Production Line Testing

Manufacturer Data Submission Template -- INSTRUCTIONS

I. About

This template allows engine manufacturers to submit production line testing data in a simple, consistent format. Based on the information entered by the submitter, the template performs the required CumSum and sample size calculations and displays the current status of the test.

It is intended that a copy of this template be created for each engine family for which you are required to report production line testing results. Please include the engine family name in the submission file name. 40 CFR Part 1051.345 (a) indicates that this information must be submitted on a quarterly basis. It is intended that one copy of a template be maintained per engine family, per year. For instance, the file submitted for the second quarter will contain all test results previously submitted for the first quarter with the results from the second quarter added on. The template provides a field to indicate the associated test period at the engine test level.

Please note that the instructions in this document are specific to the Recreational (Snowmobile) template.

II. General

● The primary worksheet for entering production line testing data is the worksheet labeled 'Submission Template.' You may only modify values in cells that are white. All other cells contain either labels or calculated values.

● The 'Notes' worksheet provides space for a manufacturer to provide any additional notes or relevant information for the engine family's production line testing information.

● The resulting calculations, including an indication of whether the test results yield a status of Pass, Fail or Open, are displayed in the 'Calculations' worksheet.

III. Entering PLT Test Information

At the top of the 'Submission Template' worksheet, there are spaces to enter general information about the production line test you are reporting. Please provide as much information as possible. These fields include:

● Manufacturer contact information;

● Engine family identifier;

● Projected annual production volume;

● Indication of whether HC+NOx testing is required (HC+NOx not required until Phase 2);

● Indication of whether HC+NOx testing is required (HC+NOx not required until Phase 3);

● Indication of whether the test data apply to a carry-over engine family (and thus, eligible to submit test results based on a reduced sample size); and

● Pre-approved reduced required sample size (if carry-over engine family).

Once the annual production volume is entered, fields will appear where start and end dates for test periods should be entered. For an annual production volume of at least 1600, four test periods should be defined. These test periods should be consecutive quarters. If the annual production period is less than 12 months long, the test periods should be defined such that they are approximately equal in length. For an annual production volume of less than 1600, only one test period should be defined. The test period in this case is the Model Year [see 40 CFR, Part 1051.310 (a)].

If you certify an engine family with carry-over emissions data and the equivalent engine families consistently pass the PLT requirements over the preceding two-year period, you may be eligible for a reduced testing rate for subsequent production line testing for that engine family, [see 40 CFR, Part 1051.301 (e)]. If this condition applies, indicate that the engine family is a carry-over engine family and enter the pre-approved number of tests required in the field labeled 'Pre-approved reduced required sample size.' The first row of data entered in this case should be the last test results from the previous year. If you have indicated that the engine family is a carry-over engine family, the first row in the calculations worksheet will appear in pink.

IV. Entering PLT Engine Test Results

Each PLT test is comprised of multiple tests of individual engines within the engine family being tested. Begin entering your data in the first row (beginning in cell D24) of the 'Submission Template' worksheet. Be sure to enter specific engine tests in the order in which they occurred, as the template's CumSum calculations depend on the correct order. In addition, please do not skip rows as you enter your results.

The following data fields are available for each engine test. Fields that are required by federal regulations and for valid CumSum calculations are indicated. The official reporting requirements can be found in 40 CFR Part 1051.345 (a).

● Test Number (required); this should be numeric and sequential
● Test Date (required)
● Test Time
● Test Period (automatically filled in based on the Test Date entered and the Test Periods defined)
● Engine ID (required)
● Build Date (required)
● Service Hours Accumulation (required)
● Service Hours Location (required)
● Include in CumSum? Indicator (required)
● HC Initial Result (required)
● HC Final Result (required)
● HC Emission Limit or FEL (required)
● HC Unit of measure (g/bhp-hr or g/kW-hr)

- HC Unit of measure (g/bhp-hr or g/kW-hr)
- HC Deterioration Factor
- CO Initial Result
- CO Final Result
- CO Emission Limit or FEL
- CO Unit of measure (g/bhp-hr or g/kW-hr)
- CO Deterioration Factor
- HC+NOx Initial Result (Phase 3 only)
- HC+NOx Final Result (Phase 3 only)
- HC+NOx Emission Limit or FEL (Phase 3 only)
- HC+NOx Unit of measure (g/bhp-hr or g/kW-hr - Phase 3 only)
- HC+NOx Deterioration Factor (Phase 3 only)
- Test Location
- Test Contact
- Invalid Test Indicator (required -- must be yes if test is declared invalid)
- Invalid Reason
- Failure Reason
- Remedy
- Repairs
- Test Comments

V. The Calculations Worksheet

The 'Calculations' worksheet checks the data that you enter and attempts to determine the current status of your PLT test. Your test will appear to be in exactly one of three possible statuses -- FAIL, PASS, or OPEN.

● FAIL: Your PLT Test will be in a failing status if, for one or more pollutants, you had consecutive engine tests in which the calculated CumSum statistic exceeds the calculated Action Limit value. Once a test has reached a fail status, subsequent tests will not change it.

● PASS: Your PLT Test will be a passing status if, for all required pollutants, the actual number of included engine tests (n) is greater than or equal to the required test sample size (N), and for all required pollutants, the mean result is less than or equal to the provided emission limit or FEL. For Recreational Snowmobile engines, a minimum of two engines must be tested in the first test period for newly certified engines. In subsequent test periods or for engine families relying on previously submitted test data, the new test result is combined with the test result from the previous test period. [see 40 CFR Part 1051.310(b)].

● OPEN: Your PLT Test will remain in an open status if it has not yet reached a fail or pass status.

VI. Troubleshooting

If you are experiencing odd or unexpected results in the 'Calculations' worksheet, please check the following:

● Have you entered all engine tests sequentially without skipping rows?

● For each engine test, have you entered the Final Result and Emission Limit, and have you indicated if the test is included in CumSum?

● Have you inadvertently marked an included test as Invalid?

● Remember that if HC+NOx testing is required, you must continue to test all pollutants until all have met their sample size requirement (N).

● If the required sample size does not appear to be calculating correctly, verify that you have not entered a low Projected Annual Production or an alternative required sample size for a carry-over engine family.

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PLT Test Information

Manufacturer:	
PLT Test Contact:	
Email Address:	
Phone #:	

Engine Family:	
Projected Annual Production Volume:	
Is this a carry-over engine family?	
Pre-approved reduced required sample size:	
Are you required to test HC+NOx?	

Comments:

PLT Engine Test Results

Test Number	Test Date	Test Time	Test Period	Engine ID	Build Date	Service Hours Accumulation	Service Hours Location	Include in CumSum?	HC Initial Result	HC Final Result	HC Emission Limit/FEL	Units	HC Det. Factor	CO Initial Result	CO Final Result	CO Emission Limit/FEL	Units	CO Det. Factor	HC+NOx Initial Result	HC+NOx Final Result	HC+NOx Emission Limit/FEL	Units	HC+NOx Det. Factor	Test Location	Test Contact	Test Invalid?	Invalid Reason	Failure Reason	Remedy
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Production Line Testing
Calculated Results Data

Current PLT Test Status:

Engine Family:	0	
HC (passing status?)	#N/A	
CO (passing status?)	#N/A	
HC+NOx (passing status?):	HC+NOx not Tested	

HC (N-met?):	No
CO (N-met?):	No
HC+NOx (N-met?):	HC+NOx not tested
Maximum Tests:	30
Test Period Requirement Met?	No

Current PLT Test Status:	#N/A	#N/A
Notes:		

* Number of included HC+Nox tests (n) is less than the required number (N).

* Production Line Test is not complete until at least 2 engines per quarter have been tested.

HC - Calculations

Actual Sample Size (n)	Required Sample Size (N)	Mean Result	Standard Deviation	Prior CumSum	CumSum	Action Limit	Sample Requirement Met?	HC Fail?	HC Pass?

CO - Calculations

Actual Sample Size (n)	Required Sample Size (N)	Mean Result	Standard Deviation	Prior CumSum	CumSum	Action Limit	Sample Requirement Met?	CO Fail?	CO Pass?

HC+NOx - Calculations

Actual Sample Size (n)	Required Sample Size (N)	Mean Result	Standard Deviation	Prior CumSum	CumSum	Action Limit	Sample Requirement Met?	HC+NOx Fail?	HC+NOX Pass?

Warnings

Production Line Testing

Please provide any additional notes here