A summary of the future exhaust emission regulation of two-wheeled vehicle in Japan

September, 2015

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Next vehicle emission regulation (Two-wheeled vehicles)

【Scope】

- Motorcycle（with sidecars）and motor-driven cycle

【Outline of Amendments】

- Strengthening the limit values ※

※ Excluding motor-driven cycle with displacement of 0.050 litters or less and maximum speed of less than 50km/h

- Introducing measures for evaporative emission（based on the gtr currently being developed at the United Nations）
- Introducing On Board Diagnostic system（based on the gtr currently being developed at the United Nations ）

【Date of Enforcement】

(1) New type approval vehicle: from Oct 1st 2016
(2) Existing model and imported vehicle：from Sep 1st 2017

Strengthening the limit values

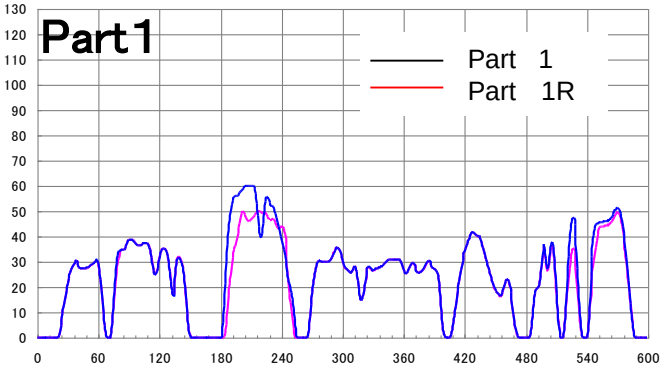
Strengthen the limit values as in the table below no later than the end of 2016 . (Excluding motorbikes with maximum speed of less than 50km / h). Test mode will remain to be WMTC mode, as conventional method.

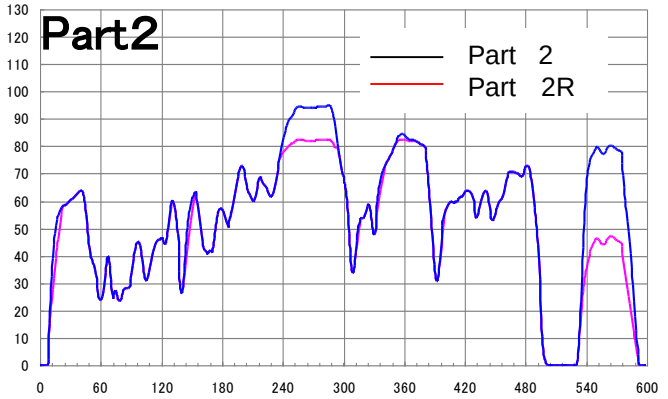
Regulatory Year	Applied vehicle type	CO	HC	NOx
2016 regulations	・Total displacement: 0.050ℓ＜,＜0.150 ℓ and maximum speed: ≦50km/h ・Total displacement: ＜0.150ℓ and maximum speed: 50km/h＜,＜100km/h (class1)	1.14g/km	0.30g/km	0.07g/km
	・Total displacement: ＜0.150ℓ and max speed: 100km/h≦,＜130km/h ・Total displacement: ≧0.150ℓ and maximum speed: ＜130km/h (class2)	1.14g/km	0.20g/km	0.07g/km
	Maximum speed: ≧130km/h (class3)	1.14g/km	0.17g/km	0.09g/km
Current limit value	Motorbike Total displacement:≦0.125ℓ	2.2g/km	0.45g/km	0.16g/km
	Motor cycle Total displacement:＞0.125ℓ	2.62g/km	0.27g/km	0.21g/km

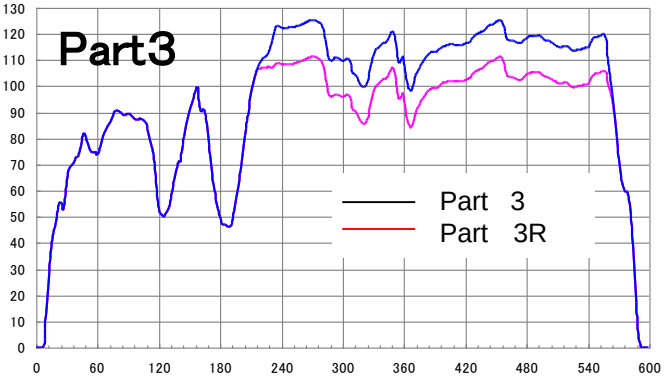
Outline of WMTC

WMTC (Worldwide harmonized motorcycle emission test cycle) was established as GTR NO.2 at WP29 in June 2005, and was introduced domestically on October 28, 2010.

Vehicle class	Cycle	Weighting	
Class 1 (Motorbike equivalent)	Part 1R, cold	w_1	50%
	Part 1R, hot	w_{1hot}	50%
Class 2-1 (Light motorcycle equivalent)	Part 1R, cold	w_1	30%
	Part 2R, hot	w_2	70%
Class 2-2 (Light motorcycle equivalent)	Part 1, cold	w_1	30%
	Part 2, hot	w_2	70%
Class 3-1 (Motorcycle equivalent)	Part 1, cold	w_1	25%
	Part 2, hot	w_2	50%
	Part 3R, hot	w_3	25%
Class 3-2 (Motorcycle equivalent)	Part 1, cold	w_1	25%
	Part 2, hot	w_2	50%
	Part 3, hot	w_3	25%

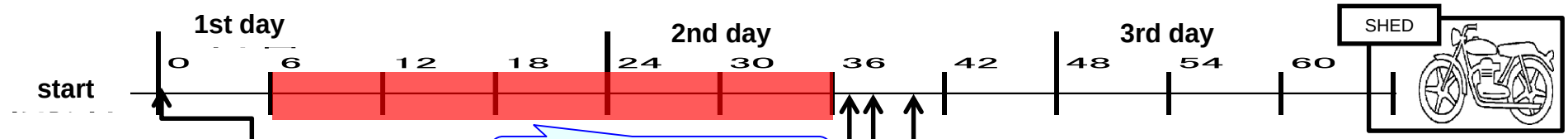






Outline of evaporative emission test method

Evaporative emissions are currently not regulated in Japan but the requirement will be introduced in stages from next issue of regulation. The testing method will be diurnal breathing loss test and hot soak loss test, the equivalent as the method used in California. Detail of the test method will be introduced based on the Global technical regulation（GTR） developed under United Nations. The limit shall be 2.0g/test or under which is the same as gasoline and LPG four-wheeled vehicle.



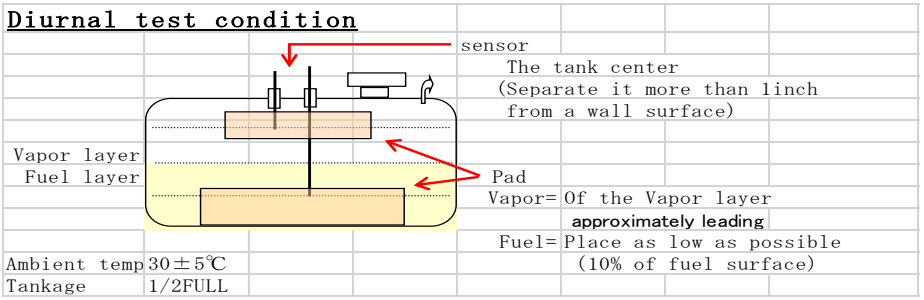
1 Preconditioning
Soak in a room where the temperature is 25±5℃ for 6 to 36 hours after driven on chassis dynamometer.

※ Soak time varies depending on vehicle class

3 On-mode driving

4 Hot soak loss Test
Measure the weight of evaporative emission of the vehicle which had been left inside the shed for 1 hour(25±5℃) after taking the vehicle emission test.

2 Diurnal breathing loss Test
Heat（15.5 → 35.5℃/1h）the fuel tank in SHED room. After exchanging fuel which is kept the required degrees. Calculate weight of evaporative emission by measuring the density change of HC inside SHED room.



【Example: measurement procedure of evaporative emission test method of California】

※ Central Environment Council's report "Future Policy for the Motor Vehicle Emission Reduction"

Introducing OBD

To monitor malfunction of the electrical circuit, (such as disconnection and other errors), OBD system shall be equipped.
Technical requirements shall be introduced based on the Global Technical Regulation(GTR) developed under United Nations.

	Subjects to monitor
Monitoring Items	○ Disconnection and malfunction of Sensors（atmosphere pressure sensor, intake pressure sensor, intake air temperature sensor, engine coolant temperature sensor, throttle position sensor, Cylinder sensor, crankshaft position sensor, O_2 sensor, O_2 sensor heater, primary ignition system, secondary air injection system and etc.）. ○ Malfunction of fuel system by monitoring fuel injection correction volume and others
Systems	○ Alarm releasing after recovery, record of accident and functional checking before driving ○ Warning lamps, ISO standards for communication protocols and connectors external diagnostics system

Alarm in case of fault

Source：Suzuki Motor Corporation HP

※ Central Environment Council's report "Future Policy for the Motor Vehicle Emission Reduction"

Thank you !