

ECE No. 39.00: Speedometers

Technical requirement

The 61th Asia Expert meeting
5th – 6th Feb. 2020



JAPAN AUTOMOBILE STANDARDS INTERNATIONALIZATION CENTER



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1. The main purpose of this regulation

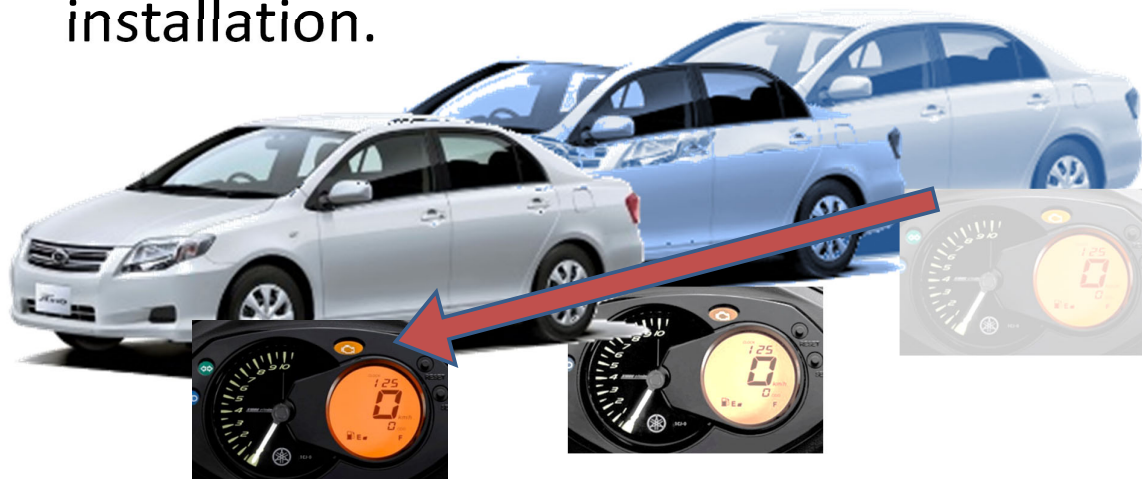
- “Speedometer” means that part of the speedometer equipment which indicates to the driver the speed of his vehicle at any given moment.



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2. Requirement

- “Approval of a vehicle” means the approval of a vehicle type with regard to the speedometer equipment including its installation.



Speedometer as Regulation

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Requirement

- Visibility from driver
- Accuracy of speed-indicating section

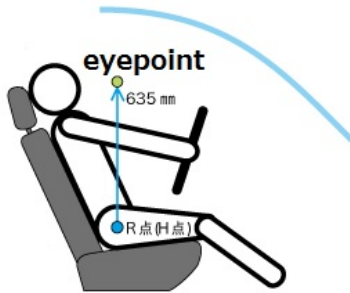
UN-R39 (01)	
5.	SPECIFICATIONS
5.1.	The display of the speedometer must be located within the direct field of view of the driver and must be clearly legible both day and night.
5.2.	The accuracy of the speedometer equipment shall be tested in accordance with the following procedure:
5.3.	The speed indicated shall not be less than the true speed of the vehicle.

Visibility from Driver

- Installation position of speedometer
- Legibility
- Range of indicated speed
- Graduation
- Speed values

Installation Position of Speedometer

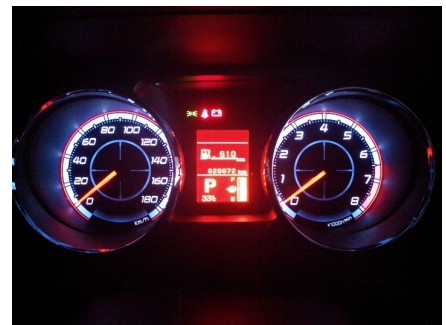
- Speedometer must be located within direct field of view of driver.



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Legibility

- Speedometers must be clearly legible both day and night



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Range of Indicated Speed

- Must include maximum speed indicated by manufacturer of vehicle fitted with speedometer
- Speedometers for categories L1 & L2: display reading must not exceed 80km/h



Category L1



Digital

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Graduations

- Graduations shall be of 1, 2, 5 or 10km/h.



2km/h



5km/h



10km/h

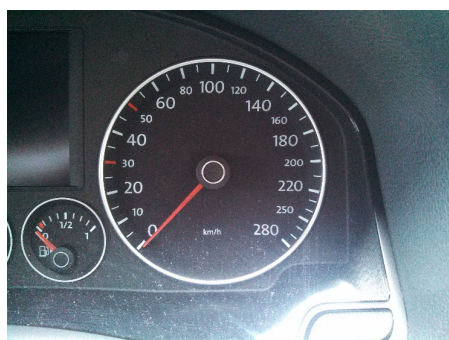
Speed Values

Maximum speed value...

- under 200km/h: intervals not exceeding 20km/h
- over 200km/h: intervals not exceeding 30km/h

Category L1 & L2: intervals not exceeding 10km/h

** The indicated numerical speed value intervals need not be uniform.*



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Speed Display in mph

- Graduations: 1, 2, 5 or 10mph
 - Numerical values of speedometer:
 - shall commence at 10 or 20mph
 - intervals shall not exceed 20mph
- * The indicated numerical speed values need not be uniform.*



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Requirement

- Visibility from driver
- Accuracy of speed-indicating section

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Test Speed

Maximum design speed (V _{max}) of vehicle specified by vehicle manufacturer (km/h)	Displayed speed on meter (V1) (km/h)		
V _{max} ≤ 45	80 % of V _{max}		
45 < V _{max} ≤ 100	40 km/h	80 % V _{max} (if resulting speed is ≥ 55 km/h)	
100 < V _{max} ≤ 150	40 km/h	80 km/h	80 % V _{max} (if resulting speed is ≥ 100 km/h)
150 < V _{max}	40 km/h	80 km/h	120 km/h

Verification of Test Results

- $0 \leq (V1 - V2) \leq 0.1 V2 + 4 \text{ km/h}$

$V1 = \text{displayed speed}$, $V2 = \text{true speed}$

(Example)

$V1 = 40 \text{ km/h}$, $V2 = 37.5 \text{ km/h}$

$$0 \leq (40 - 37.5) \leq 0.1 * 37.5 + 4$$

↓

$$0 \leq 2.5 \leq 7.75 \quad \text{OK}$$

3. Type of Speedo meter

“Type of vehicle in respect of its speedometer” means vehicles which do not among themselves display any essential differences, where those differences can apply, in particular, to the following:

1. size designation of the tires chosen from the range of tires normally fitted
2. overall transmission ration to the speedometer (incl. any reduction drives)
3. tolerance of measuring mechanism of speedometer
4. technical constant of speedometer
5. range of speeds displayed

3. Type of Speedo meter

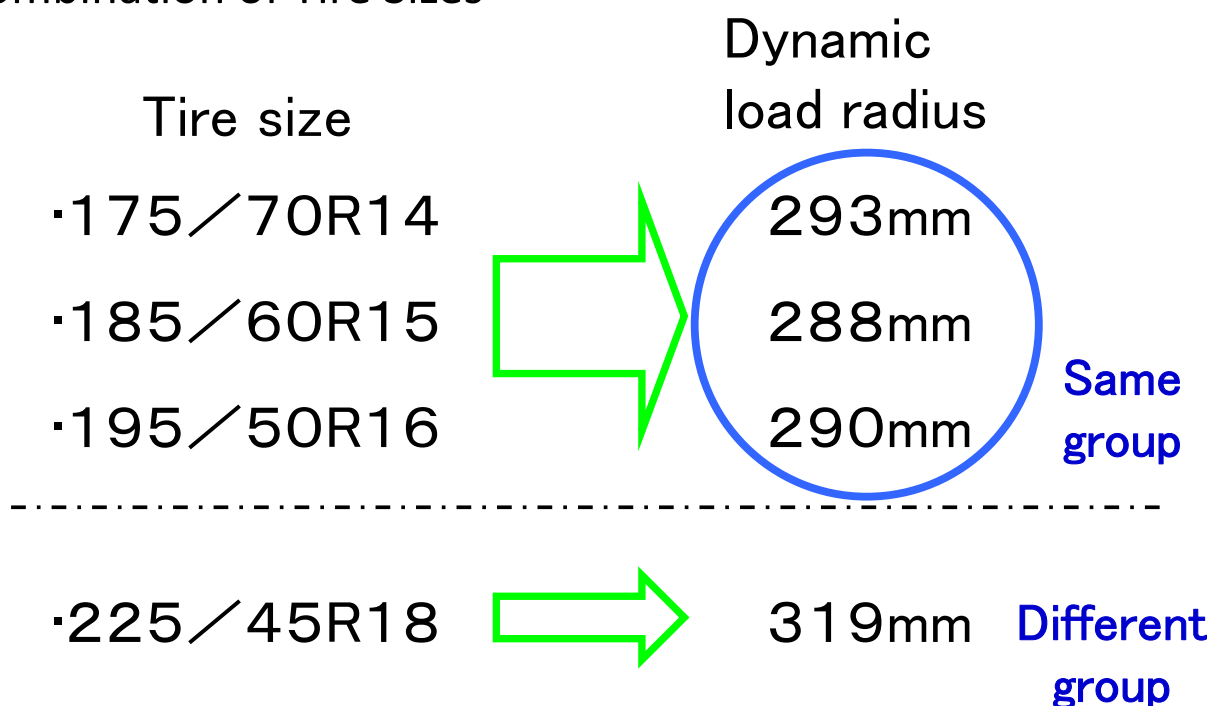
Vehicles that do not display any essential differences in the following:

1. Combination of tire sizes
2. Combination of reduction ratio
3. Speed detection method
4. Transmission method for speed-indicating section of speedometer
5. Speed-indicating section of speedometer

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Combination of Tire Sizes



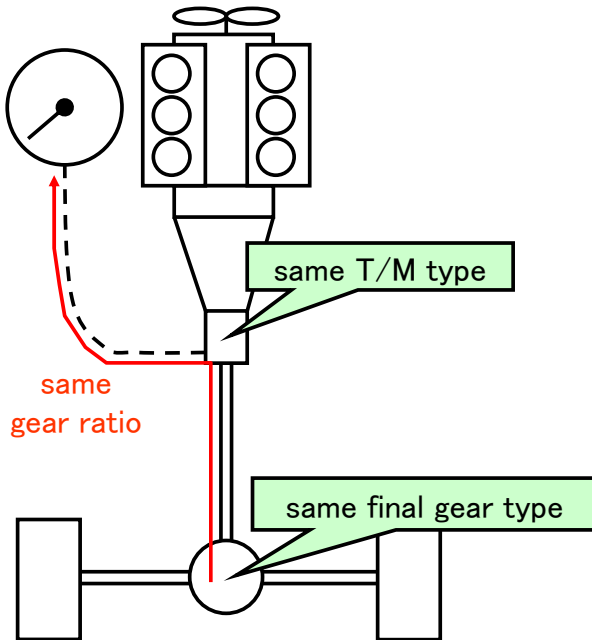
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Combination of Reduction Ratio

In case of mechanical type (signal from T/M)

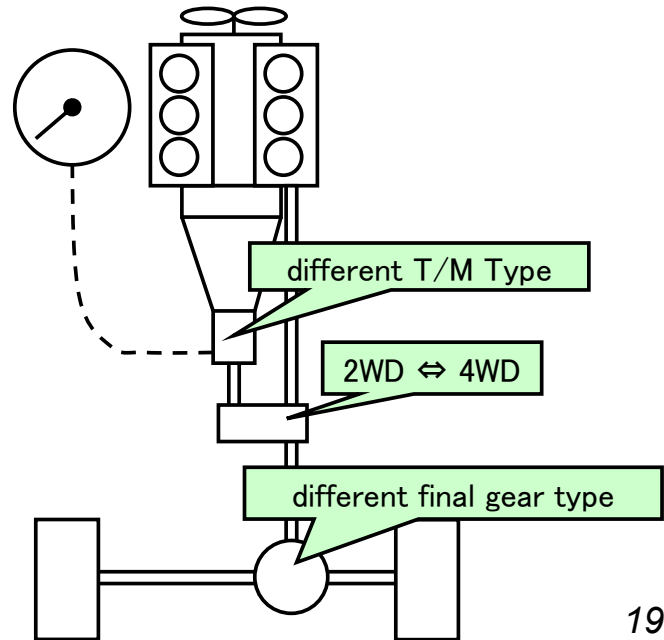
Same group

Same or similar gear ratio
from final gear to speedometer



Different group

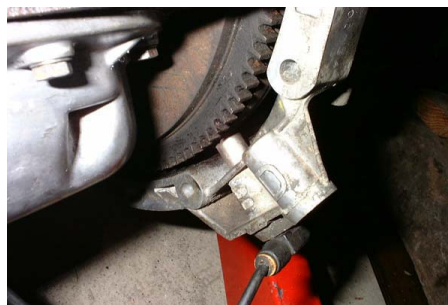
Different gear ratio
e.g. difference of T/M, 2WD ↔ 4WD, final gear



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Speed Detection Method

- Mechanical type
- Electrical type (mission detection)
- Electrical type (wheel speed sensor detection)



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Transmission Method for Speed-indicating Section of Speedometer

- Mechanical type
- Electrical type (ECU operation)
- Electrical type (ECU operation + pulse modulation)

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Indicating Section of Speedometer

- Digital type
- Dial type (including different graduation width)



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4. Overview of characteristics requirement for vehicles



Speedometer as Regulation

- Visibility from driver
- Accuracy of speed-indicating section

Thank you!