

Final Report(Summary) of Joint Meeting between  
the Automobile Evaluation Standards Subcommittee, Energy Efficiency Standards  
Subcommittee of the Advisory Committee for Natural Resources and Energy  
and  
the Automobile Fuel Efficiency Standards Subcommittee, Automobile Transport Section,  
Land Transport Division of the Council for Transport Policy

Concerning revisions of evaluation standards for Manufacturers with regard to  
improvement of automobile energy consumption efficiency

## Background to Establishing New Fuel Efficiency Standards

### (1) Present CO<sub>2</sub> and energy situation in Japan

In Japan, total greenhouse gas emissions for FY2005 (preliminary figures) were 8.1% higher than the base year (FY1990) level specified in the Kyoto Protocol, moving further from Japan's international commitment to reduce its greenhouse gas emissions by 6% from the base year level during the first commitment period (Year 2008 to 2012). This is due to a significant increase of carbon dioxide (CO<sub>2</sub>) resulting from energy consumption, which accounts for approximately 90% of Japan's greenhouse gas emissions.

Under these circumstances, the "Kyoto Protocol Target Achievement Plan", adopted at a Cabinet meeting in April 2005, set CO<sub>2</sub> emission reduction targets for each sector. Under the plan, the target for the transport sector is to reduce CO<sub>2</sub> emissions to 250 million tons in FY2010. As a result of Manufacturers' positive efforts to meet the target, such as improving fuel efficiency, CO<sub>2</sub> emissions for the transport sector (preliminary figures) were 257 million tons in FY2005, steadily approaching the target. However, global warming is predicted to become an increasingly serious problem on a global scale. It is important for the transport sector to continue with its efforts, since it accounts for approximately 20% of total CO<sub>2</sub> emissions.

In recent years, structural energy constraints have been increasing, as seen in soaring crude oil prices, sudden expansion of energy demand mainly driven by the BRICs, historically unstable supply risks, etc. In light of this, the "Outline of Economic Growth Strategy" (Council for Fiscal and Economic Reforms, July 2006) and the "New National Energy Strategy" (Ministry of Economy, Trade and Industry, May 2006) have set targets of improving energy consumption efficiency by 30% through Year 2030 and reducing the transport sector's oil dependency to about 80%.

### (2) Present status of automobile fuel efficiency standards

For automobiles, fuel efficiency standards using the Top Runner Method (\*) were introduced in 1999 to promote energy savings and reduce CO<sub>2</sub> emissions. These standards are based on the "Law Concerning the Rational Use of Energy" (1979, Law No. 49) (hereinafter referred to as "Energy Conservation Law"). The standards cover passenger vehicles with a capacity of 10 passengers or less and freight vehicles with a gross vehicle weight of 2.5 tons or less. They were followed by a series of fuel efficiency standards: standards for LPG vehicles were introduced in 2003, and in 2006 standards were introduced for heavy freight vehicles with a gross vehicle weight over 3.5 tons and passenger vehicles with a capacity of 11 or more passengers (with a gross vehicle weight over 3.5 tons).

Manufacturers must ensure that for each category, the weighted harmonic average fuel efficiency of vehicles shipped in a target fiscal year does not fall below the fuel efficiency standards under the Energy Conservation Law. If the

fuel efficiency standards are not met in a target fiscal year, warnings, public announcement, and orders will be issued, depending on the efforts made by the manufacturer in question. A fine of up to one million yen will be imposed where an order has been violated.

- \* A method to determine standard values based on vehicles presently on the market that have the highest fuel efficiency, while taking into consideration future prospects of technological development.

### (3) Consideration of establishing new fuel efficiency standards

With regard to gasoline passenger vehicles, approximately 80% (of the vehicles shipped) met the existing fuel efficiency standards (FY2010 targets) at the end of FY2004. This steady improvement in fuel efficiency is due in part to Manufacturers' positive efforts, green taxation, etc. Similarly, freight vehicles are moving steadily toward meeting the existing fuel efficiency standards.

On the other hand, greater efforts to improve fuel efficiency are necessary, in consideration of Japan's increased energy constraints, the seriousness of the situation concerning CO<sub>2</sub> emissions, and the importance of CO<sub>2</sub> reduction measures in the transport sector (automobile sector) which accounts for approximately 20% of CO<sub>2</sub> emissions.

In July 2005, the Ministry of Economy, Trade and Industry formed an "Automobile Evaluation Standards Subcommittee" under the Energy Efficiency Standards Subcommittee of its Advisory Committee for Natural Resources and Energy, while the Ministry of Land, Infrastructure and Transport formed an "Automobile Fuel Efficiency Standards Subcommittee" under the Automobile Transport Section, Land Transport Division of its Council for Transport Policy. The intention was to establish new fuel efficiency standards for passenger vehicles and freight vehicles based on the Top Runner Method. Through joint meetings held by the same members of both subcommittees, hearings with related parties were conducted, and discussions were held repeatedly on those items on which Manufacturers should base their evaluation (such as vehicles to be covered, target fiscal year, fuel efficiency measurement methods, fuel efficiency classifications, fuel efficiency standards, and display items).

The Kyoto Protocol Target Achievement Plan, Outline of Economic Growth Strategy, and New National Energy Strategy also mention the establishment of this new fuel efficiency standard (Top Runner standard) to further improve fuel efficiency, in line with future developments and trends.

### (4) Seeking public comments

In order to extensively hear comments from the public, comments were sought on the results of discussions which the joint meeting had been engaged in. This is a final report summarizing the discussion results, in consideration of these public comments. 19 valuable comments were collected from 8 people.

## Concerning Revisions of the Evaluation Standards for Manufacturers with regard to the Improvement of Automobile Energy Consumption Efficiency

Discussions were held on those items on which manufacturers or importers (hereinafter referred to as “Manufacturers”) should base their evaluation with regard to energy consumption efficiency (fuel efficiency) of passenger vehicles and freight vehicles. The following is a final summary report of such discussions.

### 1. Vehicles to be covered (See Attachment 1)

Those passenger vehicles with a capacity of 10 passengers or less and that are fueled with gasoline or diesel oil (hereinafter referred to as “passenger car”), passenger vehicles with a capacity of 11 or more passengers (gross vehicle weight of 3.5 tons or less) (hereinafter referred to as “small buses”), and freight vehicles with a gross vehicle weight of 3.5 tons or less (hereinafter referred to as “small freight vehicles”) that have received type designation (type-designated vehicles) under Article 75.1 of the Road Trucking Vehicle Law (1951, Law No. 185).

### 2. Items on which Manufacturers should base their evaluation

#### (1) Target fiscal year (See Attachment 2)

The target fiscal year is set for FY2015 in consideration of the existing fuel efficiency standards as well as the effective period of exhaust emission regulations. Taking account of the period in which each vehicle undergoes a model change in and after FY2010, sufficient time will be ensured for development toward better fuel efficiency.

#### (2) Measurement method of energy consumption efficiency (fuel efficiency) (See Attachment 3)

Energy consumption efficiency shall be fuel efficiency values (km/L), an indicator widely recognized by automobile users. These shall be values measured by the Minister of Land, Infrastructure and Transport in designating vehicle types (inspection values).

For the measurement of energy consumption efficiency (fuel efficiency), JC08 mode shall be used as the driving mode, to be consistent with exhaust gas measurement method and evaluate fuel performance more accurately.

To simulate actual driving as closely as possible, cold-start driving before the engine is warmed up shall be taken into account, as well as hot-start driving when the engine is already warm. A weighted harmonic average (see note), weighted with each driving ratio, is used to obtain JC08 mode fuel efficiency, as in the following formula.

(Note) A weighted harmonic average is the reciprocal of the weighted average of the reciprocals of measured data. It is obtained by first taking the reciprocals of data, then calculating their weighted average, and lastly taking the reciprocal of the weighted average.

$$E = \frac{1}{\left( \frac{0.25}{E_{JC08C}} + \frac{0.75}{E_{JC08H}} \right)}$$

E: JC08 mode fuel efficiency value (km/L)

E<sub>JC08C</sub>: JC08 mode fuel efficiency value by cold start (km/L)

E<sub>JC08H</sub>: JC08 mode fuel efficiency value by hot start (km/L)

(3) Fuel efficiency classifications (See Attachment 4)

Basic classifications are by vehicle type and weight. In consideration of fuel, transmission type, effects of vehicle's structural difference on fuel efficiency, actual shipments, etc., the following classifications shall be used.

Type	Fuel		Vehicle structure	Transmission	Weight category
1. Passenger vehicle	Gasoline or diesel oil		—	—	16 categories
2. Small bus	Gasoline	Diesel oil	—	—	—
3. Mini freight vehicle	Gasoline or diesel oil		A   B	MT   AT	2 – 4 categories
4. Light-weight freight vehicle	Gasoline or diesel oil		—	MT   AT	2 – 3 categories
5. Medium-weight freight vehicle	Gasoline	Diesel oil	A, B1   B2	MT   AT	1 – 8 categories

(4) Target standard values (See Attachment 5)

With regard to vehicles to be shipped to the domestic market in the target fiscal year and each subsequent fiscal year, Manufacturers must make sure that, for each category (\*), the harmonic average of the energy consumption efficiency (fuel efficiency) values measured in (2) weighted with the number of shipments will not go below the target standard value. Values exceeding the target standards may be used to supplement other categories where the targets are not met.

\* With regard to passenger vehicles, mini freight vehicles, and light-weight freight vehicles, gasoline vehicles and diesel vehicles shall be placed in the same category, to which equal target standards are applied using energy conversion (heating value equivalent). A weighted harmonic average shall be obtained using fuel efficiency values for gasoline vehicles and gasoline-heating-value-equivalent fuel efficiency values for diesel vehicles (fuel efficiency of diesel vehicles divided by 1.10).

○ Passenger car

Category	Vehicle weight (kg)	Target standard value (km/L)
1	- 600	22.5
2	601 - 740	21.8
3	741 - 855	21.0
4	856 - 970	20.8

5	971 - 1,080	20.5
6	1,081 - 1,195	18.7
7	1,196 - 1,310	17.2
8	1,311 - 1,420	15.8
9	1,421 - 1,530	14.4
10	1,531 - 1,650	13.2
11	1,651 - 1,760	12.2
12	1,761 - 1,870	11.1
13	1,871 - 1,990	10.2
14	1,991 - 2,100	9.4
15	2,101 - 2,270	8.7
16	2,271 -	7.4

○Small buses

Category	Fuel	Target standard value (km/L)
1	Gasoline	8.5
2	Diesel oil	9.7

○Small freight vehicles

[Mini freight vehicles]

Category	Vehicle structure	Transmission	Vehicle weight (kg)	Target standard value (km/L)
1	Structure A	MT	- 740	23.2
2			741 -	20.3
3		AT	- 740	20.9
4			741 - 855	19.6
5			856 -	18.9
6	Structure B	MT	- 740	18.2
7			741 - 855	18.0
8			856 - 970	17.2
9			971 -	16.4
10		AT	- 740	16.4
11			741 - 855	16.0
12			856 - 970	15.4
13			971 -	14.7

[Light-weight freight vehicles (with a gross vehicle weight of 1.7 tons or less)]

Category	Transmission	Vehicle weight (kg)	Target standard value (km/L)
1	MT	- 1,080	18.5
2		1,081 -	17.1
3	AT	- 1,080	17.4
4		1,081 - 1,195	15.8
5		1,196 -	14.7

[Medium-weight freight vehicles (with a gross vehicle weight over 1.7 tons and no more than 3.5 tons)]

Category	Fuel	Vehicle structure	Transmission	Vehicle weight (kg)	Target standard value (km/L)
1	Gasoline	Structure A	MT	—	14.2
2			AT	- 1,310	13.3
3				1,311 -	12.7
4		Structure B1	MT	- 1,310	11.9
5				1,311 - 1,420	10.6
6				1,421 - 1,530	10.3
7				1,531 - 1,650	10.0
8				1,651 - 1,760	9.8
9				1,761 -	9.7
10				AT	- 1,310
11			1,311 - 1,420		9.8
12			1,421 - 1,530		9.6
13			1,531 - 1,650		9.4
14			1,651 - 1,760		9.1
15			1,761 - 1,870		8.8
16			1,871 -		8.5
17			Structure B2	MT	- 1,310
18		1,311 - 1,420			10.2
19		1,421 - 1,530			9.9
20		1,531 - 1,650			9.7
21		1,651 - 1,760			9.3
22		1,761 -		8.9	
23		AT		- 1,310	10.5
24				1,311 - 1,420	9.7
25				1,421 - 1,530	8.9
26				1,531 - 1,650	8.6
27			1,651 -	7.9	

28	Diesel oil	Structure A and Structure B1	MT	- 1,420	14.5
29				1,421 - 1,530	14.1
30				1,531 - 1,650	13.8
31				1,651 - 1,760	13.6
32				1,761 - 1,870	13.3
33				1,871 - 1,990	12.8
34				1,991 - 2,100	12.3
35				2,101 -	11.7
36			AT	- 1,420	13.1
37				1,421 - 1,530	12.8
38				1,531 - 1,650	11.5
39				1,651 - 1,760	11.3
40				1,761 - 1,870	11.0
41				1,871 - 1,990	10.8
42				1,991 - 2,100	10.3
43				2,101 -	9.4
44		Structure B2	MT	- 1,420	14.3
45				1,421 - 1,530	12.9
46				1,531 - 1,650	12.6
47				1,651 - 1,760	12.4
48				1,761 - 1,870	12.0
49				1,871 - 1,990	11.3
50				1,991 - 2,100	11.2
51				2,101 -	11.1
52			AT	- 1,420	12.5
53				1,421 - 1,530	11.8
54				1,531 - 1,650	10.9
55				1,651 - 1,760	10.6
56				1,761 - 1,870	9.7
57				1,871 - 1,990	9.5
58				1,991 - 2,100	9.0
59				2,101 -	8.8

\* The vehicle structures in the above tables refer to cab-behind-engine (bonnet type) vans for Structure A, cab-over-engine vans for Structure B1, and cab-over-engine trucks for Structure B2. Structure B refers to vehicles of Structure B1 and B2 all together. Each structure is defined below.



[Definitions of Structure A, B, B1, and B2]

1. "Structure A" refers to a structure that meets all of the requirements listed below.

- a. The maximum loading capacity divided by the gross vehicle weight is 0.3 or smaller.
- b. The seating equipment and cargo-loading equipment are installed inside the same vehicle compartment, which is separated from the vehicle exterior with bulkhead such as fixed roof and window glass.
- c. The engine is located in front of the driver compartment.

2. "Structure B" refers to any structure other than Structure A.

3. "Structure B1" refers to Structure B that meets the requirement in 1-b.

4. "Structure B2" refers to Structure B that excludes Structure B1.

(5) Display items (see Attachment 6)

1. The following are display items.

- a. Vehicle name and type
- b. Engine type and total displacement
- c. Vehicle weight
- d. Transmission type and number of speeds
- e. Fuel supply equipment type
- f. Main fuel efficiency improvement measures
- g. Energy consumption efficiency (fuel efficiency value expressed by a unit of km/L to one decimal place)
- h. Manufacturer name
- i. Gross vehicle weight and maximum loading capacity (applicable to freight vehicles only)
- j. Maximum output and maximum torque of engine
- k. Passenger capacity (applicable to passenger vehicles only)

2. The following are compliance items.

- Display items shall be noted in catalogs of the vehicle concerned. Energy consumption efficiency (fuel efficiency values) shall be displayed in a particularly visible manner, such as by use of underlines, larger typefaces, and letters of different colors.
- In addition to vehicle name and type, vehicles on display shall have energy consumption efficiency (fuel efficiency values) clearly posted at an easily viewable place.

3. Fuel efficiency display schedule

While properly evaluating the achievement status of the existing fuel efficiency standards and taking account of exhaust gas test mode schedule, the fuel efficiency display schedule is summarized as below for the rapid promotion of realistic fuel efficiency display with efforts to prevent market confusion.

[ Display obligation (through FY2010) ]

- Vehicles of early compliance with JC08 mode (\*): Both 10•15 mode fuel efficiency value and JC08 mode fuel efficiency value shall be displayed.
- Vehicles other than those of early compliance with JC08 mode: 10•15 mode fuel efficiency value shall be displayed.

\* Those are vehicles that receive type designation by taking JC08 mode exhaust gas tests prior to the date when the exhaust gas test mode becomes obligatory.