Final Report 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

March 2007

The Automobile Evaluation Standard 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

Background to Establishing New Fuel Efficiency Standards

(1) Present CO_2 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_2) 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_2 emission reduction targets for each sector. Under the plan, the target for the transport sector is to reduce CO_2 emissions to 250 million tons in FY2010. As a result of Manufacturers' positive efforts to meet the target, such as improving fuel efficiency, CO_2 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_2 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_2 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_2 emissions, and the importance of CO_2 reduction measures in the transport sector (automobile sector) which accounts for approximately 20% of CO_2 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_{JC08C}: JC08 mode fuel efficiency value by cold start (km/L)
E_{JC08H}: 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	10.9
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	11.2
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.

3. Proposals for energy saving

Automobile fuel efficiency standards had been discussed at this joint meeting. In order to reduce automobile energy consumption, however, it is important not only to focus on improving per-vehicle fuel performance, but also to take various actions at the same time. For this reason, with the expectation that further actions will be made by all related parties, proposals are summarized as below.

(1) Government actions

1. In order to effectively popularize highly fuel-efficient vehicles such as hybrid vehicles, idling-stop vehicles, diesel passenger vehicles etc., efforts shall be undertaken to provide support measures, education for popularization, etc. to promote user awareness and Manufacturers' efforts to improve fuel efficiency.

2. In enforcing evaluation standards, Manufacturers' energy saving efforts, their approach to exhaust gas regulatory measures, and other circumstances shall be taken into account. Also, attention shall be paid so that these activities are carried out consistently with activities aimed at achieving target standard values.

3. As for new fuel efficiency improvement technologies that were inconceivable during these discussions, efforts shall be made to provide support required for developing and promoting them, while paying close attention to their development status.

4. Use of vehicles designed to reduce environmental load, so-called "eco-driving," helps reduce fuel consumption in actual use. Efforts shall be made to provide information necessary to promote "eco-driving."

5. Efforts shall be made not only for energy saving performance improvement of vehicles, but also for fuel efficiency improvement in actual on-road driving by means of smoothing traffic flow, etc.

6. In general, there is a trade-off between improving automobile fuel efficiency and reducing exhaust emission, depending on technologies used. When

studying the future measures and policies relating to the vehicles covered here, it should be noted that these target standards were established, premising on the 2009 exhaust gas emission control (the post new long-term control).

7. Basing energy saving standards on the Top Runner Method is a very effective tool for achieving energy conservation in machinery and equipment. Efforts shall be made to seek deeper understanding and promote it internationally, where appropriate.

(2) Manufacturer actions

1. It is desirable to advance technological development aimed at improving automobile fuel efficiency and to actively promote practical application of these technologies.

2. In order to promote highly fuel-efficient vehicles, it is desirable to provide appropriate information that helps vehicle users select such vehicles, as well as information to promote "eco-driving."

3. In order to promote "eco-driving," along with efforts made for practical application and popularization of technologies and products that assist "eco-driving", such as fuel efficiency indicator, it is desirable to provide appropriate information about them.

(3) User actions

It is desirable to select highly fuel-efficient vehicles and make efforts for energy conservation through "eco-driving" as well as other proper and effective use of vehicles.

(4) Other

The type and characteristic of vehicle fuel, coupled with the corresponding vehicle that uses the fuel, contribute to fuel efficiency improvement; thus, they have major effects on reducing energy consumption in Japan. Therefore, it is desirable that the automobile industry, oil industry, and other related industries cooperate with one another to diversify fuel types and improve fuel characteristics. It is also necessary for the government to positively support these actions.

(Reference)

Evaluation of Future Fuel Efficiency Improvement Rate due to the New Fuel Efficiency Standards

The following tables show fuel efficiency improvement rate for the target fiscal year (FY2015), assuming that the new fuel efficiency standards (the target standard values shown in 2.(4)) are achieved.

In the case of passenger cars, fuel efficiency for the target fiscal year (FY2015) would improve by 23.5% over the actual levels of gasoline cars in FY2004 and by 29.2% over the levels of existing fuel efficiency standards (FY2010 target).

[Fuel efficiency improvement rate from actual levels in FY2004]

Vehicle type	FY2004 actual levels	FY2015 estimates	Fuel efficiency improvement rate from FY2004 actual levels
Passenger cars	13.6 (km/L)	16.8 (km/L)	23.5%
Small buses	8.3 (km/L)	8.9 (km/L)	7.2%
Small freight vehicles	13.5 (km/L)	15.2 (km/L)	12.6%

[Fuel efficiency improvement rate from the levels of existing fuel efficiency standards]

Vehicle type	Average level equivalent to FY2010 standards	FY2015 estimate	Fuel efficiency improvement rate from FY2010 standards
Passenger cars	13.0 (km/L)	16.8 (km/L)	29.2%

* The fuel efficiency values in the above tables are JC08 mode fuel efficiency values, reflecting more recent driving conditions.
* There are no existing fuel efficiency standards established for some small buses and small freight vehicles. Thus, for these vehicles, no fuel efficiency improvement rate from the levels of existing fuel efficiency standards is given here.
* Each fuel efficiency improvement rate is calculated on the assumption that the number of shipment ratio for each category in the target fiscal year (FY2015) is the same as that in FY2004.

Attachment 1

Vehicles to be Covered

The following vehicles shall be covered under new fuel efficiency standards to be established based on the Law Concerning the Rational Use of Energy (1979, Law No. 49) (hereinafter referred to as "Energy Conservation Law"): those vehicles fueled with gasoline or diesel oil that are (1) passenger vehicles of 10 or less passenger capacity, (2) freight vehicles with a gross vehicle weight of 2.5 tons or less, (3) passenger vehicles of 11 or more passenger capacity (with a gross vehicle weight of 3.5 tons or less), and (4) freight vehicles with a gross vehicle weight over 2.5 tons and 3.5 tons or less that have been designated under the Road Trucking Vehicle Law (1951, Law No. 185) Article 75.1 (type-designated vehicles). Vehicles (1) and (2) are covered by the existing fuel efficiency standards, while there are no fuel efficiency standards presently applicable to vehicles (3) and (4).

As for passenger vehicles fueled with liquefied petroleum gas, the fuel efficiency standards are currently in effect. Because it is too soon since the fuel efficiency standards were introduced (July 2003) and the progress of the present standards needs to be closely monitored, they are excluded from the targets of standard development this time.

Vehicles using any fuel other than gasoline or diesel oil and vehicles other than type-designated ones shall not be covered due to their small market share. If in the future it is determined appropriate to cover them due to such factors as changes in the number of units shipped, then they shall be given consideration as needed.

Table 1-1 below shows vehicles to be covered under the new fuel efficiency standards as well as the Energy Conservation Law (designated products).

Table 1-1 Vehicles to be covered under the Energy Conservation Law (designated products) and the new fuel efficiency standards

	Passenger capacity	Gross vehicle weight	Gasoline	Diesel oil	Liquefied petroleum gas	Other fuel
Passenger vehicle	10 or less		Type-designated vehicles	Type-designated vehicles	Type-designated vehicles	Not covered
	11 or more	3.5 tons or less	Type-designated vehicles	Type-designated vehicles	Not covered	Not covered
		Over 3.5 tons	Not covered	Type-designated vehicles and vehicle equipped with CO and other substances emission preventive device	Not covered	Not covered
Freight vehicle		3.5 tons or less	Type-designated vehicles	Type-designated vehicles	Not covered	Not covered
		Over 3.5 tons	Not covered	Type-designated vehicles and vehicle equipped with CO and other substances emission preventive device	Not covered	Not covered

* New fuel efficiency standards shall be established for the underlined.

Attachment 2

Target Fiscal Year for Vehicles

Generally, major fuel efficiency improvement is made at the time of a model change, and the cycle of automobile model change is usually said to be approximately 5 years. It is therefore appropriate, in principle, to consider a period when each model can undergo a model change.

Diesel vehicles, in particular, will need to address the 2009 exhaust emission regulations (post new long-term exhaust gas control) to be introduced in 2009 (2010 for some vehicle types). Focus of the model change should be on minimizing fuel efficiency deterioration first and then improving future fuel efficiency. To allow sufficient time for developing fuel efficiency improvement technologies, it is appropriate to set the target fiscal year in a few years after 2009 – 2010, in consideration of the model change cycle.

On the other hand, the target fiscal year for gasoline vehicles under the existing fuel efficiency standards are set for FY2010. Manufacturers of motor vehicles have pushed forward technological development for steady achievement of the existing fuel efficiency standards. It is thus appropriate to set the target fiscal year in a few years after FY2010, in consideration of the model change cycle as well as the time frame for technological development for meeting the existing fuel efficiency standards.

Based on the above, considering the relationship to the existing fuel efficiency standards and the effective date of the exhaust emission regulations, and allowing sufficient time for developing fuel efficiency improvement technologies, it is appropriate to set the target fiscal year for FY2015. This will allow each vehicle type to undergo a model change in and after FY2010.

* Under the fuel efficiency standards for heavy vehicles established in April 2006, the target fiscal year was set for FY2015 in relationship to the effective date of the exhaust emission regulations.

Attachment 3

Method of Measuring Automobile Energy Consumption Efficiency (Fuel Efficiency)

There is a trade-off between fuel efficiency improvement and exhaust gas reduction, depending on the technologies used. It is therefore necessary to evaluate these two under the same conditions at the same time. It is also desirable that measurement method for fuel efficiency is the same as one for the exhaust emission regulations as much as possible in order to ease the burden on the Manufacturers involved in measurement.

(1) Energy consumption efficiency

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 the course of designating vehicle types (inspection values).

(2) Driving mode

Under the existing fuel efficiency standards, fuel efficiency is measured by the 10・15 mode (hot start) method using a chassis dynamometer, in line with the existing exhaust emission measurement.

In November 2006, the "Notice of the safety standard details for road trucking vehicles (Notice No. 619 of the Ministry of Land, Infrastructure and Transport, July 15, 2002)" was revised. For the purpose of evaluating exhaust emission performance more accurately, it was decided that driving modes of the new exhaust emission measurement method will be switched from the 11 mode to JC08C mode (JC08 mode by cold start) starting in FY2008 and from the 10・15 mode to JC08H mode (JC08 mode by hot start) starting in FY2011.

For the measurement of fuel efficiency under the new fuel efficiency standards, JC08 mode in Figure 3-1 shall be used as a driving mode, in order to be consistent with the exhaust emission measurement method as well as to more accurately evaluate fuel performance.

To evaluate fuel efficiency performance by simulating actual driving as closely as possible, cold start driving before the engine is warmed up shall be taken into account in addition to hot start driving when the engine is already warm, as in the case of exhaust emission measurement. Using the driving ratio of these in the exhaust emission measurement as weighting factors, JC08 mode fuel efficiency is

obtained as a weighted harmonic average of hot-start and cold-start JC08 mode fuel efficiency values, as shown in the following formula.

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

E: JC08 mode fuel efficiency value (km/L)
E_{JC08C}: JC08 mode fuel efficiency value by cold start (km/L)
E_{JC08H}: JC08 mode fuel efficiency value by hot start (km/L)

(3) Classification by equivalent inertia weight

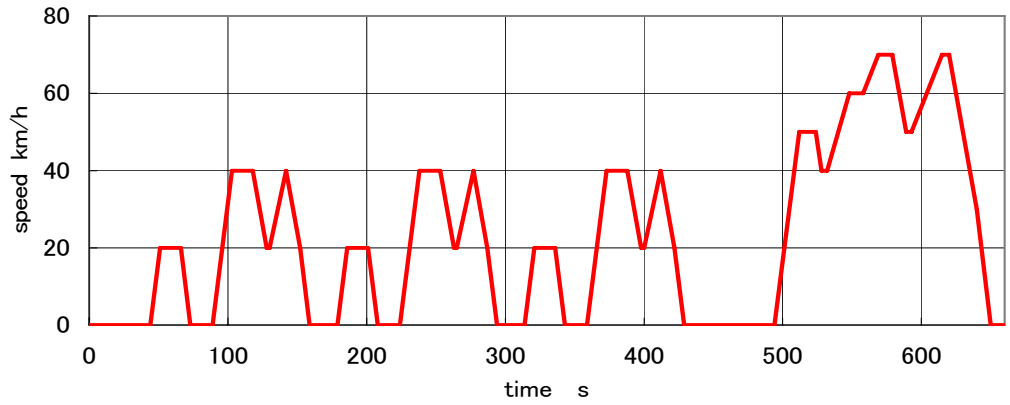
The equivalent inertia weight (hereinafter referred to as "IW") required on a test using chassis dynamometer is defined according to the weight range of vehicle under test in the "Test Methods for New Model Vehicles (Automobiles No. 669, October 20, 1971) (hereinafter referred to as "TRIAS"). TRIAS prescribes the details of existing fuel efficiency measurement methods. Under the TRIAS, IW class range is approximately twice as wide as that of the United Nations Economic Commission for Europe Regulations or ECE Regulations (*).

* Regulations based on the "United Nations Agreement Concerning the Adoption of Uniform Conditions of Approval and Reciprocal Recognition of Approval for Motor Vehicle Equipment and Parts (1958 Agreement)," a multilateral agreement concerning international harmony and reciprocal recognition of motor vehicle standards, of which Japan is a member.

Under the new fuel efficiency standards, IW classification in the ECE Regulations shall be adopted as a new IW classification, for the sake of global standards harmonization and more accurate fuel efficiency measurement. However, for vehicle under test weighing over 2,380 kg, which are not broken down by IW classification of the ECE Regulations, the existing TRIAS IW classification shall be used to ensure the fuel efficiency measuring method to be appropriate. Table 3-1 shows the new IW classification in detail.

Figure 3-1 Driving mode for measuring fuel efficiency of passenger vehicles and freight vehicles (with a gross vehicle weight of 3.5 tons or less)

○ 10・15 mode --- Driving mode under the existing fuel efficiency standards (hot start only)



○ JC08 mode --- Driving mode under the new fuel efficiency standards (a combination of hot start and cold start)

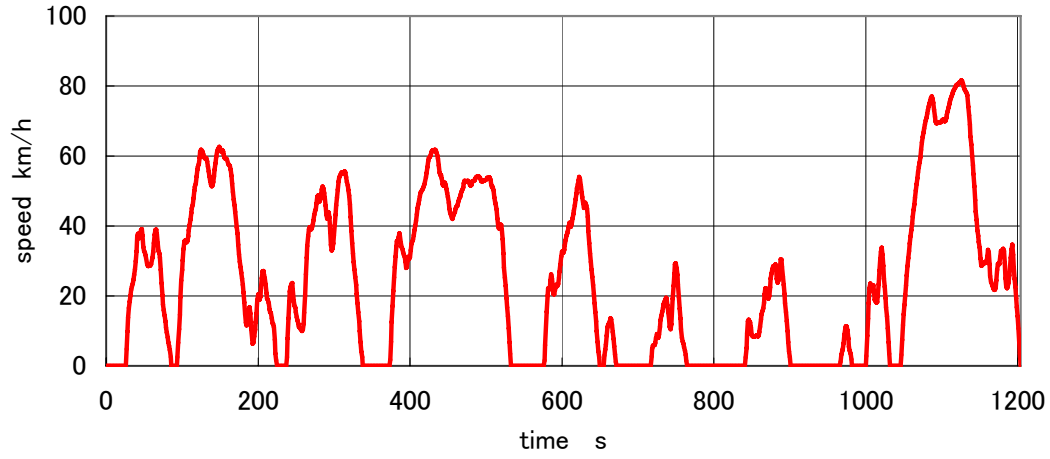


Table 3-1 New Equivalent Inertia Weight Classifications

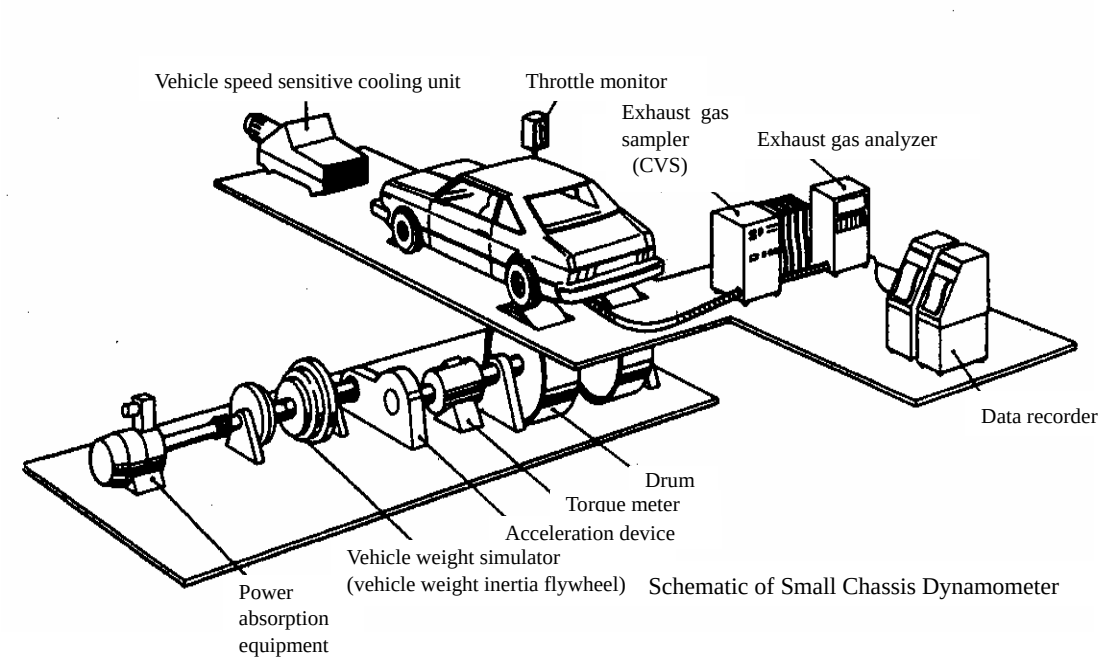
IW classification – ECE Regulations		IW classification – TRIAS		New IW classification	
Weight of vehicle under test (kg)	IW (kg)	Weight of vehicle under test (kg)	IW (kg)	Weight of vehicle under test (kg)	IW (kg)
- 480	**455**	- 562	500	- 480	**455**
481 - 540	**510**			481 - 540	**510**
541 - 595	**570**	563 - 687	625	541 - 595	**570**
596 - 650	**625**			596 - 650	**625**
651 - 710	**680**	688 - 812	750	651 - 710	**680**
711 - 765	**740**			711 - 765	**740**
766 - 850	**800**			766 - 850	**800**
851 - 965	**910**	813 - 937	875	851 - 965	**910**
966 - 1080	**1020**	938 - 1125	1000	966 - 1080	**1020**
1081 - 1190	**1130**	1126 - 1375	1250	1081 - 1190	**1130**
1191 - 1305	**1250**			1191 - 1305	**1250**
1306 - 1420	**1360**			1306 - 1420	**1360**
1421 - 1530	**1470**	1376 - 1625	1500	1421 - 1530	**1470**
1531 - 1640	**1590**			1531 - 1640	**1590**
1641 - 1760	**1700**	1626 - 1875	1750	1641 - 1760	**1700**
1761 - 1870	**1810**			1761 - 1870	**1810**
1871 - 1980	**1930**	1876 - 2125	2000	1871 - 1980	**1930**
1981 - 2100	**2040**			1981 - 2100	**2040**
2101 - 2210	**2150**	2126 - 2375	2250	2101 - 2210	**2150**
2211 - 2380	**2270**			2211 - 2380	**2270**
2381 - 2610	2270	2376 - 2625	**2500**	2381 - 2625	**2500**
2611 -	2270	2626 - 2875	**2750**	2626 - 2875	**2750**
		2876 - 3250	**3000**	2876 - 3250	**3000**
		3251 - 3750	**3500**	3251 - 3750	**3500**

- In IW classification under the ECE Regulations, weight of vehicle under test is vehicle weight (fuel 90%, spare tire and tools included) + 100 kg.
- In the TRIAS IW classification as well as the new IW classification, weight of vehicle under test is vehicle weight (fuel 100% included) + 110 kg.

(Reference 3-1)

Equivalent Inertia Weight

When measuring exhaust emissions and fuel efficiency in a test room, a chassis dynamometer is used to reproduce an actual on-road driving, and a flywheel is used to recreate inertia caused by vehicle weight. The flywheel used has several weight settings depending on the weight range of vehicle under test. The set weight of the flywheel is called equivalent inertia weight.



Schematic of Small Chassis Dynamometer

Attachment 4

Fuel Efficiency Categories for Vehicles

1. Basic concept of categories in Top Runner program

In determining Top Runner standards, designated equipment is classified based on a certain measure. This measure (basic measure) shall be physical quantity, performance, or other indicator closely related to energy consumption efficiency and determined in consideration of what consumers would base their purchase decision on (things representing consumer needs).

A target standard value shall be determined for each category of the basic measure, under which it would be possible and appropriate to aim at the same energy consumption efficiency. It is desirable to set a category range as widely as possible with a high efficiency value to promote maximum energy saving. If the same energy consumption efficiency cannot be applied as a target standard value, a separate category shall be created and a target standard value shall be determined for that category.

Even if it is not appropriate to use the same energy consumption efficiency as a target standard value, with regard to those products built with specialized technologies whose market share is sufficiently small at present and whose future is largely uncertain, they shall be categorized as special products and placed in the same category as other products built with common technologies, rather than in a separate category. If the energy consumption efficiency of these special products is used as a target standard value, it is possible that products built with widely used technologies may cease to exist, seriously distorting the market and interfering with improvement and innovation of other technologies. Therefore, special products may be removed from the Top Runner. In determining a target standard value, however, consideration shall be given to the possibility that the technologies used in special products may become popular in the future.

It is necessary to review the handling of these special products when setting categories.

2. Basic concept of fuel efficiency categories for vehicles

There is a trade-off between fuel efficiency improvement and exhaust gas reduction, depending on the technologies used. By adopting the same classifications as used under the exhaust emission regulations, fuel efficiency and exhaust gas emission can be evaluated under the same conditions. This is appropriate for the effective implementation of environmental measures. This is also appropriate in easing the burden on the Manufacturers.

Thus, as for fuel efficiency categories, the same measurement categories as in the exhaust emission regulations (vehicle type and weight) are employed as a base. In addition to the base, type of fuel used, vehicle structure, effects of transmission type on fuel efficiency, actual shipments, etc. are taken into consideration when setting fuel efficiency categories.

* See Reference 4-1 for fuel efficiency categories under the existing fuel efficiency standards.
* See Reference 4-2 for measurement categories under the exhaust emission regulations.

3. Fuel efficiency categories under the new fuel efficiency standards

(1) Classification by vehicle type

Besides passenger vehicles and freight vehicles defined as designated products under the Energy Conservation Law, the following are the vehicle type categories shared by the measurement categories under the exhaust emission regulations.

[Passenger vehicles]

1. Passenger vehicles of 10 or less passenger capacity (hereinafter referred to as "passenger cars").
2. Passenger vehicles of 11 or more passenger capacity (with a gross vehicle weight of 3.5 tons or less) (hereinafter referred to as "small buses").

[Freight vehicles]

3. Freight vehicles that are of mini vehicle category (hereinafter referred to as "mini freight vehicles").
4. Freight vehicles with a gross vehicle weight of 1.7 tons or less (hereinafter referred to as "light-weight freight vehicles").
5. Freight vehicles with a gross vehicle weight over 1.7 tons and no more than 3.5 tons (hereinafter referred to as "medium-weight freight vehicles").

(2) Classification by fuel

Table 4-1 shows the number of units of gasoline and diesel vehicles shipped in FY2004 by vehicle type.

Diesel vehicles that are passenger cars, mini freight vehicles, and light-weight freight vehicles show significantly smaller number of shipments in comparison to gasoline vehicles. From FY2000 to FY2004, the number of shipments decreased approximately 95% for passenger cars and 85% for light-weight freight vehicles.

On the other hand, with regard to small buses and medium-weight freight vehicles, approximately 40% of which are diesel vehicles, and the differences in shipment units between gasoline and diesel vehicles are smaller.

Table 4-1 Number of units of gasoline and diesel vehicles shipped (share)

Vehicle type	Gasoline vehicle shipment (share)	Diesel vehicle shipment (share)
Passenger car	4,481,817 (99.9%)	2,807 (0.1%)
Small bus	1,423 (62.5%)	855 (37.5%)
Mini freight vehicle	509,128 (100%)	0 (0%)
Light-weight freight vehicle	104,196 (97.6%)	2,604 (2.4%)
Medium-weight freight vehicle	116,128 (62.6%)	69,423 (37.4%)

Source: Japan Automobile Manufacturers Association, Inc.

[Passenger cars, mini freight vehicles, and light-weight freight vehicles]

With respect to passenger cars, mini freight vehicles, and light-weight freight vehicles, it is difficult to determine appropriate fuel efficiency standards for diesel vehicles alone using the Top Runner Method. This is because the number of these vehicles shipped is extremely small (no mini freight vehicles have been shipped). Moreover, among the existing weight categories of passenger cars, only two classes have the shipment.

The 2009 exhaust emission regulations (*) are scheduled to take effect in FY2009. With the regulations in effect, the exhaust emission control values for diesel vehicles and gasoline vehicles will be almost at the same level.

With respect to passenger cars, mini freight vehicles, and light-weight freight vehicles, it is appropriate to apply the same energy consumption efficiency to both of those using gasoline and diesel oil, in line with the general idea of promoting fuel-efficient diesel vehicles. Fuel efficiency standards shall be established based on gasoline vehicles, which are more suitable for proper setting of such standards by the Top Runner Method. Diesel vehicles shall be treated as special products which are not used as top-runner vehicles; however, they shall be treated as a fuel efficiency improvement factor, in prospect of future popularization of fuel-efficient diesel vehicles.

* See Reference 4-3 for the 2009 exhaust emission regulations.

[Small buses and medium-weight freight vehicles]

As for small buses and medium-weight freight vehicles, both of those using gasoline and diesel oil have been shipped in large quantities with no distinct difference in share. Since this trend is expected to continue in the future, fuel efficiency standards shall be established for each of gasoline and diesel vehicles in separate categories based on the Top Runner Method, as in the case of the existing fuel efficiency standards.

[How to evaluate achievement status of fuel efficiency standards]

In evaluating how well passenger cars, mini freight vehicles, and light-weight freight vehicles are achieving the fuel efficiency standards, it is appropriate to evaluate gasoline and diesel vehicles together in the same category, since the same energy consumption efficiency is applied to both types of vehicles.

Under the fuel efficiency standards, a fuel efficiency value (km/L) shall be used as a measure for energy consumption efficiency. Although the same fuel efficiency standards are applied to gasoline and diesel vehicles, it does not mean that the same values are applied in terms of energy consumption efficiency. This is because gasoline and diesel oil have different unit heating values (MJ/L) (*). Therefore, it is appropriate to use the energy-converted (heating value equivalent) fuel efficiency standard for gasoline and diesel vehicles.

* Unit heating value of gasoline and diesel oil (from the attached table No. 1 of the enforcement regulations of the Law Concerning the Rational Use of Energy [Ministry of International Trade and Industry Ordinance No. 74, September 1979])
  - Gasoline: 34.6 (GJ/kL)
  - Diesel oil: 38.2 (GJ/kL)

When evaluating the achievement of fuel efficiency standards of passenger cars, mini freight vehicles, and light-weight freight vehicles, it is appropriate to require for each manufacturer that a weighted harmonic average for each category shall be the same or above the fuel efficiency standard. The weighted harmonic average are obtained from fuel efficiency values for gasoline vehicles and gasoline heating value converted fuel efficiency value for diesel vehicles (fuel efficiency of diesel vehicles divided by 1.10) which are weighted and averaged with the number of shipments of each vehicle types.

As for small buses and medium-weight freight vehicles, for which gasoline and diesel vehicles are placed in separate categories, achievement status of fuel efficiency standards shall be evaluated separately, as in the evaluation under the existing fuel efficiency standards.

[Requirements to achieve fuel efficiency standards for passenger cars, mini freight vehicles, and light-weight freight vehicles]

Vehicle type	Fuel efficiency standard	Number of shipments by vehicle	Fuel efficiency by vehicle
Gasoline vehicle	*FS*	*Pg1, Pg2,..., Pgi*	*Fg1, Fg2,..., Fgi*
Diesel vehicle		*Pd1, Pd2,..., Pdj*	*Fd1, Fd2,..., Fdj*

$$\frac{\sum_{n=1}^{i} Pgi + \sum_{n=1}^{j} Pdj}{\sum_{n=1}^{i} \left(\frac{Pgi}{Fgi}\right) + \sum_{n=1}^{j} \left(\frac{Pdj}{Fdj/1.10}\right)} \geqq FS$$

(3) Classification by vehicle structure

Under the existing fuel efficiency standards for freight vehicles, those originated from passenger vehicles (Structure A) and those whose main purpose is to transport cargo (Structure B) are classified separately. It is considered inappropriate to treat them in the same manner, because they differ greatly in fuel efficiency performance due to different torque, vehicle body strength, etc. This situation remains the same at present, with an approximately 30% difference in fuel efficiency value between Structures A and B. Therefore, it is appropriate to continue classifying Structures A and B separately under the new standards, just as in the existing standards.

As for light-weight freight vehicles, however, there is only Structure A and thus no classification is provided by vehicle structure. It is expected that Structure A continues to dominate; therefore, no classification based on structure will be maintained.

Medium-weight freight vehicles, on the other hand, have various maximum loading capacities. Included in this category are freight vehicles with a gross vehicle weight over 1.7 tons and no more than 2.5 tons, to which the existing fuel efficiency standards apply. Added to this category are freight vehicles with a gross vehicle weight over 2.5 tons and no more than 3.5 tons. As a result, a fuel efficiency difference between vans and trucks is roughly 5 to 10%, particularly in the heavier categories. This difference in fuel efficiency is due to a large difference in maximum loading capacity between vans and trucks (the maximum loading capacity of vehicles currently in the market is 1,250 kg for vans and 1,500 kg for trucks), which results in setting of lower gears more often on trucks. Other factors, such as higher air resistance of trucks due to the loading bed placed outside of the vehicle, may also cause the difference. Users generally choose trucks for loading capacity as of utmost importance and vans for transporting goods without getting them dirty. User needs are high with both.

Therefore, in the case of medium-weight freight vehicles, it is appropriate to place vans and trucks in separate categories, considering that the range of gross vehicle weight has widened under the existing Structure B.

In summary, medium-weight freight vehicles shall be classified into three categories: Structure A, Structure B1 (vans of existing Structure B), and Structure B2 (trucks of existing Structure B). Fuel efficiency standards shall be established for each category. (As for medium-weight diesel freight vehicles, however, the number of Structure A shipped is extremely small and, in fact, there is only one model in the market. They shall be placed in the same category as Structure B1, which is the closest in terms of vehicle structure.)

[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.

(4) Classification by transmission type

Manual transmission (MT) and automatic transmission (AT) are typical types. Since they have different transmission mechanisms and transmission loss ratios, it is appropriate to classify MT vehicles and AT vehicles separately and establish fuel efficiency standards for each. If the number of units of either MT vehicles or

AT vehicles is extremely small in a relative manner, then making it difficult to establish appropriate fuel efficiency standards, fuel efficiency standards shall be examined based on the one with the higher number of units, instead of classifying them separately. The other (the one not used in determining standards) shall be treated as a special product and considered as a variation factor of fuel efficiency standards, taking account of the market share of these vehicles in the target fiscal year.

* In general, MT vehicles have higher fuel efficiency performance than AT vehicles. If AT vehicles are used as the base for standards, MT vehicles shall be treated as a fuel efficiency improvement factor. If MT vehicles are used as the base for standards, AT vehicles shall be treated as a fuel efficiency influence factor.

[Passenger cars]

Table 4-2 below shows the number of shipments and share of gasoline passenger cars in FY2004 by MT vehicles, AT vehicles, and CVT vehicles. Figure 4-1 shows changes in share of each type. The share of MT vehicles has shrunk in recent years, while the share of CVT vehicles has expanded.

While CVT vehicles increase in its share each year, it is currently smaller than that of AT vehicles. While they are highly effective in improving fuel efficiency performance mainly in small cars, CVT vehicles have its limits in penetrating into large cars due to the durability issue of metal belts. It is difficult to switch all AT vehicles to CVT vehicles, due to higher cost of CVT vehicles than AT vehicles, design issues relating to a power transmission system that prevents them from being installed in 4WD or FR vehicles, etc. From the vehicle user point of view, however, there is no particular distinction between AT and CVT vehicles in terms of ease of driving and convenience.

Therefore, CVT vehicles shall be placed in the same category as AT vehicles rather than in its own class. It is appropriate, however, to determine fuel efficiency standards by closely examining the market share of both AT and CVT vehicles.

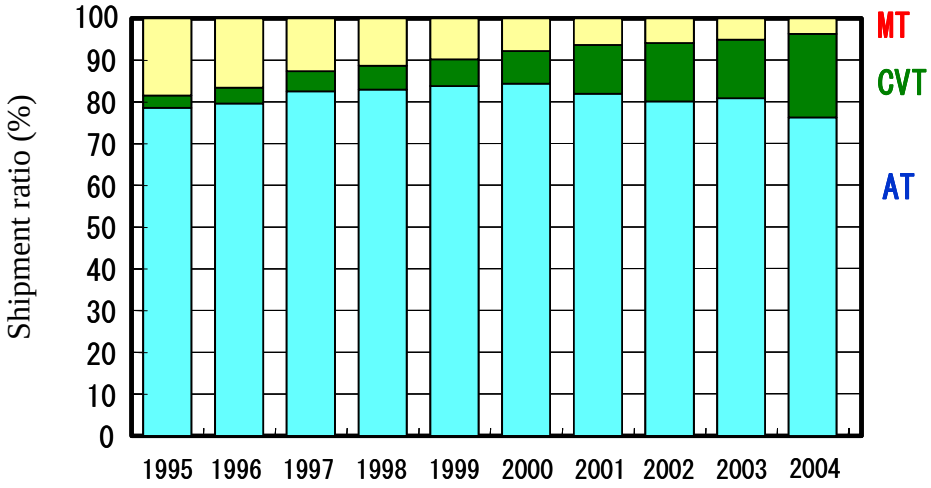
As for MT vehicles, it is difficult to establish appropriate fuel efficiency standards by the Top Runner Method in their own category, since the share of MT vehicles is small relative to AT vehicles and is even declining. Therefore, it is appropriate to examine fuel efficiency standards using AT vehicles as the base, while treating MT vehicles as special products which are considered to be a fuel efficiency standard improvement factor, in consideration of the market share of both vehicles in the target fiscal year.

Table 4-2 Number of shipments (share) of gasoline passenger cars by transmission type

Vehicle type	MT	AT	CVT
Gasoline passenger car	196,626 units (4%)	3,416,173 units (76%)	869,018 units (20%)

Source: Japan Automobile Manufacturers Association, Inc.

Figure 4-1 Changes of share of gasoline passenger cars by transmission type



Source: Japan Automobile Manufacturers Association, Inc.

[Small buses]

Table 4-3 below shows the number of shipments and share of gasoline small buses and diesel small buses in FY2004 by MT and AT vehicle type.

In gasoline small buses, AT vehicles accounted for the majority of shipments and are expected to continue dominating the share. In diesel small buses, the share of AT vehicles is larger, although not as much as in gasoline small buses, and is expected to expand further. Besides, since the number of MT vehicles shipped in FY 2004 is extremely small, it is difficult to establish appropriate fuel efficiency standards by the Top Runner Method in their own category.

In view of the above, fuel efficiency standards shall be determined based on AT vehicles for both gasoline and diesel small buses. For MT vehicles not to be used as the base, it is appropriate to treat them as special products which are considered as a fuel efficiency standard improvement factor, in consideration of the market share of both vehicle types in the target fiscal year.

Table 4-3 Number of shipments (share) of small buses by transmission type

Vehicle type	MT	AT
Gasoline small bus	103 units (7%)	1,320 units (93%)
Diesel small bus	140 units (16%)	715 units (84%)

Source: Japan Automobile Manufacturers Association, Inc.

[Small freight vehicles]

Table 4-5 below shows the number of shipments and share of gasoline mini freight vehicles, gasoline light-weight freight vehicles, gasoline medium-weight freight vehicles, and diesel medium-weight freight vehicles in FY2004 by MT, AT, and CVT vehicle type.

Each vehicle, whether MT or AT, has a large number of shipments, but neither vehicle has an extremely small share relative to others. With the same trend expected for the future, AT and MT vehicles shall be categorized separately and fuel efficiency standards shall be established for each.

CVT vehicles, presently with an extremely small share, shall be placed in the same category as AT vehicles. It is appropriate, however, to determine fuel efficiency standards by thoroughly considering the market share of both AT and CVT vehicles.

Table 4-5 Number of shipments (share) of small freight vehicles by transmission type

Vehicle type	MT	AT	CVT
Gasoline mini freight vehicle	312,413 units (61%)	186,828 units (37%)	9,887 units (2%)
Gasoline light-weight freight vehicle	11,997 units (11%)	91,918 units (88%)	281 units (1%)
Gasoline medium-weight freight vehicle	45,440 units (39%)	70,688 units (61%)	0 unit (0%)
Diesel medium-weight freight vehicle	28,975 units (42%)	40,448 units (58%)	0 unit (0%)

Source: Japan Automobile Manufacturers Association, Inc.

(5) Classification by vehicle weight

[Passenger cars and small freight vehicles]

Classification by vehicle weight under the existing fuel efficiency standards is based on IW classification of the 10・15 mode test method. However, the new JC08 mode test method will use further subdivided, new IW classification to be in harmony with international standards and improve accuracy in fuel efficiency measurement.

In order to achieve maximum energy savings, it is desirable to set highly-efficient standard values for the widest possible range of categories. However, if a vehicle weight category is set wider than the new IW class, a light IW vehicle within that category will become a top-runner vehicle and a fuel efficiency standard will be determined based on it. This means that heavier IW vehicles within the same category will be treated unfavorably due to a factor unrelated to fuel efficiency performance (poorer fuel efficiency due to IW difference).

In order to maintain fairness within a category, vehicles should be classified under equal measurement conditions. It is appropriate to use new IW classification for vehicle weight.

[Small buses]

Table 4-4 below shows the average fuel efficiency of gasoline small buses and diesel small buses in FY2004 by new IW classification.

The total number of small buses shipped is extremely small (the total number of shipment in FY2004: 2,278 units), and the differences in average fuel efficiency among IW classes are relatively small (in some class, it is in reverse compared to the relationship by weight). In view of this reality in small buses, grouping all IW classes together into one category would be sufficient, if fuel efficiency improvement efforts are made focusing on the vehicles that belong to the lightest IW class.

Thus, in order to achieve maximum energy savings, it is appropriate not to use classification by vehicle weight.

Table 4-4 Number of shipments and average fuel efficiency of small buses by IW

Vehicle type	IW	Average fuel efficiency in FY2004
Gasoline small bus	- 2040 kg	7.06 km/L
	2150 kg	8.21 km/L
	2270 kg -	7.47 km/L
Diesel small bus	- 2150 kg	9.11 km/L
	2270 kg	9.61 km/L
	2500 kg -	9.66 km/L

Source: Japan Automobile Manufacturers Association, Inc.

(6) Other

Hybrid vehicles, which use combined technologies of electric motors and engines, excel in fuel efficiency performance. They are produced by certain Manufacturers and are expensive. The share of hybrid vehicles in the gasoline passenger car market is as low as 2% in FY2004. While there is expectation for them to grow, huge uncertainties remain for its future.

If hybrid vehicles are treated in the same manner as conventional vehicles in establishing fuel efficiency standards, fuel efficiency standards will be determined based on them as being the top-runner vehicles. In such case, Manufacturers need to take measures such as switching all models to hybrid; otherwise, they will not be able to meet the target by the target fiscal year. This may cause a burden on Manufacturers and automobile users and potentially eliminate vehicles equipped with widely used fuel efficiency improvement technologies, resulting in the market distortion and interruption of other technological improvement and innovation.

Among hybrid vehicles, there are a variety of technologies including those using the electric motor as major driving power and those using the electric motor subsidiarily. It is possible that more diversified hybrid vehicles will be developed in the future, according to the maturity levels of hybrid technologies. This makes it difficult to group hybrid vehicles into one category; thus, it is not appropriate to separate them from conventional vehicles.

Accordingly, hybrid vehicles shall be grouped together with conventional vehicles in the same category. In determining fuel efficiency standards, however, hybrid vehicles shall not be treated as the top-runner but as special products which are considered as a fuel efficiency improvement factor, in consideration of their market share and technological development.

(7) Summary of classification

In view of the above, the entire classification is summarized as follows:

Type	Fuel			Vehicle structure				Transmission			Weight category
1. Passenger car	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

(Reference 4-1)

Fuel Efficiency Categories under the Existing Fuel Efficiency Standards

[Passenger vehicles]

The existing fuel efficiency standards for passenger cars are classified by the following items under the "Evaluation Standards for Manufacturers Concerning the Performance Improvement of Passenger Vehicles (Ministry of Economy, Trade and Industry/Ministry of Land, Infrastructure and Transport Notice No. 1, March 2006):"

(1) Classification by fuel (Gasoline, diesel oil, and LPG)
(2) Classification by vehicle weight (7 – 9 categories based on IW)

Diesel oil-fueled passenger vehicles of 11 or more passenger capacity (with a gross vehicle weight over 3.5 tons) are classified by the following items:

(1) Classification by vehicle type (Fixed route bus and ordinary bus)
(2) Classification by gross vehicle weight

[Freight vehicles]

The existing fuel efficiency standards for freight vehicles are classified by the following items under the "Evaluation Standards for Manufacturers Concerning the Performance Improvement of Freight Vehicle (Ministry of Economy, Trade and Industry/Ministry of Land, Infrastructure and Transport Notice No. 2, March 2006):"

(1) Classification by vehicle type (Mini freight vehicle, light-weight freight vehicle, and medium-weight freight vehicle)
(2) Classification by fuel (Gasoline and diesel oil)
(3) Classification by transmission type (MT and AT)
(4) Classification by vehicle structure (Structure A and Structure B)
(5) Classification by vehicle weight (1 – 4 categories based on IW)

Diesel oil-fueled freight vehicles with a gross vehicle weight over 3.5 tons are classified by the following items under the standards:

(1) Classification by vehicle type (trucks and tractors)
(2) Classification by gross vehicle weight (For the categories of gross vehicle weight over 3.5 tons and no more than 6 tons, classification by maximum loading capacity is also applied.)

(Reference 4-2)

Measurement Categories under the Exhaust Gas Emission Regulations

The "Notice of the safety standard details for road trucking vehicles (Notice No. 619 of the Ministry of Land, Infrastructure and Transport, July, 2002)" (hereinafter referred to as the "Detail Notice") prescribes exhaust gas emission control values for each fuel category (gasoline or LPG/diesel oil) classified by vehicle type (a. through d. below).

a. Ordinary vehicles, compact vehicles, or mini vehicles of 10 or less passenger capacity that are exclusively for passenger use
b. Ordinary vehicles or compact vehicles with a gross vehicle weight of 1.7 tons or less that exclude a. above
c. Ordinary vehicles or compact vehicles with a gross vehicle weight of 3.5 tons or less that exclude a. and b. above
d. Mini vehicles excluding a. above

Under each category, in accordance with the Attachment 42: "Exhaust Emission Measurement Methods for Light/Medium-weight Vehicles" of the Detail Notice, equivalent inertia weight (IW) is set depending on the vehicle weight, and exhaust emission is measured on a chassis dynamometer.

Following the introduction of exhaust emission measurement methods using JC08 mode, the Attachment 42 of the Detail Notice has employed new equivalent inertia weight (IW) classification, together with energy consumption efficiency (fuel efficiency) measurement methods.

(Reference 4-3)

Target Values under 2009 Exhaust Emission Control
for Diesel and Gasoline Vehicles

(Diesel vehicles)

		PM	NOx	NMHC	CO	Target year (reference)
Passenger car		0.005 ▲62%	0.08 ▲43%	0.024 0%	0.63 0%	2009
Truck/bus	Light-weight vehicle (GVW: 1.7 tons or less)	0.005 ▲62%	0.08 ▲43%	0.024 0%	0.63 0%	2009
	Medium-weight vehicle (GVW: over 1.7 tons and no more than 3.5 tons)	0.007 ▲53%	0.15 ▲40%	0.024 0%	0.63 0%	2010 (over 1.7 tons and no more than 2.5 tons) 2009 (over 2.5 tons and no more than 3.5 tons)
	Heavy-weight vehicle (GVW: over 3.5 tons)	0.01 ▲63%	[Next-phase target] 0.7 (▲65%) [Challenge Target] about 1/3 of 0.7 (▲88%)	0.17 0%	2.22 0%	2010 (over 3.5 tons and no more than 12 tons) 2009 (over 12 tons)

(Gasoline vehicles)

		PM	NOx	NMHC	CO	Target year (Reference)
Passenger car		0.005 (New)	0.05 0%	0.05 0%	1.15 0%	2009
Truck/bus	Light-weight vehicle (GVW: 1.7 tons or less)	0.005 (New)	0.05 0%	0.05 0%	1.15 0%	2009
	Medium-weight vehicle (GVW: over 1.7 tons and no more than 3.5 tons)	0.007 (New)	0.07 0%	0.05 0%	2.55 0%	2009
	Heavy-weight vehicle (GVW: over 3.5 tons)	0.01 (New)	0.7 0%	0.23 0%	16.0 0%	2009

Note 1) Unit of target value: g/kWh (heavy-weight vehicles) and g/km (vehicles other than heavy-weight vehicles)

Note 2) GVW: gross vehicle weight, NMHC: non-methane hydrocarbons

Note 3) As for challenge target level, after being technologically reviewed around 2008, the final target value and year shall be determined, if necessary.

Note 4) PM target values for gasoline vehicles are only applied to lean-burn direct-injection vehicles equipped with a NOx occlusion-reduction catalyst.

Source: "Future Policy for Motor Vehicle Emission Reduction (Eighth Report)" by Central Environment Council (April 8, 2005)

Attachment 5

Fuel Efficiency Standards

1. Basic concept of fuel efficiency standards

Based on the concept of the Top Runner Method under the Law Concerning the Rational Use of Energy (Energy Conservation Law), target standards (fuel efficiency standards) shall be determined by focusing on the most fuel-efficient (top-runner) vehicle of all the vehicles currently in the market, in consideration of future prospects of technological development, etc.

It is appropriate to determine target standard based on the fuel efficiency performance of the most fuel-efficient (top-runner) vehicle for each category among all the vehicles available in the market during FY2004, while considering fuel efficiency improvement to be achieved by the target fiscal year (FY2015) through technological development, effects of the 2009 exhaust emission regulations on fuel efficiency, etc.

2. Estimative evaluation of fuel efficiency improvement technologies, etc.

(1) Evaluation of fuel efficiency improvement factors

With regard to fuel efficiency improvement technologies for passenger vehicles and freight vehicles, while taking Manufacturers' comment through hearings into consideration, currently foreseeable future technological development was reviewed, and evaluation was made on effects of fuel efficiency improvement technologies that are expected to be introduced and gain popularity in the future.

Specifically, evaluation was made on technologies that contribute to engine improvement, auxiliary equipment loss reduction, and driving system improvement, as well as the level of fuel efficiency improvement to be attained through special products (hybrid vehicles, diesel vehicles, and MT vehicles, depending on vehicle type) as they gain popularity in the market in the future. However, since these technologies cannot immediately be applied to every vehicle type, in order to determine fuel efficiency standards, a level of fuel efficiency improvement was estimated in consideration of projected penetration of fuel efficiency improvement technologies and status of adoption of these technologies on top-runner vehicles.

Hybrid vehicles are produced by certain Manufacturers and are expensive. They excel in fuel efficiency performance and their market share is expected to grow in the future. As such, aggressive evaluation was given to the technologies of hybrid passenger cars. This technology evaluation pushed higher the level of fuel efficiency improvement in heavier categories and created an incentive for weight reduction.

The following are the fuel efficiency improvement factors (fuel efficiency

improvement rates) specifically taken into consideration:

[1] Further enhancement of conventional fuel efficiency improvement technologies (2 – 4 % in total)
- Engine compression ratio increase
- Friction reduction
- Weight reduction
- Reduction of vehicle travel resistance
- Low rolling resistance tires
- Optimizing overall control of engine

[2] Engine improvement
[Gasoline engine improvement]
- 4 valves (1%)
- 2 valves and 2 ignitions (2%)
- Variable valve system (1 – 7 %)
- Direct-injection stoichiometric engine (2%)
- Direct-injection lean-burn engine (10%)
- Variable cylinder (7%)
- Miller cycle (10%)
- High volume EGR (2%)
- Roller cam follower (1%)
- Offset crank (2%)
- Variable compression ratio (10%)

[Diesel engine improvement]
- 4 valves (1%)
- Electronically controlled fuel injection device (1.5%)
- Common rail (2.5%)
- Direct-injection diesel engine (8%)
- High pressure injection (1%)
- Supercharger and supercharger efficiency improvement (2 – 2.5%)
- Intercooler (1%)
- EGR (0.5 – 1%)
- Roller cam follower (1.5%)
- Offset crank (2%)

[3] Auxiliary equipment loss reduction
- Electric power steering (2%)
- Charge control (0.5%)

[4] Driving system improvement
- Idle-neutral control (1%)
- AT with more gears (1 – 4%)
- Switch to CVT (7%)
- Switch to automated MT (AMT/DCT) (9%)

- Switch to MT (9%)

[5] Introduction of fuel-efficient vehicles
- Hybrid vehicles (15 – 70%)
- Diesel vehicles (20%)
- Idling stop vehicles (4 – 7%)

(2) Evaluation of fuel efficiency influence factors

Evaluation was made on the effects on fuel efficiency from future exhaust emission control and safety regulations to be introduced, including the 2009 exhaust emission regulations (post new long-term regulations), the offset crash standards, etc.

The following are the fuel efficiency influence factors (fuel efficiency influence rates) specifically taken into consideration:

[1] In response to exhaust emission regulations (▲3 to ▲7.5% in total)

Consideration was given to the worsening of fuel efficiency caused by technologies used on diesel vehicles and direct-injection lean-burn vehicles in response to the 2009 exhaust emission regulations. Technologies considered were engine body improvement (NOx reduction by improving EGR, PM reduction by high pressure injection, etc.) and aftertreatment devices such as NOx occlusion reduction catalyst and continuous regeneration type DPF, etc.

[2] In response to safety measures (▲0.1 to ▲1.4% in total)

Consideration was given to the worsening of fuel efficiency caused by increased weight and travel resistance as a result of measures against/for offset crash, pedestrian protection, ISO-FIX, etc.

[3] In response to noise measures (▲0.1% in total)

(3) Securing consistency between categories

The technological estimates, obtained by estimating and evaluating fuel efficiency improvement technologies based on the top-runner vehicle, may sometimes be relatively unfair in relationship to vehicle weight, depending on the fuel efficiency of the top-runner vehicle in each category. If the degree of severity of fuel efficiency standards differs between classes, this creates unfairness between these classes and may potentially distort the market (such as increasing the shipment share of vehicles in a class where the standard is relatively loose).

Therefore, when determining fuel efficiency standards for passenger cars, it is appropriate to perform smoothing of technological estimates (smoothing correction) so that a fuel efficiency standard for each category is properly set in relationship to vehicle weight.

Specifically, when determining the fuel efficiency standards for compact/ordinary vehicles and mini vehicles, smoothing shall be performed

separately on the “category led by compact/ordinary vehicles” and the “category led by mini vehicles,” in consideration of difference in specifications and technologies to be applied. In a category where the numbers of these two vehicle types are almost equal, the values obtained by smoothing shall be weighted and averaged with the number of shipments to set fuel efficiency standards.

As for small freight vehicles, the number of vehicle types is small depending on categories, and some have particularly low fuel efficiency. As a result, the technological estimate for this category may be lower than others.

It is inappropriate to perform smoothing with the technological estimate of such category in the same manner as for passenger cars. Therefore, before determining fuel efficiency standard for such category, effort-adjusted corrections are made to the technological estimate so that the standard is appropriate relative to the relationship between technological estimates and vehicle weight of categories around the category in question.

3. Establishment of fuel efficiency standards

In consideration of the above, fuel efficiency standards shall be determined as in Table 5-1 below, based on the fuel efficiency of the top-runner vehicle, through estimative evaluation including the prospects of fuel efficiency improvement for the target fiscal year, and after securing consistency between categories so that the fuel efficiency standard of each category will be set properly relative to vehicle weight.

4. Other

While giving Manufacturers flexibility in evaluating target achievement, target fuel efficiency standards shall be set to high levels at this time, incorporating aggressive evaluation on fuel efficient improvement technologies and corrected, such as effort-adjusted, technological estimates.

Specifically, the concept of the weighted harmonic average method used under the existing fuel efficiency standards shall be applied beyond one category. A comprehensive category evaluation method (credit approach), in which the shortage of an underachieving category can be filled with the excess of an overachieving category, shall be used within the categories of passenger car, small bus, and small freight vehicle.

Table 5-1 New fuel efficiency standards

○ Passenger car

Class	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

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

○ Small freight vehicle

[Mini freight vehicles]

Class	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]

Class	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]

Class	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	10.9
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	11.2
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.

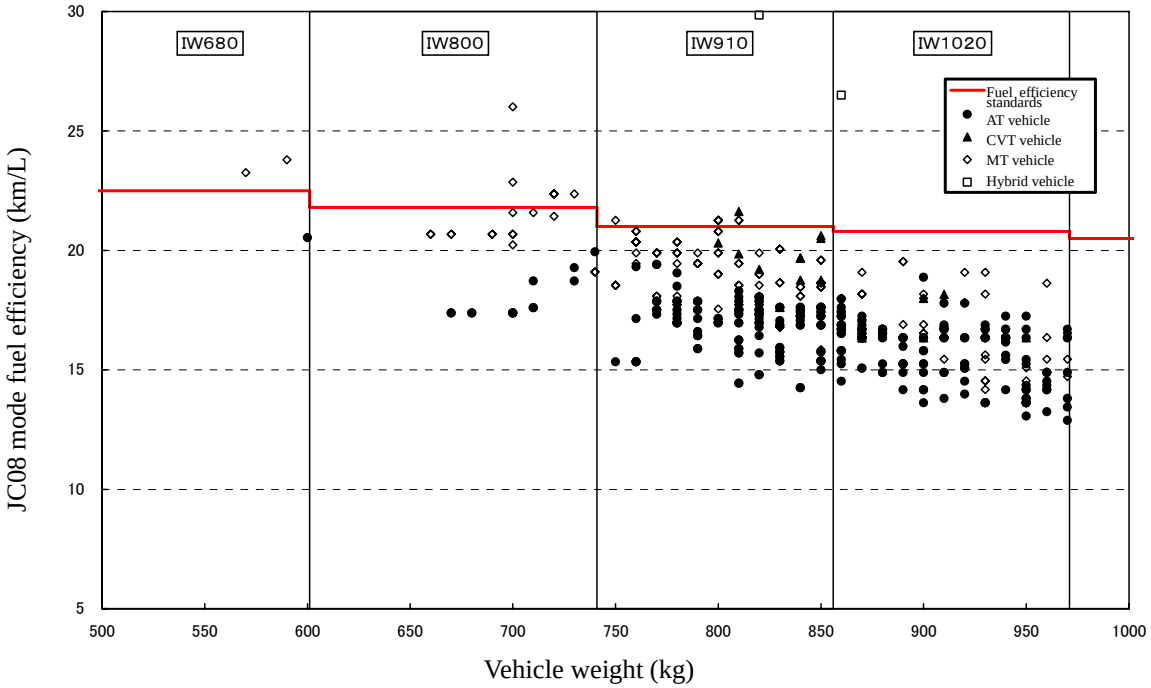
[Definitions of Structure A, B, B1, and B2]

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.

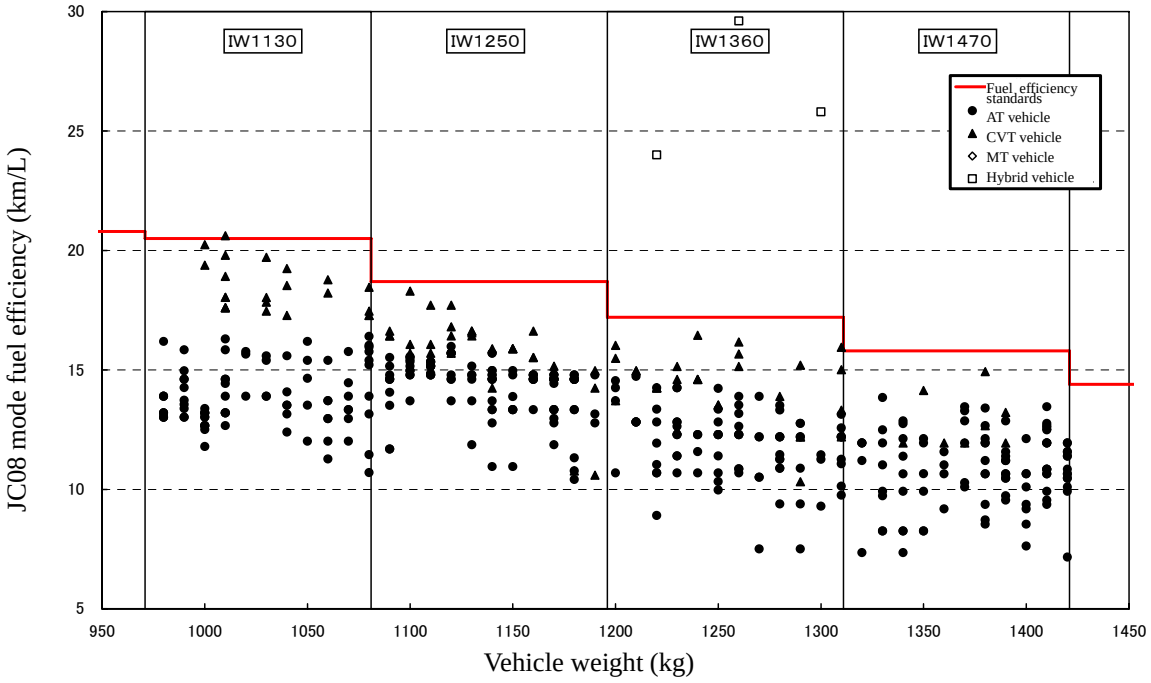
(Reference 5-1)

Fuel Efficiency Distribution of Vehicles Shipped in FY2004 and New Fuel Efficiency Standards

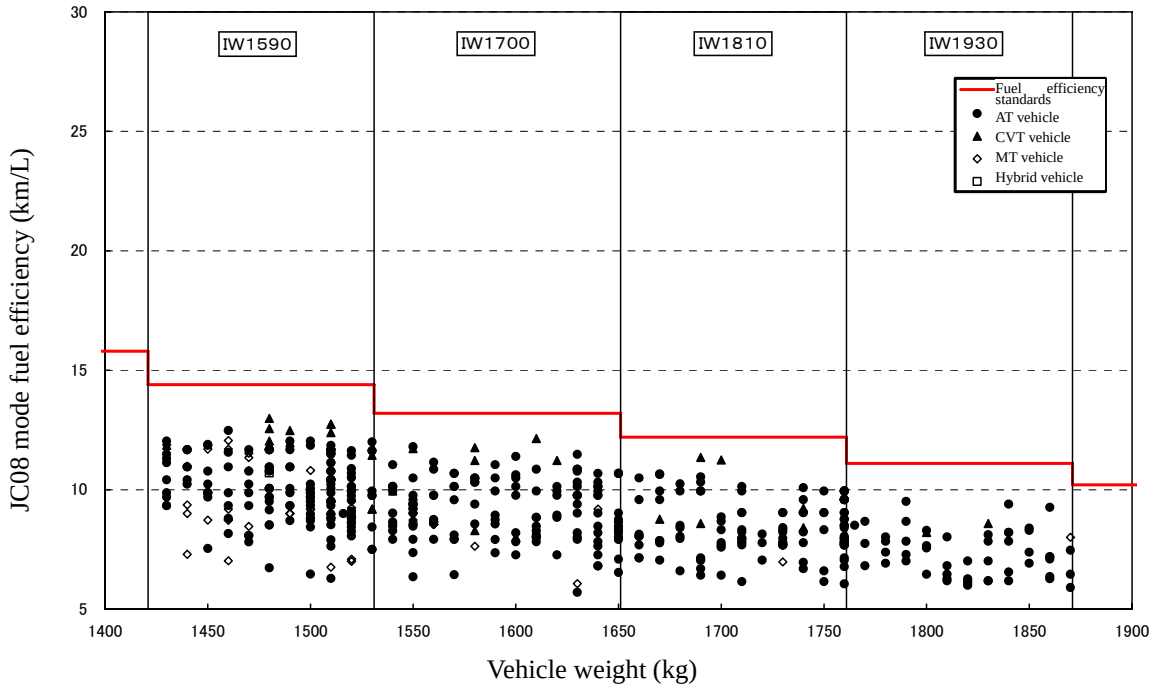
[Passenger car (Class No. 1 – 4)]



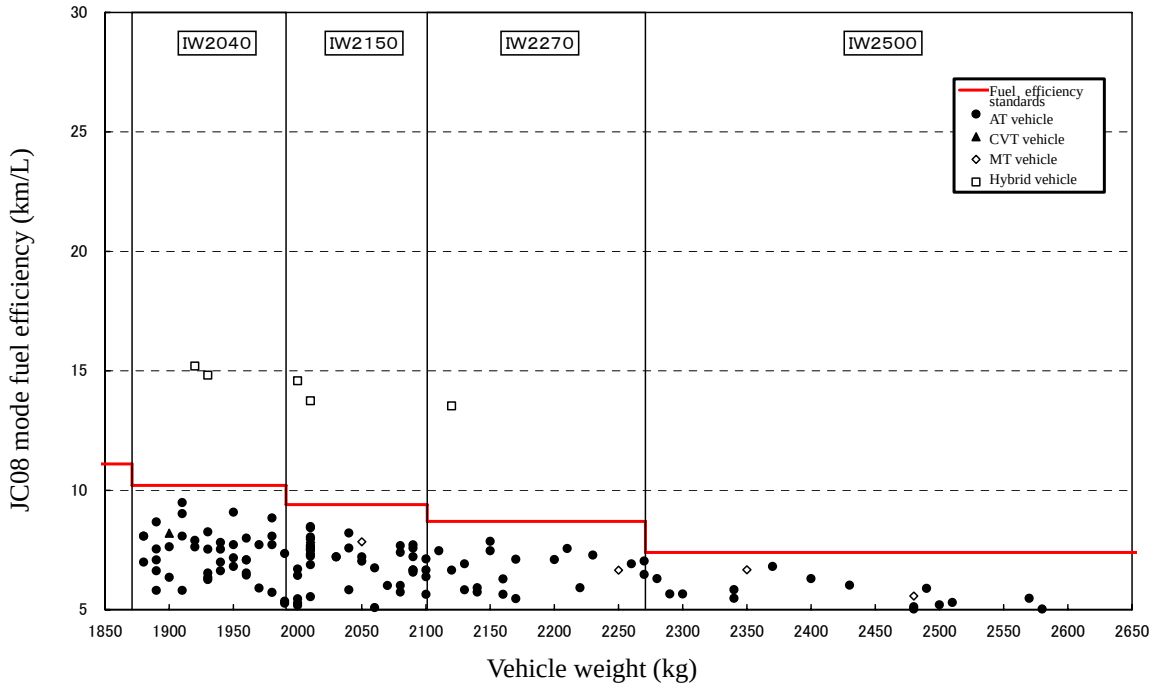
[Passenger car (Class No. 5 – 8)]



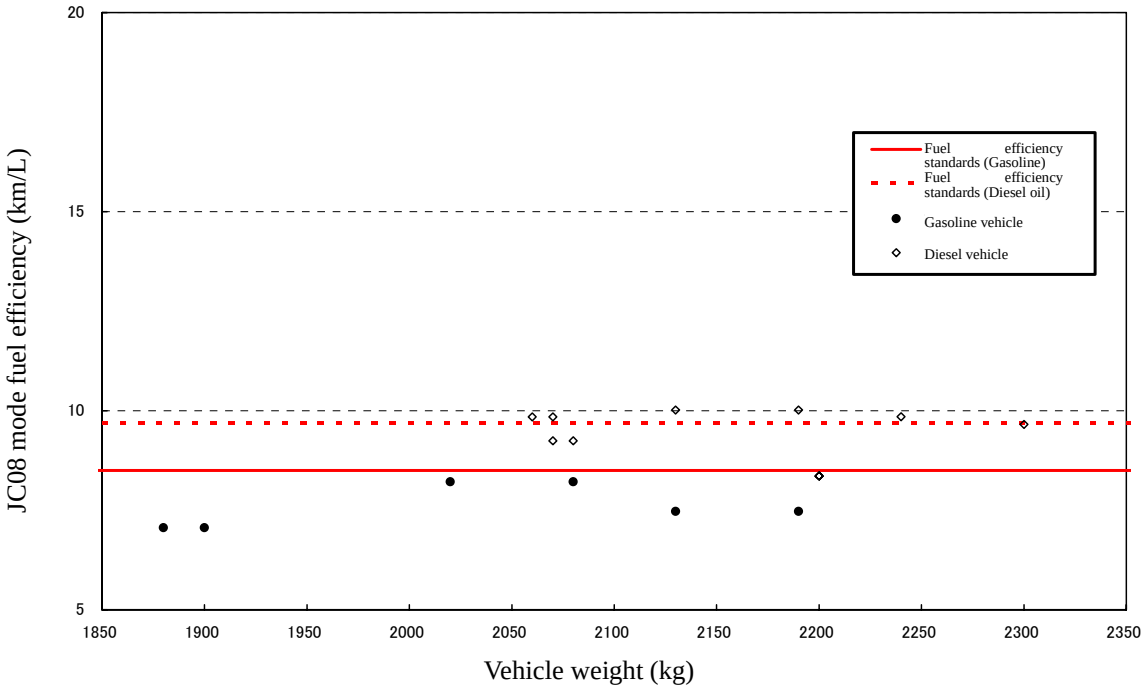
[Passenger car (Class No. 9 – 12)]



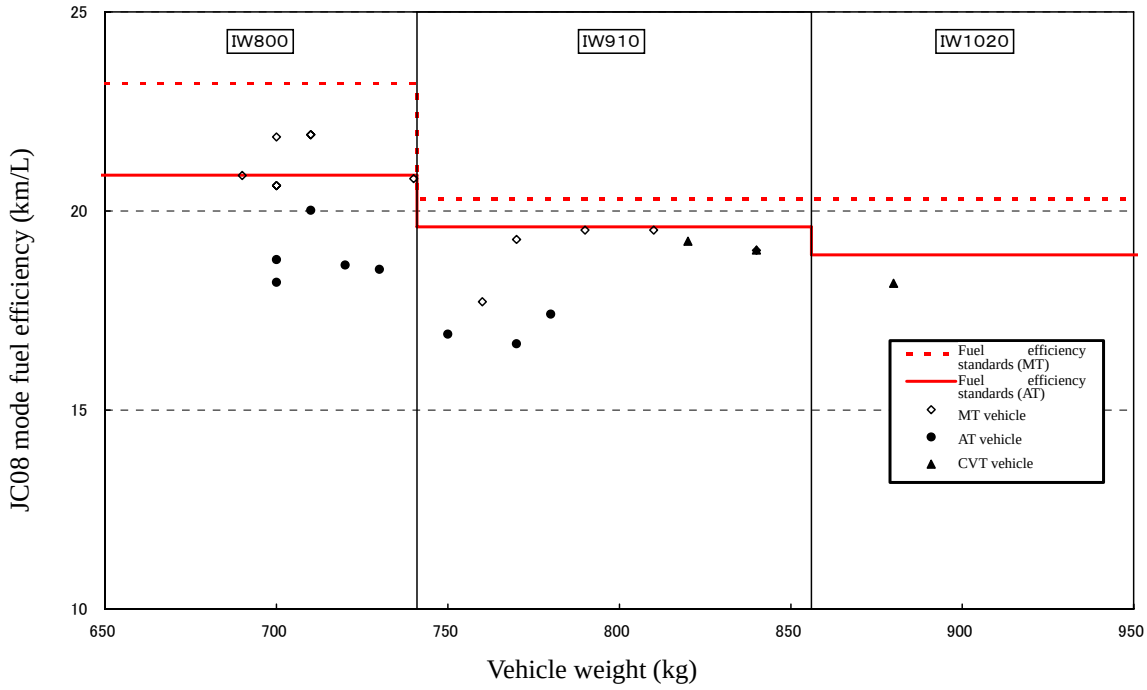
[Passenger car (Class No. 13 – 16)]



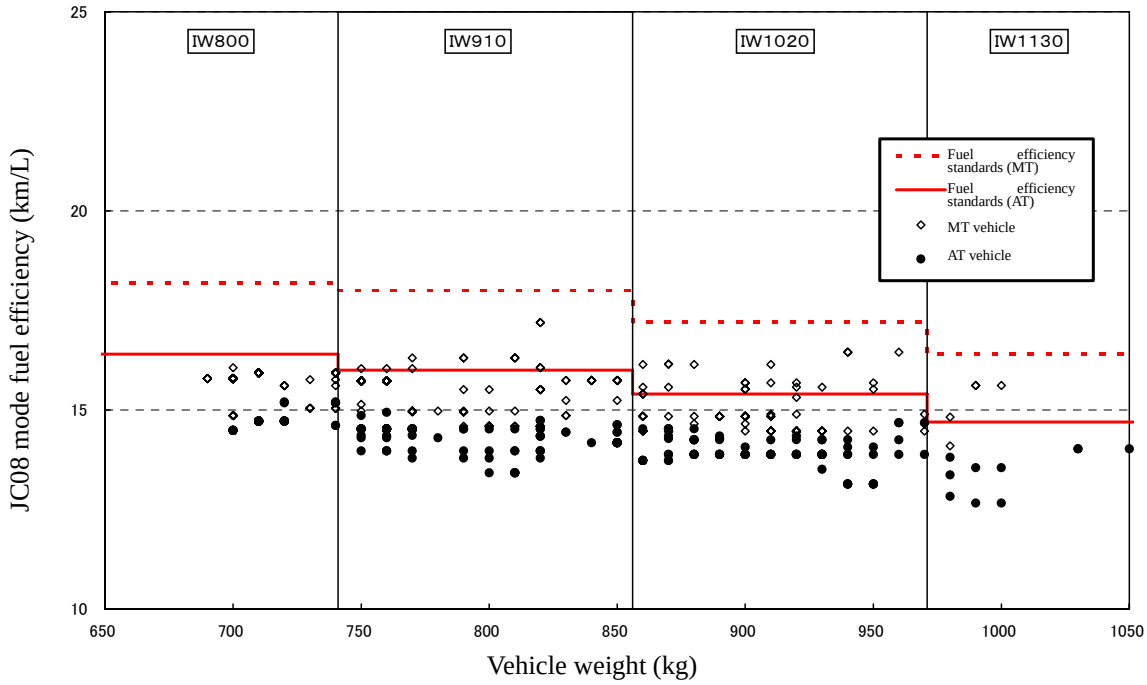
[Small bus]


20
15
10
5
1850
1900
1950
2000
2050
2100
2150
2200
2250
2300
2350
JC08 mode fuel efficiency (km/L)
Vehicle weight (kg)
Fuel efficiency standards (Gasoline)
Fuel efficiency standards (Diesel oil)
Gasoline vehicle
Diesel vehicle

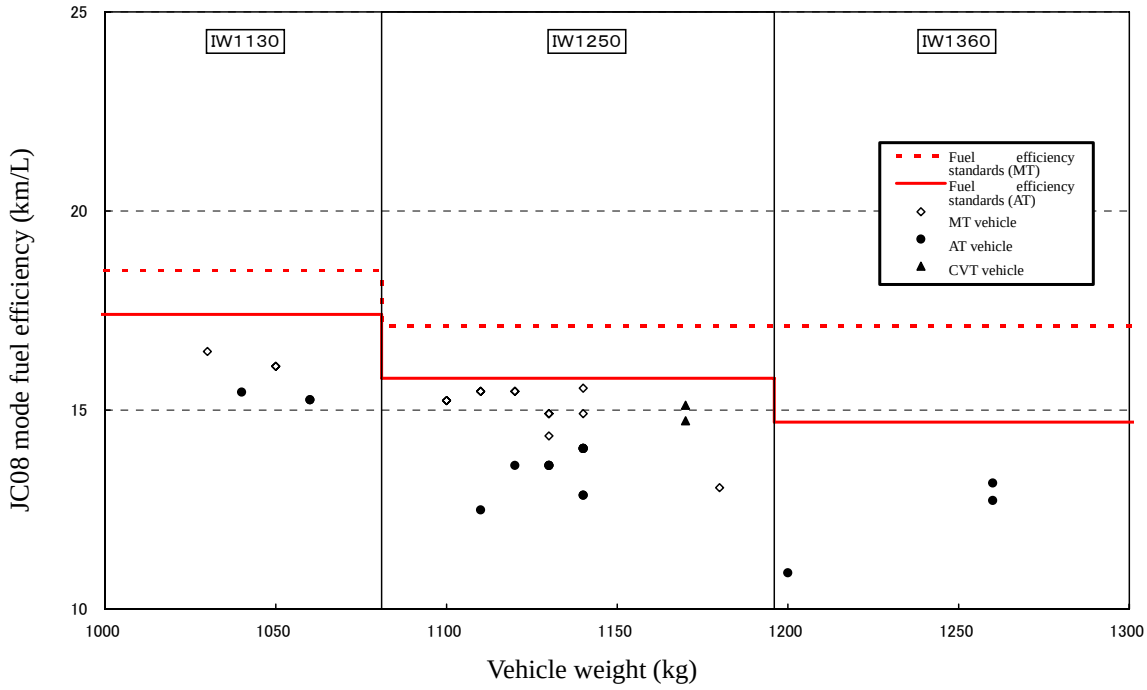
[Mini freight vehicle (Structure A)]



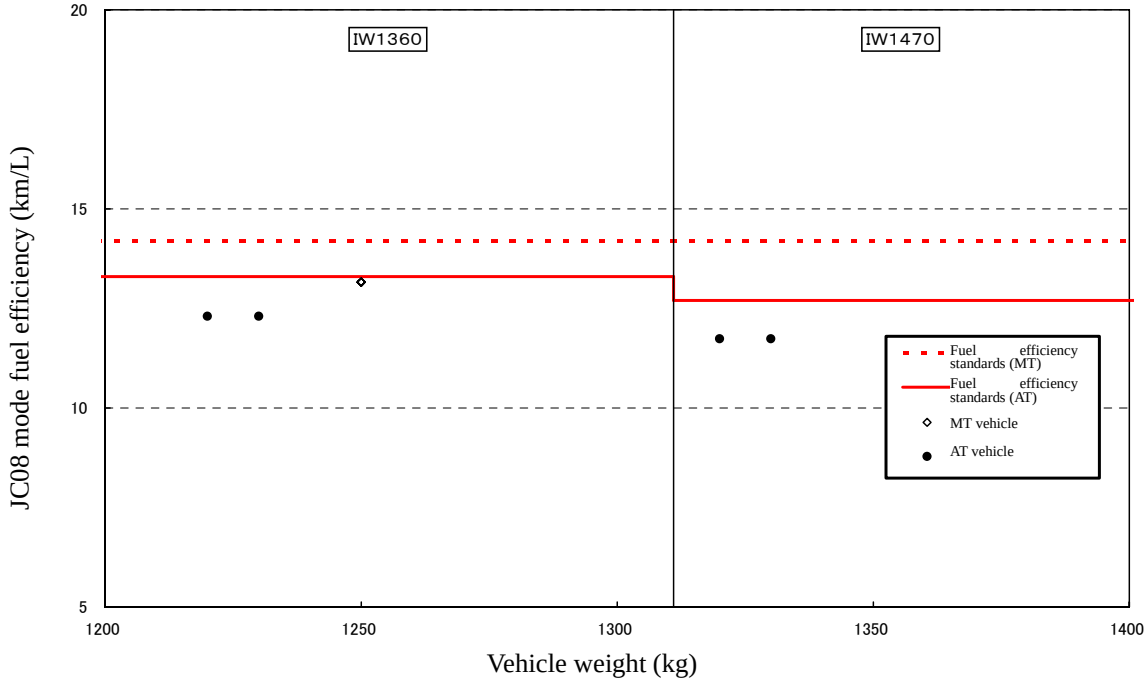
[Mini freight vehicle (Structure B)]



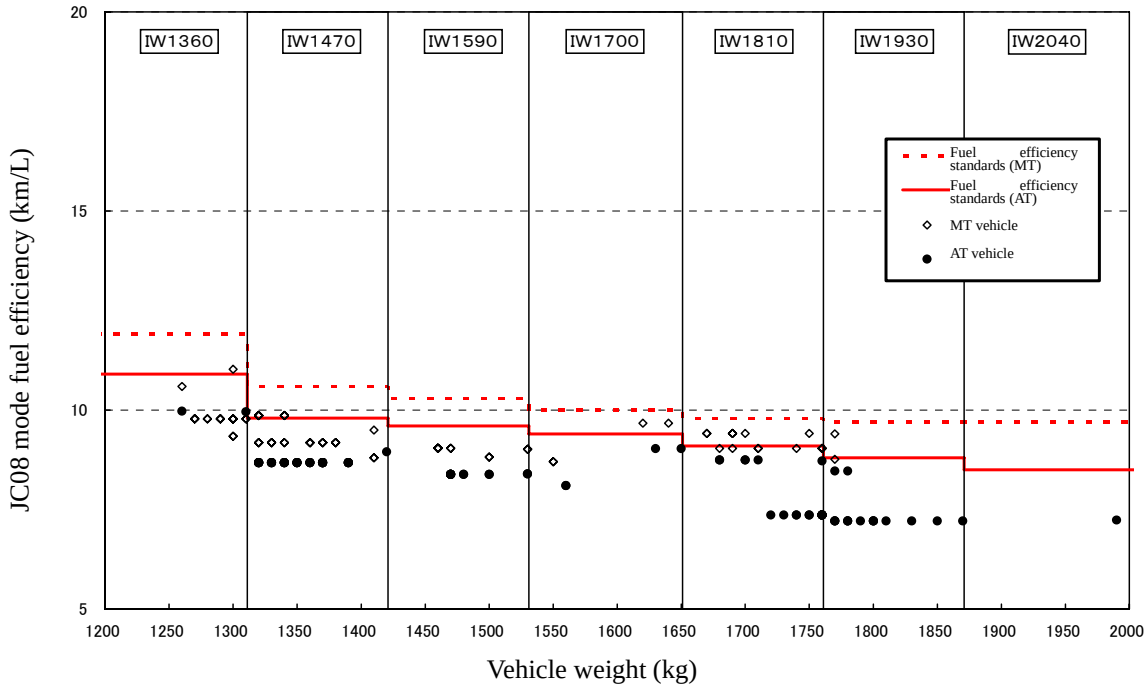
[Light-weight freight vehicle]



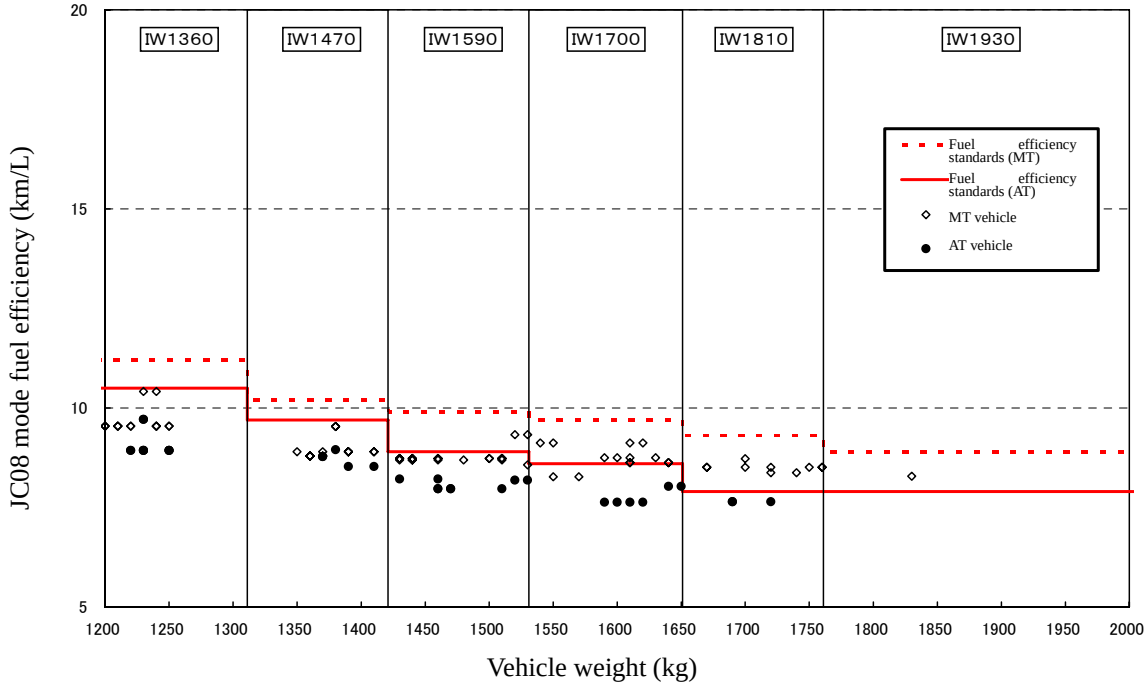
[Gasoline medium-weight freight vehicle (Structure A)]



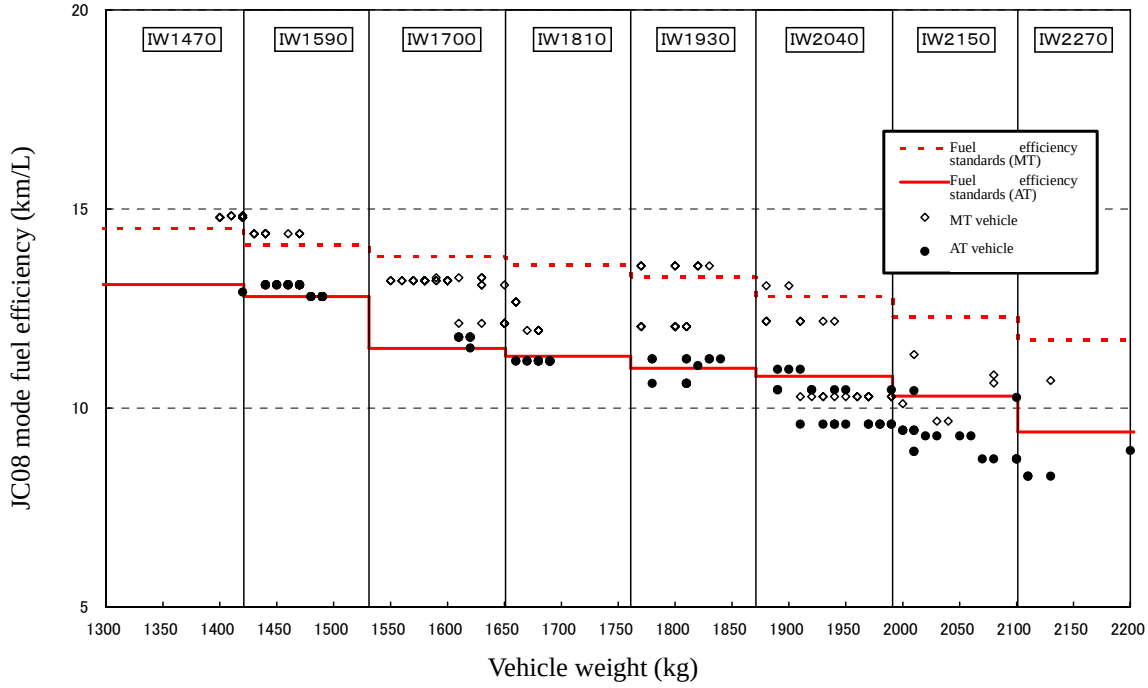
[Gasoline medium-weight freight vehicle (Structure B1)]



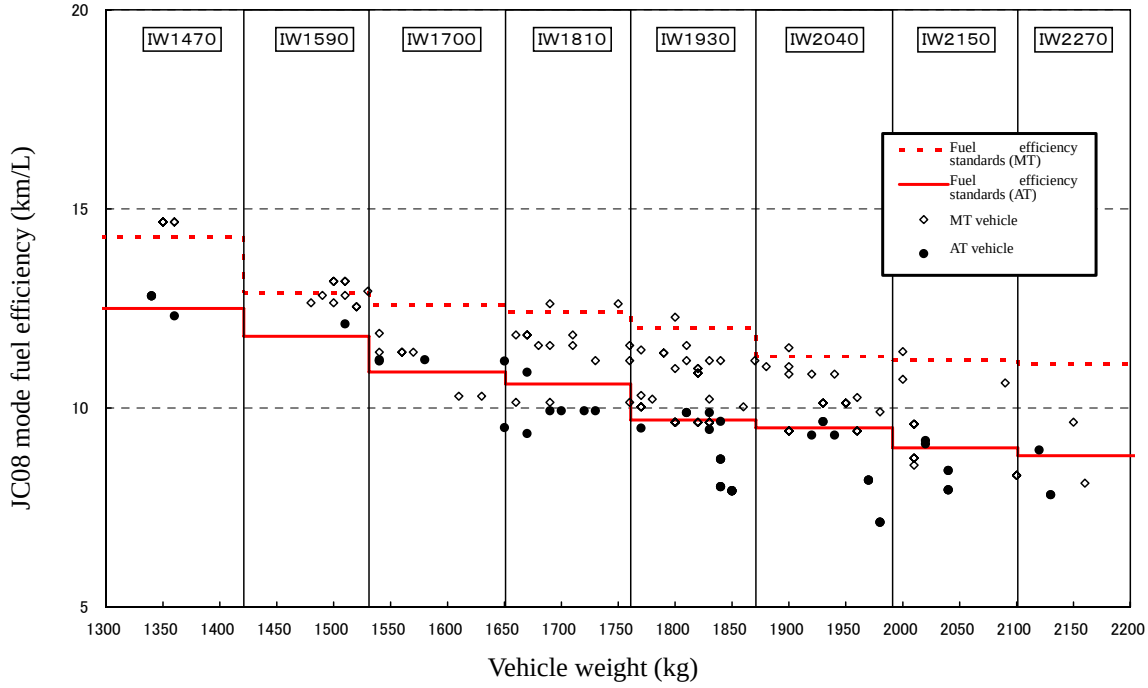
[Gasoline medium-weight freight vehicle (Structure B2)]



[Diesel medium-weight freight vehicle (Structures A and B1)]



[Diesel medium-weight freight vehicle (Structure B2)]



Attachment 6

Display Items

1. Display items, etc.

The purpose of display system is to promote fuel-efficient vehicles by helping automobile users, at the time of purchase, easily identify energy consumption efficiency (fuel efficiency values) to choose such vehicles. Therefore, it is appropriate to display fuel efficiency values in an easily visible manner along with those items closely related to fuel efficiency performance.

(1) Display items

It is appropriate to designate the items a. through k. below as display items, as in the case of the display items used under the existing fuel efficiency standards and the fuel efficiency standards for heavy vehicles.

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) Compliance items

It is appropriate to designate the following as compliance items, as in the case of the compliance items under the existing fuel efficiency standards.

[1] Display items listed in (1) above shall be noted in the catalog 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.

[2] 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) Other

Under the existing display system, the items in (1) above must be noted in the catalog of each vehicle to encourage automobile users to purchase fuel-efficient

vehicles.

Fuel efficiency values displayed in vehicle catalogs are measured under the prescribed uniform driving conditions to enable comparative evaluation of fuel efficiency. This piece of information is expected to heighten automobile users' interest in fuel efficiency performance and eventually promote "eco-driving." Therefore, it is appropriate to take measures so that automobile users, even after purchase, easily notice the fuel efficiency values of their vehicles.

2. Fuel efficiency display schedule

In a display system under the existing fuel efficiency standards, with the target fiscal year set for FY2010 (FY2005 for diesel vehicles), 10・15 mode fuel efficiency values are displayed in vehicle catalogs, etc.

Under the new fuel efficiency standards, fuel efficiency measurements are changed to the JC08 mode method in order to simulate actual driving conditions as closely as possible. It is appropriate, therefore, to display JC08 mode fuel efficiency in a catalog, etc. according to a display system under the new standards.

(1) Future 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 (*1), it is appropriate to summarize the fuel efficiency display schedule as below for the rapid promotion of more realistic fuel efficiency display with efforts to prevent market confusion.

[Display obligation (through FY2010)]
[1] Vehicles of early compliance with JC08 mode (*2): Both 10・15 mode fuel efficiency value and JC08 mode fuel efficiency value shall be displayed.
[2] Vehicles other than those of early compliance with JC08 mode: 10・15 mode fuel efficiency value shall be displayed.

*1 Under the exhaust emission regulations, compliance with JC08 mode (JC08H mode and JC08C mode) will be mandatory on April 1, 2011 for new models and March 1, 2013 for continuous-production models and imported vehicles.

*2 "Vehicles of early compliance with JC08 mode" refer to vehicles that receive type designation by taking JC08 mode exhaust gas tests prior to the date when the exhaust gas test mode becomes obligatory.

This fuel efficiency display schedule will allow automobile users to perform the comparative evaluation of fuel efficiency performance of all vehicles with 10・15 mode fuel efficiency value and to obtain more realistic fuel efficiency information (JC08 mode fuel efficiency) earlier, during the period until FY2010.

In and after FY2011, it is appropriate to take measures to display JC08 mode fuel efficiency values of principally all vehicles in their catalogs, etc., while paying attention to the time table of JC08 mode exhaust gas tests for continuous-production models and imported vehicles (mandatory on March 1, 2013).

(2) Handling of vehicles to be added to designated products

Passenger vehicles of 11 or more passenger capacity (with a gross vehicle weight of 3.5 tons or less) and freight vehicles with a gross vehicle weight over 2.5 tons and no more than 3.5 tons will be covered, for the first time, under the Energy Conservation Law (designated equipment). Therefore, fuel efficiency of these vehicles has never been displayed in their catalogs, etc.

It is important to provide automobile users with fuel efficiency information for these vehicles as well. It is thus appropriate to start displaying the information for them as soon as possible, like in other vehicles.

(3) Other

It is necessary to be careful not to confuse the market because of the period when display of fuel efficiency values in JC08 mode and 10・15 mode coexists, as described in (1) above. It is also necessary to give automobile users proper information so that they understand the intention of changing fuel efficiency test modes as well as the differences, characteristics, etc. of these modes.

Attachment 7

History of Joint Meetings between
Automobile Evaluation Standards Subcommittee, Energy Efficiency Standards Subcommittee of the Advisory Committee for Natural Resources and Energy
and
Automobile Fuel Efficiency Standards Subcommittee, Automobile Transport Section, Land Transport Division of the Council for Transport Policy

First joint meeting (July 7, 2005)
- Opening joint meetings to the public
- Current status of passenger cars, etc.
- Main issues to be discussed

Second joint meeting (November 16, 2005)
- Vehicles to be covered
- Energy consumption efficiency measurement methods
- Concept of selecting vehicles to be measured for passenger vehicles

Third joint meeting (February 3, 2006)
- Fuel efficiency categories
- Subject matters for hearings with automobile manufacture/import trade organizations

Fourth joint meeting (March 30, 2006)
- Hearing with automobile manufacture/import trade organizations (mainly for passenger cars)

Fifth joint meeting (June 15, 2006)
- Target fiscal year
- Fuel efficiency standard values for passenger cars

Sixth joint meeting (July 27, 2006)
- Hearing with automobile manufacture organizations (mainly for small freight vehicles and small buses)

Seventh joint meeting (December 15, 2006)
- Fuel efficiency standard values
- Display items
- Interim report

Public comment period on the interim report (December 19 ~ January 23)

Eighth joint meeting (February 2, 2007)
- The final report as well as comments on the interim report

Attachment 8

Committee Member List of Joint Meetings between
Automobile Evaluation Standards Subcommittee, Energy Efficiency Standards Subcommittee of the Advisory Committee for Natural Resources and Energy
and
Automobile Fuel Efficiency Standards Subcommittee, Automobile Transport Section, Land Transport Division of the Council for Transport Policy

Committee Chairman	
Makoto Ikegami	Professor, Dept. of Engineering, Fukui University of Technology
Committee Vice-Chairman	
Masahiro Sugiyama	Professor, Faculty of Commerce, the Graduate School, Waseda University
Committee Members	
Akira Ishihara	Managing Director, The Energy Conservation Center, Japan
Takeyuki Kamimoto	Professor, Future Science and Technology Joint Research Center, Tokai University
Risuke Kubochi	Vice-Chairman, Japan Auto-Body Industries Association Inc.
Keizo Saito	Fellow, Metrology Institute of Japan, National Institute of Advanced Industrial Science and Technology (Independent Administrative Institution)
Yasuhiro Daisho	Professor, School of Science and Engineering, Waseda University
Eiji Toyota	Executive Director, Japan Trucking Association
Yoshiyasu Nao	Vice-Chairman and Executive Director, Japan Automobile Manufacturers Association, Inc.
Akira Noda	Director, National Traffic Safety and Environment Laboratory (Independent Administrative Institution)
Naoyoshi Hayashi	Director, Japan Automobile Research Institute
Masatoshi Matsunami	Adviser, Japan Automobile Federation
Masanobu Wada	Managing Director, Japan Automobile Importers Association