WLTP-20-15e
Appendix-01

Confirmation of requirements in latest GTR 15

Sep. 2017

JAPAN

Contents

Japan would like to confirm understandings regarding following paragraphs in GTR 15.

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Length of connecting tube of Exhaust gas dilution system (1/2)

■ Annex 5 3.3.1.3.(a)

Be less than 3.6 metres long, or less than 6.1 metres long if heat insulated. Its internal diameter shall not exceed 105 mm; the insulating materials shall have a thickness of at least 25 mm and thermal conductivity shall not exceed 0.1 $W/m^{-1}K^{-1}$ at 400 °C. Optionally, the tube may be heated to a temperature above the dew point. This may be assumed to be achieved if the tube is heated to 70 °C;

■ Our understanding

To prevent the PN/PM measuring loss, GTR limits the gas contact area of the connecting tube in the exhaust gas dilution system. This will able the effect of laboratory and/or facility difference as small as possible.

■ Confirmation

If not measuring PM/PN for gasoline vehicles, we think Annex 5 3.3.1.3. (a) does not need to apply. Is our understanding correct?

(Most gasoline exhaust gas dilution system in Japan does not need to measure particulate that there exists the system without tunnels.)

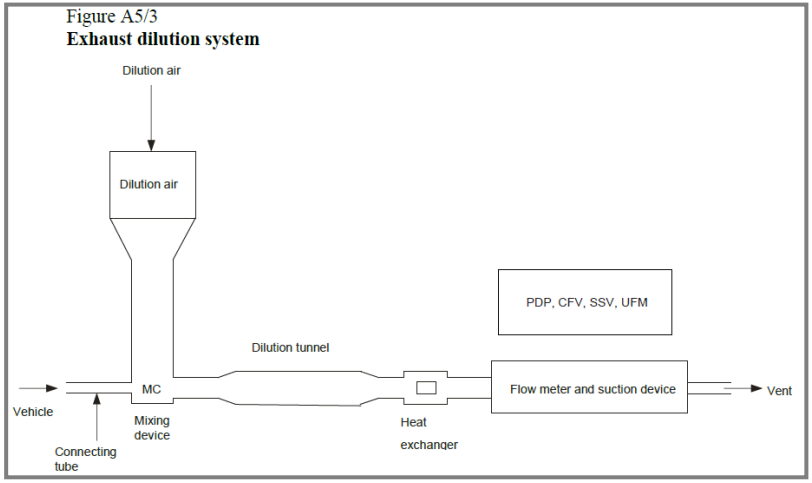
Length of connecting tube of Exhaust gas dilution system (2/2)

■ Background

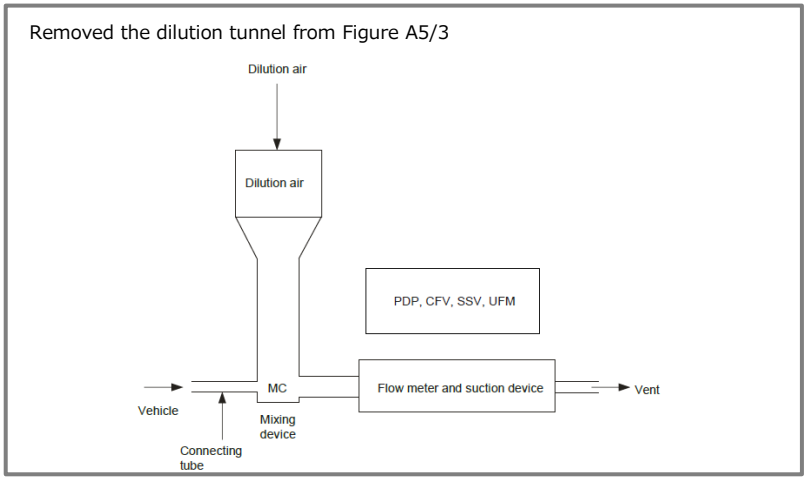
Comparison of general emission measurement system at EU and Japan

- Emission measurement system on GTR No.15
  The requirements of exhaust gas dilution system are written based on the system with dilution tunnel. (see Fig. A below)

- Emission measurement system on attachment 42 (JC08 mode test)
  Since PN/PM measurement is not required in Japan, many the gasoline exhaust measurement system does not have dilution tunnel. (see Fig. B below)



■ Figure A: Included to measure particulate matter



■ Figure B: Measure only gaseous emissions

Requirement on connecting tube

■ Annex 5 3.3.1.3.(c)

No component of the connecting tube shall be of a material that might affect the gaseous or solid composition of the exhaust gas. To avoid generation of any particles from elastomer connectors, elastomers employed shall be as thermally stable as possible and have minimum exposure to the exhaust gas. It is recommended not to use elastomer connectors to bridge the connection between the vehicle exhaust and the connecting tube.

■ Our understanding

The purpose not to use “elastomer connectors” to bridge the connection between the vehicle exhaust and the connecting tube is “to avoid generation of any particles from elastomer connectors.”

■ Confirmation

We understand that this recommendation is applied only when measuring PM/PN. Is our understanding correct?

Accuracy of time measurement for CH-DY (1/2)

■ Annex 5 2.2.3.

The dynamometer shall have a time measurement system for use in determining acceleration rates and for measuring vehicle/dynamometer coastdown times. This time measurement system shall have an accuracy of at least ±0.001 per cent. This shall be verified upon initial installation.

■ Confirmation

This accuracy of at least ±0.001% means the time should not differ more than 0.00001 sec in 1 sec measurement? Or 0.01 sec during 1000 sec measurement?

Accuracy of time measurement for CH-DY (2/2)

■ US CFR 1066 Subpart C, §1066.320 Time verification procedure

(c) *Procedure*. Perform this verification using one of the following procedures:

(1) ***WWV method***. You may use the time and frequency signal broadcast by NIST from radio station WWV as the time standard if the trigger for the dynamometer timing circuit has a frequency decoder circuit, as follows:

(i) Contact station WWV by telephone by dialing (303) 499-7111 and listen for the time announcement. Verify that the trigger started the dynamometer timer. Use good engineering judgment to minimize error in receiving the time and frequency signal.

(ii) **After at least 1000 seconds**, re-dial station WWV and listen for the time announcement. Verify that the trigger stopped the dynamometer timer.

(iii) Compare the measured elapsed time, y_{act}, to the corresponding time standard, y_{ref}, to determine the time error, y_{error}, using the following equation:

$$y_{error} = \frac{y_{act} - y_{ref}}{y_{ref}} \cdot 100\ \%$$

(2) ***Ramping method.*** You may use an operator-defined ramp function to serve as the time standard as follows:

(i) Set up a signal generator to output a marker voltage at the peak of each ramp to trigger the dynamometer timing circuit. Output the designated marker voltage to start the verification period.

(ii) **After at least 1000 seconds**, output the designated marker voltage to end the verification period.

(iii) Compare the measured elapsed time between marker signals, y_{act}, to the corresponding time standard, y_{ref}, to determine the time error, y_{error}, using Eq. 1066.230-1.

(3) ***Dynamometer coastdown method***. You may use a signal generator to output a known speed ramp signal to the dynamometer controller to serve as the time standard as follows:

(i) Generate upper and lower speed values to trigger the start and stop functions of the coastdown timer circuit. Use the signal generator to start the verification period.

(ii) **After at least 1000 seconds**, use the signal generator to end the verification period.

(iii) Compare the measured elapsed time between trigger signals, y_{act}, to the corresponding time standard, y_{ref}, to determine the time error, y_{error}, using Eq. 1066.230-1.

(d) *Performance evaluation.* **The time error determined in paragraph (c) of this section may not exceed ±0.001%.**

US CFR is based on at least 1000 seconds out of ±0.001%.

Temperature requirement to start the test

■ Annex 6 2.8.1.

The test cell temperature at the start of the test shall be 23 °C ±3 °C. The engine oil temperature and coolant temperature, if any, shall be within ±2 °C of the set point of 23 °C.

■ Confirmation

It is so difficult for non-English native to understand “if any” is on “coolant temperature” or whole “the engine oil temperature and coolant temperature.”

We understand this as both engine oil temperature and coolant temperature must be 23°C ±3 °C when starting the test. Is our understanding correct?

Thank you for your attention!