| | Company corporate name as listed on the engine type certificate | Applicable calendar year | Complete sub-model name | Engine type (turbofan, turboprop, etc.) | FAA type certificate number | Certificating authority of original type certificate | Date of issue of type certificate, (mm-yyyy) | Name of engine sub-model which received original type certificate | Derivative engine for emission certification purposes? (Y/N) | If derivative, name of original certificated engine model | Combustor type |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Column is CBI (Y/N)** | | | | | | | | | | | |
| 1 | | | | | | | | | | | |
| 2 | | | | | | | | | | | |
| 3 | | | | | | | | | | | |
| 4 | | | | | | | | | | | |
| 5 | | | | | | | | | | | |
| 6 | | | | | | | | | | | |
| 7 | | | | | | | | | | | |
| 8 | | | | | | | | | | | |
| 9 | | | | | | | | | | | |
| 10 | | | | | | | | | | | |
| 11 | | | | | | | | | | | |
| 12 | | | | | | | | | | | |
| 13 | | | | | | | | | | | |
| 14 | | | | | | | | | | | |
| 15 | | | | | | | | | | | |
| 16 | | | | | | | | | | | |
| 17 | | | | | | | | | | | |
| 18 | | | | | | | | | | | |
| 19 | | | | | | | | | | | |

| | Company corporate name as listed on the engine type certificate | Applicable calendar year | Complete sub-model name | Engine type (turbofan, turboprop, etc.) | FAA type certificate number | Certificating authority of original type certificate | Date of issue of type certificate, (mm-yyyy) | Name of engine sub-model which received original type certificate | Derivative engine for emission certification purposes? (Y/N) | If derivative, name of original certificated engine model | Combustor type |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | | | | | | | | | | | |
| 21 | | | | | | | | | | | |
| 22 | | | | | | | | | | | |
| 23 | | | | | | | | | | | |
| 24 | | | | | | | | | | | |
| 25 | | | | | | | | | | | |
| 26 | | | | | | | | | | | |
| 27 | | | | | | | | | | | |
| 28 | | | | | | | | | | | |
| 29 | | | | | | | | | | | |
| 30 | | | | | | | | | | | |
| 31 | | | | | | | | | | | |
| 32 | | | | | | | | | | | |
| 33 | | | | | | | | | | | |
| 34 | | | | | | | | | | | |
| 35 | | | | | | | | | | | |
| 36 | | | | | | | | | | | |
| 37 | | | | | | | | | | | |

| | Number of tests run per sub-model | Number of engines tested per sub-model | Applicable tier of NOx standards | Reference pressure ratio | Engine maximum rated thrust output, in kilonewtons (kN) - kilowatts (kW) for turboprop engines | Calendar year production volumes | | | Nitrogen Oxides (NOx) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Mass over each segment of the entire Landing and Take-off (LTO) Cycle (g) | | | | |
| | | | | | | Intended for new aircraft | Non-exempt spare engines intended for in-use aircraft | Excepted Spare Engines | Take-off | Climbout | Approach | Ground idle / taxi | Total LTO mass (g) |
| | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | - |
| 2 | | | | | | | | | | | | | - |
| 3 | | | | | | | | | | | | | - |
| 4 | | | | | | | | | | | | | - |
| 5 | | | | | | | | | | | | | - |
| 6 | | | | | | | | | | | | | - |
| 7 | | | | | | | | | | | | | - |
| 8 | | | | | | | | | | | | | - |
| 9 | | | | | | | | | | | | | - |
| 10 | | | | | | | | | | | | | - |
| 11 | | | | | | | | | | | | | - |
| 12 | | | | | | | | | | | | | - |
| 13 | | | | | | | | | | | | | - |
| 14 | | | | | | | | | | | | | - |
| 15 | | | | | | | | | | | | | - |
| 16 | | | | | | | | | | | | | - |
| 17 | | | | | | | | | | | | | - |
| 18 | | | | | | | | | | | | | - |
| 19 | | | | | | | | | | | | | - |

| | Number of tests run per sub-model | Number of engines tested per sub-model | Applicable tier of NOx standards | Reference pressure ratio | Engine maximum rated thrust output, in kilonewtons (kN) - kilowatts (kW) for turboprop engines | Calendar year production volumes | | | Nitrogen Oxides (NOx) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Mass over each segment of the entire Landing and Take-off (LTO) Cycle (g) | | | | |
| | | | | | | Intended for new aircraft | Non-exempt spare engines intended for in-use aircraft | Excepted Spare Engines | Take-off | Climbout | Approach | Ground idle / taxi | Total LTO mass (g) |
| 20 | | | | | | | | | | | | | - |
| 21 | | | | | | | | | | | | | - |
| 22 | | | | | | | | | | | | | - |
| 23 | | | | | | | | | | | | | - |
| 24 | | | | | | | | | | | | | - |
| 25 | | | | | | | | | | | | | - |
| 26 | | | | | | | | | | | | | - |
| 27 | | | | | | | | | | | | | - |
| 28 | | | | | | | | | | | | | - |
| 29 | | | | | | | | | | | | | - |
| 30 | | | | | | | | | | | | | - |
| 31 | | | | | | | | | | | | | - |
| 32 | | | | | | | | | | | | | - |
| 33 | | | | | | | | | | | | | - |
| 34 | | | | | | | | | | | | | - |
| 35 | | | | | | | | | | | | | - |
| 36 | | | | | | | | | | | | | - |
| 37 | | | | | | | | | | | | | - |

| | | Hydrocarbons (HC) | | | | | | Carbon Monoxide (CO) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Characteristic level | Mass over each segment of the entire Landing and Take-off (LTO) Cycle (g) | | | | Total LTO mass (g) | Characteristic level | Mass over each segment of the entire Landing and Take-off (LTO) Cycle (g) | | | | Total LTO mass (g) | Characteristic level | Number over each segment of the entire La (LTO) Cycle) | | |
| | | Take-off | Climbout | Approach | Ground idle / taxi | | | Take-off | Climbout | Approach | Ground idle / taxi | | | Take-off | Climbout | Approach |
| 1 | | | | | | - | | | | | | - | | | | |
| 2 | | | | | | - | | | | | | - | | | | |
| 3 | | | | | | - | | | | | | - | | | | |
| 4 | | | | | | - | | | | | | - | | | | |
| 5 | | | | | | - | | | | | | - | | | | |
| 6 | | | | | | - | | | | | | - | | | | |
| 7 | | | | | | - | | | | | | - | | | | |
| 8 | | | | | | - | | | | | | - | | | | |
| 9 | | | | | | - | | | | | | - | | | | |
| 10 | | | | | | - | | | | | | - | | | | |
| 11 | | | | | | - | | | | | | - | | | | |
| 12 | | | | | | - | | | | | | - | | | | |
| 13 | | | | | | - | | | | | | - | | | | |
| 14 | | | | | | - | | | | | | - | | | | |
| 15 | | | | | | - | | | | | | - | | | | |
| 16 | | | | | | - | | | | | | - | | | | |
| 17 | | | | | | - | | | | | | - | | | | |
| 18 | | | | | | - | | | | | | - | | | | |
| 19 | | | | | | - | | | | | | - | | | | |

| | | Hydrocarbons (HC) | | | | | | Carbon Monoxide (CO) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Characteristic level | Mass over each segment of the entire Landing and Take-off (LTO) Cycle (g) | | | | Total LTO mass (g) | Characteristic level | Mass over each segment of the entire Landing and Take-off (LTO) Cycle (g) | | | | Total LTO mass (g) | Characteristic level | Number over each segment of the entire La (LTO) Cycle) | | |
| | | Take-off | Climbout | Approach | Ground idle / taxi | | | Take-off | Climbout | Approach | Ground idle / taxi | | | Take-off | Climbout | Approach |
| 20 | | | | | | - | | | | | | - | | | | |
| 21 | | | | | | - | | | | | | - | | | | |
| 22 | | | | | | - | | | | | | - | | | | |
| 23 | | | | | | - | | | | | | - | | | | |
| 24 | | | | | | - | | | | | | - | | | | |
| 25 | | | | | | - | | | | | | - | | | | |
| 26 | | | | | | - | | | | | | - | | | | |
| 27 | | | | | | - | | | | | | - | | | | |
| 28 | | | | | | - | | | | | | - | | | | |
| 29 | | | | | | - | | | | | | - | | | | |
| 30 | | | | | | - | | | | | | - | | | | |
| 31 | | | | | | - | | | | | | - | | | | |
| 32 | | | | | | - | | | | | | - | | | | |
| 33 | | | | | | - | | | | | | - | | | | |
| 34 | | | | | | - | | | | | | - | | | | |
| 35 | | | | | | - | | | | | | - | | | | |
| 36 | | | | | | - | | | | | | - | | | | |
| 37 | | | | | | - | | | | | | - | | | | |

| | Smoke | | | Fuel flow | | | | | Carbon dioxide ($CO_2$) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | nding and Take-off | | | Over each segment of the Landing and Take-off (LTO) Cycle (g / sec) | | | | | Mass over each segment of the entire Landing and Take-off (LTO) Cycle (g) | | | | |
| | Ground idle / taxi | Maximum | Characteristic level | Take-off | Climbout | Approach | Ground idle / taxi | Total fuel flow over LTO (g) | Take-off | Climbout | Approach | Ground idle / taxi | Total LTO mass (g) |
| | | | | | | | | | | | | | |
| 1 | | | | | | | | - | - | - | - | - | - |
| 2 | | | | | | | | - | - | - | - | - | - |
| 3 | | | | | | | | - | - | - | - | - | - |
| 4 | | | | | | | | - | - | - | - | - | - |
| 5 | | | | | | | | - | - | - | - | - | - |
| 6 | | | | | | | | - | - | - | - | - | - |
| 7 | | | | | | | | - | - | - | - | - | - |
| 8 | | | | | | | | - | - | - | - | - | - |
| 9 | | | | | | | | - | - | - | - | - | - |
| 10 | | | | | | | | - | - | - | - | - | - |
| 11 | | | | | | | | - | - | - | - | - | - |
| 12 | | | | | | | | - | - | - | - | - | - |
| 13 | | | | | | | | - | - | - | - | - | - |
| 14 | | | | | | | | - | - | - | - | - | - |
| 15 | | | | | | | | - | - | - | - | - | - |
| 16 | | | | | | | | - | - | - | - | - | - |
| 17 | | | | | | | | - | - | - | - | - | - |
| 18 | | | | | | | | - | - | - | - | - | - |
| 19 | | | | | | | | - | - | - | - | - | - |

| | Smoke | | | Fuel flow | | | | | Carbon dioxide ($CO_2$) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | nding and Take-off | | | Over each segment of the Landing and Take-off (LTO) Cycle (g / sec) | | | | | Mass over each segment of the entire Landing and Take-off (LTO) Cycle (g) | | | | |
| | Ground idle / taxi | Maximum | Characteristic level | Take-off | Climbout | Approach | Ground idle / taxi | Total fuel flow over LTO (g) | Take-off | Climbout | Approach | Ground idle / taxi | Total LTO mass (g) |
| 20 | | | | | | | | - | - | - | - | - | - |
| 21 | | | | | | | | - | - | - | - | - | - |
| 22 | | | | | | | | - | - | - | - | - | - |
| 23 | | | | | | | | - | - | - | - | - | - |
| 24 | | | | | | | | - | - | - | - | - | - |
| 25 | | | | | | | | - | - | - | - | - | - |
| 26 | | | | | | | | - | - | - | - | - | - |
| 27 | | | | | | | | - | - | - | - | - | - |
| 28 | | | | | | | | - | - | - | - | - | - |
| 29 | | | | | | | | - | - | - | - | - | - |
| 30 | | | | | | | | - | - | - | - | - | - |
| 31 | | | | | | | | - | - | - | - | - | - |
| 32 | | | | | | | | - | - | - | - | - | - |
| 33 | | | | | | | | - | - | - | - | - | - |
| 34 | | | | | | | | - | - | - | - | - | - |
| 35 | | | | | | | | - | - | - | - | - | - |
| 36 | | | | | | | | - | - | - | - | - | - |
| 37 | | | | | | | | - | - | - | - | - | - |

| | Any additional remarks to the EPA |
|---|---|
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| 10 | |
| 11 | |
| 12 | |
| 13 | |
| 14 | |
| 15 | |
| 16 | |
| 17 | |
| 18 | |
| 19 | |

| | |
|---|---|
| **Row 4** | **Please mark each column YES or NO to designate whether it contains any confidential business information as such, but only mark that which is truly confidential. Most of the fields will NOT be confidential.** |

For further information on these reporting requirements, see 40 CFR parts 87.42 and 87.64.

Questions regarding these requirements can be submitted via email to aircraft_engine_reporting@epa.gov.

## Guidance on specific columns:

| | |
|---|---|
| **Column C:** | This is the calendar year for which production is being reported. |
| **Column E:** | If engine is turbofan, please indicate if it is mixed flow or not. |
| **Column G:** | This is the certificating authority that issued the original certificate for the engine type (e.g., FAA, EASA, TC) |
| **Column H:** | This is the date of issuance of the original type certificate for that submodel, not the most recent revision date of the type certificate. Original dates for all submodels are contained in the most recent revision of the type certificate. |
| **Columns R, S, and T:** | For purposes of calendar year production, an engine is considered to have been produced on the date shown on its FAA Form 8130-3, "AIRWORTHINESS APPROVAL TAG" or the date shown on the engine identification plate per 14 CFR 45.13(a)(7).<br>If a given engine submodel is manufactured by more than one manufacturer or at more than one facility, you may submit the total production of that submodel in a single report.<br>If there are no sales of a particular submodel, please enter "0" rather than leaving blank. |
| **Columns U through AL:** | Reporting of NOx, HC and CO is not required for engines only subject to a smoke standard. |
| **Columns Y, AE, AK, AW-BB, BT-BY and CJ-CO:** | These columns each contain formulas which will calculate the value based on the inputs of their respective preceeding ~~four~~ columns. They are shaded light grey. |
| **Column AQ:** | For smoke number, please provide an explanation in the notes column if this value is different than the maximum of the four LTO points. |
| **Column AX-BB:** | Carbon dioxide is automatically calcuated: *CO2 = fuel_flow*time_in_mode* 3.16* |
| **Column BD through CO** | Reporting of nvPM is only required for engines with rated thrust greater than 26.7 kilonewtons |
| **Column BT-BY & CJ-CO** | nvPM emission rates are calculated:<br>*nvPM_corrected = measured_nvPM * nvPM_loss_correction_factor * fuel_flow * time_in_mode* |

## Additional guidance:

| | |
|---|---|
| **Significant Figures:** | Please report values consistent with the significant figure requirements contained in 14 CFR 34.23. |

Reporting of emission indices at individual LTO operating thrust mode settings are optional, but recommended, for NOx, HC, CO and Smoke.