



SURFACE VEHICLE INFORMATION REPORT

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Heavy-Duty OBD IUMPR Data Collection Tool Process

RATIONALE

This document has been revised to add NOx Binning and GHG Tracking example displays to 5.5.3 and to update regulation references to reflect CARB's November 2022 publication of 13 CCR § 1971.1.

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1. SCOPE

This SAE Information Report describes the collection of IUMPR data required by the heavy-duty onboard diagnostic regulation 13 CCR § 1971.1 (l)(2.3.3), using SAE J1939-defined messages incorporated in a suite of software functions.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

SAE J1939	Serial Control and Communications Heavy-Duty Vehicle Network - Top-Level Document
SAE J1939-14	Physical Layer, 500 kbit/s
SAE J1939-15	Physical Layer, 250 Kbps, Un-Shielded Twisted Pair (UTP)
SAE J1939-21	Data Link Layer
SAE J1939-31	Network Layer
SAE J1939-71	Vehicle Application Layer
SAE J1939-73	Application Layer - Diagnostics
SAE J1939-81	Network Management
SAE J1939DA	J1939 Digital Annex

2.1.2 ATA Publications

Available from American Trucking Association, 80 M Street SE, Suite 800, Washington, DC 20003, www.trucking.org.

TMC RP 1210C	Windows Application Program Interface (API)
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2.1.3 CARB Publications

Available from California Air Resources Board (CARB), 1001 Street, P.O. Box 2815, Sacramento, CA 95812, Tel: 916-322-2990, www.arb.ca.gov.

13 CCR §1971.1	On-Board Diagnostic System Requirements - 2010 and Subsequent Model-Year Heavy-Duty Engines
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2.1.4 GitHub Publications

Available from github.com.

IUMPR Data Collection Tool Project, <https://github.com/Equipment-and-Tool-Institute/iump>

IUMPR User Documentation Help File, <https://github.com/Equipment-and-Tool-Institute/iump>

3. DEFINITIONS

Refer to 13 CCR §1971.1 and SAE J1939 for terms and definitions that are not defined in this document. In the event of conflicting definitions, those in 13 CCR §1971.1 shall take precedence.

4. ABBREVIATIONS

CARB	California Air Resources Board
DM	Diagnostic message
EPA	Environmental Protection Agency
HD	Heavy-duty
IUMPR	In-use monitor performance ratio

Refer to SAE J1939 for other abbreviations not defined in this document.

5. TECHNICAL REQUIREMENTS

5.1 IUMPR Data Collection Process

The IUMPR Data Collection Tool is used for HD vehicles that comply with U.S. EPA and CARB data communications regulations using the SAE J1939 family of standards. The purpose of the tool is the collection and summary of vehicle data for test results, monitor ratios, and monitor completion, using messages that are defined in SAE J1939-73 and SAE J1939DA, as discussed below. The collected data and summaries are then automatically reported in a text file, creating a standardized format for the submission of (I)(2.3.3) data to CARB. This software is distributed using the MIT Software License Model as described by <https://opensource.org/licenses/MIT> and is available from github.com.

The methods and procedures described by the SAE Standards that are referenced in 2.1.1 are incorporated into the software. For example, the data collection tool claims address F9h, as described in SAE J1939-81. The software is intended to be capable of collecting data using both the 250 kbit/s and 500 kbit/s data communication speeds in SAE J1939-15 and SAE J1939-14. Queries for SAE J1939DA and SAE J1939-73 message data are conducted using SAE J1939-21.

5.2 IUMPR Data Collection Tool Overview

The software consists of four principle functions. These functions may be run in sequence during each use of the software. The functions are implemented so that they may be run in alternate orders that are best suited to the driving demonstration cycles planned for the monitor entry conditions of individual tests. The last report contained in any tool output file to be provided to CARB shall be the report from Function E - Collect Test Results. The first report in any tool output file shall be the report from Function B - Generate Vehicle Data Plate.

The output file is verified by the collection tool to provide data from only one vehicle VIN and one unique set of DM19 calibration identification and calibration verification number (CVN). As a function is initiated (see 5.2.2 through 5.2.5), the function verifies that the selected output file matches the VIN, and the calibration identification and CVN match that displayed by the vehicle.

[Figure 1](#) shows an example user interface screen for the IUMPR Data Collection Tool. Each of the key functions is matched to a button that allows the user to select the function for execution.