



Appendix-6

Pilot Interface Control Document

Interface Control Document

Version 1.6

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Revision History

Name Of Person Responsible For Change	Date Of Revision	Reason For Change and Short Summary of Revisions Made	Version Number
Matthew Dorfman	2/22/16	First Revision based on Caltrans and Vendor Feedback. Addition of Odometer message. Addition of Vehicle Class to VIN Summary report. Various clarifications throughout document.	1.1
Matthew Dorfman	2/29/16	Minor clarifications based on vendor feedback on version 1.1.	1.2
Matthew Dorfman	2/29/16	Added VINClass to Account and VIN Update Report.	1.3
Matthew Dorfman	3/4/16	Modified MRDHealth to make certain responses optional; removed NullMileageDays; modified odometer message	1.4
Matthew Dorfman	3/4/16	Added VehicleActivationCode to Account and VIN update message (was called UserID in version 1.4)	1.5
Matthew Dorfman	5/9/17	Various post-pilot additions: <ul style="list-style-type: none"> ▶ Add Time Permit Length Summary message ▶ VINStatus updated ▶ Added VINComplianceStatus ▶ Added Manual Methods to VIN Summary Message ▶ Separated Account information and VIN information in Account and VIN Update ▶ Added TimePermitLengthSummary block. ▶ Added AccountStatus 	1.6



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Preface

This is a system engineering document provided to Department of Transportation (Caltrans) in support of the development of Road Charge pilot program policies and procedures. The purpose of this report is to provide technical specifications for a potential future road charge system.



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1. Introduction

1.1. Purpose

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

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

- ▶ System Name: California Road Charge System
- ▶ System Acronym: Road Charge System
- ▶ System Owner Information: Caltrans

This ICD describes the interfaces between the Mileage Reporting subsystem and Account Management subsystem, including the mileage message; and the interface between the Account Management subsystem and Account Management Oversight subsystem.

A diagram of the architecture is included below.

Figure 1-1 The Three Subsystems that Comprise the Road Charge System



1.2. Document Overview

This document provides the specifications for the interfaces between the subsystems of the Road Charge system.

1.3. Definitions, Acronyms, and Abbreviations

- ▶ AM – Account Manager, an entity certified by the State of California to record the miles traveled by Road Charge eligible vehicles, collect the simulated Road Charge due on behalf of the State, and provide Road Charge account management.
- ▶ Caltrans – California Department of Transportation
- ▶ FIPS – Federal Information Processing Standard, which includes two-digit numerical codes for each U.S. state/territory.
- ▶ HTTP – HyperText Transfer Protocol
- ▶ ICD – Interface Control Document
- ▶ IP – Internet Protocol
- ▶ JSON – JavaScript Object Notation



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- ▶ MRD – Mileage Reporting Device
- ▶ REST – Representational State Transfer
- ▶ SRS - System Requirements Specifications
- ▶ TCP – Transmission Control Protocol
- ▶ UTC – Coordinated Universal Time (same time as Greenwich Mean Time, GMT)
- ▶ VIN – Vehicle Identification Number

1.4. System Interface Overview

This section describes project information as it relates to requirements.

1.5. Project Context

The California Road Charge System implemented a Road Usage Charge to provide road usage charging for a volunteer group of vehicles. This system allowed for automatic collection of road use charges from subject vehicles. This automatic collection used a Mileage Reporting subsystem, which is comprised of a Mileage Meter (Mileage Meter) and a Data Collection component (which may be located in the Mileage Meter, or may be located on a server), which sent a “mileage message” to Account Management servers run by Account Managers. The mileage message is defined in this document.¹

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

In addition to the mileage message as the primary interface between the Mileage Reporting subsystem and the Account Management subsystem, this interface control document defines the interface between the Account Management and Account Management Oversight subsystems as well.

Note that during the California pilot, no actual funds were exchanged. Account managers sent invoices to Participants, and participants used simulated forms of payment to pay their bills. Account Managers reported simulated financial details to Account Management Oversight.

A significant portion of the contents of this document was derived or adopted from the Oregon Department of Transportation’s Road Usage Charge Interface Control Document.² However, this document expands upon those requirements to incorporate several new mileage reporting technologies and manual operational concepts. It is also tailored to meet the considerations of a California pilot. To be consistent with the Oregon document, the description of mileage meter used in the naming of variables is Mileage Reporting Device (MRD), derived from Oregon’s terminology.

¹ The mileage message is defined in Section 2, 2.1-2.6.

² Oregon Department of Transportation, Road Usage Charge Program Interface Control Document version 1.5, June 5, 2015.



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1.6. Project Documents

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

- ▶ A Concept of Operations that describes the functions and processes of the system at a high level.
- ▶ A System Requirements Specification (SRS) that provides the functional technical requirements for the component subsystems.

1.7. Open Systems Objective

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

1.8. Applicable Standards and Preferences

- ▶ REST (REpresentational State Transfer)
- ▶ JSON (JavaScript Object Notation)
- ▶ HTTP (HyperText Transfer Protocol)
- ▶ TCP (Transmission Control Protocol)
- ▶ IP (Internet Protocol)

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

1.9. Interface Control Standardization

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

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

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

1.10. Scope and Identification of Systems

This Interface Control Document (ICD) specifies the interface between:



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- ▶ The Mileage Reporting Subsystem and the Account Management Subsystem, and
- ▶ The Account Management Subsystem and the Account Management Oversight Subsystem.

1.10.1. Mileage Reporting Subsystem

The Mileage Reporting subsystem is comprised of the Mileage Meter and the Data Collection component, which may or may not be housed in the Mileage Meter. The Mileage Meter collects mileage driven for each travel zone if a mileage meter with general location plan is selected. Data Collection receives mileage transactions (and zone mileage) from the Mileage Meter and creates mileage messages. Data Collection also transmits Summary mileage data to the Account Management Subsystem. See Figure 1 in Section 1.10.4 below for a graphic illustration of this subsystem.

1.10.2. Account Management Subsystem

The Account Management subsystem is comprised of the Transactions Processor component and the Pilot Participant Account Management component. Account Management collects Summary mileage and revenue data, prepares electronic reports, and transmits them to the Account Management Oversight subsystem. The Account Management develops four required reports: the Mileage and Road Charge Revenue Report, the Vehicle Identification Number (VIN) Summary Report, the Errors and Events Report, and the VIN and Account Update Report. The Account Management transmits road charges calculated for all Road Charge payers during the period. Account Management is run by an Account Manager, which may be the agency, or a private provider. See Figure 1 in Section 1.10.4 below for a graphic illustration of this subsystem.

1.10.3. Account Management Oversight Subsystem

The Road Charge Pilot Project Administration uses the Account Management Oversight subsystem to oversee financial operations of all Account Managers. Account Management Oversight audits, edits and verifies the completeness and correctness of the mileage and revenue data. Account Management Oversight confirms revenue transfers to the appropriate state account and provides accounting posting information. Account Management Oversight develops operational and statistical reports for verification of monthly operations, revenue forecasting and for program evaluation. See Figure 1 in Section 1.10.4 below for a graphic illustration of this subsystem.

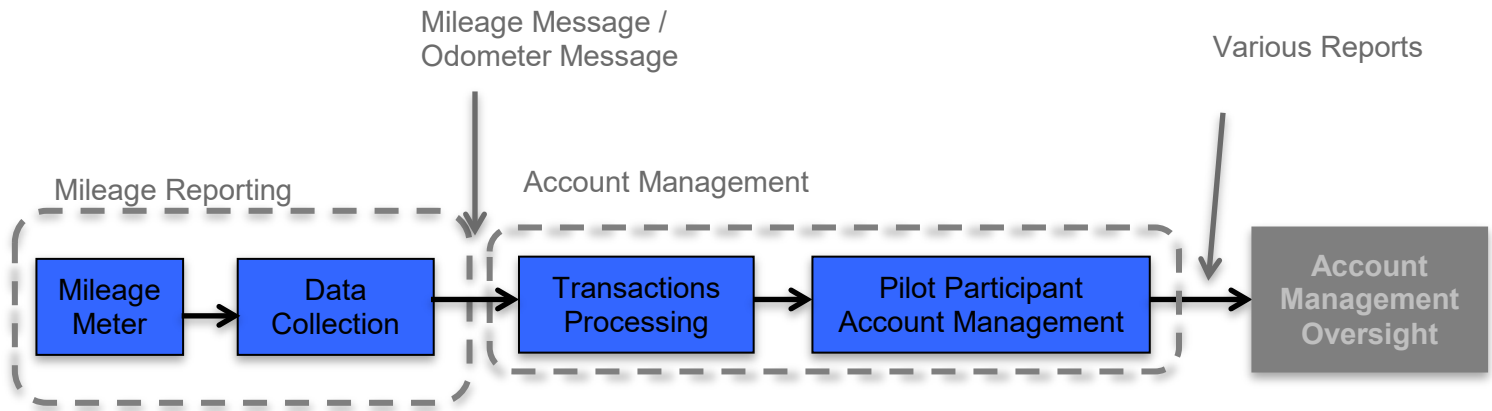


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1.10.4. Graphical Overview of Subsystems

The following block diagram illustrates the three subsystem:

Figure 1-2 Block Diagram of Three Subsystems and Interfaces Between Them





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2. Interface for Mileage Message and Odometer Message

2.1. Mileage Message and Odometer Message Overview

Between Mileage Reporting subsystem to Account Management subsystem, is a mileage message that is independent of communication channel, and specific hardware or software, except in the case of Smartphone image-based mileage meters, which use the odometer message (defined in 2.6-2.9).

2.1.1. Data Transfer

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

2.1.2. Transactions

Transactions are comprised of one mileage message moving from Mileage Reporting to Account Management. Transactions will be acknowledged by the Account Management subsystem with a standard response from a REST transaction (HTTP 200) if the message can be parsed and synchronous validation is successful. If the message fails parsing or synchronous validation, an HTTP 400 will be sent to the Mileage Reporting subsystem from which it came with a failure message as the JSON payload. The failure message is specified in the Mileage Message Failure sections (2.4-2.5).

2.1.3. Interface Requirements and Security

The Mileage message is a means of transmitting mileage data from the Mileage Reporting subsystem to the Account Management 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 Account Management subsystem server provided by the Account Manager.

2.1.4. Communication Methods

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

2.1.5. Interface Initiation

The Mileage Message is a push message from the Mileage Reporting subsystem to the Account Management subsystem. The Account Management subsystem accepts the message at all times, whenever the Mileage Reporting subsystem transmits it.



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

The Mileage message contains data for only one vehicle (VIN). If a Mileage Meter determines it has been inserted into a new vehicle but still has unsent mileage days in its buffer from previous days, it shall send these in one mileage message (identified by the old VIN) before it sends new mileage day records (for the new vehicle with the new VIN) in a new mileage message.

2.2. Mileage Message Pseudocode

<i>{MileageMessage</i>	
MRDID	
MRDIssuer	
MRDManufacturer	
	<i>{ MRDConfigVersion</i>
	HWMModel
	HWMMainRelease
	HWSUBRelease
	SWMainRelease
	SWSUBRelease
	MapMainRelease
	MapSubRelease
	}
FuelUseMethod	
VIN	
MsgID	
MsgType	
TransmittedTimestamp	

The following block of code is the mileage day details record. If Day-level detail is available, for each mileage message, include a record for each day not yet transferred to transactions processor. All days shall be included, even if miles driven are 0. If Day-level detail is not available, use the MileageRangeDetails record below.

<i>{MileageDayDetails</i>
ReportDate
TotalMilesOnDate



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AccuMRDMilesOnDate
FuelUsageOnDate
FuelAddedOnDate

The following block of code is the mileage range details record. Use this block of code if day-level detail is not available:

<i>{MileageRangeDetails</i>
ReportStartDate
ReportEndDate
TotalMilesInRange
AccuMRDMilesInRange
FuelUsageInRange
FuelAddedInRange

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

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

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

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

}



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}

2.3. Mileage Message Definitions

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



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Data Element	Meaning
HWSubRelease	<ul style="list-style-type: none"> • Required • Description: HW secondary release number • Data Type: String • Format: VARCHAR(15) • Calculation: N/A • Values: N/A • Special Rules: N/A
SWMainRelease	<ul style="list-style-type: none"> • Required • Description: SW primary release number • Data Type: String • Format: VARCHAR(10) • Calculation: N/A • Values: N/A • Special Rules: N/A
SWSubRelease	<ul style="list-style-type: none"> • Required • Description: SW secondary release number • Data Type: String • Format: VARCHAR(10) • Calculation: N/A • Values: N/A • Special Rules: N/A
MapMainRelease	<ul style="list-style-type: none"> • Required • Description: Map primary release number • Data Type: String • Format: VARCHAR(3) • Calculation: N/A • Values: N/A • Special Rules: N/A
MapSubRelease	<ul style="list-style-type: none"> • Required • Description: Map secondary release number • Data Type: String • Format: VARCHAR(3) • Calculation: N/A • Values: N/A • Special Rules: N/A



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Data Element	Meaning
FuelUseMethod	<ul style="list-style-type: none"> • Required • Description: A value indicating which fuel consumption method is used to calculate fuel usage • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ul style="list-style-type: none"> ○ 1 = Fuel use not calculated due to unavailability of data ○ 2 = Fuel calculated from actual fuel use on the device ○ 3 = Fuel Use calculated using approved EPA methods (see Business Requirements Document) ○ 4 = Vehicle does not use taxable fuel ○ 5 = Fuel use not calculated due to unreliability of data • Special Rules: N/A
VIN	<ul style="list-style-type: none"> • Required • Description: The VIN of the vehicle in which the Mileage Meter is installed • Data Type: String • Format: VARCHAR (20) • Calculation: N/A • Values: N/A • Special Rules: N/A
MsgID	<ul style="list-style-type: none"> • Required • Description: Message identification number for sequencing of mileage messages • Data Type: Number • Format: Integer • Calculation: N/A • Values: N/A • Special Rules: a unique, increasing, number only for messages that are accepted by the AM (i.e. http 200 response). The same MsgID <i>may</i> be used again to recover from a message send failure (a http 400 response).
MsgType	<ul style="list-style-type: none"> • Required • Description: A value to indicate the type of message from the Mileage Meter • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ul style="list-style-type: none"> ○ 1 = Normal message ○ 2 = First Message from vehicle (only when installed into a completely new vehicle, not a reinstall) ○ 3 = Last Message from vehicle • Special Rules: N/A



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Data Element	Meaning
TransmittedTimestamp	<ul style="list-style-type: none"> • Required • Description: Timestamp provided by transmitting entity when message sent • Data Type: String • Format: The date / time is specified in the following form • "YYYY-MM-DDT hh:mm:ss" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day ○ T indicates the start of the required time section ○ hh indicates the hour ○ mm indicates the minute ○ ss indicates the second • Calculation: N/A • Values: N/A • Special Rules: UTC (Coordinated Universal Time)
ReportDate	<ul style="list-style-type: none"> • Required • Description: The date of Mileage Day Record • Data Type: String • Format: The date is specified in the following form "YYYY-MM-DD" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day • Calculation: N/A • Values: N/A • Special Rules: N/A
TotalMilesOnDate	<ul style="list-style-type: none"> • Required • Description: Total Miles Reported for the VIN/Mileage Meter for a given day • Data Type: Number • Format: One decimal place - Miles to nearest tenth of a mile [0,0.1,0.2...10,000,000.0] • Calculation: N/A • Values: N/A • Special Rules: N/A
AccuMRDMilesOnDate	<ul style="list-style-type: none"> • Required • Description: Cumulative miles of the Mileage Meter since installed in the VIN (all miles of given VIN/MRD combination), including TotalMilesOnDate • Data Type: Number • Format: One decimal place - Miles to nearest tenth of a mile [0,0.1,0.2...10,000,000.0] • Calculation: N/A • Values: N/A • Special Rules: If no miles accumulated, set this field value to 0



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Data Element	Meaning
FuelUsageOnDate	<ul style="list-style-type: none"> • Required • Description: Accumulated fuel usage on reporting date for the VIN/Mileage Meter • Data Type: Number • Format: Two decimal places - Gallons to hundredth of a gallon [0.01, 0.02, 99,999,999.99] • Calculation: Must reconcile with the following: SUM of "MsgFuelUsageInSubRuleID" for all Sub Rule IDs in reporting period • Values: N/A • Special Rules: N/A
FuelAddedOnDate	<ul style="list-style-type: none"> • Required • Description: The amount of fuel added on a given day for the VIN/Mileage Meter • Data Type: Number • Format: Gallons to hundredth of a gallon [0.01, 0.02, 99,999,999.99] • Calculation: Must reconcile with the following: SUM of "MsgFuelAddedInSubRuleID" for all Sub Rule IDs in reporting period • Values: N/A • Special Rules: Calculating fuel added to vehicle is not a required functionality at this time – if no data for this field, set field value to blank.
ReportStartDate	<ul style="list-style-type: none"> • Required • Description: The start date of Mileage Range Record • Data Type: String • Format: The date is specified in the following form "YYYY-MM-DD" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day • Calculation: N/A • Values: N/A • Special Rules: N/A
ReportEndDate	<ul style="list-style-type: none"> • Required • Description: The end date of Mileage Range Record • Data Type: String • Format: The date is specified in the following form "YYYY-MM-DD" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day • Calculation: N/A • Values: N/A • Special Rules: N/A



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Data Element	Meaning
TotalMilesInRange	<ul style="list-style-type: none"> • Required • Description: Total Miles Reported for the VIN/Mileage Meter for a given date range • Data Type: Number • Format: One decimal place - Miles to nearest tenth of a mile [0,0.1,0.2...10,000,000.0] • Calculation: N/A • Values: N/A • Special Rules: N/A
AccuMRDMilesInRange	<ul style="list-style-type: none"> • Required • Description: Cumulative miles of the Mileage Meter since installed in the VIN (all miles of given VIN/MRD combination), including TotalMilesInRange • Data Type: Number • Format: One decimal place - Miles to nearest tenth of a mile [0,0.1,0.2...10,000,000.0] • Calculation: N/A • Values: N/A • Special Rules: If no miles accumulated, set this field value to 0
FuelUsageInRange	<ul style="list-style-type: none"> • Required • Description: Fuel usage in reporting date range for the VIN/Mileage Meter • Data Type: Number • Format: Two decimal places - Gallons to hundredth of a gallon [0.01, 0.02, 99,999,999.99] • Calculation: Must reconcile with the following: SUM of "MsgFuelUsageInSubRuleID" for all Sub Rule IDs in reporting period • Values: N/A • Special Rules: N/A
RuleID	<ul style="list-style-type: none"> • Required • Description: An identifier associated with a geographic area, or zone, in which a specific rate per mile will be assessed for miles traveled. FIPS codes are used to identify states. • Data Type: Number • Format: Integer • Calculation: N/A • Values: Rule ID codes and definitions are defined in the Agency provided Road Charge Rate Table • Special Rules: N/A



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Data Element	Meaning
SubRuleID	<ul style="list-style-type: none"> • Required • Description: Sub Rule ID, numerical index for region of travel within given Rule ID • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ul style="list-style-type: none"> 1=all public on-road (chargeable) miles in given RuleID 2=all non-chargeable miles in given RuleID • Special Rules: N/A
MsgMileageInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Miles Traveled in VIN/Mileage Meter Sub Rule ID on given date • Data Type: Number • Format: Miles to nearest tenth of a mile [0,0.1,0.2, 10,000.0] • Calculation: N/A • Values: N/A • Special Rules: N/A
MsgFuelUsageInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Amount of fuel consumed based on Fuel Use Method in given VIN/Mileage Meter Sub Rule ID on given day • Data Type: Number • Format: Gallons to hundredth of a gallon [0.01, 0.02, 99,999,999.99] • Calculation: N/A • Values: N/A • Special Rules: N/A
MsgFuelAddedInSubRuleID	<ul style="list-style-type: none"> • Required • Description: The amount of fuel added in given VIN/Mileage Meter Sub Rule ID on a given day. • Data Type: Number • Format: Two decimal places - Gallons to hundredth of a gallon [0.01, 0.02, 99,999,999.99] • Calculation: N/A • Values: N/A • Special Rules: Calculating fuel added to vehicle is not a required functionality at this time – if no data for this field, set field value to blank.



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Data Element	Meaning
<p>MRDHealth</p>	<ul style="list-style-type: none"> • Required (if Mileage Meter error or event occurs during reporting period) • Description: Coding of each error and event that occurred for the given Mileage Meter on the given date, when the error was detected by the Mileage Meter • Data Type: Number • Format: Integer • Calculation: N/A • Values: <p>All the following values are supported but optional, except values 4, 5, and 12, which are supported and mandatory for OBDII device mileage meters (only). Vendors should support as many of the values as feasible/convenient.</p> <ol style="list-style-type: none"> 1. Low Voltage 2. Anomalies in monitored vehicle functions and parameters which could compromise the collection and reporting of road charge data (e.g., MIL on - Check Engine light) 3. Storage full 4. Disconnected from vehicle 5. Connected to new vehicle (note that this MRDHealth signal should always be generated during first installation) 6. Vehicle interface communications failure 7. Location data degraded [Mileage Meter with general location only] 8. Incorrect date/time (conflict between date/time from vehicle interface and from wireless communications) 9. Software resets 10. Software updates 11. Degraded mileage data 12. Missed mileage 13. Inconsistent mileage data (between multiple raw data sources) 14. Mobile App failure (other than faults indicated above in 9-13) 15. Vehicle telematics interface failure (other than faults indicated above in 9-13) 16. Vehicle Failure preventing accurate recording of mileage data 17. Vendor-specific • Special Rules: N/A



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

2.4. Mileage Message Failure Pseudocode

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

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



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2.5. Mileage Message Failure Definitions

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



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Data Element	Meaning
MsgFailedCode	<ul style="list-style-type: none"> • Required (if failed message occurs) • Description: A value indicating the reason that the message was not processed. • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ol style="list-style-type: none"> 1. Duplicate message (a mileage message with identical MRDID and MsgID has already been received) 2. Data Inconsistency (other data consistency check failed) • Special Rules: Numbers beyond #2 will be determined by the Agency • Note: Failed Authentication should result in an HTTP 401 response, thus not covered in this code which accompanies an HTTP 400 response.

2.6. Odometer Message Pseudocode

<i>{MileageMessage</i>
AppUserID
AppIssuer
AppID
VIN
OdometerReading
OdometerReadingTimestamp
TransmittedTimestamp
MsgIDalpha

Data Element	Meaning
AppUserID	<ul style="list-style-type: none"> • Required • Description: Unique identifier for App User (such as serial number) • Data Type: String • Format: VARCHAR(64) • Calculation: N/A • Values: N/A • Special Rules: N/A



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Data Element	Meaning
AppIssuer	<ul style="list-style-type: none"> • Required • Description: Name of entity issuing App • Data Type: String • Format: VARCHAR(50) • Calculation: N/A • Values: N/A • Special Rules: N/A
AppID	<ul style="list-style-type: none"> • Required • Description: Name of App • Data Type: String • Format: VARCHAR(50) • Calculation: N/A • Values: N/A • Special Rules: N/A
VIN	<ul style="list-style-type: none"> • Required • Description: The VIN of the vehicle whose odometer is being reported • Data Type: String • Format: VARCHAR(20) • Calculation: N/A • Values: N/A • Special Rules: N/A
OdometerReading	<ul style="list-style-type: none"> • Required • Description: Value of Odometer Reading • Data Type: Number • Format: Miles [0 ... 999,999] • Calculation: N/A • Values: N/A • Special Rules: N/A
OdometerReadingTimestamp	<ul style="list-style-type: none"> • Required • Description: Timestamp of odometer reading • Data Type: String • Format: The date / time is specified in the following form • "YYYY-MM-DDT hh:mm:ss" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day ○ T indicates the start of the required time section ○ hh indicates the hour ○ mm indicates the minute ○ ss indicates the second • Calculation: N/A • Values: N/A • Special Rules: UTC



Interface Control Document

Data Element	Meaning
TransmittedTimestamp	<ul style="list-style-type: none"> • Required • Description: Timestamp provided by transmitting entity when message sent • Data Type: String • Format: The date / time is specified in the following form • "YYYY-MM-DDT hh:mm:ss" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day ○ T indicates the start of the required time section ○ hh indicates the hour ○ mm indicates the minute ○ ss indicates the second • Calculation: N/A • Values: N/A • Special Rules: UTC
MsgIDalpha	<ul style="list-style-type: none"> • Required • Description: Unique alphanumeric Message identifier • Data Type: String • Format: VARCHAR(20) • Calculation: N/A • Values: N/A • Special Rules: N/A

2.7. Odometer Message Failure Pseudocode

Note that the Failure Message shall only be transmitted by the Account Management if the odometer message fails data validation checks.

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



Interface Control Document

2.8. Odometer Message Failure Definitions

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



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Data Element	Meaning
MsgFailedCode	<ul style="list-style-type: none"> • Required (if failed message occurs) • Description: A value indicating the reason that the message was not processed. • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ol style="list-style-type: none"> 1. Duplicate message (a mileage message with identical MRDID and MsgID has already been received) 2. Data Inconsistency (other data consistency check failed) • Special Rules: Numbers beyond #2 will be determined by the Agency <p>Note: Failed Authentication should result in an HTTP 401 response, thus not covered in this code which accompanies an HTTP 400 response.</p>



Interface Control Document

3. Interface between Account Management and Account Management Oversight

3.1. Overview

The interface between the Account Managers and the Account Management Oversight subsystem has five defined messages:

1. **Mileage and Road Charge Revenue Report:** Transfer of Summary Mileage and Road Charge Revenue report to the California Department of Transportation on a periodic basis.
2. **VIN Summary Report:** A Summary of all VINs and related data managed by Account Managers to the Account Management Oversight on a periodic basis.
3. **VIN Manual Methods Summary report:** A summary of all VINs using Manual Methods managed by the State Account Manager to the Account Management Oversight on a periodic basis. Account Managers who do not support manual methods do not send this report.
4. **Errors and Events Report:** An Errors and Events Report, which provides exception (or health) codes on Mileage Reporting/Account Manager hardware or data gathering to monitor performance of the system.
5. **Account and VIN Update:** Report of all account attribute changes and status updates regarding status in the program. This flow also returns data to indicate status of the volunteers.

3.1.1. Data Transfer

Road Charge Reporting is initiated by the Account Management subsystem by calling a REST/JSON interface implemented by the Account Management Oversight subsystem. The method will be mutually agreed to by Account Manager and the agency. The frequency of transmission is defined in the Business Rules.

3.1.2. Interface Requirements and Security

This interface is a means of transmitting data from the Account Management (the account managers) and the Account Management Oversight subsystems (agency).

- ▶ **Application Layer:** HTTP over TLS/SSL
- ▶ **Transport Layer:** TCP
- ▶ **Internet Layer:** IP
- ▶ **Web-services protocol:** REST
- ▶ **Message definition:** JSON

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



Interface Control Document

3.1.3. Interface Initiation

The Account Manager shall initiate the interfaces with the Account Management Oversight.

3.2. Mileage and Road Charge Revenue Report

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

3.2.1. Mileage and Road Charge Revenue Report Pseudocode

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

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

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

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



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

}

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

TotalMileage
TotalRevenue
TotalFuelUsage
TotalFuelTaxCredit
TotalADJMileage
TotalADJRevenue
TotalADJFuelUsage
TotalADJFuelTaxCredit
TotalADJBalance
TotalBalance
}



Interface Control Document

3.2.2. Mileage and Road Charge Revenue Report Definitions

Data Element	Meaning
AMID	<ul style="list-style-type: none"> • Required • Description: The AM identifier number which is provided by the agency • Data Type: Number • Format: Integer • Calculation: N/A • Values: N/A • Special Rules: N/A
TransmittedTimestamp	<ul style="list-style-type: none"> • Required • Description: Timestamp provided by transmitting entity when message sent • Data Type: String • Format: The date / time is specified in the following form "YYYY-MM-DDT hh:mm:ss" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day ○ T indicates the start of the required time section ○ hh indicates the hour ○ mm indicates the minute ○ ss indicates the second • Calculation: N/A • Values: N/A • Special Rules: UTC
PeriodStartDate	<ul style="list-style-type: none"> • Required • Description: The start date of the reporting period in which the mileage information was received by the Account Manager (not necessarily the period in which it was collected by the MRD). • Data Type: String • Format: The date is specified in the following form "YYYY-MM-DD" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day • Calculation: N/A • Values: N/A • Special Rules: N/A



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Data Element	Meaning
PeriodEndDate	<ul style="list-style-type: none"> • Required • Description: The Reporting period end date • Data Type: String • Format: The date is specified in the following form • "YYYY-MM-DD" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day • Calculation: N/A • Values: N/A • Special Rules: N/A
RuleID	<ul style="list-style-type: none"> • Required • Description: Rule Identification. An identifier associated with a geographic area, or zone, in which a specific rate per mile will be assessed for miles traveled. FIPS codes are used to identify states • Data Type: Number • Format: Integer • Values: Rule ID codes and definitions are defined in the Agency provided Road Charge Rate Table • Special Rules: N/A
TotalMileageInRuleID	<ul style="list-style-type: none"> • Required • Description: Total Miles traveled in given Rule ID for given period • Data Type: Number • Format: One decimal place - Miles to nearest tenth of a mile [0,0.1,0.2...10,000,000.0] • Calculation: Must reconcile with the following: SUM of "TotalMileageInSubRuleID" for all Sub Rule IDs in Rule ID • Values: N/A • Special Rules: N/A
TotalNonTaxableMileageInRuleID	<ul style="list-style-type: none"> • Required • Description: Total miles traveled for all non-taxable Sub Rule IDs in given Rule ID for given period, per Agency provided Road Charge Rate Table • Data Type: Number • Format: One decimal place - Miles to nearest tenth of a mile [0,0.1,0.2...10,000,000.0] • Calculation: Must reconcile with the following: SUM of "TotalMileageInSubRuleID" for all non- taxable Sub Rule IDs in given Rule ID, per Agency provided Road Charge Rate Table • Values: N/A • Special Rules: N/A



Interface Control Document

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



Interface Control Document

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



Interface Control Document

Data Element	Meaning
TotalADJBalanceInRuleID	<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 • Special Rules: N/A
TotalRevenueInRuleID	<ul style="list-style-type: none"> • Required • Description: Total Road Charge 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 "MRDRRevenueInSubRuleID" for all taxable Sub Rule IDs in given Rule ID • Values: N/A • Special Rules: Determination of taxable Sub Rule IDs can be found in the Agency provided Road Charge Rate Table
TotalFuelUsageInRuleID	<ul style="list-style-type: none"> • Required • Description: Total fuel usage in given Rule ID for given period • Data Type: Number • Format: Two decimal places - Gallons to hundredth of a gallon: [0.01, 0.02, 99,999,999.99] • Calculation: Must reconcile with the following: SUM of "TotalFuelUsageInSubRuleID" for all Sub Rule IDs in Rule ID • Values: N/A • Special Rules: N/A
TotalNonTaxableFuelUsageInRuleID	<ul style="list-style-type: none"> • Required • Description: Total non-taxable fuel usage in given Rule ID for given period • Data Type: Number • Format: Two decimal places - Gallons to hundredth of a gallon: [0.01, 0.02, 99,999,999.99] • Calculation: Must reconcile with the following: SUM of "TotalFuelUsageInSubRuleID" for all non- taxable Sub Rule IDs in Rule ID • Values: N/A • Special Rules: N/A



Interface Control Document

Data Element	Meaning
TotalTaxableFuelUsagelnRuleID	<ul style="list-style-type: none"> • Required • Description: Total taxable fuel usage in given Rule ID for given period • Data Type: Number • Format: Two decimal places - Gallons to hundredth of a gallon: [0.01, 0.02, 99,999,999.99] • Calculation: Must reconcile with the following: SUM of "TotalFuelUsagelnSubRuleID" for all taxable Sub Rule IDs in Rule ID • Values: N/A • Special Rules: N/A
TotalFuelTaxCreditlnRuleID	<ul style="list-style-type: none"> • Required • Description: Total Fuel Tax Credit in all taxable Sub Rule IDs in given Rule ID for given period. Should be negative. • 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 "TotalFuelTaxCreditlnSubRuleID" for all Sub Rule IDs in Rule ID • Values: N/A • Special Rules: Determination of taxable Sub Rule IDs can be found in Agency provided Road Charge Rate Table
TotalBalanceInRuleID	<ul style="list-style-type: none"> • Required • Description: Total amount to invoice/credit to Pilot Participant 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: "TotalRevenueInRuleID" plus "TotalFuelTaxCreditlnRuleID" plus "TotalADJBalanceInRuleID" • Values: N/A • Special Rules: N/A
SubRuleID	<ul style="list-style-type: none"> • Required • Description: Sub Rule ID, numerical index for region of travel within given Rule ID • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ul style="list-style-type: none"> 1=all public on-road (chargeable) miles in given RuleID 2=all non-chargeable miles in given RuleID • Special Rules: N/A



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Data Element	Meaning
TotalMileageInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Total Miles traveled in given Sub Rule ID for all VIN/MRDs given period • Data Type: Number • Format: One decimal place - Miles to nearest tenth of a mile [0,0.1,0.2...10,000,000.0] • Calculation: Must reconcile with the following: SUM of "MRDMileageInSubRuleID" for all VIN/MRDs in reporting period for given Sub Rule ID • Values: N/A • Special Rules: N/A
RateInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Mileage rate used in Sub Rule ID, provided by Agency in Road Charge Rate Table • Data Type: Number • Format: Three decimal places – Dollars and cents + tenth of a cent [0.015, 0.020, ... , 9,999.999] • Calculation: N/A • Values: Assigned by Agency as necessary, provided in Road Charge Rate Table • Special Rules: N/A
TotalADJMileageInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Total adjusted Miles in for Sub Rule ID for all VIN/MRDs for given period • Data Type: Number • Format: Miles to nearest tenth of a mile [0,0.1,0.2...10,000,000.0] • Calculation: Must reconcile with the following: SUM of "MRDADJMileageInSubRuleID" for all VIN/MRDs in given Sub Rule ID • Values: N/A • Special Rules: N/A
TotalADJRevenueInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Total Road Charge revenue adjusted for Sub Rule ID for all VIN/MRDs for given period • Data Type: Number • Format: Two decimal places - Dollars and cents: [0.01, 0.02, ... , 99,999,999.99] • Calculation: Must reconcile with the following: SUM of "MRDADJRevenueInSubRuleID" for all VIN/MRDs in given Sub Rule ID • Values: N/A • Special Rules: N/A



Interface Control Document

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



Interface Control Document

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



Interface Control Document

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



Interface Control Document

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



Interface Control Document

Data Element	Meaning
TotalADJBalance	<ul style="list-style-type: none"> • Required • Description: Total adjusted Balance for all Rule IDs for given period • Data Type: Number • Format: Two decimal places - Dollars and cents: [0.01, 0.02, ... , 99,999,999.99] • Calculation: Must reconcile with the following: SUM of "TotalADJBalanceInRuleID" for all Rule IDs • Values: N/A • Special Rules: N/A
TotalBalance	<ul style="list-style-type: none"> • Required • Description: Total Amount to invoice/credit to Pilot 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 • Special Rules: N/A

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

3.3. VIN Summary Report

The VIN Summary report includes travel records for each vehicle/VIN registered with the Account Manager. In the VIN Summary Report, a VIN Status code is given for each vehicle, and the time that activity code was achieved. All vehicles registered with a given account manager should be included in the VIN Summary Report, even vehicles on manual mileage reporting methods. For time permits and mileage permits, however, miles traveled will always be 0. Details of all manual methods continue to be included in the VIN Manual Methods Summary report. Note that the identical VINs should be included in the VIN Summary Report as the Account and VIN Update Report for a given reporting period.

3.3.1. VIN Summary Report Pseudocode

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



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

<i>{ VSMDetails</i>
VIN
VINStatus
VINComplianceStatus
VINClass
TotalVINMiles
TotalVINFuelUse
TotalVINBalance
LastReportDate

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

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

For location-based methods, include one block for each RuleID included for this VIN / MRDID combination. All totals are for the Reporting period specified in PeriodStartDate and PeriodEndDate. This block is not required for non-location-based methods.

<i>{ VSMDRuleDetails</i>
RuleID
MRDMileageInRuleID
MRDNonTaxableMileageInRuleID
MRDTaxableMileageInRuleID
MRDRevenueInRuleID
MRDFuelUsageInRuleID
MRDNonTaxableFuelUsageInRuleID
MRDTaxableFuelUsageInRuleID
MRDFuelTaxCreditInRuleID
MRDADJMileageInRuleID
MRDADJRevenueInRuleID



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MRDADJFuelUsageInRuleID
MRDADJFuelTaxCreditInRuleID
MRDADJBalanceInRuleID
MRDBalanceInRuleID
}

For location-based methods, include one block for each SubRuleID included for this VIN / MRDID / RuleID combination. All totals are for the Reporting period specified in PeriodStartDate and PeriodEndDate. This block is not required for non-location based methods.

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

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

{ <i>VSMDAjustedSubRuleDetails</i>
ADJMileage
ADJRevenue
ADJFuelUsage
ADJFuelTaxCredit
ADJBalance
ADJDateTime
ADJCode
ADJReasonDescription
}



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```

    }
  }
}

```

3.3.2. VIN Summary Report Definitions

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



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Data Element	Meaning
PeriodEndDate	<ul style="list-style-type: none"> • Required • Description: The reporting period end date • Data Type: String • Format: The date is specified in the following form "YYYY-MM-DD" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day • Calculation: N/A • Values: N/A • Special Rules: N/A
VIN	<ul style="list-style-type: none"> • Required • Description: The VIN of the vehicle in which the Mileage Meter is installed • Data Type: String • Format: VARCHAR(20) • Calculation: N/A • Values: N/A • Special Rules: N/A
VINStatus	<ul style="list-style-type: none"> • Required • Description: An integer value indicating the reason for the status of a given VIN at the period end date of the report • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ul style="list-style-type: none"> 1 = Pending – If the VIN has been submitted for approval and is not yet approved by the agency 2 = Started - If the VIN is first appearing on the report 3 = Active - if the VIN has previously appeared 4 = Discontinued – Exiting program this reporting period and will not appear in a future reporting period unless added again (status 2) 5 = Changing Vehicle Information – information about the vehicle is changing, but vehicle (VIN) remains the same 6 = Swapping vehicle – VIN has just changed; new vehicle in place • Special Rules: Only statuses 1 and 3 may appear for consecutive reporting periods.



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Data Element	Meaning
VINComplianceStatus	<ul style="list-style-type: none"> • Required • Description: An integer value indicating the compliance status of the vehicle for the reporting period • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ul style="list-style-type: none"> 1 = vehicle never reported mileage (not initially compliant) 2= vehicle compliant (Definition below) 3= vehicle has been initially compliant but not compliant for this reporting period 4= vehicle not in this reporting period and in prior reporting period • Special Rules: Definition of compliance: <ul style="list-style-type: none"> ○ OBD-II: plugged in once during reporting period ○ Smartphone—reported during reporting period ○ Telematics—able to pull data during reporting period ○ Time permit—time permit not expired ○ Mileage permit—mileage permit not overrun based on most recent odometer reading and odometer readings submitted on required schedule ○ Odometer charge—odometer readings submitted on required schedule and paid in full to last odometer reading
VINClass	<ul style="list-style-type: none"> • Required • Description: An integer value indicating the weight class of the vehicle • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ul style="list-style-type: none"> 1 = Light Vehicle (<10,000 pounds) – passenger cars and Class 1-2 trucks 2 = Medium trucks (10-26,000 pounds) – Class 3-6 trucks 3 = Heavy trucks (>26,000 pounds) – Class 7-8 trucks • Special Rules: N/A
TotalVINMiles	<ul style="list-style-type: none"> • Required • Description: Actual Miles Traveled in all Rule IDs for given VIN • Data Type: Number • Format: One decimal place - Miles to nearest tenth of a mile [0,0.1,0.2... 10,000,000.0] • Calculation: Must reconcile with the following: • SUM of “TotalMilesOnDate” (from Mileage Message) for all MRDs for given VIN • Values: N/A • Special Rules: N/A



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Data Element	Meaning
TotalVINFuelUse	<ul style="list-style-type: none"> • Required • Description: Fuel Usage in gallons for all Rule IDs for given VIN (estimated or measured) • 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 MRDs for given VIN • Values: N/A • Special Rules: N/A
TotalVINBalance	<ul style="list-style-type: none"> • Required • Description: Amount to invoice/credit to Pilot 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 "MRDBalanceInRuleID" for all Rule IDs for all MRDs for a given VIN • Values: N/A • Special Rules: N/A
LastReportDate	<ul style="list-style-type: none"> • Required • Description: The last date this VIN reported miles • Data Type: String • Format: The date is specified in the following form "YYYY-MM-DD" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day • Calculation: N/A • Values: N/A • Special Rules: N/A
MRDID	<ul style="list-style-type: none"> • Required • Description: Unique identifier for Mileage Meter (such as serial number) • Data Type: String • Format: VARCHAR(64) • Calculation: N/A • Values: N/A • Special Rules: N/A



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Data Element	Meaning
CertID	<ul style="list-style-type: none"> • Required • Description: Certification ID number assigned by Agency – indicates the issuer and manufacturer of an Mileage Meter as well as MRD type (OBDII, Smartphone, Vehicle Telematics, or Commercial Vehicle) • Data Type: Number • Format: Integer • Calculation: N/A • Values: Agency assigned values • Special Rules: N/A
FuelUseMethod	<ul style="list-style-type: none"> • Required • Description: A value indicating which fuel consumption method is used to calculate fuel usage • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ul style="list-style-type: none"> 1 = Fuel use not calculated due to unavailability of data 2 = Fuel calculated from actual fuel use on the device 3 = Fuel Use calculated using approved EPA methods (see Business Requirements Document) 4 = Vehicle does not use taxable fuel 5 = Fuel use not calculated due to unreliability of data • Special Rules: N/A
RuleID	<ul style="list-style-type: none"> • Required • Description: Rule ID, An identifier associated with a geographic area, or zone, in which a specific rate per mile will be assessed for miles traveled. FIPS codes are used to identify states • Data Type: Number • Format: Integer • Calculation: N/A • Values: Rule ID codes and definitions are defined in the Agency provided Road Charge Rate Table • Special Rules: N/A
MRDMileageInRuleID	<ul style="list-style-type: none"> • Required • Description: Miles Traveled in Rule IDs for given VIN/Mileage Meter for given period • Data Type: Number • Format: Miles to nearest tenth of a mile [0,0.1,0.2...10,000,000.0] • Calculation: Must reconcile with the following: SUM of “MRDMileageInSubRuleID” for all Sub Rule IDs in given Rule ID for given VIN/Mileage Meter • Values: N/A • Special Rules: N/A



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Data Element	Meaning
MRDNonTaxableMileageInRuleID	<ul style="list-style-type: none"> • Required • Description: The count of non-taxable miles in a Rule ID for a given VIN/Mileage Meter • Data Type: Number • Format: Miles to nearest tenth of a mile [0,0.1,0.2...10,000,000.0] • Calculation: This must reconcile with the following: SUM of "MRDMileageInSubRuleID" for all non- taxable Sub Rule IDs within given Rule ID • Values: N/A • Special Rules: Determination of taxable Sub Rule IDs can be found in Agency provided Road Charge Rate Table
MRDTaxableMileageInRuleID	<ul style="list-style-type: none"> • Required • Description: The count of taxable miles in a Rule ID for a given VIN/Mileage Meter • Data Type: Number • Format: Miles to nearest tenth of a mile [0,0.1,0.2...10,000,000.0] • Calculation: This must reconcile with the following: SUM of "MRDMileageInSubRuleID" for all taxable Sub Rule IDs within given Rule ID • Values: N/A • Special Rules: Determination of taxable Sub Rule IDs can be found in Agency provided Road Charge Rate Table
MRDRevenueInRuleID	<ul style="list-style-type: none"> • Required • Description: Amount of Road Charge Revenue for given Rule IDs for VIN/Mileage Meter for given period • Data Type: Number • Format: Two decimal places - Dollars and cents [0.01, 0.02, ... , 9,999.999] • Calculation: Must reconcile with the following: SUM of "MRDRevenueInSubRuleID" for all taxable Sub Rule IDs in given Rule ID for given VIN/Mileage Meter • Values: N/A • Special Rules: Determination of taxable Sub Rule IDs can be found in Agency provided Road Charge Rate Table
MRDFuelUsageInRuleID	<ul style="list-style-type: none"> • Required • Description: Fuel Usage in Rule ID for given VIN/Mileage Meter 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 "MRDFuelUsageInSubRuleID" for all Sub Rule IDs in given Rule ID for given VIN/Mileage Meter • Values: N/A • Special Rules: N/A



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



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Data Element	Meaning
MRDADJRevenueInRuleID	<ul style="list-style-type: none"> • Required • Description: The revenue amount adjusted for a given VIN/Mileage Meter 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 “MRDADJRevenueInSubRuleID” for all Sub Rule IDs in given Rule ID for given VIN/Mileage Meter • Values: N/A • Special Rules: N/A
MRDADJFuelUsagInRuleID	<ul style="list-style-type: none"> • Required • Description: The gallons count adjusted for a given VIN/Mileage Meter 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 “MRDADJFuelUsagInSubRuleID” for all Sub Rule IDs in given Rule ID for given VIN/Mileage Meter • Values: N/A • Special Rules: N/A
MRDADJFuelTaxCreditInRuleID	<ul style="list-style-type: none"> • Required • Description: The fuel tax credit amount adjusted for a given VIN/Mileage Meter in a Rule ID. Should be negative. • 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 “MRDADJFuelTaxCreditInSubRuleID” for all Sub Rule IDs in given Rule ID for given VIN/Mileage Meter • Values: N/A • Special Rules: N/A
MRDADJBalancelnRuleID	<ul style="list-style-type: none"> • Required • Description: Balance adjusted for this VIN/Mileage Meter 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 “MRDAdjBalancelnSubRuleID” for all Sub Rule IDs in given Rule ID for given VIN/Mileage Meter • Values: N/A • Special Rules: N/A



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Data Element	Meaning
MRDBalanceInRuleID	<ul style="list-style-type: none"> • Required • Description: The amount to invoice/credit to Pilot Participant calculated for the Rule IDs for given VIN/Mileage Meter • Data Type: Number • Format: Two decimal places - Dollars and cents [0.01, 0.02, ... , 9,999.99] • Calculation: Must reconcile with the following: • “MRDRevenueInRuleID” plus “MRDFuelTaxCreditInRuleID” plus “MRDADJBalanceInRuleID” • Values: N/A • Special Rules: N/A
SubRuleID	<ul style="list-style-type: none"> • Required • Description: Sub Rule ID, numerical index for region of travel within given Rule ID • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ul style="list-style-type: none"> 1=all public on-road (chargeable) miles in given RuleID 2=all non-chargeable miles in given RuleID • Special Rules: N/A
MRDMileageInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Miles traveled in Sub Rule ID for given VIN/Mileage Meter 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 during reporting period • Values: N/A • Special Rules: N/A
MRDRevenueInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Amount of Road Charge Revenue in Sub Rule ID for given VIN/Mileage Meter 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 during reporting period multiplied by “RateInSubRuleID” (per Agency provided rate table) • Values: N/A • Special Rules: N/A



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Data Element	Meaning
MRDFuelUsagelnSubRuleID	<ul style="list-style-type: none"> • Required • Description: Fuel Usage in given Sub Rule ID for given VIN/Mileage Meter 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 “MsgFuelUsagelnSubRuleID” from Mileage Messages during reporting period • Values: N/A • Special Rules: N/A
MRDFuelTaxCreditlnSubRuleID	<ul style="list-style-type: none"> • Required • Description: Fuel Tax Credit in given Sub Rule ID for given VIN/Mileage Meter for given period. Should be negative. • 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 “MsgFuelUsagelnSubRuleID” from Mileage Messages for given VIN/Mileage Meter during reporting period) multiplied by “FuelRateInSubRuleID” (per Agency provided rate table) • Values: N/A • Special Rules: N/A
MRDADJMileagelnSubRuleID	<ul style="list-style-type: none"> • Required • Description: Miles adjusted for this VIN/Mileage Meter 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/Mileage Meter in given Sub Rule ID • Values: N/A • Special Rules: N/A
MRDADJRevenueInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Revenue adjusted for this VIN/Mileage Meter 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/Mileage Meter in given Sub Rule ID • Values: N/A • Special Rules: N/A



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Data Element	Meaning
MRDADJFuelUsageInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Fuel Usage adjusted for this VIN/Mileage Meter 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/Mileage Meter in given Sub Rule ID • Values: N/A • Special Rules: N/A
MRDADJFuelTaxCreditInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Fuel Tax Credit adjusted for this VIN/Mileage Meter in given Sub Rule ID for given period. Should be negative. • 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/Mileage Meter in given Sub Rule ID • Values: N/A • Special Rules: N/A
MRDADJBalanceInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Balance adjusted for this VIN/Mileage Meter 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/Mileage Meter in given Sub Rule ID • Values: N/A • Special Rules: N/A
MRDBalanceInSubRuleID	<ul style="list-style-type: none"> • Required • Description: Amount to invoice/credit Pilot Participant in Sub Rule ID for given VIN/Mileage Meter for given period • Data Type: Number • Format: Two decimal places - Dollars and cents accuracy [0.01, 0.02, ... , 9,999.99] • Calculation: Must reconcile with the following: "MRDRevenueInSubRuleID" plus "MRDFuelTaxCreditInSubRuleID" plus "MRDADJBalanceInSubRuleID" • Values: N/A • Special Rules: N/A



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Data Element	Meaning
ADJMileage	<ul style="list-style-type: none"> • Required (if adjustment activity occurs in Sub Rule ID for given VIN/Mileage Meter during reporting period) • Description: Miles adjusted for the individual adjustment – entered manually by Account Manager • Data Type: Number • Format: One decimal place - Miles to nearest tenth of a mile [0,0.1,0.2...10,000,000.0] • Calculation: N/A • Values: N/A • Special Rules: Manual adjustment must be made at an Account Manager level
ADJRevenue	<ul style="list-style-type: none"> • Required (if adjustment activity occurs in Sub Rule ID for given VIN/Mileage Meter during reporting period) • Description: Adjusted Road Charge revenue amount for the adjustment – entered manually by Account Manager • Data Type: Number • Format: Two decimal places - Dollars and cents [0.01, 0.02, ... , 2.55] • Calculation: Must reconcile with the following: “ADJMileage” multiplied by “RateInSubRuleID” • Values: N/A • Special Rules: Calculation is to be used unless Revenue is the manual adjustment made at an Account Manager level
ADJFuelUsage	<ul style="list-style-type: none"> • Required (if adjustment activity occurs in Sub Rule ID for given VIN/Mileage Meter during reporting period) • Description: Adjusted Fuel Usage amount for the adjustment – entered manually by Account Manager • Data Type: Number • Format: Two decimal places - Gallons to hundredth of a gallon [0.01, 0.02, 99,999,999.99] • Calculation: N/A • Values: N/A • Special Rules: Manual adjustment must be made at an Account Manager level – may be an estimated fuel usage based on miles adjusted



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Data Element	Meaning
ADJFuelTaxCredit	<ul style="list-style-type: none"> • Required (if adjustment activity occurs in Sub Rule ID for given VIN/Mileage Meter during reporting period) • Description: Adjusted Fuel Tax Credit for this adjustment – entered manually by Account Manager • Data Type: Number • Format: Two decimal places (negative numbers) - Dollars and cents [0.01, 0.02, ... , 2.55] • Calculation: Must reconcile with the following: “ADJFuelUsage” multiplied by “FuelRateInSubRuleID” for given Sub Rule ID • Values: N/A • Special Rules: Calculation is to be used, unless Fuel Tax Credit is the manual adjustment made at an Account Manager level
ADJBalance	<ul style="list-style-type: none"> • Required (if adjustment activity occurs in Sub Rule ID for given VIN/Mileage Meter during reporting period) • Description: Adjusted balance for this adjustment – entered manually by Account Manager • Type: Number • Format: Two decimal places - Dollars and cents [0.01, 0.02, ... , 2.55] • Calculation: Must reconcile with the following: “ADJRevenue” plus “ADJFuelTaxCredit” • Values: N/A • Special Rules: N/A
ADJDateTime	<ul style="list-style-type: none"> • Required (if adjustment activity occurs in Sub Rule ID for given VIN/Mileage Meter during reporting period) • Description: Timestamp of when the transaction was added to the account. (Not the date the miles are applied to) • Data Type: String • Format: The date / time is specified in the following form “YYYY-MM-DDT hh:mm:ss” where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day ○ T indicates the start of the required time section ○ hh indicates the hour ○ mm indicates the minute ○ ss indicates the second • Calculation: N/A • Values: N/A • Special Rules: UTC



Interface Control Document

Data Element	Meaning
ADJCode	<ul style="list-style-type: none"> • Required (if adjustment activity occurs in Sub Rule ID for given VIN/Mileage Meter during reporting period) • Description: indicator of what adjustment was conducted on the account – entered manually by Account Manager • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ul style="list-style-type: none"> 0 (Zero) = Other 1 = Mileage Meter installed in the wrong vehicle 2 = Miles self-reported by Road Charge payer 3 = Mileage Meter assigned to the wrong driver 4 = Daily Assessed Mileage • Other codes to be assigned by Agency • Special Rules: N/A
ADJReasonDescription	<ul style="list-style-type: none"> • Required (if adjustment activity occurs in Sub Rule ID for given VIN/Mileage Meter during reporting period) • Description: Sentence describing why adjustment was made – entered manually by Account Manager • Data Type: String • Format: VARCHAR(100) • Calculation: N/A • Values: N/A • Special Rules: N/A

3.4. VIN Manual Methods Summary Report

The VIN Manual Methods Summary report includes records for each vehicle/VIN registered with the State Account Manager for a manual method (time permit, mileage permit, and odometer charge). This information is required **in addition** to the VIN Summary Report—all vehicles on time permit, mileage permit, and odometer charge should also be included in the VIN Summary Report. In the VIN Manual Methods Summary Report, a VIN Status code is given for each vehicle, and the time that activity code was achieved.

3.4.1. VIN Manual Methods Summary Report Pseudocode

{ <i>VINManualMethodsSummaryMessage</i>
AMID
TransmittedTimestamp
PeriodStartDate
PeriodEndDate
PeriodTimePermitRevenue
PeriodMileagePermitRevenue
PeriodOdometerChargeRevenue



Interface Control Document

<i>{TimePermitSummaryMessage</i>
Include one for each length of permit offered in a given program.
<i>{TimePermitLengthSummary</i>
TimePermitLength
TimePermitLengthCumulativeNumberPurchased
TimePermitLengthAverageMilesDriven
TimePermitLengthPercentConsumedByDistance
TimePermitLengthPercentConsumedByTime
<i>}</i>

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

<i>{ TimePermitDetails</i>
VIN
VINStatus
CurrentTimePermitStartDate
CurrentTimePermitEndDate

Include one of the following block of code for every permit purchased during the period.

<i>{ TimePermitsPurchased</i>
TimePermitLength
TimePermitCharge
<i>}</i>
<i>}</i>
<i>}</i>

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

<i>{ MileagePermitDetails</i>
VIN
VINStatus



Interface Control Document

CurrentMileagePermitStartOdometerValidity
CurrentMileagePermitEndOdometerValidity
LastOdometerReading
DateofLastOdometerReading
LastOfficialOdometerReading
DateofLastOfficialOdometerReading

Include one of the following block of code for every permit purchased during the period.

```

{ MileagePermitsPurchased
  MileagePermitLength
  MileagePermitCharge
}
}
    
```

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

```

{ OdometerChargeDetails
  VIN
  VINStatus
  OdometerChargeStartOdometer
  OdometerChargeDateofReconcilliationReading
  LastOdometerReading
  DateofLastOdometerReading
  LastOfficialOdometerReading
  DateofLastOfficialOdometerReading
  MileagePaidinPeriod
  ChargeforMileagePaidinPeriod
  FuelTaxCreditsforMileagePaidinPeriod
}
}
    
```



Interface Control Document

3.4.2. VIN Manual Methods Summary Report Definitions

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



Interface Control Document

Data Element	Meaning
PeriodEndDate	<ul style="list-style-type: none"> • Required • Description: The reporting period end date • Data Type: String • Format: The date is specified in the following form "YYYY-MM-DD" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day • Calculation: N/A • Values: N/A • Special Rules: N/A
PeriodTimePermitRevenue	<ul style="list-style-type: none"> • Required • Description: Total Revenue from all time permits sold in the reporting period • Type: Number • Format: Two decimal places - Dollars and cents [0.01, 0.02, ... , 2.55] • Calculation: Must equal the sum of cost for all Time Permits reported in the message • Values: N/A • Special Rules: N/A
PeriodMileagePermitRevenue	<ul style="list-style-type: none"> • Required • Description: Total Revenue from all mileage permits sold in the reporting period • Type: Number • Format: Two decimal places - Dollars and cents [0.01, 0.02, ... , 2.55] • Calculation: Must equal the sum of cost for all Mileage Permits reported in the message • Values: N/A • Special Rules: N/A
PeriodOdometerChargeRevenue	<ul style="list-style-type: none"> • Required • Description: Total Revenue from all odometer charges paid for in the reporting period • Type: Number • Format: Two decimal places - Dollars and cents [0.01, 0.02, ... , 2.55] • Calculation: Must equal the sum all odometer charge payments reported in the message • Values: N/A • Special Rules: N/A



Interface Control Document

Data Element	Meaning
TimePermitLength	<ul style="list-style-type: none"> • Required • Description: The number of days on a given purchased time permit • Data Type: Number • Format: Integer • Calculation: N/A • Values: N/A • Special Rules: N/A
TimePermitLengthCumulativeNumberPurchased	<ul style="list-style-type: none"> • Required • Description: The cumulative number of time permits of the specified TimePermitLength purchased. • Data Type: Number • Format: Integer • Calculation: N/A • Values: N/A • Special Rules: N/A
TimePermitLengthAverageMilesDriven	<ul style="list-style-type: none"> • Required • Description: The average number of miles driven on time permits of the specified TimePermitLength, as determined by self-reported odometer readings, if available. • Data Type: Number • Format: Integer • Calculation: N/A • Values: N/A • Special Rules: N/A
TimePermitLengthPercentConsumedbyDistance	<ul style="list-style-type: none"> • Required • Description: The percentage distance of time permits of the specified TimePermitLength, as determined by self-reported odometer readings, for the given reporting period. In the California Road Charge Pilot program, the base (100%) values are the following: 10-day permit = 688 miles; 30-day permit = 2,063 miles; 90-day permit = 6,189 miles. • Data Type: Number • Format: Integer • Calculation: distance/base value. • Values: N/A • Special Rules: N/A



Interface Control Document

Data Element	Meaning
<p>TimePermitLengthPercentConsumedbyTime</p>	<ul style="list-style-type: none"> • Required • Description: The percentage of time of time permits of the specified TimePermitLength, as determined by self-reported odometer readings, for the given reporting period. For example, if a participant purchases a new 10-day time permit after 9 days, the percentage is 90%. • Data Type: Number • Format: Integer • Calculation: N/A • Values: N/A • Special Rules: N/A
<p>VIN</p>	<ul style="list-style-type: none"> • Required • Description: The VIN of the vehicle in which the Mileage Meter is installed • Data Type: String • Format: VARCHAR(20) • Calculation: N/A • Values: N/A • Special Rules: N/A
<p>VINStatus</p>	<ul style="list-style-type: none"> • Required • Description: An integer value indicating the reason for the status of a given VIN at the period end date of the report • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ul style="list-style-type: none"> 1 = Pending – If the VIN has been submitted for approval and is not yet approved by the agency 2 = Started - If the VIN is first appearing on the report 3 = Active - if the VIN has previously appeared 4 = Discontinued – Exiting program this reporting period and will not appear in a future reporting period unless added again (status 2) 5 = Changing Vehicle Information – information about the vehicle is changing, but vehicle (VIN) remains the same 6 = Swapping vehicle – VIN has just changed; new vehicle in place • Special Rules: Only statuses 1 and 3 may appear for consecutive reporting periods.



Interface Control Document

Data Element	Meaning
CurrentTimePermitStartDate	<ul style="list-style-type: none"> • Required • Description: The start date of the time permit that the vehicle is using at the time of report compilation • Data Type: String • Format: The date is specified in the following form "YYYY-MM-DD" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day • Calculation: N/A • Values: N/A • Special Rules: N/A
CurrentTimePermitEndDate	<ul style="list-style-type: none"> • Required • Description: The end date of the time permit that the vehicle is using at the time of report compilation • Data Type: String • Format: The date is specified in the following form "YYYY-MM-DD" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day • Calculation: N/A • Values: N/A • Special Rules: N/A
TimePermitCharge	<ul style="list-style-type: none"> • Required • Description: The charge for the given time permit • Type: Number • Format: Two decimal places - Dollars and cents [0.01, 0.02, ... , 2.55] • Calculation: N/A • Values: N/A • Special Rules: N/A
CurrentMileagePermitStartOdometerValidity	<ul style="list-style-type: none"> • Required • Description: The value of the odometer when the mileage permit that the vehicle is using at the time of report compilation was activated • Type: Number • Format: Six-digit odometer reading "XXX,XXX" • Calculation: N/A • Values: N/A • Special Rules: N/A



Interface Control Document

Data Element	Meaning
CurrentMileagePermitEndOdometerValidity	<ul style="list-style-type: none"> • Required • Description: The value of the odometer at the end of the mileage permit that the vehicle is using at the time of report compilation • Type: Number • Format: Six-digit odometer reading "XXX,XXX" • Calculation: Start Odometer reading + miles in current permit • Values: N/A • Special Rules: N/A
LastOdometerReading	<ul style="list-style-type: none"> • Required • Description: The value of the last odometer reading that was provided for the vehicle (either official or self-reported reading) • Type: Number • Format: Six-digit odometer reading "XXX,XXX" • Calculation: N/A • Values: N/A • Special Rules: N/A
DateofLastOdometerReading	<ul style="list-style-type: none"> • Required • Description: The date of report of the last odometer reading • Data Type: String • Format: The date is specified in the following form "YYYY-MM-DD" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day • Calculation: N/A • Values: N/A • Special Rules: N/A
LastOfficialOdometerReading	<ul style="list-style-type: none"> • Required • Description: The value of the last odometer reading that was provided for the vehicle (official reading only) • Type: Number • Format: Six-digit odometer reading "XXX,XXX" • Calculation: N/A • Values: N/A • Special Rules: N/A



Interface Control Document

Data Element	Meaning
DateofLastOfficialOdometerReading	<ul style="list-style-type: none"> • Required • Description: The date of report of the last official odometer reading • Data Type: String • Format: The date is specified in the following form "YYYY-MM-DD" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day • Calculation: N/A • Values: N/A • Special Rules: N/A
MileagePermitLength	<ul style="list-style-type: none"> • Required • Description: The number of miles on a given purchased mileage permit • Data Type: Number • Format: Integer • Calculation: N/A • Values: N/A • Special Rules: N/A
MileagePermitCharge	<ul style="list-style-type: none"> • Required • Description: The charge for the given mileage permit • Type: Number • Format: Two decimal places - Dollars and cents [0.01, 0.02, ... , 2.55] • Calculation: N/A • Values: N/A • Special Rules: N/A
OdometerChargeStartOdometer	<ul style="list-style-type: none"> • Required • Description: The value of the vehicle's odometer at the reading used for the last reconciliation (payment) • Type: Number • Format: Six-digit odometer reading "XXX,XXX" • Calculation: N/A • Values: N/A • Special Rules: N/A



Interface Control Document

Data Element	Meaning
OdometerChargeDateofReconciliationReading	<ul style="list-style-type: none"> • Required • Description: The date of the official odometer reading upon which the last odometer charge payment was based • Data Type: String • Format: The date is specified in the following form "YYYY-MM-DD" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day • Calculation: N/A • Values: N/A • Special Rules: N/A
MileagePaidinPeriod	<ul style="list-style-type: none"> • Required • Description: The number of miles paid for during the current period • Data Type: Number • Format: Integer • Calculation: N/A • Values: Remains zero (0) except in periods in which the participant pays for an odometer charge • Special Rules: N/A
ChargeforMileagePaidinPeriod	<ul style="list-style-type: none"> • Required • Description: The charge for the given mileage permit • Type: Number • Format: Two decimal places - Dollars and cents [0.01, 0.02, ... , 2.55] • Calculation: (MileagePaidinPeriod) x (per-mile rate) • Values: N/A • Special Rules: N/A
FuelTaxCreditsforMileagePaidinPeriod	<ul style="list-style-type: none"> • Required • Description: The fuel tax credits on the charge for the given mileage. • Type: Number • Format: Two decimal places - Dollars and cents [0.01, 0.02, ... , 2.55] • Calculation: (MileagePaidinPeriod) / (vehicle fuel efficiency) x (fuel tax credit rate) • Values: N/A • Special Rules: N/A

3.5. Errors and Events Report

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



Interface Control Document

3.5.1. Errors and Events Report Pseudocode

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

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

{ EEMDevices
VIN
MRDID
CertID

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

{ EEMDetails
ErrorEventDate
ErrorEventCode
TotalMilesOnDate
}

}
}

3.5.2. Errors and Events Report Definitions

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



Interface Control Document

Data Element	Meaning
TransmittedTimestamp	<ul style="list-style-type: none"> • Required • Description: Timestamp provided by transmitting entity when message sent • Data Type: String • Format: The date / time is specified in the following form "YYYY-MM-DDT hh:mm:ss" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day ○ T indicates the start of the required time section ○ hh indicates the hour ○ mm indicates the minute ○ ss indicates the second • Calculation: N/A • Values: N/A • Special Rules: UTC
PeriodStartDate	<ul style="list-style-type: none"> • Required • Description: The date of start of the reporting period for the data file • Data Type: String • Format: The date is specified in the following form "YYYY-MM-DD" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day • Calculation: N/A • Values: N/A • Special Rules: N/A
PeriodEndDate	<ul style="list-style-type: none"> • Required • Description: The date of end of the reporting period for the data file • Data Type: String • Format: The date is specified in the following form "YYYY-MM-DD" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day • Calculation: N/A • Values: N/A • Special Rules: N/A
VIN	<ul style="list-style-type: none"> • Required • Description: The VIN of the vehicle in which the Mileage Meter is installed • Data Type: String • Format: VARCHAR(20) • Calculation: N/A • Values: N/A • Special Rules: N/A



Interface Control Document

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



Interface Control Document

Data Element	Meaning
<p>ErrorEventCode</p>	<ul style="list-style-type: none"> • Required • Description: Coding of each error or event that occurred for the given Mileage Meter or VIN on the given date when the error was detected by the Mileage Meter or the Account Management • Data Type: Number • Format: Integer • Calculation: N/A • Values: <p>From Mileage Meter Health code:</p> <ol style="list-style-type: none"> 1. Low Voltage 2. Anomalies in monitored vehicle functions and parameters which could compromise the collection and reporting of road charge data (e.g., MIL on - Check Engine light) 3. Storage full 4. Disconnected from vehicle 5. Connected to new vehicle (note that this MRDHealth signal should always be generated during first installation) 6. Vehicle interface communications failure 7. Location data degraded [Mileage Meter with general location only] 8. Incorrect date/time (conflict between date/time from vehicle interface and from wireless communications) 9. Software resets 10. Software updates 11. Degraded mileage data 12. Missed mileage 13. Inconsistent mileage data (between multiple raw data sources) 14. Mobile App failure (other than faults indicated above in 9-13) 15. Vehicle telematics interface failure (other than faults indicated above in 9-13) 16. Vehicle Failure preventing accurate recording of mileage data 17. Vendor-specific <p>Generated at the Account Management Subsystem:</p> <ol style="list-style-type: none"> 100. No message received from Mileage Meter 101. Unreadable Message from Mileage Meter / Checksum failure 102. MessageIDs from Mileage Meter not correctly incrementing 103. VIN - Mileage Meter ID mismatch 104. Date/time not increasing from last message 105. Accumulated Mileage decreased from last message 106. New total mileage does not equal sum of mileage in zones 107. InvalidRule ID ("Zone") <ul style="list-style-type: none"> • Special Rules: Any additional error/event codes will be determined by Agency



Interface Control Document

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

3.6. Account and VIN Update Report

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

3.6.1. Account and VIN Update Report Pseudocode

{ *AccountAndVINUpdateMessage*

AMID TransmittedTimestamp

Repeat for each day being reported.

{ *AVMDetails*

ReportDate

{ *AVMAccountDetails*

The following block of code is the Account record. Include one for each Account registered with the account manager.

{ <i>AVMVINDetails</i>
VehicleActivationCode
AccountStatus
AccountFirstName
AccountMiddleName
AccountLastName
MailingAddressLine1
MailingAddressLine2
MailingAddressCity
MailingAddressState
MailingAddressPostalCode
MailingAddressCounty



Interface Control Document

MailingAddressCountry
CompanyName
AccountEmail
AccountPhone
PreferredContactMethod
AccountCloseDate
AMCustomerNumber

The following block of code is the VIN record. Include one for each VIN registered with the account .

<i>{ AVMVINDetails</i>
VIN
ResidentialAddressLine1
ResidentialAddressLine2
ResidentialAddressCity
ResidentialAddressState
ResidentialAddressPostalCode
ResidentialAddressCounty
ResidentialAddressCountry
VehicleEPARating
VehicleMake
VehicleModel
VehicleYear
LicensePlate
MRDID
CertID
<i>{ MRDConfigVersion</i>
HWModel
HWMainRelease
HWSubRelease
SWMainRelease
SWSubRelease
MapMainRelease



Interface Control Document

MapSubRelease
}
FuelUseMethod
VINStatus
VINStatusDate
VINExitReason
VINClass
ProgramEsignTime
ProgramEsignVersion
BeginningOdometer
EndingOdometer
VINExitDate
}

}
}
}

3.6.2. Account and VIN Update Definitions

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



Interface Control Document

Data Element	Meaning
TransmittedTimestamp	<ul style="list-style-type: none"> • Required • Description: Timestamp provided by transmitting entity when message sent • Data Type: String • Format: The date / time is specified in the following form • "YYYY-MM-DDT hh:mm:ss" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day ○ T indicates the start of the required time section ○ hh indicates the hour ○ mm indicates the minute ○ ss indicates the second • Calculation: N/A • Values: N/A • Special Rules: UTC
ReportDate	<ul style="list-style-type: none"> • Required • Description: The date of the report submission • Data Type: String • Format: The date is specified in the following form "YYYY-MM-DD " where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day • Calculations: N/A • Values: N/A • Special Rules: N/A
VehicleActivationCode	<ul style="list-style-type: none"> • Required • Description: Alphanumeric User ID (provided by agency) • Data Type: String • Format: VARCHAR(5) • Calculation: N/A • Values: N/A • Special Rules: N/A



Interface Control Document

Data Element	Meaning
AccountStatus	<ul style="list-style-type: none"> • Required • Description: An integer value indicating the compliance status of the account for the reporting period. • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ul style="list-style-type: none"> 1 = New Account 2 = Existing Account 3 = Changing Account Information (Existing Account updating any account-level field) 4 = Account Closing • Special Rules: Statuses 1 and 4 should only appear for one reporting period. After an account has dropped (status 4), if the account holder wants to open up a new account, it must appear as status 1.
	<ul style="list-style-type: none"> • Required • Description: The VIN of the vehicle in which the Mileage Meter is installed • Data Type: String • Format: VARCHAR(20) • Calculation: N/A • Values: N/A • Special Rules: N/A
AccountFirstName	<ul style="list-style-type: none"> • Required • Description: The first name of the account holder • Data Type: String • Format: VARCHAR(20) • Calculation: N/A • Values: N/A • Special Rules: N/A
AccountMiddleName	<ul style="list-style-type: none"> • Required • Description: The middle name of the account holder • Data Type: String • Format: VARCHAR(20) • Calculation: N/A • Values: N/A • Special Rules: N/A
AccountLastName	<ul style="list-style-type: none"> • Required • Description: The last name of the account holder • Data Type: String • Format: VARCHAR(36) • Calculation: N/A • Values: N/A • Special Rules: N/A



Interface Control Document

Data Element	Meaning
MailingAddressLine1	<ul style="list-style-type: none"> • Required • Description: The first line of the street of the address of the account holder • Data Type: String • Format: VARCHAR(36) • Calculation: N/A • Values: N/A • Special Rules: N/A
MailingAddressLine2	<ul style="list-style-type: none"> • Required • Description: The second line of the street of the address of the account holder • Data Type: String • Format: VARCHAR(36) • Calculation: N/A • Values: N/A • Special Rules: N/A
MailingAddressCity	<ul style="list-style-type: none"> • Required • Description: The city of the address of the account holder • Data Type: String • Format: VARCHAR(30) • Calculation: N/A • Values: N/A • Special Rules: N/A
MailingAddressState	<ul style="list-style-type: none"> • Required • Description: The U.S. state of the address of the account holder • Data Type: String • Format: VARCHAR(2) • Calculation: N/A • Values: N/A • Special Rules: N/A
MailingAddressPostalCode	<ul style="list-style-type: none"> • Required • Description: The U.S. postal code of the address of the account holder • Data Type: String • Format: VARCHAR(10) • Calculation: N/A • Values: N/A • Special Rules: 5 characters required, additional 4 characters optional



Interface Control Document

Data Element	Meaning
MailingAddressCounty	<ul style="list-style-type: none"> • Optional • Description: The county of the address of the account holder • Data Type: String • Format: VARCHAR(20) • Calculation: N/A • Values: N/A • Special Rules: Account Manager not required to capture or derive county from address – if no county available, omit field from report.
MailingAddressCountry	<ul style="list-style-type: none"> • Optional • Description: The country of the address of the account holder • Data Type: String • Format: VARCHAR(20) • Calculation: N/A • Values: N/A • Special Rules: Account Manager not required to capture or derive country from address – if no country available, omit field from report.
ResidentialAddressLine1	<ul style="list-style-type: none"> • Required • Description: The first line of the street the vehicle is registered to • Data Type: String • Format: VARCHAR(36) • Calculation: N/A • Values: N/A • Special Rules: N/A
ResidentialAddressLine2	<ul style="list-style-type: none"> • Required • Description: The second line of the street of the address the vehicle is registered to • Data Type: String • Format: VARCHAR(36) • Calculation: N/A • Values: N/A • Special Rules: N/A
ResidentialAddressCity	<ul style="list-style-type: none"> • Required • Description: The city of the address the vehicle is registered to • Data Type: String • Format: VARCHAR(30) • Calculation: N/A • Values: N/A • Special Rules: N/A



Interface Control Document

Data Element	Meaning
ResidentialAddressState	<ul style="list-style-type: none"> • Required • Description: The U.S. state of the address the vehicle is registered to • Data Type: String • Format: VARCHAR(2) • Calculation: N/A • Values: N/A • Special Rules: N/A
ResidentialAddressPostalCode	<ul style="list-style-type: none"> • Required • Description: The U.S. postal code of the address the vehicle is registered to • Data Type: String • Format: VARCHAR(10) • Calculation: N/A • Values: N/A • Special Rules: 5 characters required, additional 4 characters optional
ResidentialAddressCounty	<ul style="list-style-type: none"> • Optional • Description: The county of the address the vehicle is registered to • Data Type: String • Format: VARCHAR(20) • Calculation: N/A • Values: N/A • Special Rules: Account Manager not required to capture or derive county from address – if no county available, omit field from report.
ResidentialAddressCountry	<ul style="list-style-type: none"> • Optional • Description: The country of the address the vehicle is registered to • Data Type: String • Format: VARCHAR(20) • Calculation: N/A • Values: N/A • Special Rules: Account Manager not required to capture or derive country from address – if no country available, omit field from report.
CompanyName	<ul style="list-style-type: none"> • Required • Description: The company name if it is the registered owner of the vehicle • Data Type: String • Format: VARCHAR(50) • Calculation: N/A • Values: N/A • Special Rules: If no Company Name available, set this field value to blank



Interface Control Document

Data Element	Meaning
AccountEmail	<ul style="list-style-type: none"> • Required • Description: The e-mail address of the account holder • Data Type: String • Format: VARCHAR(100) • Calculation: N/A • Values: N/A • Special Rules: N/A
AccountPhone	<ul style="list-style-type: none"> • Required • Description: The phone number of the account holder • Data Type: String • Format: VARCHAR(22) • Calculation: N/A • Values: N/A • Special Rules: N/A
PreferredContactMethod	<ul style="list-style-type: none"> • Required • Description: Preferred contact method for the Pilot Participant • Data Type: String • Format: VARCHAR(20) • Calculation: N/A • Values: <ul style="list-style-type: none"> ○ E-Mail ○ Text message ○ Phone ○ (Other values as assigned by Agency) • Special Rules: N/A
VehicleEPARating	<ul style="list-style-type: none"> • Required • Description: Combined MPG rating for the vehicle • Data Type: Number • Format: One decimal place - Number in tenth of miles [0,1.1,2.1...999.9] • Calculation: N/A • Values: N/A • Special Rules: See the agency Business Requirements Document for correct EPA values for this field
VehicleMake	<ul style="list-style-type: none"> • Required • Description: The Make of the vehicle associated with the VIN • Data Type: String • Format: VARCHAR(5) • Calculation: N/A • Values: N/A • Special Rules: N/A



Interface Control Document

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



Interface Control Document

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



Interface Control Document

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



Interface Control Document

Data Element	Meaning
VINStatus	<ul style="list-style-type: none"> • Required • Description: Reason for the status of a given VIN at the period end date of the report • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ul style="list-style-type: none"> 1 = Pending – If the VIN has been submitted for approval and is not yet approved by the agency 2 = Started – If the VIN is first appearing on the report 3 = Active – if the VIN has previously appeared 4 = Discontinued – Exiting program this reporting period and will not appear in a future reporting period unless added again (status 2) 5 = Changing Vehicle Information – information about the vehicle is changing, but vehicle (VIN) remains the same 6 = Swapping vehicle – VIN has just changed; new vehicle in place • Special Rules: Only statuses 1 and 3 may appear for consecutive reporting periods.
VINStatusDate	<ul style="list-style-type: none"> • Required • Description: date upon which VIN status (new or deleted) was effective • Data Type: String • Format: The date is specified in the following form "YYYY-MM-DD" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day • Calculation: N/A • Values: N/A • Special Rules: N/A
VINExitReason	<ul style="list-style-type: none"> • Required • Description: The reason given by the driver for exiting the given Account Manager • Data Type: String • Format: VARCHAR(100) • Calculation: N/A • Values: N/A • Special Rules: If account still active, set this field value to blank



Interface Control Document

Data Element	Meaning
VINClass	<ul style="list-style-type: none"> • Required • Description: An integer value indicating the weight class of the vehicle • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ul style="list-style-type: none"> 1 = Light Vehicle (<10,000 pounds) – passenger cars and Class 1-2 trucks 2 = Medium trucks (10-26,000 pounds) – Class 3-6 trucks 3 = Heavy trucks (>26,000 pounds) – Class 7-8 trucks • Special Rules: N/A
ProgramEsignTime	<ul style="list-style-type: none"> • Required • Description: Date and Time program terms were accepted • Data Type: String • Format: The date / time is specified in the following form "YYYY-MM-DDT hh:mm:ss" where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day ○ T indicates the start of the required time section ○ hh indicates the hour ○ mm indicates the minute ○ ss indicates the second • Calculations: N/A • Values: N/A • Special Rules: N/A
ProgramEsignVersion	<ul style="list-style-type: none"> • Required • Meaning: Description of the version of the agreement(s) and process used to sign the volunteer agreement • Data Type: String • Format: VARCHAR(10) • Calculations: N/A • Values: N/A • Special Rules: N/A
BeginningOdometer	<ul style="list-style-type: none"> • Required, If not provided set value to zero • Description: Initial odometer reading of the vehicle • Data Type: Number • Format: One decimal place - Miles to nearest tenth of a mile [0,0.1,0.2, 10,000.0] • Calculation: N/A • Values: N/A • Special Rules: N/A



Interface Control Document

Data Element	Meaning
EndingOdometer	<ul style="list-style-type: none"> • Required (if VINStatus is 'discontinued') • Description: Odometer reading when the VIN exits the program • Data Type: Number • Format: One decimal place - Miles to nearest tenth of a mile [0,0.1,0.2, 10,000.0] • Calculation: N/A • Values: N/A • Special Rules: If account is still active, set this field value to 0
VINExitDate	<ul style="list-style-type: none"> • Required • Description: Date a vehicle (VIN) exited a Pilot Participant account • Data Type: String • Format: The date is specified in the following form "YYYY-MM-DD " where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day • Calculation: N/A • Values: N/A • Special Rules: If account still active, set this field value to blank
AccountCloseDate	<ul style="list-style-type: none"> • Required (when account is closed) • Description: Date account is closed with the account manager • Data Type: String • Format: The date is specified in the following form "YYYY-MM-DD " where: <ul style="list-style-type: none"> ○ YYYY indicates the year ○ MM indicates the month ○ DD indicates the day • Calculation: N/A • Values: N/A • Special Rules: If account is still active, set this field value to blank
AMCustomerNumber	<ul style="list-style-type: none"> • Required • Description: Account Manager unique reference number to the customer • Data Type: String • Format: VARCHAR(100) • Calculation: N/A • Values: N/A • Special Rules: N/A

3.6.3. Account and VIN Update Return Data Pseudocode

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



Interface Control Document

- ▶ 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

```

{ AccountAndVINUpdateResult
  { AVMRDetails
    VIN
    ApprovalStatus
    DenialReasonCode
    DenialReasonDescription
    AgencyCustomerNumber
    AMCustomerNumber
  }
}
    
```

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



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Data Element	Meaning
DenialReasonCode	<ul style="list-style-type: none"> • Required if status is denied, otherwise not used • Description: Reason for not being allowed in the volunteer program • Data Type: Number • Format: Integer • Calculation: N/A • Values: <ul style="list-style-type: none"> 1 = Over Program limit 2 = Over MPG Category limit (not used in pilot) 3 = Volunteer information does not match owner DMV records (not used in pilot) 4 = Vehicle not registered in California (not used in pilot) 5 = Vehicle already in the program 6 = Ineligible volunteer 7 = Ineligible vehicle <p>Codes can only be assigned by the agency</p> <ul style="list-style-type: none"> • Special Rules: N/A
DenialReasonDescription	<ul style="list-style-type: none"> • Required • Description: Description of why vehicle was denied • Data Type: String • Format: VARCHAR(255) • Calculation: N/A • Values: N/A • Special Rules: N/A
AgencyCustomerNumber	<ul style="list-style-type: none"> • Required • Description: The agency number used to uniquely identify a volunteer • Data Type: Number • Format: Integer • Calculation: N/A • Values: N/A • Special Rules: N/A
AMCustomerNumber	<ul style="list-style-type: none"> • Required • Description: Account Manager unique reference number to the customer • Data Type: String • Format: VARCHAR(100) • Calculation: N/A • Values: N/A • Special Rules: N/A