: none"> • Conditionally Required • Description: Certification ID number assigned by the Administrator – indicates the issuer and manufacturer of an MRO • Data Type: Number • Format: Integer • Calculation: N/A • Values: Administrator assigned values • Conditional Rules: Required for VIN Status = 3. Also required when MROID is provided. • Validation Rules: Must be a valid CertID in the Administrator System.
<i>MROConfigVersion</i>	<ul style="list-style-type: none"> • Conditionally Required (for VIN Status = 3) • Description: Segment name • Does not repeat
HWMModel	<ul style="list-style-type: none"> • Required • Description: HW Model number • Data Type: String • Format: VARCHAR(15) • Calculation: N/A • Values: N/A • Conditional Rules: If no MRO is assigned at time of message, omit the “MROConfigVersion” code block from the message.
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 • Conditional Rules: If no MRO is assigned at time of message, omit the “MROConfigVersion” code block from the message.
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 • Conditional Rules: If no MRO is assigned at time of message, omit the “MROConfigVersion” code block from the message.

Data Element	Meaning
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 • Conditional Rules: If no MRO is assigned at time of message, omit the “MROConfigVersion” code block from the message.
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 • Conditional Rules: If no MRO is assigned at time of message, omit the “MROConfigVersion” code block from the message.
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 • Conditional Rules: If no MRO is assigned at time of message, omit the “MROConfigVersion” code block from the message.
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 • Conditional Rules: If no MRO is assigned at time of message, omit the “MROConfigVersion” code block from the message.
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"> ○ 2 = Actual ○ 3 = EPA ○ 4 = Vehicle doesn't use taxable fuel

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 message • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ul style="list-style-type: none"> ○ 2 = Started – new VIN enrollment or re-enrollment ○ 3 = Active – approved VIN is provisioned to report travel data ○ 4 = Discontinued – VIN has exited the program • Conditional Rules: Send VIN Status = 2 until approval or denial is received • Validation Rules: Must be a valid value from list above.
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 • Conditional Rules: N/A
VINExitReason	<ul style="list-style-type: none"> • Conditional • Description: The reason given by the driver for discontinuing the vehicle with the given Account Manager • Data Type: String • Format: VARCHAR(100) • Calculation: N/A • Values: N/A • Conditional Rules: Required only if the participant provides a reason, otherwise set this field to blank. If vehicle account still active, set this field value to blank.

Data Element	Meaning
ProgramEsignTime	<ul style="list-style-type: none"> • Required • Description: Date and time the program terms were accepted by the participant • 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 • Conditional 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 • Conditional 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 • Conditional Rules: N/A
EndingOdometer	<ul style="list-style-type: none"> • Optional • 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 • Conditional Rules: N/A

Data Element	Meaning
VINExitDate	<ul style="list-style-type: none"> • Conditionally Required • Description: Date a vehicle (VIN) account is no longer taxable (not tax-liable). • 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 • Conditional Rules: Required for VIN Status = 4
AccountCloseDate	<ul style="list-style-type: none"> • Conditionally Required • Description: Date participant 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 • Conditional Rules: Required when participant account is closed. If participant account is still active, set this field value to blank
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 • Conditional Rules: N/A
<i>PilotDetails</i>	<ul style="list-style-type: none"> • Conditionally Required • Description: Segment name • Conditional Rules: Required to add a vehicle to a pilot. To add a vehicle to a pilot, include this segment and receive a 200 response for a VIN with an Approved vehicle status. This segment is also required when VIN has previously been reported in a pilot only until a PilotExitDate is provided and processed or the Pilot ends. • Conditionally repeats when vehicle belongs to more than one non-exclusive pilot as provided by the Administrator. Cannot repeat if the VIN belongs to an 'exclusive pilot'.

Data Element	Meaning
PilotID	<ul style="list-style-type: none"> • Required • Description: The ID for pilot(s) within which the given VIN is participating • Data Type: Number • Format: Integer • Calculation: N/A • Values: Valid PilotID Values are provided by the Administrator. • Conditional Rules: N/A • Validation Rules: Must be a valid pilot ID provided by the Administrator. When adding a vehicle to a pilot, pilot must be active and vehicle must not already be participating in an active exclusive pilot as defined by the Administrator.
VehicleEntryDate	<ul style="list-style-type: none"> • Required • Description: date upon which the VIN entered the pilot • 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 • Conditional Rules: N/A • Validation Rules: Must be on or after the Pilot Start Date and on or before the Pilot End Date, as provided by the Administrator
VehicleExitDate	<ul style="list-style-type: none"> • Optional • Description: date upon which the VIN exits the pilot • 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 • Conditional Rules: N/A • Validation Rules: Must be on or after the Pilot Start Date and on or before the Pilot End Date, as provided by the Administrator

Data Element	Meaning
VehicleExitReason	<ul style="list-style-type: none">• Optional• Description: comment describing reason vehicle exited the pilot• Data Type: String• Format: VARCHAR (100)• Calculation: N/A• Values: N/A• Conditional Rules: N/A• Validation Rules: Cannot submit a VehicleExitReason without a VehicleExitDate.

3.5.3 Account and VIN Update Response Data JSON Structure

The message response will include information that will indicate to the account manager the status of participant 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

{
AVMRDetails
[
{
VIN
ApprovalStatusCode
ApprovalStatusDescription
EnrollmentStatusCode
EnrollmentStatusDescription
AdministratorCustomerNumber
AMCustomerNumber
}
],
msgErrorsDetails
[[
msgErrorDetail
]]
}

3.5.4 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 MRO is installed • Data Type: String • Format: VARCHAR(20) • Calculation: N/A • Values: N/A • Conditional Rules: N/A
ApprovalStatusCode	<ul style="list-style-type: none"> • Required • Description: Administrator enrollment status of a given VIN in the program • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ul style="list-style-type: none"> ○ 1 = Approved ○ 2 = Pending ○ 3 = Denied • Conditional Rules: N/A
ApprovalStatusDescription	<ul style="list-style-type: none"> • Required • Description: Description for ApprovalStatusCode • Data Type: String • Format: VARCHAR(255) • Calculation: N/A • Values: N/A • Conditional Rules: N/A
EnrollmentStatusCode	<ul style="list-style-type: none"> • Required • Description: Reason provided by the Administrator that explains ApprovalStatusCode. • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ul style="list-style-type: none"> ○ 7 = Ineligible vehicle ○ 9 = Under 20 mpg threshold ○ 11 = Under ODOT Review ○ 100 = Enrolled Codes can only be assigned by the Administrator • Conditional Rules: N/A
EnrollmentStatusDescription	<ul style="list-style-type: none"> • Required • Description: Description for enrollment status code • Data Type: String • Format: VARCHAR(255) • Calculation: N/A • Values: N/A • Conditional Rules: N/A

Data Element	Meaning
AdministratorCustomerNumber	<ul style="list-style-type: none"> • Required • Description: The Administrator number used to uniquely identify a volunteer • Data Type: Number • Format: Integer • Calculation: N/A • Values: N/A • Conditional Rules: N/A
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 • Conditional Rules: N/A
msgErrorsDetails	<ul style="list-style-type: none"> • Optional • Description: Array of validation errors for the associated VIN • Does not repeat
msgErrorDetail	<ul style="list-style-type: none"> • Optional • Description: validation errors for the associated VIN • Data Type: String • Format: VARCHAR(MAX) • Calculation: N/A • Values: N/A • Conditional Rules: N/A

3.6 Quarterly Tax Report Overview

The Quarterly 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 message
2. VIN Summary message
3. Errors and Events message

The three reports must be combined into a single JSON file prior to upload into the tax reporting system, as shown below.

```
{
  "MileageAndRUCRevenueMessage":
    {
    },
  "VINSummaryMessage":
    {
    }
}
```



```
    },  
    "ErrorsAndEventsMessage":  
    {  
    }  
}
```

Please refer to flow definitions for specifications on each flow.

3.6.1 Data Transfer

For Tax Reporting, the Account Management subsystem will generate the appropriate files so that an account manager representative will upload to the Administrator Subsystem by logging on to the Administrator site following the provided instructions (provided by the Administrator).

3.6.2 Interface Requirements and Security

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

3.6.3 Interface Initiation

The Account Manager shall initiate the interfaces with the Administrator site.