

Outline of draft regulation for amendments of the exhaust gas emissions regulation for special large motor vehicles and special small motor vehicles fueled gasoline or liquefied petroleum gas (LPG)

(Draft partial amendments of “Public Notice that Prescribes Details of Safety Regulations for Road Transport Vehicles”, etc.)

1. Background

Japan has introduced the exhaust gas emissions regulations for special motor vehicles with an engine which maximum power is not smaller than 19 kW and not larger than 560kW. For special motor vehicles with a gasoline or LPG fueled engine, the steady test mode, C2 mode (7 mode), has been applied as the exhaust gas testing cycle since 2007. On the other hand, for special motor vehicles with a diesel engine, the steady test mode, C1 mode (8 mode) and the Non-Road Transient Cycle (NRTC) has been applied since 2011 and then the Ramped Modal Cycle (RMC) is also applicable as an alternative method of the C1 mode from 2014.

The three way catalyst (TWC) is a common after treatment device for gasoline or LPG fueled special motor vehicles. To achieve higher reducing rate, a feedback system according to condensation of oxygen in the exhaust gas measured by the O₂ sensor is commonly applied to keep the air-fuel ratio properly. However, the response delay of catalyst temperature during transient use or the performance degradation of TWC due to the nonsteady inflow of exhaust gas cannot be evaluated enough the current steady test cycle for gasoline or LPG special motor vehicles installed such a TWC and feedback system.

The release of blow-by gas in the air is prohibited for standard motor vehicles, compact vehicles, light vehicles, motor cycles, motorized bicycle and diesel fueled special motor vehicles. In contrast, gasoline or LPG fueled special motor vehicles are not prohibited to release blow-by gas currently. As a result of the investigation, it shows that the recent gasoline fueled special motor vehicles are technically able to comply to prohibit to release blow-by gas.

Based on the situation, the Central Environment Council published a report in August 2020 that recommends to reduce gas emissions from special large motor vehicles and special small motor vehicles fueled gasoline or liquefied petroleum gas by following measures. i.e. i) strengthen exhaust gas emissions limits for carbon monoxide (CO) and nitrogen oxides (NO_x), ii) introduce the LSI-NRTC (Large Spark Ignition Non-Road Transient Cycle) and 7M-RMC (7 mode Ramped Modal Cycle) as emissions test cycles and iii) prohibit to release blow-by gas in the air.

2. Outline of Amendment

Regulations to be amended: Public Notice that Prescribes Details of Safety Regulations for Road Transport Vehicles, etc.

Scope: special large motor vehicles and special small motor vehicles with an engine which maximum power is not smaller than 19 kW and not larger than 560 kW fueled gasoline or liquefied petroleum gas

Outline: The amendments include i) strengthening exhaust gas emissions limits, ii) introduce of the LSI-NRTC and the 7M-RMC as the emissions test cycles and iii) enforcement of installation of blow-by gas recirculation device.

- i) Strengthening exhaust gas emissions limits
- ii) Introduce of the LSI-NRTC and the 7M-RMC

The exhaust gas emissions limits for each test cycle are shown in the following table.

Scope	Test Cycle	Limits [g/kWh]			Note
		Average value ^{*3} (maximum value) ^{*3}			
		CO	HC	NO _x	
Gasoline or LPG Special motor vehicles ^{*1}	LSI-NRTC	15.0 (20.0)	0.60 (0.80)	0.30 (0.40)	This amendments
	7M-RMC or C2 mode ^{*2}				
	C2 mode	20.0 (26.6)	0.60 (0.80)	0.60 (0.80)	Current

*1 Special large motor vehicles or special small motor vehicles with a gasoline or LPG fueled engine which maximum power is not smaller than 19kW and not larger than 560kW

*2 The 7M-RMC or C2 mode is selectable option on the exhaust gas testing.

*3 The average value is applied to type approval vehicles.
The maximum value is applied to non-type approval vehicles.

- iii) Enforcement of installation of blow-by gas recirculation device

A blow-by gas recirculation device that recirculates the leaked gases from the combustion chamber of the engine to the crankcase is enforced to install and shall be that its installation is secure and exhibits no damage.

3. Proposed Schedule

Date of adoption: around January, 2024

Dates of application:

New type engines: from October, 2024

All engines: applied later than new type engines, to be determined by the adoption