

OICA PROPOSAL FOR DRAFT AMENDMENTS TO REGULATION No. 83

PROPOSAL

In order to harmonize the test procedures, to adapt the regulation to technical progress (noise reduction and aerodynamic measures) and to reflect customer behaviour (average parking duration), the introduction of an alternative preconditioning procedure is proposed for the Type I test.

This alternative preconditioning adopts the Type VI test preconditioning requirement:

- Soak time 12 – 36 hours
- No requirement concerning the temperature of engine oil and coolant

Proposed amendments to Regulation 83:

List of contents, annexes,

Annex 4,

Item 5.3.1.; amend to read:

5.3.1. For compression-ignition engines for the purpose of measuring particulates, at most 36 hours and at least 6 hours before testing, the Part Two cycle described in Appendix 1 to this annex shall be used. Three consecutive cycles shall be driven. The dynamometer setting shall be indicated in paragraphs 5.1. and 5.2. above.

At the request of the manufacturer, vehicles fitted with positive-ignition engines may be preconditioned with one Part One and two Part Two driving cycles.

After this preconditioning, specific for compression-ignition engines, and before testing, compression-ignition and positive-ignition engines shall be kept in a room in which the temperature remains relatively constant between 293 and 303 K (20 and 30 °C). This conditioning shall be carried out for at least six hours and continue until the engine oil temperature and coolant, if any, are within +/- 2 K of the temperature of the room.

As an alternative, after this preconditioning, the vehicle shall be kept in a room in which the temperature remains relatively constant between 293 and 303 K (20 and 30°C) for not less than 12 hours nor for more than 36 hours prior to the exhaust emission test.

Annex 4a,

Item 6.3.1.; amend to read:

6.3.1. For the purpose of measuring particulates,

..... are within ± 2 K of the temperature of the room.

As an alternative, after this preconditioning, the vehicle shall be kept in a room in which the temperature remains relatively constant between 293 and 303 K (20 and 30 °C) for not less than 12 hours nor for more than 36 hours prior to the exhaust emission test.

JUSTIFICATION

The preconditioning requirements of the Type I test define a soak time of 6 – 36 hours and an engine oil and coolant temperature within $\pm 2^{\circ}\text{C}$ of the soak area temperature before the emission test can be started.

Differing to this requirement the preconditioning of the Type VI test (emission test at low ambient temperatures) and the US FTP test procedure (40 CFR Part 86, §.86.132-96 (g)) define a soak time of 12 – 36 hours and have no requirement concerning the engine oil or coolant temperature. The Japanese TRIAS test procedure requires 6 - 36 hours without any restriction of oil or coolant temperature.

The proposed amendment harmonizes the test procedures of Type I test, Type VI test, US FTP and Japan TRIAS. This means, that for the Type I test, as an alternative to the present preconditioning, a soak time of 12 -36 hours should be introduced without any restriction of oil or coolant temperature.

Actual vehicle/engine concepts use encapsulation measures to reduce external noise and aerodynamic drag. As a side effect this leads to extended cool down times of the power train after engine shutoff. Fig. 1 shows the impact of these developments to the engine cool down times.

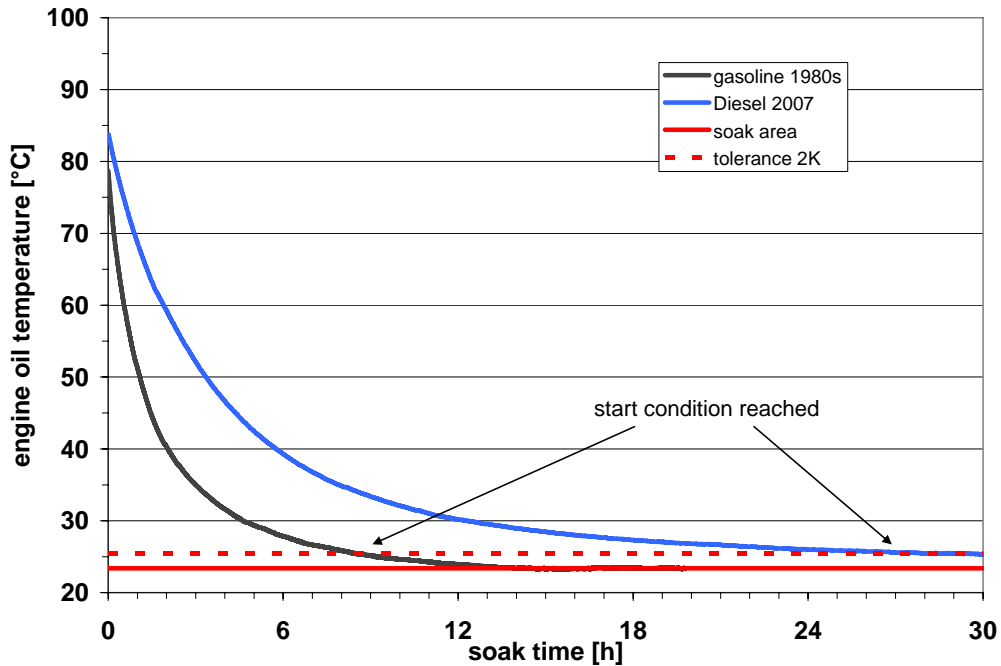


Fig. 1: Development of engine cool down times.

Contrary to the development of noise reduction and aerodynamic measures leading to longer cool down times, the preconditioning requirement of test Type I remained unchanged. The regulation defines a minimum soak period of 6 hours and a start condition of engine oil and coolant temperature in between $\pm 2^{\circ}\text{C}$ of the temperature of the soak area ($20\text{-}30^{\circ}\text{C}$), before the emission test can be started. Modern vehicle concepts remain in a warmed up condition with engine temperatures above 2 K above ambient temperature for more than 24 hours. This situation causes increased workload in the development and type approval process as additional cooling fans have to be used to reduce the soak times between preconditioning cycle and emission test (forced cooling down).

Another aspect is the typical parking duration which is not reflected by the present preconditioning requirement. In practice, the mean cool down time for customer use between two trips is less than 12 hrs, because vehicles are used on average for more than two trips a day [KONTIV89, published 1992 by Ministry of Transport, Germany; Verkehrsverhalten (Traffic Studies), published 9/2001 by Ministry of Economics, State of North Rhine Westphalia, Germany].

The impact of the proposed alternative preconditioning procedure on emissions and fuel consumption is within the normal range of measurement deviations, regarding exhaust emissions a test variation up to 12% and up to 1% for fuel consumption occurred. These values are within normal test-to-test variations.

