UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NATIONAL VEHICLE AND FUEL EMISSIONS LABORATORY
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ANN ARBOR, MICHIGAN 48105-2498

OFFICE OF
AIR AND RADIATION

May 5,2006

CISD-06-0 11 (HD)

Dear Manufacturer:

SUBJECT: Manufacturer-Run, Heavy-Duty In-Use Testing Program: Reporting Guidance

Enclosed with this letter is a guidance document addressing procedures for reporting and submitting emissions data collected in the Heavy-Duty In-Use program. This document fulfills the commitment to publish additional reporting details, including the final format, as outlined in the preamble of the June 2005 final rule.

If you have any questions about this guidance, please contact Ms. Khesha Jennings of my staff at (202) 343-9499.

Sincerely,

Karl Simon
Acting Director
Compliance and Innovative Strategies Division

Enclosures

Manufacturer-Run, Heavy-Duty Diesel Engine In-Use Testing Program

Reporting Guidance

I. Purpose

The purpose of this guidance is to outline procedures for preparing and submitting emissions data collected in the Heavy-Duty In-Use Test program. This document will discuss the format and timing of results reported to the EPA as well as records required to be maintained.

11. Background

EPA published a final rule on June 14,2005, which created a manufacturer-run in-use emissions testing program for 2007 and later model year heavy-duty diesel vehicles (with a pilot program scheduled to commence in 2005). The testing program requires engine manufacturers to assess in-use exhaust emissions from heavy-duty diesel vehicles using portable emissions measurement systems during typical operation on the road. Emissions data and other relevant information must be submitted periodically to EPA. This guidance is intended to outline a standardized, electronic reporting format. Manufacturers that want to use a different format must submit a written request with justification.

III. Template

EPA has worked with engine manufacturers to establish a list of reportable data elements for several months. EPA met with representatives of the Engine Manufacturers Association (EMA) and the California Air Resources Board (CARB) in September 2005, to review and finalize data elements. The attached Heavy-Duty In-Use Data Requirements spreadsheet (Attachment 1) reflects decisions that were reached during the meeting and minor changes discussed in subsequent meetings. The spreadsheet (or template) is organized with separate tabs containing program summary, engine family, test results, fuel analyses, rejected vehicle and recordkeeping information.

IV. Data Submission

A. Electronic File Submittal

Information submitted by manufacturers of heavy-duty engines as part of the in-use testing program comes in two forms. The data acquired from a test will be submitted in a text file. This file will include all the different data elements recorded at a frequency of one hertz, such as date, time, altitude, power, pollutant concentration, etc. All of the other information will be submitted in an XML file. Different sections of the XML schema will cover test program information, engine family information, test vehicle information, and test summary information.

The Agency's goal is to ensure the confidentiality of a manufacturer's confidential business information (CBI) while making the in-use test program as transparent and useful to others as possible. After carefully considering how to balance these competing interests, we will

make the following information publicly available: engine family, model, and rating identification; description of test route and test conditions; mass emissions and work performed each at a one hertz interval; emissions results (for each valid NTE event); vehicle pass ratio; and any other information needed to calculate the summary emissions results and the NTE zone for that engine. We will also make available a generic indication as to whether a deficiency or limited testing region (LTR) has been encountered for each second of the test (For a more complete description of deficiencies and LTRs, see Section IV. B.). Information that a manufacturer may designate as CBI will be safeguarded and withheld from public release by the Agency subject to EPA's CBI regulations. The Agency does not intend to include second by second engine speed and torque with test data that is made publicly available. If the EPA receives a request, under the Freedom of Information Act, for manufacturer in-use test records that were not previously released, the agency will notify the manufacturer and then make a final determination of confidentiality according to 40 **CFR** 2.

A manufacturer's representative must establish an account with EPA's Central Data Exchange (CDX) before submitting any files. CDX is EPA's designated channel for accepting electronic information. Procedures for establishing an account will be provided. The only tools required are an internet connection and a browser. The actual file transmittal process is relatively simple. After logging on to one's account the user selects the VERIFY: HD IU Testing option, and then Upload In-Use Data Sets on the next screen. On the Upload Heavy-Duty Diesel In-Use Data From Manufacturer Workstation screen that next appears the user selects the Document Submission Type (new or revised), types the directory path and file name or browses to select the file under Local File for the file to be uploaded, enters Engine family and Model Year applicable to the engine tested and selects the Upload Data Set File button. Only one file may be sent at a time. Files may be compressed before transmitting, but only one file per zipped file. A message will be sent to the user's CDX email account to indicate whether the file was received and validated satisfactorily or what problems were encountered. EPA will send a copy of files submitted through CDX to CARB on physical media (DVDs or CDs) by mail.

B. Deficiencies and Limited Testing Regions

The Agency may decide that an engine complies with the NTE standards even though the manufacturer has not met certain "specific requirements" (see 40 CFR 86.007-11(a)(4)(iv)). The set of operating conditions under which a manufacturer is not responsible for complying with the NTE standards is called a "deficiency." A deficiency may occur under normal conditions and not be acted upon by an emission control strategy, or it may be detected and treated with a strategy. Manufacturers describe deficiencies during the certification process and receive approval from EPA.

If a manufacturer seeks to take advantage of the compliance flexibilities that deficiencies provide, sufficient data must be collected during in-use testing and provided to EPA so that the Agency may independently identify and assess when the conditions of an approved deficiency have been met. During certification, the manufacturer must describe all of the parameters used to detect a deficiency condition. Additionally, if a deficiency is electronically sensed and actively managed, the manufacturer must also describe all of the parameters, threshold values, and interactive logic, if any, used to trigger deficiency software.

The Agency understands that the data necessary to identify whether deficiencies are encountered during in-use testing may not be part of the data stream available to portable emission measurement systems (PEMS). In some cases, special equipment (e.g., "proprietary tools") may be required to extract this data from the Electronic Control Module (ECM). In other cases, auxiliary data acquisition and sensing systems may be required to record deficiency triggering parameters that are not monitored by the ECM or used for engine control. Consequently those parameters will not be part of the data file produced by PEMS.

Nevertheless, and in addition to other required data, manufacturers will submit to EPA all second-by-second data recorded by PEMS during in-use testing, including the data relating to the parameters that could potentially activate or deactivate a deficiency. Further, those manufacturers that utilize proprietary tools and/or auxiliary data acquisition and sensing systems to record deficiency-related data during in-use testing will provide those data as separate files. That data will be formatted (e.g., using date/time stamps that are identical in each file) so that EPA can determine how to properly time align records in the supplemental file with records in the TXT file. EPA will combine the data from these files when analyzing test data.

All NTE events will be evaluated during compliance determinations unless sufficient deficiency information is provided along with test results to warrant the exclusion of data obtained during approved deficiency conditions. EPA anticipates that future technological developments could result in making this deficiency data available through ECMs beginning in 2010. In any case, any second-by-second test result that a manufacturer claims is associated with operation in an approved deficiency must be properly identified as such in the data file submitted to EPA.

In the event that EPA wishes to conduct its own in-use testing, manufacturers will provide EPA with any proprietary information and/or tools needed to extract any deficiency triggering parameters available from the ECM within 60 days. In addition, engine manufacturers are expected to assist EPA with acquiring any other deficiency trigger parameters that are not available either through the PEMS or ECM.

Manufacturers may request approval for a limited testing region (LTR) at the time of engine certification. (See 40 CFR 86.1370-2007(b)(7)). The LTR is an area of engine speed and brake torque under the torque curve of the engine. The area defined must generally be elliptical or rectangular, be defined by speed and load, and share a portion of its boundary with one of the boundaries of the NTE zone. EPA must be able to independently identify when the engine is operating in an LTR so that NTE sampling periods in which operation within an LTR constitutes more that 5.0% of the time-weighted operation within the entire sampling period can be excluded in making compliance determinations. EPA understands that PEMS will store the criteria for LTRs, and identify in the data file those second-by-second records, which are part of the LTR.

C. Format for Information Submitted for Approval During Certification

LTRs must be defined and approved at the time of certification. Manufacturers may present the LTR graphically as a shaded portion of the NTE Zone. Such visual presentations must be accompanied by equations (as a function of load and speed) and intersection points that

describe the region. Deficiencies must also be approved at the time of certification. Since defining deficient operating conditions is substantially more complicated than LTRs, EPA will work with EMA to develop a standard format to be used in 2007.

D. Notification for Voluntary Testing and Failures

In order for EPA to be aware of all testing conducted on designated engine families and to prevent a situation where voluntary testing could be used to screen for passing results, manufacturers must submit notification describing any voluntary vehicle /engine testing conducted with PEMS. Specifically 40 CFR 86.1920(d) requires that manufacturers inform EPA of testing conducted on engines within an EPA-designated engine family between the time the family is designated for testing until all of the results associated with that family are reported. The notification, to be submitted no later than the final reports, must clearly describe the purpose of the voluntary testing and how it is unrelated to the vehicle recruitment, screening, and testing conducted under the manufacturer-run, in-use testing program. In addition, manufacturers must maintain all test data and other relevant information associated with voluntary testing as described in the recordkeeping section below.

In addition to the vehicle pass/fail determination to be reported in the NTE Event summary section of the template, manufacturers are required to notify EPA "quickly" when certain individual vehicles fail the vehicle-pass criteria. Electronic notification is required within 15 days if initial reviews of test data indicate that three engines in Phase 1 testing have failed to comply with the vehicle-pass criteria. Similarly, notification is required within 3 days if the initial review of any engine in Phase 2 testing fails the vehicle-pass criteria (40 CFR 86.1920(e)).

E. Other Notifications/Reports

Since neither voluntary testing nor failure notifications are reports that will routinely be submitted by all manufacturers, they are not included in the Heavy-Duty In-Use Data Requirements spreadsheet. Instead manufacturers may send notification by email to inuse@epa.gov. Please note that the attached spreadsheet includes data elements for reporting incomplete or invalid tests and rejected vehicles.

V. Recordkeeping

Manufacturers are required to maintain certain records as outlined in 40 CFR 86.1925 for five years after testing for a selected family is completed. Recordkeeping items include: a copy of the report that is submitted to EPA, the procurement and vehicle selection process, pre-test maintenance and adjustments. In addition, during the September 2005 EPA/EMA/CARB meeting, agreement was reached to move several reportable items to the recordkeeping tab of the template. Those items should be maintained with the regulatory required records for five years.

VI. Report Submission Timing

For the 2005 pilot program, EPA will delay the start of the 18-month testing and reporting period until the issuance of this guidance. Engine family selections for the 2006 pilot

and the 2007 enforceable in-use testing programs will be made in December of each year. Selections for the 2008 program will be made in October of 2008. The Agency will typically make designations for subsequent test programs by June 30 of each calendar year. Results of testing will be due 18 months after manufacturers are notified of engine family designations as required by the provisions of 40 CFR 86.1905(d) except for 2007. For the first year of the fully enforceable program, an additional ***6*** months will be granted for testing to be completed and reported. Manufacturers may submit reports for individual engine families within 30 days after the test is completed, or include them in reports submitted 30 days after the end of each quarter. When submitting quarterly reports, only include tests completed in the previous quarter. As described in Section IV. D., more immediate notification is required when initial reviews of data indicate that engines have failed to comply with the vehicle-pass criteria.

Heavy Duty Diesel Engine In Use Testing Data Reporting Requirements

Section 2 IS program information in XML format To be submitted quarterly 01 as required

Section 3 is general engine family information applicable to all the engine models and codes, in an XML file It need be submitted only once

Section 4 is test information Section 4 a is test vehicle, test engine, test background, a test summary information Section 4 b is 1hz data To be submitted after each test

2. General program information

Section 2 is program information in XML format To be submitted quarterly or as required

Data Element Number	Plain English Name	Data Element Name	Data Element Definition	Reporting Frequency	Required	Comments	Reg Reference	Example	Format	Validation
1	Engine Family	Eng_Fam	Engne Family being tested	Once per engine family	Y		86 1920(b)(1)		A,12	No lower case letters
2	Date Selected	Date_Selected	Note the date of the letter indicating EPA selected this engine family to be tested in use.	Once per engine family	Y		86 1920(b)(3)		YYYYMMDD	Must be later than August 2005, earlier than current
25	Recruitment Efforts	Recruit_Efforts	Describe how you recruited vehicles. Describe how you used any criteria or thresholds to narrow your search or to screen individual vehicles.	Once per engine family	Y	Questions lo be answered by this data element will be added to the guidance	86 1920(b)(1)		A,2000	
26	Explanation of any Incomplete Tests	Test_Incompl_Explan	A description d the reasons fainvalidating, voiding or otherwise not completing tests	Once per engine family	Y	Questions to be answered by this dah element will be added to the guidance	86 1920(c)(6)		A, 200	

. General Engine Family Information

ection 3 is general engine family information applicable to all the engine models and codes in an XML file It need be submitted only once.

Data Element Number	Plain English Name	Data Element Name	Data Element Definitior	Reporting Frequency	Required	Comments	Rea Reference	Example	Format	Validatior
asic Information -Sent once per Engine Family										
1	Engine Family	Eng_Fam	The identifier assigned per 86 077 2	Once per engine family (would apply to every vehicle tested for that engine family)	Y	Identification information	86 1920(c)(3)(i)	5XYZ0465HGY	A12	No lower case letters
2	Date Selected	Date_Selected	Note the date of the letter from EPA in which this engine family was selected to be tested in use	Once per engine family	Y	Identification information	86 1920(b)(3)		YYYYMMDD	Must be late than August 2005, earlier than current date.
40	Engine Model Year	Eng_MY	Model year of this engine family	Once per engine family	Y	Needed fw determination of application of some limits		2007, 2008, etc	A,4	2005' or late
42	Ambient Operating Region	Amb_Oper_Region	Ambient operating region in which the NTE limits apply to this engine family Temperature limited (T) or not temperature limited (N)	Once per engine family (would apply to every vehicle tested fw that engine family)	Y	Needed for determinahon of application of some limits	[86 007-11(a)(4)(ii)]	T, N	A,1	
43	EPA Manufacturer Code	Mfr_Code	The 3-letter code assigned to each manufacturer of EPA-certified engines	Once per engine family (would apply to every vehicle tested for that engine family)	V	Identification information		ABC	A,3	No lower case letters
44	CARB Manufacturer Code	ARB–Code	The 4-character code used by the California Air Resources Board to identify a manufacurer	Once per engine family (would apply to every vehicle tested for that engine family)	V	Identification information		DG3T	A,4	
120	EGR Equipped?	EGR	An indication of whether this engine is equipped with Exhaust Gas Recirculation Permitted values Y N	Once per engine family	Y		86.1912(b)	Y, N	A,1	
121	Regeneration Signal Sent?	Regeneration	An indication of whether this engine is equipped with emission controls that include discrete regeneration events started by ai electronic signal Permitted values Yes, No	Once per engine family	Y		[86.1370-2007(d)(2)]	Y, N	A,1	
122	Aftertreatment Device for NMHC Reduction Installed?	NMHC_AT_Device	An indication of whether this engine is equipped mth an after treatment device to reduce NMHC Permitted values Yes, No	Once per engine farnly	Y		[86 1370-2007(g)]	Y, N	A,1	
123	Aftertreatment Device for NOx Reduction Installed7	NOx_AT_Device	An indication of whether this engine is equipped mth an after treatment device to reduce NOx Permitted values Yes. No	Once per engine family	Y	Note The 'NTE Threshold" for all pollutants is the transient-testing standard times a multiplier, plus the in-use compliance margin plus the accuracy margin [(trans std*mult) + CM +AM]	[86 1370-2007(g)]	Y, N	A,1	
tandards Information										
69	NMHC Transient Test Standard–	NMHC_Trans_Test_Std	The NMHC standard (or FEL) applicable to transient testing for this model year and this engine family. in g/bhp-hr	Once per engine family	Y		[86.007-11(a)(1)(ii)(A)]		N(4,2)	0.0 to 1.0
70	NMHC NTE Standard Multiplier	NMHC_NTE_Std_Mult	The number which the NMHC transient testing standard is multiplied by to get the NTE standard for NMHC Choices are 1 25 or 1 5	Once per engine family	Y		[86.007-11(a)(4)(i)(A)]	1 25 or 1 5	N(4,2)	
71	NMHC NTE Accuracy Margin	NMHC_NTE _Acc_Margin	The correction factor determined from the portable emission monitoring system (PEMS) study referred to in the rule, which adjusts the NMHC NTE standard for accuracy 0 17 until the study is complete, in g/bhp-hr	Once per engine family	V		[86 1912(a), 1935(a)]		N(4,2)	- 1 0 to 1 0
72	NMHC NTE Threshold	NMHC_NTE Thresh	The result of (NMHC transient testing standard* NMHC multiplier) + NMHC accuracy margin. in g/bhp-hr	Once per engine family	Y		86 1920(b)(5)(i)		N(4,2)	0.0 to 5.0
73	CO Transient Test Standard	CO_Trans_Test_Std	The CO standard (or FEL) applicable to translent testing fw this model year and this engine family. in g/bhp-hr	Once per engine family	Y		[86.007-11(a)(1)(iii)]		N(4,2)	o o t o s o o
74	CO NTE Standard Multiplier	CO_NTE _Std_Mult	The number which the CO transient testing standard is multiplied by to get the NTE standard for CO Initially 1 25	Once per engine family	Y		[86.007-11(a)(4)(i)(D)]	1 25	N(4,2)	
75	CO NTE Accuracy Margin	CO_NTE _Acc_Margin	The correction factw. determined from the portable emission monitoring system (PEMS) study referred to in the rule, which adjusts the CO NTE standard for accuracy 0 60 until the Study is complete. in g/bhp hr	Once per engine family	Y		(86.1912(a)(3)(ii), 1935(a))		N(4,2)	-50.0 lo 50 0
76	CO NTE Threshold	CO_NTE Thresh	Cakulated CO NTE threshold The result of (CO transient testing standard* CO multiplier) + CO accuracy margin. in g/bhp hr	Once per engine family	Y		86.1920(b)(5)(i)		N(4,2)	0.0 to 100
77	NOx Transient Test Standard	NOX_Trans_Test_Std	The NOX standard (or FEL) applicable to transient testing for this model year and this engine family in g/bhp-hr	Once per engine family	Y		[86.007-11(a)(1)(i)(A)]		N(4,2)	0 0 to 20 0
78	NOx NTE Standard Type	NOX_Std_Type	Indicate whether this engine family is certified to the standard emission limit or to a Family Emission Limit (FEL)	Once per engine family	Y		(86.1912(f)(2))	Normal (N) or FEL (F)	A,1	

	79	NOx NTE Standard Multiplier	NOX_NTE_Std_Mult	The number which the NOX transient tesbng standard is multiplied by to get the NTE standard for NOX Choices are 1.25 or 1.5	Once per engine family	Y		[86007-11(a)(4)(i)]	1.25 or 1 5	N(4,2)	
	81	NOx NTE Accuracy Margin	NOX_NTE_Acc_Margin	The correction factor determined from the portable emission monitoring system (PEMS) study referred to in the rule which adjusts the NOx NTE standard for accuracy 0 50 until the study is complete in g/bhp hr	Once per engine famly	Y		(86.1912(a)(3)(iii), 1935(a))		N(4,2)	-2 0 to 5 9
	82	NOx NTE Threshold	NOX_NTE Thresh	Calculated NOX NTE threshold The result of (N0x transient testing standard * N0x multiplier) + N0x accuracy margin + N0x compliance margin. in g/bhp-hr	Once per engine fanuiy	Y		86.1920(b)(5)(i)		N(4,2)	0.0 to 20.0
	83	PM Transient Test Standard	PM_Trans_Test_Std	The PM standard (or FEL) applicable to transient testing for this model year and this engine family in g/bhp-hr	Once per engine family	Y		[86.007-11(a)(1)(iv)(A)]		N(4,2)	0 0 to 5.0
	84	PM NTE Standard Multiplier	PM NTE Std Mult	The number which the PM transient tessng standard is multipiied by lo get the NTE standard for PM Value of 1 5	Once per engine famly	Y		[86.007-11(a)(4)(i)(C)]	1.5	N(4,2)	
	86	PM NTE Accuracy Margin	PM NTE Acc__Margin	The correction factor, determined from the portable emission monitoring system (PEMS) study referred to in the rule, whch adjusts the PM NTE standard for accuracy 0 10 until the study is complete, in g/bhp-hr	Once per engine family	Y		(86.1912(a)(3)(iv), 1935(a))		N(4,2)	-2 0 to 2 0
	87	PM NTE Threshold	PM_NTE_Thresh	Calculated PM NTE threshold The result of (PM transient tesbng Standard * PM multiplier) + PM accuracy margin in g/bhp-hr	Once per engine family	Y		86 1920(b)(5)(i)		N(4,2)	0.0 to 10.(
	45	NTE LTR - Type of Description	NTE_LTR_desc_type	Type of description used to define a manufacturer defined region of speeds and torques within the M E control area generally rectangular or elliptical in shape which must share some portion of its boundary with the outside limits of the NTE zone. and approved by agencies during certification, where NTE compliance tessng is not applicable if the vehicle were to stay in that region over 5% of the time weighted operation Choices are P - Polynomial or, or X (X Y) Coordinates	Once per engine family or subclass (would apply to every vehicle tested for that family or subclass)	if certified with a limited tesbng region (LTR)	1 Need either a polynomial to define the ellipse, or (x,y) coordinates	86 1370-07(b)(7), 86 1920(b)(5)(ii)	P. X	A,1	
	46	NTE LTR - Polynomial	NTE_LTR_polynomial	Polynomial equation incorporating engine speed and torque that defines the NTE limited testing region (LTR) defined in 86.1370-07(b)(7).	Once per engine family or subclass (would apply to every vehicle tested for that family or subclass)	Y if P is selected aboue.	Expand the into coefficient, x x^2 x^3, etc DEs to make it more automatic?	[86 1370-07(b)(7), 86 1920(b)(5)(ii)]		A,100	
	47	NTE LTR - X Pant	NTE_LTR_X	X (engine speed) point of the X,Y (engine speed, torque) coordinate pair of points only with each point connected to the next by a straight line that define the NTE limited testing region (LTR)	Once per engine family or subclass (would apply to every vehicle tested for that family or subclass)	Y if X is selected aboue	Repeat this and the next data element as necessary	[86 137007(b)(7) 86 1920(b)(5)(ii)]		N(6.2)	
	48	NTE LTR - Y Point	NTE_LTR_Y	Y (engine torque) point of the X,Y (engine speed torque) coordinate pair of points only with each point connected to the next by a straight line that define the NTE limited testing region (LTR)	Once per engine famly 0f subclass (would apply to every vehicle tested for that family or subclass)	Y if X is selected aboue		[86 1370-07(b)(7), 86 1920(b)(5)(ii)]		N(6 2)	

. Test Information

ection 4 is test information Section4 a is test vehicle, test engine, test background, or test summary information Section 4.b is 1hz data To be submitted after each test.

.a Test Vehicle Information

.a.1 General Test Vehicle Information

Data Element Number	Plain English Name	Data Element Name	Data Element Definition	Reporting Frequency	Reauired	Comments	Rea Reference	Example	Format	Validatiot
1	Engine Family	Eng_Fam	The identifier assigned per 86.077-2	Once per program file	Y	Only needed if above information is separated from test results.	86.1920(b)(3)(i)	5XYZ0465HGY	A,12	No lower case letters
2	Date Selected	Date_Selected	Note the date of the letter from EPA in which this engine family was selected to be tested in use	Once per program file	Y	Identification information.	86.1920(b)(3)		YYWMMDD	Must be later than August 2005, earlier than current date
41	Manufacturer Code	Mfr_Code	The 3-letter code assigned to each manufacturer of EPA-certified engines.	Once per program file	Y	Identification information.	-	ABC	A,3	No lower case letters Unique for this Eng Family + Date_Selec ted + Mfr_Code
88	Test Number	Test_Number	The unique test number assigned by the manufacturer This number with mfr code must be unique.	Once per program file	Y	Identification information.	86.1920(b)(4)(i)	03-462	A,10	

est Vehicle Information

27	Vehicle Manufacturer	Veh_Mfr	The name of lhe vehlcle manufacturer (make)	Once per vehicle	Y	Provide list	86.1920(b)(3)(iv)	Ford Motor Company, Freightliner Trucks, Sterling Trucks, Western Star Trucks	A,25	
329	Altemate Vehicle Manufaclurer	Veh_Mfr_Alt	If the necessary vehicle manufacturer is not provided as a choice enter the vehlcle manufacturer name here	Once per vehicle	N	Only needed if Other is selected for Veh_Mfr			A,25	
28	Vehicle Model	Veh_Mod	The vehicle model	Once per vehicle	Y		86 1920(b)(3)(iv)	[Vehicle model]	A,20	none
29	Year Vehicle Built	Veh_B_YR	The year the vehicle was built by *the* manufacturer	Once per vehicle	Y		86 1920(b)(3)(iv)	2005	A.4	2005 to current yea
30	Vehicle Identifcation Number	VIN	The Vehicle IdentifcationNumber (VIN) stamped or printed on the label riveted to the vehicle's dashboard	Once per vehicle	V		86.1920(b)(3)(v)	5JDUF84LYTI70SUEJ	A17	All characters are alphanume c Letters are upper case The letters "I", "O", and "Q" are not used The last four characters of a 17 character VIN must be numerals The tenth character should agree with the indicated model year (Data element 28)
31	Vehicle Type	Veh_Type	The vehicle type as described by its use	Once per vehicle	Y		86.1920(b)(3)(vi)	Delivery, Line haul, Dump truck, Other	A.25	
330	Altemale Vehicle Type	Veh_Type_Alt	If me necessary vehicle lype is not provided as a choice enter the vehlcle type here	Once per vehicle	N	Only needed if Other is selected for Veh_Type_Alt			A.25	
90	Transmission Type	Trans-Type	The transmission type	Once per vehicle	Y	Choice of Manual or automatic?	[86 1370-2007(b)(4)]	manual, 16 speed	A.4	

Test Trailer Information

95	Trailer Type	Trailer_Type	The trailer type	Once per vehicle.	Y, if trailer used during test	List of choices, plus Other	86.1920(b)(3)(vi)	Refrigerated, Insulated, Livestock, Automobile transport, Boat transport, Tank, Pole, Dump trailers, Double trailer. Plain enclosed box. Open box, Flatbed, Slake. Log container, Low rider, No trailer, Other	A,25	
331	Alternate Trailer Type	Trailer_Type_Alt	If the necessary trailer type is not provided as a chace enter the trailer type here	Once per vehicle	N	Only needed it Other IS selected for Trailer_Type_Alt				
96	Trailer VIN	Trailer_VIN	The trailer's vehicle identification number (VIN)	Once per vehicle	Y, if trailer used during test	Should be 17 characters, but older trailers may have a shorter VIN or none at all		0834YFJKEGRFLJKW5	A,19	All characters are alphanumeric Letters are upper case The letters "I", "O", and "Q" are not used The last tour characters of a 17 character VIN must be numerals
Engine Information										
32	Engine Model	Eng_Model	Manufacturer designation for engine configuration(s) which share basic design parameters (i e Same basic long block design)	Once per vehicle.	Y	Engine model for this engine family from Cert application	86.1920(b)(3)(i)	ENGMOD1	A.15	none
33	Engine Code	Eng_Code	A designabon which identifies a specific torque/HP configuration or other combination of attributes which define the engine	Once per vehicle.	Y			3	A,10	none
34	Engine Serial Number	Eng_Serial	The unique designation stamped on the engine and used to identify and track the speafic engine	Once per vehicle.	Y		86.1920(b)(3)(v)	4758-73827364	A.12	none
35	Engine Displacement	Eng_Displ	The total volume swept by the piston stroke. times the number of cylinders. in liters	Once per vehicle	Y		86.1920(b)(3)(i)	4	N(3,1)	0 to 18
37	Engine Build Date	Eng_Build_Date	The build date idenbfiedon the engine or the emissions label	Once per vehicle	Y			38354	YYYYMMDD	
97	ECM Model Number	ECM_Model_No	Model or part number (identifying Information) of the ECM (ECU) hardware	Once per vehicle	Y			PA4879632	A,15	none
98	ECM Software Number	ECM_Software_No	Software version or calibration number or flash file number (identifyinginformation) of the program that is running in the ECM (ECU)	Once per vehicle	Y			a5 7456 298	A,20	none
99	Rated Speed - Scan Tod	Rated_Speed_ST	The speed identified by the scan tool (scan tool) as "rated" speed when the tool is plugged into the vehicle's diagnostic port. in rpm	Once per vehicle	Y			1800	N(4,0)	1650 to 3950
100	Horsepower at Rated Speed - Scan Tool	HP_RS_ST	The horsepower at rated speed according to a diagnostic tool when it is plugged into the vehicle's diagnostic port	Once per vehicle	Y		(86.1920(b)(3)(i))	300	N(3,0)	100 to *750*
101	Maximum Horsepower-Scan Tool	HP_Max_ST	The maximum horsepower according to a diagnostic tool when it is plugged into the vehicle's diagnostic port. if available	Once per vehicle.	Y			*300*	N(3,0)	100 to 750
102	Speed at Maximum Horsepower-Scan Tool	Speed_HP_Max_ST	The speed at maximum horsepower according to a diagnostic tool when it is plugged into the vehicle's diagnostic port. in rpm, if available	Once per vehicle	Y			1800	N(4,0)	1650 to 3950
103	Peak Toque. Scan Tod	Torque_Peak_ST	The peak torque according to a diagnostic tool when it IS plugged into the vehicle's diagnostic port. in lb ft	Once per vehicle	Y			1440	N(4,0)	180 to 350
105	Speed at Peak Torque - Scan Tool	Speed_PT_ST	The speed at peak torque according to a diagnostic tool when it is plugged into the vehicle's diagnostic port. in rpm	Once per vehicle	Y			1800	N(4,0)	980 to 350
106	Rated Speed - Cert Application	Rated_Speed_CA	The rated speed according to the manufacturer's Application for Certification, in rpm	Once per vehicle	Y			1800	N(4,0)	1650 lo 3950
107	Horsepower at Rated Speed - Cert Application	HP_RS_CA	The horsepower at rated speed according to the manufacturer's Application tor Certification	Once per vehicle.	Y			300	N(3,0)	100 to *750*
108	Maximum Horsepower	HP_Max	m e maximum horsepower from the engine map prepared according to 1065 510 used to define the NTE zone	Once per vehicle	Y			300	N(3,0)	100 to 750

	109	Speed at Maximum Horsepower	Speed_HP_Max	The speed at maximum horsepower, in rpm	Once per vehicle.	Y			1800	N(4,0)	1650 to 3950
	110	Peak Toque	Torque–Peak	The maximum torque from the engine map prepared according to 1065 510 used to define the NTE zone	Once per vehicle	Y			1440	N(4,0)	180 to 350
	112	Speed at Peak Torque	Speed–PT	The speed at peak torque, in rpm	Once per vehicle.	Y			1800	N(4,0)	980 to 350
TE Zone Information											
	113	N Low	N_LO	Engine low speed as determined by calculating the lowest rpm at which 50% of maximum power occurs, in rpm Values used in the calculation will come from the provided engine map (data elements 116 117)	Once per vehicle.	Y		86 1360-2007(c)	1182	N(4,0)	0 to 3500
	114	N High	N_HI	Engine high speed as determined by calculating the highest rpm at which 70% of the maximum power occurs in rpm Values used in the calculation will come from the provided engine map (data elements 116, 117)	Once Der vehicle	Y		86 1360-2007(c)	2185	N(4,0)	980 to 450
	115	Minimum Speed of NTE Zone	NTE_Area_Min_Speed	Minimum engine operating speed tor the NTE control area N io + 0 15 X (N_hi N_lo), in rpm	Once per vehicle	Y	This is commonly referred to as '15% ESC speed.'	[86.1370-2007(b)(1)]		N(4,0)	0 to 3500
	116	Engine Map Speed	Eng_Map_X	X (engine speed, in rpm) point of the X Y (engine speed torque) coordinate pair of points only with each point connected to the next by a straight line that define the engine map The speed and load data collected according to 86 1332 or 1065 510	Once per vehicle	Y	X,Y (engine speed, toque) paints only with each point connected to the next by a straight line. This and the following DE are repeated as many times as necessary.		1340	N(6,2)	450 - 3950
	117	Engine Map Torque	Eng_Map_Y	Y (engine torque in lb-ft) point of the X,Y (engine speed, torque) coordinate pair of points only with each point connected to the next by a straight line that define the engine map The speed and load data collected according to 86 1332 or 1065 510	Once per vehicle	Y	XY (engine speed, torque) points only mth each point connected to the next by a straight line		*800*	N(6,2)	0 to 4500
	118	Minimum BSFC	BSFC_Min	Minimum brake specific fuel consumption value for this engine, in lbs/bhp-hr Applicable to hybrid or infinitely vanable transmission (IVT) only	Once per vehicle	Y		[86.1370-2007(b)(3)]			0 to 500
	119	BSFC 5 Percent Level	BSFC_5Percent	Minimum brake specific fuel consumption value for this engine times 1 05, in lbs/bhp hr To determine points that must be included in the NTE Applicable to hybnd or infinitely vanable transmission (IVT) only	Once per vehicle	Y		[86.1370-2007(b)(3)]			0 to 500
ast Vehicle Historical Information											
	124	Vehicle Maintenance History	Veh_Maint_Hist	A description of past maintenance pertomed on this vehicle May be provided as a separate file	Once per vehicle	Y	Includes comparison with accept criteria from 86.1908(b)	86.1920(b)(3)(vii)	new exhaust system installed at 89,000 miles, oil change every 3k miles	A,5000	
	125	Vehicle Usage History	Veh_Usage_Hist	A desciption of how the vehicle was used in the past May be provided as a separate file	Once per vehicle	Y	includes comparison mth accept cntena from general test plan and 86 1908(b)	86 1920(b)(3)(vii)	Vehicle has been used to haul lumber from Atlanta to Houston	A,1000	
	126	Engine Idle History	Idle–Hist	The ratio of idle to non-idle time for this vehicle, as indicated by the vehicle ECU. if available.	Once per vehicle	Y	Includes comparison with accept cntena from general test plan and 86 1908(b)		0 2	N(2,1)	0 to 800
	127	EMD Code History	EMD_Code_Hist	If an EMD/OBD code was set by the engine from the time it was new up to the paint of portable emissions monitoring system installation select Yes and then fill out the common EMD/OBD information as many times as is needed, if the information is available in the ECM Information available in the ECM is only the history since it was last reset	Once per vehicle (May need to be once for each historical EMD code)	Y	Should be able to enter as many as necessary	86 1920(b)(3)(viii)	Y or N	A,1	
.a.2 Test Vehicle - Maintenance Information											
	132	Vehicle Maintenance-Acceptance	Veh_Maint_Accept_Test	A description of any maintenance. adjustments. modifications, or repairs to the vehicle or engine to prepare for or continue testing after acceptance of the vehicle	Once per vehicle	Y		86 1920(b)(3)(x)	None	A,1000	
.a.3 Test Background Information											
	136	Odometer at Start of Test	Odom_SOT	The odometer reading in miles at the beginning of the test	Once per test	Y	Must be within useful life	86 1920(b)(4)(vi)	65294	N(7,0)	0 to 1,500,000
	286	Odometer at End of Test	Odom_EOT	The odometer reading in miles at the end of the test	Once per test	Y			1200	N(5,0)	0 to 1,500,000
	137	Engine Hours at Start of Test	Eng_Hrs_SOT	The total number of hours, if available, that the engine has operated since it was new (up until the start of the test)	Once per test	Y, if available		86 1920(b)(4)(vi)	1200	N(5,0)	20 21900
	138	NMHC Measurement Method	NMHC_Method	Indicate the method used to determine NMHC as per part 1065, Subpart J	Once per test	Y		86 1920(b)(4)(ix)	1 (M) Measure CH4 2 (T) 0.98 times THC	A,1	

141	Drain and Refill?	Drain–Refill	An indication of whether the tester drained the fuel from the vehicle and filled the tank with some other lud	Once per test	Y		86 1920(c)(5), (c)(6)	Allowed values N - not drained and refilled. I - tank was drained and refilled upon vehicle's acceptance in the program as standard practice (analysis not required). C - tank was drained and refilled lo correct a misfueling situation before testing. F - tank was drained and refilled alter vehicle failed a test (fuel sample analysis required). Selection of C or F leads to fuel analyses section	A,1	
142	Actions on Misfueling	Misfuel_Actions	For a vehicle retained in the program describe the circumstances surrounding and any actions taken to dram and refill the vehicle's fuel tanks to correct a misfueling problem				86.1920(b)(3)(x)		A,1000	
145	Fuel Addihve Description	Fuel_Additives	A description including manufacturer name and product name of any additives used in the test fuel	Once per test	Y	Additives normally used by owner/operator	[86 1910(c)(5)]	NA	A,50	
146	Fuel Addihve Volume	Additive_Vol	The amount in ounces per gallon of additives. if any. used in the fuel	Once per test	Y, if additive used		[86 1910(c)(5)]		N(5,2)	0.0 to 128
147	Minimum Test Rig Weight Estimate	Rig_weight_Min	The estimated minimum weight in pounds of the truck, trailer. and load	Once per test	Y			56380	N(6,0)	1500 to 300,000
328	Maximum Test Rig Weight Estimate	Rig_weight_Max	The estimated maximum weight in pounds of the truck, trailer. and load	Once per test	Y			21554	N(6,0)	1500 to 300,000
80	NOX NTE Compliance Margin	NOX_NTE_Compl_Test_Margin	The correction factor which adjusts the NOx NTE standard for compliance for engines with FELs no higher than 1 30 g/bhp-hr Mileage adjustment Up to 110,000 miles. 110,001 to 185,000 miles, or greater than 185.001	Once per vehicle	Y	Submit for each vehicle due to mileage stipulation	(86.007-11(h)(2)(i) thru (iii))	Choices are 0.1 or 0.15 or 0.2 g/b-hphr for MYs up to 2011.	N(4,2)	
85	PM NTE Compliance Margin	PM_NTE_Compl_Test_Margin	The correction factor which adjusts the PM NTE standard for in-use compliance for engines of model years prior to 2012, in g/bhp-hr	Once per vehide	Y	Submit for each vehicle due to model year stipulation	(86 W7-11(h)(3))	0 01 g/bhp-hr	N(4,2)	
339	THC Zero Check - Before Test	THC_Z_Ck_BT	Record THC response to zero gas before the test Reading is in ppm	Once before each lest	Y				N (4,0)	
340	CH4 Zero Check - Before Test	CH4_Z_Ck_BT	Record CH4 response to zero gas before the test Reading is in ppm	Once before each test	Y. if used				N (4,0)	
341	CO Zero Check - Before Test	CO_Z_Ck_BT	Record CO response lo zero gas before the test Reading is in percent	Once before each lest	Y				N (4,0)	
342	C02 Zero Check - Before Test	CO2_Z_Ck_BT	Record CO2 response to zero gas before the test Reading is in percent	Once belore each test	Y, if used				N (4,0)	
343	O2 Zero Check - Before Test	O2_Z_Ck_BT	Record 0 2 response lo zero gas before the test Reading is in percent	Once belore each test	Y. if used				N (4,0)	
344	NO Zero Check - Before Test	NO_Z_Ck_BT	Record NO response to zero gas before the test Reading is in ppm	Once before each test	Y, if used	Either NOx checks or NO and NO2 checks are expected			N (4,0)	
345	NO2 Zero Check. Before Test	NO2_Z_Ck_BT	Record NO2 response to zero gas before the test Reading is in ppm	Once before each test	Y, if used	Either NOx checks or NO and NO2 checks are expected			N (4,0)	
346	NOx Zero Check - Before Test	NOx_Z_Ck_BT	Record NOx response lo zero gas before the test Reading is in ppm	Once before each test	Y. if used	Either NOx checks or NO and NO2 checks are expected			N (4,0)	
347	PM Zero Check - Before Test	PM_Z_Ck_BT	Record PM response to zero gas before the test Reading is in ppm	Once before each test	Y				N (4,0)	
348	THC Span Check - Before Test	THC_Span_Ck_BT	Record THC response to span gas before the test Reading is in ppm.	Once before each test	Y				N (4,0)	
349	CH4 Span Check - Before Test	CH4_Span_Ck_BT	Record CH4 response to span gas befwe the test Reading is in ppm	Once before each test	Y, if used				N (4,0)	

350	CO Span Check. Before Test	CO_Span_Ck_BT	Record CO response to span gas before the test Reading is in percent	Once before each test	Y		N (4,0)
351	CO2 Span Check- Before Test	CO2_Span_Ck_BT	Record C02 response to span gas before the test Reading is in percent	Once before each test	Y, if used		N (4,0)
352	0 2 Span Check - Before Test	O2_Span_Ck_BT	Record 0 2 response to span gas before the test Reading is in percent	Once before each test	Y. if used		N (4,0)
353	NO Span Check. Before Test	NO_Span_Ck_BT	Record NO response to span gas before the test Reading is in ppm	Once before each test	Y. if used	Either NOx checks or NO and NO2 checks are expected.	N (4,0)
354	NO2 Span Check - Before Test	NO2_Span_Ck_BT	Record NO2 response to span gas before the test Reading is in ppm	Once before each test	Y, if used	Either NOx checks or NO and NO2 checks are expected	N (4,0)
355	NOx Span Check. Before Test	NOx_Span_Ck_BT	Record NOx response lo span gas before the test Reading is in ppm	Once before each test	Y, if used	Either NOx checks or NO and NO2 checks are expected	N (4,0)
356	PM Span Check - Before Test	PM_Span_Ck_BT	Record PM response to span gas before the test Reading is in ppm	Once before each test	Y		N (4,0)
357	THC Zero Check - Penodic	THC_Z_Ck_Per	Record THC response to zero gas periodically during the test Reading is in ppm	Repeat as necessary Expected frequency is once hour	Y		N (4,0)
358	CH4 Zero Check - Penodtc	CH4_Z_Ck_Per	Record CH4 response to zero gas determined periodically during the test Reading is in ppm	Repeat as necessary Expected frequency is once/hour	Y, if used		N (4,0)
359	CO Zero Check - Penodic	CO_Z_Ck_Per	Record CO response to zero gas determined periodically dunng the test Reading is in percent	Repeat as necessary Expected frequency is once hour	Y		N (4,0)
360	C02 Zero Check - Penodic	CO2_Z_Ck_Per	Record C02 response to zero gas determined periodically during the test Reading is in percent	Repeat as necessary Expected frequency is once/hour	Y, if used		N (4,0)
361	0 2 Zero Check - Penodic	O2_Z_Ck_Per	Record 02 response to zero gas determined penodicaily dunng the test Reading is in percent	Repeat as necessary Expected frequency is once hour	Y, if used		N (4,0)
362	NO Zero Check - Penodic	NO_Z_Ck_Per	Record NO response to zero gas determined periodically during the test Reading is in ppm	Repeat as necessary Expected frequency is once/hour.	Y, if used	Either NOx checks or NO and NO2 checks are expected	N (4,0)
363	NO2 Zero Check - Penodic	NO2_Z_Ck_Per	Record NO2 response to zero gas determined periodically dunng the test Reading is in ppm	Repeat as necessary Expected frequency is once/hour	Y, if used	Either NOx checks or NO and NO2 checks are expected	N (4,0)
364	NOx Zero Check - Penodtc	NOx_Z_Ck_Per	Record NOx response to zero gas determined penodmlly during the test Reading is in ppm	Repeat as necessary Expected frequency is once hour	Y, if used	Either NOx checks or NO and NO2 checks are expected	N (4,0)
365	PM Zero Check - Periodic	PM_Z_Ck_Per	Record PM resoonse to zero oas determined periodically during the test Reading is in ppm	Repeat as necessary Expected frequency is once/hour	Y		N (4,0)
366	THC Zero Check- After Test	THC_Z_Ck_AT	Record THC response to zero gas after the test Reading is in ppm	Once after each test	Y		N (4,0)
367	CH4 Zero Check-After Test	CH4_Z_Ck_AT	Record CH4 response to zero gas after the test Reading is in ppm	Once after each test	Y, if used		N (4,0)
368	CO Zero Check-After Test	CO_Z_Ck_AT	Record CO response lo zero gas after the lest Reading is in percent	Once after each test	Y		N (4,0)
369	C02 Zero Check - After Test	CO2_Z_Ck_AT	Record C02 response to zero gas after the test Reading is in percent	Once after each test	Y, if used		N (4,0)
370	02 Zero Check After Test	O2_Z_Ck_AT	Record 0 2 response to zero gas after the test Reading is in percent	Once after each test	Y. if used		N (4,0)
371	NO Zero Check - After Test	NO_Z_Ck_AT	Record NO response to zero gas after the test Reading is in ppm	Once after each test	Y. if used	Either NOx checks or NO and NO2 checks are expected	N (4,0)
372	NO2 Zero Check- After Test	NO2_Z_Ck_AT	Record NO2 response to zero gas after the test Reading is in ppm	Once after each test	Y, if used	Either NOx checks or NO and NO2 checks are expected	N (4,0)
373	NOx Zero Check-Mer Test	NOx_Z_Ck_AT	Record NOx response to zero gas after the test Reading is in ppm	Once after each test	Y. If used	Either NOx checks or NO and NO2 checks are expected	N (4,0)
374	PM Zero Check. After	PM_Z_Ck_AT	Record PM response to zero gas after the test Reading is in ppm	Once after each test	Y		N (4,0)

375	THC Span Check - After Test	THC_Span_Ck_AT	Record THC response to span gas after the test Reading is in ppm	Once aner each test	Y				N (4,0)	
376	CH4 Span Check - After Test	CH4_Span_Ck_AT	Record CH4 response to span gas after the test Reading is in ppm	Once after each test	Y, if used				N (4,0)	
377	CO Span Check - After Test	CO_Span_Ck_AT	Record CO response to span gas after the test Reading is in percent	Once after each test	Y				N (4,0)	
378	CO2 Span Check - After Test	CO2_Span_Ck_AT	Record C02 response to span gas alter the test Reading is in percent	Once after each test	Y, if used				N (4,0)	
379	0 2 Span Check - After Test	O2_Span_Ck_AT	Record 0 2 response to span gas alter the test Reading is in percent	Once after each test	Y, if used				N (4,0)	
380	NO Span Check - After Test	NO_Span_Ck_AT	Record NO response to span gas after the test Reading is in ppm	Once after each lest	Y. if used	Either NOx checks or NO and NO2 checks are expected.			N (4,0)	
381	NO2 Span Check - After Test	NO2_Span_Ck_AT	Record NO2 response to span gas after lhe test Reading is in ppm	Once after each test	Y, if used	Either NOx checks or NO and NO2 checks are expected.			N (4,0)	
382	NOx Span Check - After Test	NOx_Span_Ck_AT	Record NOx response to span gas after the test Readmg is in ppm	Once after each test	Y, if used	Either NOx checks or NO and NO2 checks are expected.			N (4,0)	
383	PM Span Check - After Test	PM_Span_Ck_AT	Record PM response lo span gas after lhe test Reading is m ppm	Once after each test	Y				N (4,0)	

.a.3.i Supplemental Information, submitted as needed

Fuel Analyses

						Repeat as needed	86.1920(b)(2), (c)(5), (c)(6)			
8	Cetane Number	Cetane-No	ASTM Test Method No D613	Once per sample	Y, if fuel samples were taken		1065 703	45	N(3,0)	20 to 70
9	Distillation IBP	Dist_IBP	ASTM Test Method No 86, in degrees F	Once per sample	Y, if fuel samples were taken		1065 703	181	N(3,0)	250 to 550
10	Distillation 10 Percent	Dist_10Pct	ASTM Test Method No 86, in degrees F	Once per sample	Y, if fuel samples were taken		1065.703	206	N(3,0)	300 to 600
11	Distillation 50 Percent	Dist_50Pct	ASTM Test Method No 86, in degrees F	Once per sample	Y, if fuel samples were taken		1065 703	253	N(3,0)	350 to 700
12	Distillation 90 Percent	Dist_90Pct	ASTM Test Method No 86, in degree F	Once per sample	Y, if fuel samples were taken		1065.703	302	N(3,0)	450 to 750
13	DistillationEP	Dist_EP	ASTM Test Method No 86, in degrees F	Once per sample	Y, if fuel samples were taken		1065 703	333	N(3,0)	500 to 800
14	Gravity	Gravity	ASTM Test Method No 287, m degrees API	Once per sample	Y, if fuel samples were taken		1065.703	33	N(3,0)	20 to 60
15	Sulfur	Sulfur	ASTM Test Method No 2622, in per cent	*Once* per sample	Y, if fuel samples were taken		1065.703	9	N(3,0)	0 to 25
16	HC Aromatic	HC_Aromatic	ASTM Test Method No 5186. in per cent	Once per sample	Y, if fuel samples were taken		1065.703	100	N(3,0)	0 to 50
17	Flashpoint	Flashpoint	ASTM Test Method No 93. in degrees F	Once per sample	Y, if fuel samples were taken		1065 703	54	N(3,0)	100 to 160
18	viscosity	Viscosity	ASTM Test Method No 445, in centistokes	Once per sample	Y, If fuel samples were taken		1065.703	2.6	N(3,1)	0 to 5

Code Information

						Repeat as needed	86.1920(b)(3)(viii, ix, x), (c)(4)			
20	EMD Code	EMD_Code	The numeric/alphanumeric EMD/OBD code recorded by lhe ECM in its memory when lhe ECM senses a condition which is specified to be one in which a Trouble Code is required la be recorded	Once per each EMD/OBD code per vehicle	Y, if EMD/OBD code was discovered	Repeat ths and the next two data elements as necessary	86.1920(b)(3)(viii, ix, x), (c)(4)		A,8	
21	EMD Code Description	EMD_Code_Desc	A description of this EMD/OBD code and the engine and vehicle operating conditions at the bme the code was set	*Once* per each EMD/OBD code per vehicle	Y, if EMWOBD code was discovered		86.1920(b)(3)(viii, ix, x), (c)(4)		A,1000	

	22	EMD Code Actions	EMD_Code_Act	A description of the action taken to address this EMD/OBD code.	Once per each EMD/OBD code per vehicle	EMD/OBD code was discovered		86 1920(b)(3)(viii, ix, x), (c)(4)		A,1000	

ction 4 bis 1hz data to be Submitted after each test

.b Vehicle Test Results

Identifying information to tie 1hz data to other files

150	Engine Family	Eng_Fam	The identifier assigned per 86.077-2	Once per engine family (would apply to every vehicle tested lor that engine family)	Y	For file identification	86 1920(b)(3)(i)	5XYZ0465HGY	A,12	No lower case letter! Must be later man 2005
151	Date Selected	Date–Selected	Note the date of the letter fmm EPA in which this engine family was selected to be tested in use.	Once per program file	Y	For file identification	86 1920(b)(3)		YYWMMDD	August earlier thar current date
152	Manufacturer Code	Mfr_Code	The 3-letter code assigned to each manufacturer of EPA-certified engines	Once per engine family (would apply to every vehicle tested for that engine family)	Y	For file identification Retain if needed for ID.		ABC	A,3	No lower case letter
153	Test Number	Test–Number	The unique test number assigned by the manufacturer. This number combined with the mfr code must be unique	Once per test	Y	For file identification Retain if needed for ID	86.1920(b)(4)(i)	03-462	A,10	Unique for this Eng Family + Date_Selected + Mfr_Code

HZ Data

337	Local Time	Local_Time	The Local time (real clock time. not test time) corresponding to each record in the 1-Hertz file, corrected for sample delay time so that the test time reflects the moment the emissions were sampled in the flowmeter	Once per second. for each road test	Y		86.1920(b)(4)(xii)		HHMMSS.S	
155	Altitude	Altitude	The altitude in feet above sea level	Once per second, for each road test	Y		86 1920(b)(4)(xii)	-300 - 10,000	N (6,1)	
156	Latitude	Lat	North latitude in degrees at this second	Once per second, lor each data file (ie for each road test)	Y				N(6,3)	
157	Longitude	Long	West longitude in degrees at this second	Once per second, for each data file (ie for each road test)	Y				N(6,3)	
158	Distance	Distance	The distance covered dunng the previous second of the mad test, in feet	Once per second, for each data file (ie for each mad test)	Y				N (4,1)	
160	Vehicle Speed	Veh_Speed	The vehicle speed over the previous second of the road test (in mph)	Once per second, for each road test	Y				N (6,3)	
161	Throffle Percent	Throttle_Percent	The amount in percent of total accelerator pedal position over the previous second dunng the road test	Once per second, lor each road test	Y		86.1920(b)(4)(xii)	35	N (4,1)	
162	Torque Output	Torque_Out	Torque produced by the engine over the previous second in lb ft	Once per second, lor each road test	Y		86.1920(b)(4)(xii)	56	N (4,0)	
163	RPM	RPM	The engine speed over the previous second 01 the road test. in rpm	Once per second, for each road test	Y		86 1920(b)(4)(xii)		N (4,0)	
164	ECT	ECT	The temperature of the engine coolant over the previous second 01 the road test in degrees F	Once per second. lor each road test	Y		86 1920(b)(4)(xii)		N (4,1)	
165	ECTEGR	ECT_EGR	jir coolant p limit defined oy tl il tli ip w en it a ic absolute intake manifold pressure shown in 86.1370-2007(f) in degrees F for EGR engines.	Once per second, for each road test.	Y		[86 1912(b)]		N (4,1)	
167	Ambient Temperature	Temp–Amb	Ambient air temperature, in degrees F	Once per second, lor each road test	Y		86 1920(b)(4)(xii)		N (4,1)	
169	Calculated Maximum NTE Ambient Temperature	Temp_Amb_Alt_Max	Calculated maximum temperature. adjusted lor altitude. for the NTE zone over the previous second In degrees F	Once per second, for each road test	Y		[86.007-11(a)(4)(i)(B)(1)]		N (4,1)	
170	Ambient Pressure	Press–Amb	Ambient barometnc pressure, in inches of Hg	Once per second, for each road test	Y		86 1920(b)(4)(xii)		N (5,1)	
172	Ambient Dewpoint Temperature	Temp_Amb_Dewpoint	Ambient dewpoint temperature over the previous second. in degrees F	Once per second, for each road test	Y		86.1920(b)(4)(vii)		N (4,1)	
174	Ambient Humidity	Humidity_Amb	Absolute humidity 01 the ambient air over the previous second in grains per pound of dry air	Once per second. lor each road test	Y		86 1920(b)(4)(xii)		N (4,1)	
175	IMT	IMT	The temperature in degrees F 01 the air imide the Intake manifold over the previous second	Once per second, for each road	Y		86.1920(b)(4)(xii)		N (4,1)	

176	IMT EGR	IMT_EGR	Intake manifold temperature limit defined by the relationship betweenit and absolute intake manilold pressure shown in 86 1370-2007(f) in degrees F for EGR engines	Once per second, for each road test	Y		[86 1912(b)]	N (4,1)
177	Absolute IMP	IMP_Abs	The absolute pressure in bars inside the intake manifold	Once per second, for each road test	Y		86 1920(b)(4)(xii)	N (5,1)
178	Exhaust Annubar DP	DP_Exh_Annu	For an annubar type system the differential pressure reading from a pressure transducer connected to the annubar. in inches of water	Once per second, for each road test	Y		[86 1920(b)(4)(xii)]	N (7,4)
180	Exhaust Annubar SP	SP_Exh_Annu	For an annubar type system the static pressure inside the flow pipe, in inches of Hg	Once per second. for each road test	Y	These five if an annubar type system	[86 1920(b)(4)(xii)]	N (7,4)
182	Exhaust Annubar Temperature	Temp_Exh_Annu	The temperature in degrees F of the exhaust inside the flow pipe	Once per second. for each road test	Y	These five if an annubar type system	[86 1920(b)(4)(xii)]	N (4,1)
189	Exhaust Aftertreatment Temperature	Temp_Exh_AT	Exhaust aftertreatment temperature over the previous second measured within 12 inches of after treatment outlet For multi-bed systems measure at the outlet of the device with the maximum Row In degrees F	Once per second. lor each road test	Y, if installed	Evaluated as to whether it invalidates the NTE Event		N (5,1)
202	Raw Exhaust Flow Rate	Oexhl	The calculated, uncorrected flow rate of exhaust through the flow meter or flow device over the previous second of the road test based on flow meter calibration. in cfm	Once per second, for each road test	Y		86.1920(b)(4)(x)	N(7,3)
204	Standardized Exhaust Flow Rate	Qexh2	Flow rates of exhaust through the flow meter at standard conditions over the previous second of the road test based on flow meter calibrahon adjusted for standard temperature and pressure, in scfm	Once per second, for each road test	Y		86.1920(b)(4)(x)	N(7,3)
206	THC Concentration	THC_Conc	Total hydrocarbon concentration in parts per million over the previous second of the road test This is a raw (uncorrected) reading	Once per second, for each road test	Y		86 1920(b)(4)(xii)	N (4,0)
207	NMHC Concentration	NMHC_Conc	Nonmethanehydrocarbon concentration in parts per million over the previous second of the road test This is a raw (uncorrected) reading	Once per second, for each road test	Y		86.1920(b)(4)(xii)	N (4,0)
208	CH4 Concentration	CH4_Conc	Methane concentration in parts per million over the previous second of the road test This is a raw (uncorrected) reading	Once per second, for each road test	Y, if used		86.1920(b)(4)(xii)	N (4,0)
209	CO Concentration	CO_Conc	The Carbon Monoxide (CO) concentration in % over the previous second of the road test This is a raw (uncorrected) reading	Once per second, for each road test	Y		88.1920(b)(4)(xii)	N (4,2)
210	CO2 Concentration	CO2_Conc	The Carbon Dioxide (CO2) concentration in %over the previous second 01 the road test This is a raw (uncorrected) readina	Once per second, for each road test	Y, if used	CO2 or 0 2	86 1920(b)(4)(xii)	N (4,2)
211	0 2 Concentration	O2_Conc	The Oxygen (02) concentration in % Over the previous second of the road test This is a raw (uncorrected) reading	Once per second, for each road test	Y, if used		86 1920(b)(4)(xii)	N (4,2)
212	NOx Concentration	NOX_Conc	The Oxides of Nitrogen (NOx) concentration in ppm over the previous second of the road test This is a raw (uncorrected) reading	Once per second, for each road test	Y		86 1920(b)(4)(xii)	N (4,0)
213	PM Concentration	PM_Conc	The Particulate Matter (PM) measurement in ppm over the previous second of the road test This is a raw (uncorrected) readina	Once per second, for each road test	Y	What will the standard units be for sec-by-sec PM data measured via QCM? Unneeded? Direct measurement?	86 1920(b)(4)(xii)	N (4,0)
214	THC Mass per Second	THC_Mass_Sec	Total hydrocarbon mass emitted over the previous second of the road test in grams	Once per second for each road test	Y		86 1920(b)(4)(xii)	N (7,4)
215	NMHC Mass per Second	NMHC_Mass_Sec	Nonmethanelhydrocarbon mass emitted over the previous second of the road test in grams	Once per second for each road test	Y		86 1920(b)(4)(xii)	N (7,4)
216	CH4 Mass per Second	CH4_Mass_Sec	Methane mass emitted over the previous second of the road test in grams if used to measure NMHC	Once per second for each road test	Y, if used		86 1920(b)(4)(xii)	N (7,4)
217	CO Mass per Second	CO_Mass_Sec	Carbon Monoxide mass emitted over the previous second of the road test in grams	Once per second for each road test	Y		86 1920(b)(4)(xii)	N (7,4)
218	CO2 Mass per Second	CO2_Mass_sec	Carbon Dioxide mass emitted over the previous second of the road test in grams	Once per second for each road test	Y. if used		86 1920(b)(4)(xii)	N (9,4)
219	O2 Mass per Second	O2_Mass_Sec	Oxygen mass emitted over the previous second of the road test in grams	Once per second for each road test	Y, if used		86 1920(b)(4)(xii)	N (9,4)
220	NOx Mass per Second	NOX_Mass_Sec	Oxides of Nitrogen mass emitted over the previous second of the road test in grams	Once per second for each road test	Y		86 1920(b)(4)(xii)	N (8,4)
221	PM Mass per Second	PM_Mass_Sec	Particulate Matter mass emitted Over the previous second of the road test in grams	Once per second for each road test	Y	May not be able to measure on a one hz basis	86 1920(b)(4)(xii)	N (8,4)
222	MPG	MPG_Sec	The fuel economy in miles per gallon over the previous second of the road test	Once per second for each road test	Y			N (3,1)
223	BSFC	BSFC_Sec	The Brake Specific Fuel Consumption, fuel flow (in lbs/bhp-hr) over the previous second of the road test Provided by ECM or computed by carbon balance equation.	Once per second for each road test	Y		[861370-2007(b)(3)]	N (4,2)
224	HP per second	HP_Sec	The calculated power in horsepower produced by the engine over the previous second of the road test	Once per second for each road test	Y		86 1920(b)(4)(xii)	N (4,2)
225	THC Work	THC_Work	Total hydrocarbon mass emitted per unit work over the previous second of the road test corrected for zero and span drift in grams per brake horsepower-hour	Once per second for each road	Y		86 1920(b)(4)(xii)	N (5,4)

226	NMHC Work	NMHC_Work	Nonmelhane hydrocarbonmass emitted per unit work over the previous second of the mad test corrected for zem and span drift in grams per brake horsepower hour	Once per second for each road test	Y	86 1920(b)(4)(xii)		N (5,4)
227	CH4 Work	CH4_Work	Methane mass emined per unit work over the previous second 01 the road test corrected lor zem and span dntt in grams per brake horsepower hour	Once per second for each road test	Y, if used	86.1920(b)(4)(xii)		N (5,4)
228	cowork	CO_Work	Carbon monoxide mass emitted per unit work over the previous secondof the road test corrected for zero and span drift in grams per brake horsepower hour	Once per second for each road test	Y	86 1920(b)(4)(xii)		N (6,4)
229	CO2 Work	CO2_Work	Carbon dioxide mass emitted per unit work over the previous second of the road test corrected for zem and span dntt in grams per brake horsepower hour	Once per second for each road test	Y, if used	86.1920(b)(4)(xii)		N (8,4)
230	O2 Work	02-work	Oxygen mass emitted per unit work over the previous second of the road test corrected lor zero and span drift in grams per brake horsepower-hour	Once per second for each road test	Y, if used	86.1920(b)(4)(xii)		N (9,4)
231	NOX Work Initial	NOX_Work_Initial	The oxides of nitrogen mass emitted per unit work over the previous second 01 the road test corrected for zero and span drift in grams per brake horsepower hour	Once per second for each road test	Y	86 1920(b)(4)(xii)		N (6,4)
232	NOX Work Corrected for Humidity	NOX_Work_Humid	Oxides of nitrogen mass emitted per unit work over the previous second of the mad test adjusted lor humidity correction in grams per brake horsepower-hwr	Once per second for each road test.	Y	86.1370-2007(e)(1)(i)		N (6,4)
233	NOX Work Corrected for Humidity and Temperature	NOX_Work	Oxides of nitrogen mass emined per unit work over the previous second of the mad test adjusted lor humidity AND temperaturecorrection in grams per brake horsepower-hour.	Once per second for each road test.	Y	2007(e)(1)(ii)		N (6,4)
234	PM Work Initial	PM_Work_Initial	The particulatematter mass emitted per unit work over the previous second of the road test corrected for zero and span dntt in grams per brake horsepower-hour	Once per second for each road test	Y	86.1920(b)(4)(xii)		N (6,4)
235	PM Work	PM_Work	Particulatematter mass emitted per unit work over the previous second of the road test adjusted for temperature correction in grams per brakehorsepower-hour	Once per second for each road test	Y	86 1920(b)(4)(xii)		N (6,4)
236	Set EMD Code	EMD_Code_Set	An indication. if available. of whether an EMD/OBD conlrol was set over the previous second of operation as pe 1587.1708, or 2284 as appmpnate Permitted values yes, no	Once per second lor each road test	Y		Y, N	A,1
238	Regeneration Signal	Regen-Signal	An indication. if available, of whether the signal from the ECM to initiate a regenerationevent was sent over the previous second Permittedvalues yes. no	Once per second for each road test	Y	86.1370-2007(d)(2)	Y, N	A,1
336	LTR Encountered Indicator	LTR_Flag	An indication 01whether the engine was operating in a limited testing region (LTR) or not during the previous second	Once per second for each road test	Y	Fed Reg Vol 70, No 113. II N	Y, N	A,1
384	Deficiency Encountered Indicator	Def_Flag	An indication of whether the engine was operating under an approved deficiency (Y), was not operating under an approved deficiency (N) or readings were not collected or data were not evaluated to determine whether the engine operated in a deficiency (U) during the previous second If exclusions of records are claimed based on operation in a defic ana (U) cannot be used	Once per second for each road test	Y	Fed. Reg. Vol 70, No. 113, II.N	Under the deficiency (Y), not operating under a deficiency (N), or readings were not collected or data were not evaluated to determine whether the	A,1
338	Zem Check Indicator	Zero_Check_Flag	An indication 01 whether the analyzer was performing a periodic zero check If yes. Ihe data recorded at this second are unusable lor NTE calculations	Once per second for each road test	Y		Y, N	A,1

.a.4 Test Summary

NTE Events Data

Repeat the next 12 fields as necessary for each valid NTE event

239	NTE Event Number	NTEE_Number	Consecutive number of this NTE event (e g , 1, 2, 3,)	Once per NTE event	Y	86 1920(b)(4)(viii)		N(4,0)	0 to 1000 no negative numbers, no letters. Later than or equal to DE #273
240	NTE Event Start Time	NTEE_Start	Start time of this NTE event First second in the event	Once per NTE event	Y	86 1920(b)(4)(viii)		HHMMSS.S	

241	NTE Event Stop Time	NTEE_Stop	End time of this NTE event Last second in the event	Once per NTE event	Y		86 1920(b)(4)(viii)		HHMMSSS	no negative numbers. no letters Later than or equal to DE 1273 plus DE #275
242	NTE Event Measured Time	NTEE_Measured_Time	Total number of seconds in this NTE event (NTEE Stop - NTEE_Start + 1) >= 30 secs	Once per NTE event	Y		86 1920(b)(4)(viii)		N(5,0)	1 to 28,800
244	NTE Event Duration	NTEE_Duration	Total number of seconds in this NTE event adjusted to be measured time, 600 seconds. or 10 times the shortest NTEE whichever is shorter	Once per NTE event	Y		86.1920(b)(4)(viii)		N(4,0)	30 to 600
246	THC Average over NTE Event	THC_Avg NTEE	The integrated total hydrocarbon emission results as calculated lor current NTE event in grams/bhp-hr	Once per NTE event	Y		86 1920(b)(4)(viii)		N (4,2)	no negative numbers. no letters
247	NMHC Average over NTE Event	NMHC_Avg_NTEE	The integrated nonmethane hydrocarbon emission results as calculated lor current NTE event in grams/bhp-hr	Once per NTE event	Y		86.1920(b)(4)(viii)		N (4,2)	no negabve numbers. no letters
248	CO Average over NTE Event	CO_Avg_NTEE	The integrated carbon monoxide emission results as calculated lor current NTE event in grams/bhp-hr	Once per NTE event	Y		86.1920(b)(4)(viii)		N (4,2)	no negahve numbers, no letters
249	NOx Average over NTE Event	NOX_Avg_NTEE	The integrated oxides of nitrogen emission results as calculated lor current NTE event in grams/bhp-hr	Once per NTE event	Y		86.1920(b)(4)(viii)		N (4,2)	no negative numbers. no letters
250	PM Average over NTE Event	PM_Avg_NTEE	The integrated particulate matter emission results as calculated lor wrrent NTE event in grams/bhp-hr.	Once per NTE event	Y		86.1920(b)(4)(viii)		N (4,2)	no negative numbers. no letters
251	CO2 Average over NTE Event	CO2_Avg_NTEE	The integrated carbon dioxide emission results as calculated lor current NTE event in grams/bhp-hr.	Once per NTE event	Y		86.1920(b)(4)(viii)		N (4,2)	no negative numbers, no letters
252	0 2 Average over NTE Event	O2_Avg_NTEE	m e integrated oxygen emission results as calculated for current NTE event in grams/bhp-hr	Once per NTE event	Y		86.1920(b)(4)(viii)		N (4,2)	no negative numbers. no letters
NTE Events Summary										
254	NMHC Vehicle Pass Ratio	NMHC_VPR	The vehicle pass ratio as per regulation lor NMHC	Once per test	Y		86.1920(b)(4)(xi)		N (2,2)	0.0 to 1.0
256	CO Vehicle Pass Ratio	CO_VPR	The vehicle pass ratio as per regulation for CO	Once per test	Y		86.1920(b)(4)(xi)		N (2,2)	0.0 to 1.0
258	NOx Vehicle Pass Ratio	NOX_VPR	The vehicle pass ratio as per regulation lor NOx	Once per test	Y		86.1920(b)(4)(xi)		N (2,2)	0.0 to 1.0
260	PM Vehicle Pass Ratio	PM_VPR	The vehicle pass ratio as per regulation lor PM	Once per test	Y		86.1920(b)(4)(xi)		N (2,2)	0.0 to 1.0
332	NMHC NTE Events Total Weighted Time	NMHC_NTEE_Total Weighted _Time	Sum of weighted NTEE times for valid NMHC readings (Sum NTEE_Duration) Becomes the VPR denominator. in seconds	Once per test	Y		[86.1920(b)(4)(xi)]		N(5,0)	30 to 28800
333	CO NTE Events Total Waghted Time	CO_NTEE_Total_Weighted Ti me	Sum of weighted NTEE times lor valid CO readings (Sum NTEE_Duration) Becomes the VPR denominator, in seconds	Once per test	Y		[86.1920(b)(4)(xi)]		N(5,0)	30 To 28800
334	NOx NTE Events Total Weighted Tim	NOx NTEE_Total_Weighted_ Time	Sum of weighted NTEE times lor valid NOx readings (Sun NTEE Duration) Becomes the VPR denominator, in seconds	Once per test	Y		[86.1920(b)(4)(xi)]		N(5,0)	30 to 28800
335	PM NTE Events Total Weighted Time	PM_NTEE_Total Weighted_Ti me	Sum of weighted NTEE times lor valid PM readings (Sun NTEE_Duration) Becomes the VPR denominator, in seconds	Once per test	Y		[86.1920(b)(4)(xi)]		N(5,0)	30 to 28800
287	Vehicle Pass or Fail	veh Pass Fad	Indicate whether me vehicle passed or faded this test, and if it failed whether it failed the 90% VPR cntenon. the twice the threshold limit cntenon. or for NOx the 2 0 g/bhp-hr criterion If any pollutant's VPR did not meet a criterion the vehicle tailed	Once per test	Y	Will also need DE 78 to see if certified to FEL and DE 77 to find FEL value.	86.1920(b)(6)(i)	Pass (P), Fail the 90% VPR (9), Fail the twice the threshold limit (2), or Fail the 2.0 g/bhp-hr NOx limit (N)	A, 1	
262	NTE Event Minimum Measured Time	NTEE Min_Measured Time	The shortest measured time of all valid NTEEs, in seconds (Greater than or equal to 30 seconds)	Once per test	Y		[86.1920(b)(4)(viii)]		N (5,0)	30 to 28800
263	Maximum NTE Event Time	Max-NTEE	The duration in seconds of the longest NTE event m the whole test, in seconds Non-weighted time Max of NTEE_Measured_Time	Once per test	Y				N (5,0)	30 to 28800
ther Summary Data										
272	Test Date	Test_Date	Date at the Start of the first record (lint piece of 1-Hz data) test	Once per test	Y		86 1920(b)(4)(i)		YYYYMMDD	
273	Test Start Time	Test Time	Time at the start of me fint record (lint piece of 1-Hz data) test	Once per test	Y		86.1920(b)(4)(i)		HHMMSS S	

274	Shift Days in Test	Test_Shift_Days	The number of shift-days (period of a normal workday for an individual employee) over which this file was gathered	Once per test	Y	86.1920(b)(4)(ii)	Normally 1 or 2, could be 3 or more.	N(1,0)	1 to 20
275	Test Duration	Test_Duration	The length of the test in seconds	Once per test	Y	86.1920(b)(4)(ii)	43000	N (8,0)	1 to 43200
277	Non Idle Test Time	Time_Non_Idle	The number of seconds of non-idle operation (Idle is defined as engine at idle speed with zero torque)	Once per test	Y	86.1920(b)(4)(ii)		N (5,0)	0 to 28800
288	Diagnostics after Test Failure	Test_Fail_Diagnostics	A description of the results 01 any diagnosis performed on a truck after the truck failed a road test Enter null if this test was completed	Once per test	Y	86 1920(c)(2), (3)		A,1000	
289	Test Program Phase	Test_Prog_Phase	The program phase under which this engine family was tested Permitted values Phase 1, Phase 2	Once per test	Y	86 1920(c)(3)(ii)	1.2	A,1	
295	Test Comments	Comments-Test	Any comments the manuf may want to make about this section	Once per test	Y			A 1000	

.a.6 Portable Device (PD) Description

296	Portable Device Manufacturer	PD_Mfr	The name of the manufacturer who made the portable device	Once per unit	Y		OBS1300	A,25	
297	Portable Device Model	PD_Model	The model designation of the portable device	Once per unit	Y			A,25	
298	Portable Device Serial Number	PD_Serial_Number	The serial number of the portable device	Once per unit	Y			A.20	
327	Portable Device Changes	PD_Change	Describe any changes made to the portable device from its original configuration at the time 01 purchase, as necessary	Once per unit	Y			A,1000	

. General program information

ection 2 is program information in XML format To be submitted quarterly or as required

This information is requredfor vehicles that passed through the initial screening but were then rejected for testing It does not apply to vehicles screened but not tested because other vehicles filled the quota

Data Element Number	Plain English Name	Data Element Name	Data Element Definition	Reporting Freauency	Required	Comments	Rea Reference	Example	Format	Validation
ejected Vehicle Information					Y, if any vehicles were reiected	Repeat as necessary				
27	Vehicle Manufacturer	Veh_Mfr	The name of the vehicle manufacturer (make)	Once per rejected vehicle	Y, if any vehicles were rejected		(86 1920(b)(2))		A,25	No numbers
28	Vehicle Model	Veh_Mod	The vehicle model	Once per rejected vehicle	Y, if any vehicles were rejected		(86 1920(b)(2))		A,2000	none
29	Year Vehicle Built	Veh_B_YR	The year the vehicle was built by the manufacturer	Once per rejected vehicle	Y, if any vehicles were rejected		(86 1920(b)(2))	2005	A,4	2005' or later
30	Vehicle Identifcation Number	VIN	The Vehicle IdentifcationNumber (VIN) stamped or printed on the label riveted to the vehicle's dashboard	Once per rejected vehicle	Y, if any vehicles were rejected		(86 1920(b)(2))	5JDUF84LYTI70S UEJD	A,2000	No lower case letters
31	Vehicle Type	Veh_Type	The vehicle type as described by its use For example-delivery line haul, or dump truck	Once per rejected vehicle	Y, if any vehicles were rejected	Provide SCC codes	(86 1920(b)(2))	dump truck	A,25	none
32	Engine Model	Eng_Model	Manufacturer designation for engine configuration(s) which share basic design parameters (i e same basic long block design)	Once per rejected vehicle	Y, if any vehicles were rejected		(86 1920(b)(2))	ENGMOD1	A.15	none
33	Engine Code	Eng_Code	A designation which identifies a specific torque/HP configuration or other combination of attributes which define the engine	Once per rejected vehicle	Y, if any vehicles were rejected		(86 1920(b)(2))	3	A.10	none
34	Engine Serial Number	Eng_Serial_No	The unique designation stamped on the engine and used to identify and track the specific engine	Once per rejected vehicle	Y, if any vehicles were rejected		(86 1920(b)(2))	4758-73827364	A,12	none
35	Engine Displacement	Eng_Displ	The total volume swept by the piston stroke, times the number of cylinders, in liters	Once per rejected vehicle	Y. if any vehicles were rejected		(86 1920(b)(2))	4	A,20	0 to 18
37	Engine Build Date	Eng_Build_Date	The build date identified on the engine or the emissions label	Once per rejected vehicle	Y. if any vehicles were rejected		(86 1920(b)(2))	38354	YYYYMMDD	
								1 Unrepresentative 2 Atypical usage 3 Improper maintenance 4 Tampered or rebuilt 5 Misfueled 6 EMD 7 MIL 8 Too much idle 9 Exceeded useful life 10 No space for PEMS		
38	Reason Rejected	Reject-Reason	The reason a vehicle/engine was rejected during screening.	Once per rejected vehicle	Y, if any vehicles were rejected	If 6, fill out fuel analyses If 7, fill out EMD info If 8, fill out MIL info.	86 1920(b)(2)		A,50	
39	Rejection Explanation	Reject-Explan	Further explain the cause of the vehicle's rejection. if information is available.	Once per rejected vehicle	Y, if any vehicles were rejected		86.1920(b)(2)		A,1000	

Items for Record Keeping

Section 1.a is information in an XML, word processing file (.doc, .wpd) or .pdf file. Submitted as needed, but at least by the end of the test program

.a General program summary

Data Element Number	Plain Enalish Name	Data Element Name	Data Element Definition	Reporting Freauency	Required	Comments	Reg Reference	Example	Format	Validation
1	Engine Family	Eng_Fam	Engine Family being tested	Once perprogram			[86 1920(b)(1)]		A(12)	
2	Date Selected	Date_Selected	Note the date of the letter from EPA in which this engine family was selected to be tested in use.	Once per program			[86.1920(b)(1)]		Date	
3	Number of Companies Solicited	Number_Companies_Solicited	Number of different companies solicited for this family	Once per program			[86 1920(b)(1)]		N(2,0)	
4	Number of States	Number_States	Number of different states searched in for this family	Once per program			[86 1920(b)(1)]		N(2,0)	
5	Number of Companies Solicited	Number_Companies_Vehs	Number of companies that provided vehicles for this testing	Once per engine family (would apply to every vehicle tested for that engine family)			[86 1920(b)(1)]		N(2,0)	
6	Test Schedule - Tentative	Test_Sched	Tentative test schedule for testing the famly (e g , six vehicles to be tested in Summer 2006)	Once per program			[86 1920(b)(1)]		A,2000	
7	Comments- Program Design	Comments_Prog_Design	Any comments you may want to make about this section	Once per vehicle			[86.1920(b)(1)]		5000,A	
89	Number of Drive Wheels	Drive_Wheels	The number of drive wheels on the vehicle	Once per vehicle	Y	May need data elements for tire size and ECM fuel		8	N(1,0)	
91	Number of Forward Gears	Forward_Gears	The number of forward gears available in the transmission	Once per vehicle	Y					
92	Exhaust Pipe Diameter	Exh_Pipe_Dia	The exhaust pipe outer diameter at the exit of the stock exhaust in mm	Once per vehicle	Y			6	N(1,0)	
94	Flowmeter Hardware	Flowmeter_Hardware	A description of anything you have to install between the tailpipe and the flowmeter in order to have an acceptable installation		Y				A,1000	
129	Engine Modified	Eng_Modd	An indication of whether or not the engine has been physically modified or upgraded in any way or the ECM has been changed in any way from Its certified configuration. Permitted values yes, no	Once per vehicle.	Y			Y or N	A,1	
130	Modification Date	Mod_Date	The date of any modification made to the engine	Once per vehicle					Date	
131	Modification Description	Mod-Desc	If yes to above, a description of the modification to the engine and the mileage at the time of the change, if available	Once per vehicle.					A,200	
139	Test Fuel	Test_Fuel	Indicate the fuel used for the test Permitted values 2D, Biodiesel.	Once per test	Y			2 -2 0 or B -	A,1	
140	Biodiesel Blend	Biodiesel_Blend	Amount of fuel (in %) that is biologically based	O — per test	Y if B above				N(2,0)	
143	source - New Fu	New_fuel_Source	A brief description of where the lest fuel came from if the manufacturer drained the owner's fuel and filled the tank with another fuel	Once per test					A,100	
278	Delay Time - THC	Delay_Time_THC	The amount of time in seconds between when emissions are sampled and when the THC analyzer records the concentration of gases	once per test	Y	This e also known as 'data	[1065 201]		5 N(3,1)	
279	Delay Time - NM	Delay_Time_NMHC	The amount of time in seconds between when emissions are sampled and when the NMHC analyzer records the concentration of gases	Once per test	Y	This is also known as 'data	[1065.201]		5 N(3,1)	
280	Delay Time - NO	Delay_Time_NOX	The amount of time in seconds between when emissions are sampled and when the NOx analyzer records the concentration of gases–	Once per test	Y	This ts also known as 'data	[1065 201]		5 N(3,1)	
281	Delay Time - CO	Delay_Time_CO	The amount of time in seconds between when emissions are sampled and when the CO analyzer records the concentration of gases	Once per test	Y	This is also known as 'data	[1065.201]		5 N(3,1)	
282	Delay Time - CO2	Delay_Time_CO2	The amount of time in seconds between when emissions are sampled and when the C02 analyzer records the concentration of gases	Once per test	Y	This is also known as 'data	[1065 201]		5 N(3,1)	
283	Delay Time - 0 2	Delay_Time_O2	The amount of time in seconds between when emissions are sampled and when the 0 2 analyzer records the concentration of gases.	Once per test	Y	The ts also known as 'data	[1065.201]		5 N(3,1)	
284	Delay Time - PM	Delay_Time_PM	The amount of time in seconds between when emissions are sampled and when the PM analyzer records the concentration of gases	Once per test	Y	This is also known as 'data	[1065.201]		5 N(3,1)	
285	Delay Time - CH4	Delay_Time_CH4	The amount of time in seconds between when emissions are sampled and when the CH4 analyzer records the concentration of gases	Once per test	Y	This is also known as data	[1065.201]		5 N(3,1)	
290	Normal Operations - Differences	Normal_Ops_Steps	Note any significantly unusual events inconsistent with normal operation and use	Once per test	Y		86 1920(b)(4)(iv)		A, 1000	