
Maintenance and Serviceability

1 Introduction

1.1. Vehicle market in 2013

In 2013, 5,375,513 new vehicles were sold in Japan, an increase of just 5,793 from the 5,369,720 sold in 2012. This was an increase of 0.1% from the previous year.

Vehicle sales declined on a year-on-year basis since September 2012, when the incentive system for environmentally friendly vehicles ended. However, after the general election of December 2012 a coalition government of the Liberal Democratic Party (LDP) and New Komeito was formed and the second cabinet of Prime Minister Abe began. The ruling party, the LDP, also won the upper house elections in July 2013 and this ended a period of divided government. This led to rising expectations that the cabinet's so-called Abenomics policies would help Japan pull out of its deflationary cycle, revitalize the economy, and lead to an economic recovery. This recovery trend was also seen on the consumption side as the year-on-year declining trend for new vehicle sales, suddenly reversed course in September 2013 and have increased by 16 to 25% since then.

A more detailed analysis of new vehicle sales reveals that the number of registered vehicles was 3,262,522, a decrease of 127,752 (3.8%) from the previous year. Mini-vehicle sales were 2,112,991, a record high for a calendar year. This represented an increase of 133,549 vehicles (6.7%) from the previous year.

In terms of used vehicle sales, the number of registered vehicles was 3,892,830, a decrease of 123,079 (3.1%) from the previous year. Used mini-vehicle sales were 3,002,191, an increase of 98,997 (3.4%) from the previous year and the second highest total in history, next to the total from 2006.

In 2013, the total of both new and used registered and mini-vehicle sales reached 12,270,534, virtually unchanged from the previous year and a slight decrease of 18,289 (0.2%).

1.2. Vehicle ownership trends in 2013

The number of vehicles owned in Japan reached a peak in 2006 at 79,450,000, but then continued to decline from 2007. In 2010, the number began to increase again and by the end of December 2013 the number of vehicles owned in Japan had reached 80,411,439, the first time above the 80 million mark in history. This is an increase of 446,236 vehicles (0.6%) compared to 2012. It also is the fourth consecutive year that the number of vehicles owned in Japan has increased and set a new record for the calendar year.

According to model type, the number of 4-wheeled registered vehicles was 47,711,498, a decline of 262,473 (0.6%) from the previous year. Although this number was buoyed by new vehicle sales and represented a slowing in the overall downward trend in the number of vehicles owned, it was the eighth consecutive year-on-year decline.

The number of 4-wheeled mini-vehicles reached 29,064,780, due to a series of new model launches and strong new vehicle sales. This is an increase of 757,383 vehicles (2.7%) from the previous year. The number of 4-wheeled mini-vehicles owned in Japan is gaining momentum and has continued to increase year-on-year by 240,000 in 2010, 440,000 in 2011, and 710,000 in 2012.

The number of inspected 2-wheeled vehicles owned in Japan also increased to 1,615,981, 25,630 (1.6%) higher than the previous year. The number of 2-wheeled mini-vehicles owned in Japan is 2,003,702, a decrease of 74,966 (3.6%) from the previous year.

The number of mini-vehicles that are owned in Japan as a percentage of the total number of registered and 4-wheeled mini-vehicles rose by 0.8% from the previous year and is now at 37.9%, which is the highest in history.

According to a study by the Automobile Inspection & Registration Information Association (AIRIA), the average age of registered passenger vehicles at the end of March 2013 was 8.07 years, the first time that the 8-year

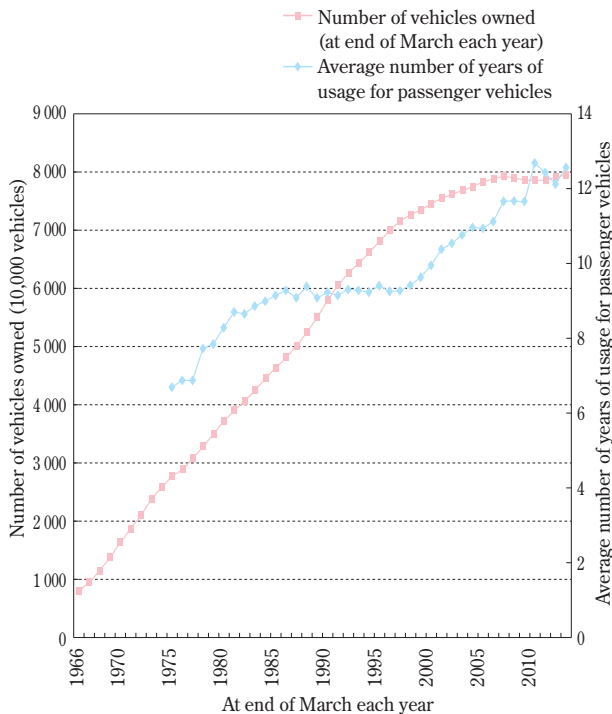


Fig. 1 Trends for number of vehicles owned and average number of years of usage for passenger vehicles (average vehicle age).

mark was achieved. This is 0.12 years longer than the previous year and also means that the average vehicle age has continued to grow for the past 21 years in a row. This is the highest average vehicle age in history and a new record has been set for the past 19 consecutive years. The average vehicle age has increased by 1.68 years compared to 10 years ago in 2003. This result is clearly affected by the fact that vehicles are now being used for longer.

The average number of years of usage of passenger vehicles that were scrapped in a one-year period (equivalent to the average life span of a human being) between April 2012 and March 2013 was 12.58 years. This was an increase of 0.42 years compared to the value from the previous year of 12.16 years and the first increase in 3 years (Fig. 1). This result is probably due to an increase in the number of vehicles aged 12 years and over scrapped in 2013. It is also thought that some major reasons for the continuous usage of older vehicles have now weakened, such as the end of the incentive system for environmentally friendly vehicles that promoted the purchase of new vehicles when older ones were scrapped and the insufficient supply of new vehicles due to the Great East Japan Earthquake.

The average age of registered trucks at the end of March 2013 was 10.73 years. This increased by 0.30 years compared to the value of the previous year of 10.43 years and is now the highest age in history after increasing for the past 20 years in a row. This is also probably due to the fact that vehicles are being used for longer.

According to a study by the Light Motor Vehicle Inspection Organization, the current average age of mini-vehicles at the end of December 2013 is 7.77 years. This is 0.09 years longer than the average age recorded in 2012 (7.68 years). This organization first started recording this data for mini-vehicles in 2005 and the average age that year was 6.13 years. This means that the average age of mini-vehicles has increased for the past 8 years in a row by a total of 1.64 years or approximately 27%.

The average age of mini-vehicle trucks at the end of December 2013 was 11.56 years. This is 0.24 years longer than the average age recorded in 2012 (11.32 years). This data for mini-vehicles was first recorded in 2005 and the average age that year was 9.33 years. This means that the average age of mini-vehicle trucks has increased for the past 8 years in a row by a total of 2.23 years or approximately 24%.

The average number of years of usage of passenger mini-vehicles was 13.20 years at the end of December 2012. In 2013 this had increased by 0.38 years to 13.58 years. The average number of years of usage in 2005 was 11.49 years. Therefore, in comparison, the average number of years of usage has increased by 2.09 years. The same trend is seen in the average number of years of usage of mini-vehicle trucks. In 2012 it was 14.69 years, but this had increased by 0.26 years to 14.95 years by 2013. This represents a total increase of 2.17 years compared to the average number of years of usage recorded in 2005 of 12.78 years.

In general, the number of older vehicles within the total number of vehicles that are owned in Japan is continuing to increase. As of the end of March 2013, the total number of registered passenger vehicles owned in Japan was 40,009,350 (a decrease of 134,091 vehicles or 0.3% from the previous year) and the number of vehicles with an age of 10 years or more within this total was 13,269,805. This was an increase of 254,761 vehicles (2.0%) from the previous year and it accounted for 33.2% of the total number of registered passenger vehicles (Fig. 2).

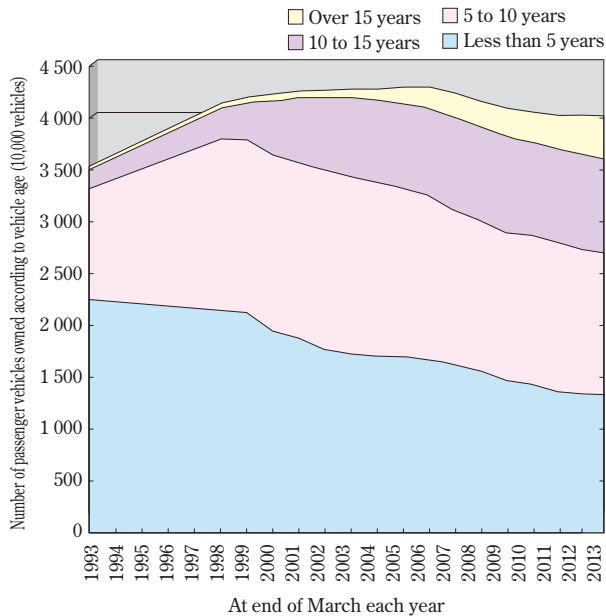


Fig. 2 Trends in vehicle age breakdown amongst total number of passenger vehicles owned.

2 Recent Trends in Vehicle Maintenance Industry

The Japan Automobile Service Promotion Association (JASPA) conducted its 2013 survey of the vehicle repair and maintenance industry at the end of June 2013. The targets of the survey were vehicle repair and maintenance businesses defined by the Road Transport Vehicle Act. The survey was sent to approximately 20% of the 91,933 businesses and valid responses were received from approximately 10% or 9,154 of all the workplaces. The values that were reported, such as the sales volume, were those from the accounting period closest to the time of the survey at the end of June (e.g., from the 2012 fiscal year).

According to this survey, the total maintenance sales were 5 trillion 421.7 billion yen. This was the first time in 2 years that these sales increased and it was an increase of 123.5 billion yen (2.3%) compared to the results in the survey from the previous year.

JASPA is presuming that the causes of this increase in total maintenance sales were a rebound in consumer confidence, which had contracted following the Great East Japan Earthquake in March 2011, an increase in consumer spending, and the recovery in new vehicle sales due to the incentive system for environmentally-friendly vehicles.

2.1. Maintenance Facilities and Maintenance Personnel

2.1.1. Outline of maintenance facilities

The number of businesses in the vehicle repair and maintenance industry was 73,173 at the time of the survey on June 30, 2013, a reduction of 399 businesses (0.5%).

In contrast, the total number of workplaces (number of certified maintenance shops) increased once again by 66 shops from the previous year and now stands at 91,933 (Table 1).

When the number of workplaces was examined according to the types of business, full-time vehicle maintenance shops accounted for the majority at 56,948 (61.9% of the total number of workplaces). This represented a decrease of 228 (0.4%) from the previous year. Maintenance shops that were run as an additional business accounted for 15,294 (16.6%). This was an increase of 270 (1.8%) from the previous year.

The number of maintenance shops at vehicle dealers was 16,033 (17.4%), an increase of 72 (0.5%) from the previous year. This is the first time in 5 years that the number of dealer-based maintenance shops increased. The number of private owner-run maintenance shops was 3,658 (4.0%). This number decreased by 48 (1.3%) from the previous year.

The number of designated workshops (i.e., private shops permitted to carry out the Japanese *shaken* vehicle inspection procedure) is increasing consistently and reached 29,493 in the 2013 survey. This is an increase of 133 (0.5%) from the previous year. The number of workplaces that have obtained this designation (i.e., the designation acquisition ratio) accounts for 32.1% of the total number of workplaces.

If the designation acquisition ratio is examined according to the different types of business, 13,316 out of the total number of full-time vehicle maintenance shops (56,948) have obtained the designation. This is an increase of 50 (0.6%) from the previous year and represents a designation acquisition ratio of 23.4%. This has now increased for 5 consecutive years.

In the case of maintenance shops that were run as an additional business, 4,575 out of the total of 15,294 have obtained the designation. This is an increase of 29 (0.6%) from the previous year and represents a designation acquisition ratio of 29.9%. There were a total of 16,033 maintenance shops at vehicle dealers and of these 10,385 have obtained the designation. This is an increase of 69

Table 1 Maintenance sales volume, composition ratio, and rate of change compared to previous year according to type of business and work content.

(Sales volume units: hundred million yen)

Business type \ Work content		Vehicle inspection (shaken) maintenance			Regular inspection and maintenance				Collision repair	Other maintenance	Total	Number of shops and composition ratio	Number of mechanics and composition ratio
		2 years	1 year	Subtotal	1 year	6 months	3 months	Total					
Full-time	Sales volume	5 975	3 312	9 287	345	102	224	671	4 491	5 873	20 322	56 948	167 497
	Change in sales volume compared to previous year	42	-64	-22	13	4	-30	-13	373	469	807	-228	-3 032
	Composition ratio	29.4 %	16.3 %	45.7 %	1.7 %	0.5 %	1.1 %	3.3 %	22.1 %	28.9 %	100.0 %	61.9 %	48.8 %
	Ratio of increase or decrease compared to previous year	100.7 %	98.1 %	99.8 %	103.9 %	104.1 %	88.2 %	98.1 %	109.1 %	108.7 %	104.1 %	99.6 %	98.2 %
Additional business	Sales volume	2 333	591	2 924	148	32	32	212	1 388	1 902	6 426	15 294	50 355
	Change in sales volume compared to previous year	29	-59	-30	18	7	-5	20	149	93	232	270	564
	Composition ratio	36.3 %	9.2 %	45.5 %	2.3 %	0.5 %	0.5 %	3.3 %	21.6 %	29.6 %	100.0 %	16.6 %	14.7 %
	Ratio of increase or decrease compared to previous year	101.3 %	90.9 %	99.0 %	113.8 %	128.0 %	86.5 %	110.4 %	112.0 %	105.1 %	103.7 %	101.8 %	101.1 %
Full-time + additional business	Sales volume	8 308	3 903	12 211	493	134	256	883	5 879	7 775	26 748	72 242	217 852
	Change in sales volume compared to previous year	71	-123	-52	31	11	-35	7	522	562	1 039	42	-2 468
	Composition ratio	31.1 %	14.6 %	45.7 %	1.8 %	0.5 %	1.0 %	3.3 %	22.0 %	29.1 %	100.0 %	78.6 %	63.5 %
	Ratio of increase or decrease compared to previous year	100.9 %	96.9 %	99.6 %	106.7 %	108.9 %	88.0 %	100.8 %	109.7 %	107.8 %	104.0 %	100.1 %	98.9 %
Dealer	Sales volume	6 954	979	7 933	1 557	226	75	1 858	6 276	9 038	25 105	16 033	109 211
	Change in sales volume compared to previous year	105	-275	-170	-24	25	-50	-49	255	-20	16	72	51
	Composition ratio	27.7 %	3.9 %	31.6 %	6.2 %	0.9 %	0.3 %	7.4 %	25.0 %	36.0 %	100.0 %	17.4 %	31.8 %
	Ratio of increase or decrease compared to previous year	101.5 %	78.1 %	97.9 %	98.5 %	112.4 %	60.0 %	97.4 %	104.2 %	99.8 %	100.1 %	100.5 %	100.0 %
Private owner-run	Sales volume	678	160	838	119	20	49	188	586	752	2 364	3 658	16 147
	Change in sales volume compared to previous year	-25	-70	-95	43	-27	41	57	96	122	180	-48	-424
	Composition ratio	28.7 %	6.8 %	35.4 %	5.0 %	0.8 %	2.1 %	8.0 %	24.8 %	31.8 %	100.0 %	4.0 %	4.7 %
	Ratio of increase or decrease compared to previous year	96.4 %	69.6 %	89.8 %	156.6 %	42.6 %	612.5 %	143.5 %	119.6 %	119.4 %	108.2 %	98.7 %	97.4 %
Total	Sales volume	15 940	5 042	20 982	2 169	380	380	2 929	12 741	17 565	54 217	91 933	343 210
	Change in sales volume compared to previous year	151	-468	-317	50	9	-44	15	873	664	1 235	66	-2 841
	Composition ratio	29.4 %	9.3 %	38.7 %	4.0 %	0.7 %	0.7 %	5.4 %	23.5 %	32.4 %	100.0 %	100.0 %	100.0 %
	Ratio of increase or decrease compared to previous year	101.0 %	91.5 %	98.5 %	102.4 %	102.4 %	89.6 %	100.5 %	107.4 %	103.9 %	102.3 %	100.1 %	99.2 %

(0.7%) from the previous year and represents a designation acquisition ratio of 64.8%. In the case of private owner-run maintenance shops, 1,217 out of the total of 3,658 have obtained the designation. This is a decrease of 15 (1.2%) from the previous year and represents a designation acquisition ratio of 33.3%.

Table 2 compares the scale of maintenance shops based on the number of vehicle maintenance personnel that are employed.

At the time of this survey in June 2013, the number of private companies was 72,724 after subtracting the number of public offices. However, at the time of the June 2006 survey 6 years ago, the number of private companies was 70,579 after subtracting the number of public offices. Table 3 shows this comparison based on the number of employees.

2.1.2. Outline of mechanics and maintenance personnel

At the time of the 2013 survey, the number of maintenance-related personnel was 549,902. This was a decrease of 3,991 (0.7%) from the previous year. This

means the number of personnel has returned to almost the same level it was at 5 years ago.

When these changes in the numbers of maintenance-related personnel are examined by business type, the full-time vehicle maintenance businesses employed 259,836 people, an increase of 6,386 (2.5%) from the previous year. This was the first increase in 4 years. Vehicle maintenance businesses that are run as an additional business employed 87,192 people, 266 (0.3%) less than the previous year. The number of maintenance-related personnel at maintenance shops at vehicle dealers also decreased to 154,411 people, 4,909 (3.1%) less than the previous year. In the case of private owner-run maintenance shops, the number of maintenance-related personnel decreased to 48,463 people, 5,202 (9.7%) less than the previous year.

The number of maintenance personnel (shop workers) was 400,336, a decrease of 763 (0.2%) from the previous year. The number of mechanics was 343,210, a decrease of 2,841 (0.8%) from the previous year.

The number of personnel who obtained the Class 1 ve-

Table 2 Number of vehicle maintenance-related personnel.

Scale of business	A1 (2 to 3 people)	A2 (4 to 10 people)	B (11 to 20 people)	C (21 to 30 people)	D (31 people or more)	Total	Change compared to previous year	Rate compared to previous year
Number of shops	51 765	35 976	3 626	423	143	91 933	66	100.1 %
Number of shops that obtained designation		26 415	2 663	310	105	29 493	133	100.5 %
Acquisition ratio		73.4 %	73.4 %	73.3 %	73.4 %	32.1 %	前年	32.0 %
Total number of personnel	184 321	279 019	65 668	13 482	7 412	549 902	- 3 991	99.3 %
Total number of maintenance personnel	123 576	210 441	49 774	10 330	6 215	400 336	- 763	99.8 %
Number of Class 1 auto mechanics	1 371	4 577	1 327	163	94	7 532	1 124	117.5 %
Number of Class 2 auto mechanics	79 865	154 700	36 276	6 779	3 920	281 540	- 1 888	99.3 %
Number of Class 3 auto mechanics	21 073	25 865	5 128	1 310	762	54 138	- 2 077	96.3 %
Total number of mechanics	102 309	185 142	42 731	8 252	4 776	343 210	- 2 841	99.2 %

Table 3 Number of businesses according to number of employees.

	2 to 5 people	6 to 10 people	11 to 15 people	16 to 20 people	21 to 30 people	31 to 50 people	51 to 100 people	101 to 300 people	More than 300 people	Private company total	Public offices	Overall total
June 2006	39 187	13 685	4 189	2 547	2 667	1 641	1 905	2 608	2 150	70 579	438	71 017
June 2013	40 899	15 584	4 609	2 309	2 380	1 667	1 818	1 981	1 477	72 724	449	73 173
Change	1 712	1 899	420	- 238	- 287	26	- 87	- 627	- 673	2 145	11	2 156

hicle mechanic qualification was 7,532 people, an increase of 1,124 (17.5%) from the previous year. The number of personnel who obtained the Class 2 vehicle mechanic qualification was 281,540, a decrease of 1,888 (0.7%) from the previous year. The number of personnel with Class 3 vehicle mechanic qualification was 54,138, a decrease of 2,077 (3.7%) from the previous year (Table 1, Table 2).

The average age of maintenance personnel has continued to rise consistently, but a decline was recorded for the first time in the history of this survey in 2010. The average age increased once again in 2011 and increased again by 0.2 years to 43.5 years in 2013.

2. 2. Demand for vehicle maintenance

2. 2. 1. Trends in total maintenance sales volume

The total maintenance sales volume in the 2013 survey (results from the 2012 fiscal year) was 5 trillion 421.7 billion yen. Table 1 compares the maintenance sales volume generated by full-time vehicle maintenance businesses, those run as an additional business, those at dealers, and those that are private owner-run businesses. It also compares the sales volume according to the content of the work that was performed, such as *shaken* vehicle inspection and maintenance, regular inspection and maintenance, collision repairs, and other maintenance.

The other maintenance category includes items such as extraordinary maintenance for a breakdown or malfunction, regular vehicle maintenance such as oil

changes, voluntary inspections requested by the vehicle's owner, additional maintenance for a vehicle issued a limited inspection certificate, vehicle customization services, and the like.

In the survey conducted for the previous year, the sales volumes for all of the different kinds of maintenance work were lower than the previous year. However, this year, the survey showed that the sales volume from regular inspection and maintenance increased slightly, there was a significant increase in the sales volumes for collision repairs and other maintenance, and there appeared to be a positive change in how much vehicle owners spent on their vehicles.

The total sales volume for *shaken* vehicle inspection and maintenance was 2 trillion 982 billion yen and, within that amount, the sales volume from 2-year vehicle inspections was 1 trillion 594 billion yen, which accounted for 76% of the total. This was an increase of 15.1 billion yen (1.0%) from the previous year. In contrast, there was a downward trend in the number of 1-year inspection vehicles, such as taxis and trucks, that are owned and so the sales volume from this type of vehicle inspection and maintenance was 504.2 billion yen, which was a significant decrease of 46.8 billion yen (8.5%) from the previous year. This was certainly a factor in the overall decline of vehicle inspection and maintenance sales.

A similar trend was also seen in the regular inspection

and maintenance sales, where 74% of the sales volume of 292.9 billion yen was made up of sales from annual vehicle inspections. The number of vehicles brought in for a maintenance service visit increased for the annual inspections and 6-month inspections due to the effects of the measures that were implemented to increase visits for regular inspection service. However, there was a decrease in the number of service visits for taxis and large trucks, which are subject to 3-month inspections, due to the fact that the number of these vehicles that are owned is decreasing.

2.2.2. Average number of vehicles serviced according to type of business and work content

The average number of vehicles brought in for maintenance during the year per shop was 1,560, an increase of 31 (2.0%) from the previous year. When the number of vehicles is broken down according to the content of the work that was performed, the average number of vehicles brought in for vehicle inspection and maintenance per shop was 354, a decrease of 9 vehicles (2.5%) from the previous year. This accounted for 22.7% of the total number of vehicles that were brought in (1,560 vehicles). The average number of vehicles brought in for regular inspection and maintenance per shop was 201, a decrease of 2 vehicles (1.0%) from the previous year. This accounted for 12.9% of the total number of vehicles brought in. The average number of vehicles brought in for collision repairs per shop was 102, an increase of 4 vehicles (4.1%) from the previous year. This accounted for 6.5% of the total number of vehicles brought in. The average number of vehicles brought in for other maintenance per shop was 903, an increase of 38 vehicles (4.4%) from the previous year. This accounted for 57.9% of the total number of vehicles brought in.

Looking at the average number of vehicles brought in for maintenance during the year per shop according to the type of business, the average number of vehicles brought into full-time vehicle maintenance businesses was 790. This was an increase of 6 vehicles (0.8%) from the previous year. The average number of vehicles brought into maintenance shops run as an additional business was 1,144 per shop, a decrease of 93 vehicles (7.5%) from the previous year. The average number of vehicles brought into maintenance shops at dealers was 4,699 per shop, an increase of 230 vehicles (5.1%) from the previous year.

Furthermore, looking at the content of the maintenance

work according to the type of business, the average number of vehicles brought into full-time vehicle maintenance businesses for vehicle inspection and maintenance during the year was 271 per shop. This was a decrease of 7 vehicles (2.5%) from the previous year. This also accounted for 34.3% of all the vehicles brought into those shops for maintenance. In the same category, the average number of vehicles brought into maintenance shops run as an additional business was 337 per shop, a decrease of 22 vehicles (6.1%) from the previous year. This accounted for 29.5% of the total number of vehicles brought into those shops for maintenance. On the other hand, the average number of vehicles brought into maintenance shops at dealers for vehicle inspection and maintenance was 665. This was a decrease of 5 vehicles (0.7%) from the previous year and accounted for 14.2% of all the vehicles brought into those shops for maintenance.

Next, the average number of vehicles brought into full-time vehicle maintenance businesses for regular inspection and maintenance during the year was 71 per shop. This was a decrease of 3 vehicles (4.1%) from the previous year and accounted for 9.0% of all the vehicles brought into those shops for maintenance. In the same category, the average number of vehicles brought into maintenance shops run as an additional business was 90 per shop, a decrease of 3 vehicles (3.2%) from the previous year. This accounted for 7.9% of the vehicles brought into those shops for maintenance. The average number of vehicles brought into maintenance shops at dealers was 769 per shop, the same number as the previous year. This accounted for 16.4% of the vehicles brought into those shops for maintenance.

The average number of vehicles brought in for collision repairs during the year was 71 vehicles at the full-time vehicle maintenance businesses. This was an increase of 3 vehicles per shop (4.4%) from the previous year. This accounted for 9.0% of all the vehicles brought in for maintenance service. In the same category, the average number of vehicles brought into maintenance shops run as an additional business was 76 vehicles. This was an increase of 1 vehicle per shop (1.3%) from the previous year and it accounted for 6.6% of all the vehicles brought in for maintenance service. The average number of vehicles brought into maintenance shops at dealers was 236 per shop. This was an increase of 11 vehicles (4.9%) from the previous year and it accounted

for 5.0% of all the vehicles brought in for maintenance service.

Other maintenance accounted for the largest portion of vehicles brought in for maintenance or service. The average number of vehicles brought into full-time vehicle maintenance businesses for other maintenance was 377 per shop. This was an increase of 13 vehicles (3.6%) from the previous year and accounted for 47.7% of all the vehicles brought into those shops for maintenance during the year. In the same category, the average number of vehicles brought into maintenance shops run as an additional business for other maintenance was 641 per shop, a decrease of 69 vehicles (9.7%) from the previous year. This accounted for 56.0% of all the vehicles brought into those shops for maintenance. In contrast, the average number of vehicles brought into maintenance shops at dealers for other maintenance was 3,029 per shop, an increase of 224 vehicles (8.0%) from the previous year. This accounted for 64.5% of all the vehicles brought into those shops for maintenance.

2.2.3. Trends in *shaken* vehicle inspection and regular inspection and maintenance fees according to type of business

Two-year vehicle inspections account for over three-quarters of the *shaken* vehicle inspection sales volume. If the unit prices of the 2-year vehicle inspections are compared at the different types of businesses, the unit price at the full-time vehicle maintenance businesses was 51,193 yen, which is an increase of 1,578 yen (3.2%) over the price the previous year of 49,615 yen. The unit price at the maintenance shops run as an additional business was 53,193 yen, which is an increase of 2,606 yen (5.2%) over the price the previous year of 50,587 yen. In contrast, the unit price at the maintenance shops at dealers was 71,282 yen, which is a decrease of 534 yen (0.7%) from the price the previous year of 71,816 yen.

Even though the number of vehicles brought in to full-time vehicle maintenance businesses, maintenance shops run as an additional business, and maintenance shops at dealers for *shaken* vehicle inspections decreased, the unit price for this service increased at full-time vehicle maintenance businesses and maintenance shops run as an additional business, while it decreased slightly at maintenance shops at dealers. The price difference for the *shaken* vehicle inspection fees at full-time vehicle maintenance businesses and maintenance shops at dealers shrunk from 22,201 yen the previous year to 20,089

yen in 2013.

One-year vehicle inspections account for approximately three-quarters of the regular inspection and maintenance sales volume. If the average unit prices of the 1-year regular inspections are compared at the different types of businesses, the average unit price at the full-time vehicle maintenance businesses was 20,953 yen. This was an increase of 918 yen (4.6%) over the price the previous year of 20,035 yen. The average unit price at the maintenance shops run as an additional business was 18,087 yen, which was a significant rise of 1,821 yen (11.2%) from the previous year of 16,266 yen. The average unit price at the maintenance shops at dealers was 17,117 yen, which was a decrease of 1,091 yen (6.0%) compared to the price the previous year of 18,208 yen.

The number of vehicles brought into maintenance shops for service is a value that was calculated by the people that conducted the survey. These independent calculations were based on the numerical values listed in the survey and due to rounding there are cases where a slight shift occurred after the decimal point or in the unit place. However, this does not change the overall trends and so the values are shown as is.

2.3. Maintenance technical information and promotion of ICT usage

JASPA began operating the FAINES internet-based subscription service for providing vehicle maintenance technical information in 1998. At the end of 2013 the number of FAINES subscribers had reached 31,027 businesses, which was a significant increase of 4,129 (15.4%) from the previous year.

In April 2013 JASPA reviewed the fee structure and conducted a subscription promotion campaign to obtain new subscribers to this service. Regional vehicle service promotion associations also actively carried out subscription promotion activities and, as a result, the number of FAINES users increased almost nationwide.

The average number of times that FAINES was used per month increased from approximately 450,000 times in 2011 to about 500,000 times in 2012, and then to approximately 700,000 times every month in 2013. The number of times that it is used a month per business also increased from 24 times a month in 2011 to 25 times a month in 2012, and then to 30 times per month in 2013.

The types of information that FAINES provides and the data stored in its system are as follows: (1) maintenance manual information: 1,101 pieces of data, 488

vehicle models (last year: 1,004 pieces of data and 451 models), (2) vehicle maintenance standard work points table: 4,886 pieces of data from the 1995 version to the 2013 version (last year: 4,388 pieces of data), (3) examples of breakdown repairs and maintenance advice: 4,885 pieces of data (last year: 4,490 pieces of data), (4) vehicle data (sampling data) from registered vehicles equipped with OBD, mainly vehicles compatible with J-OBD II: 195 pieces of data, (5) technical information: 1,531 pieces of data (last year: 1,463 pieces of data), (6) service data for Japanese and imported vehicles: (main specification values and inspection standard values for vehicles, engines, and chassis) 2,672 pieces of data (last year: 2,528 pieces of data), (7) guidelines for timing belt changes: 76 pieces of data (last year: 76 pieces of data), (8) new technologies for vehicle maintenance: 572 pieces of data (last year: 545 pieces of data), (9) fuel injection system troubleshooting manual: 338 pieces of data (last year: 338 pieces of data), (10) list of applicable tire rims: 1 piece of data (last year: 1 piece of data), (11) illustrated manual for chassis number and power unit model stamping positions, and the like: 184 pieces of data (last year: 184 pieces of data).

In June 2006, the Japanese government started a system that denies renewals of *shaken* inspections for vehicles that have unpaid illegal parking fees. In August 2006, JASPA began operating an illegal parking fee delinquent vehicle information inquiry system that allows vehicle maintenance personnel to confirm the illegal parking fee payment status of a vehicle that has been brought in for a *shaken* vehicle inspection. By the end of 2013, 36,091 maintenance shops had registered to use this system and during that same year there were 1,594,444 queries entered into the system. The system is used constantly and every month there are hundreds of thousands of inquiries. In fact, from the start of operations until March 2014 there have been a total of 11,088,471 queries entered into the system.

As part of the environmental conservation measures being pursued by the vehicle maintenance industry, JASPA also operates an environmental budgeting system to help reduce the amount of CO₂ emissions that are associated with the vehicle maintenance industry. The maintenance businesses that register with the system input the amount of energy used in each registered shop, calculate the amount of CO₂ emissions, and then utilize this information to implement improvements in working environments and methods to reduce emissions.

3 Inspection and Maintenance System Trends

3.1. Vehicle inspections

In 2013 the total number of *shaken* renewal inspections (sum of data from the Japanese Ministry of Land, Infrastructure, Transport and Tourism (MLIT), the National Agency of Vehicle Inspection, and the Light Motor Vehicle Inspection Organization) was 32,051,769 cases, a reduction of 207,715 cases (0.6%) compared to 2012. Within that total, the number of vehicles specified to receive maintenance was 22,873,189, a decrease of 72,175 vehicles (0.3%) compared to 2012. The specified maintenance rate rose by 0.3% from the previous year to 71.4%.

Closer analysis of the data for registered vehicles shows that the number of registered vehicles subjected to a *shaken* renewal inspection was 21,122,536, a decrease of 480,308 vehicles (2.2%) compared to 2012. The number of registered vehicles specified to receive maintenance was 15,741,676 and the specified maintenance rate increased by 0.1% to 74.5% from the previous year.

In 2013, the number of inspections conducted by the National Agency of Vehicle Inspection at inspection centers throughout Japan to assess compliance with the Japanese Safety Regulations for Road Vehicles (total of new inspections, *shaken* renewal inspections, structural change inspections, and re-inspections) was 7,135,403. This was a decrease of 129,283 inspections (1.8%) compared to 2012.

The number of on-street inspections was 124,954, a decrease of 7,100 (5.4%) compared to 2012.

The breakdown of the number of the different types of inspections indicates that there were 1,030,928 new inspections (including preliminary inspections), an increase of 60,734 (6.3%) compared to 2012. The number of *shaken* renewal inspections was 5,310,321, a decrease of 157,472 (2.9%) compared to 2012. The number of structural change inspections was 62,974, a decrease of 3,373 (5.1%) compared to 2012.

There were 731,180 re-inspections in 2013, a decrease of 29,172 (5.4%) compared to 2012. This decrease in the number of re-inspections has continued for 8 years in a row since 2006.

When the data for mini-vehicle inspections is examined, there were 10,999,772 *shaken* renewal inspections, an increase of 273,838 (2.6%) compared to 2012. The number of *shaken* renewal inspections for mini-vehicles first exceeded 10 million in 2010 and it has now exceeded

this number for 4 years in a row.

The number of mini-vehicles specified to receive maintenance was 7,131,513 and the specified maintenance rate was 64.8%, an increase of 0.7% from the previous year.

The number of vehicles brought into the Japan Light Motor Vehicle Inspection Organization for a *shaken* renewal inspection was 3,868,259. This total consisted of 2,674,091 vehicles that were brought in by maintenance personnel and 1,194,186 vehicles that were brought in by the owner for vehicle inspection and maintenance.

It should be noted that there are some cases where the total values do not match up due to errors in the preliminary values and the confirmed values. However, this does not change the overall trends and so the values are presented as is.

3.2. Operation of advanced facilities and introduction of large multi-tester

The National Agency of Vehicle Inspection introduced a prototype large multi-tester at its Kanto Inspection Division in June 2013 and began trial operation. Heavy trucks are equipped with a speed limiting device (SLD) to restrict the maximum speed of the truck to 90 km/h.

However, some people illegally modify this device and in 2009 alone there were over 400 reports received from other vehicle owners of trucks being driven at speeds that exceeded this maximum speed. Various shipping companies around the country were then subjected to on-site audits and other inspections and any vehicles that were suspected of having been illegally modified were actually driven on the large multi-tester.

The large multi-tester has the following special features: (1) it is equipped with a function that can safely and reliably test the SLD, (2) it can handle a wide variety of different vehicle inspections, (3) it reduces the number of times the vehicle under inspection needs to be moved, (4) it is equipped with an easy-to-understand guidance display, (5) it is equipped with new rollers that have excellent quiet performance and will not damage the tires easily, and (6) it is equipped with a vehicle model selection declaration monitor. This tester allows for inspections to be conducted according to a variety of different situations and is able to handle inspections of vehicles equipped with a variety of different functions, such as 4WD vehicles and vehicles equipped with traction control.

The prototype tester that was introduced in the Kanto Inspection Division was used to verify the various func-

tions of the tester and create specifications for a mass-production model. One of these new testers will be deployed to each inspection division during the third medium-term 5-year plan. From 2016 and on these testers will also be deployed one by one to all of the inspection stations throughout Japan.

Full-fledged operation of the advanced inspection facilities that had been developed began in April of 2013. Electronic collection and storage of vehicle images and inspection data are being used to prevent unauthorized secondary modification of vehicles and unauthorized vehicle inspection and maintenance. In addition, the collection and analysis of inspection data will allow vehicle malfunctions to be identified so that recalls can be implemented and also allow inspection results to be provided to the owners of the vehicles being inspected.

The operational rules for the inspections, which are the guidelines and requirements for the vehicle inspections stipulated by the National Agency of Vehicle Inspection, were subject to 61 revisions during 2013 to ensure consistency with the revisions that were made to the Japanese Safety Regulations for Road Vehicles. In addition, efforts are being made to enhance the knowledge and training of the inspectors in response to the introduction of these new standards. Particular attention and effort was focused on the new compressed hydrogen gas fuel systems that are used on fuel cell vehicles. The world's first screening method was formulated for these vehicles, which will be used when these vehicles are subjected to the *shaken* renewal inspection. This was the start of the infrastructure development aimed at full-scale popularization of fuel cell vehicles.

During 2013, there were a total of 87 cases of undue claims made during vehicle inspections according to the reports from inspection stations across Japan. This was a decrease of 84 cases (49%) or nearly half the number compared to 2012. The number of such undue claims reached its peak in 2007 at 667 cases, but has decreased for 6 years in a row and has now fallen to one-eighth of the peak level.

In addition, efforts are also being made to eliminate unlawfully modified vehicles. One of these initiatives was to dispatch some 44 vehicle inspectors to 4 different custom car shows held in major cities throughout Japan to check on 2,163 vehicles that were being exhibited. The inspectors issued warnings in writing to certain exhibitors for 111 exhibition vehicles that did not clearly

indicate that the vehicle could not be driven lawfully on Japanese public roads due to non-compliance or possible non-compliance with the Japanese Safety Regulations for Road Vehicles.

4 Measures for Diagnostic Equipment and Electronic Maintenance

In July 2010 MLIT established a generic scanning tool promotion investigative commission (Chairman: Yoshihiro Suda, Director of the Advanced Mobility Research Center, Institute of Industrial Science, University of Tokyo) to carry out various studies.

In August 2011, a new vehicle maintenance technology advancement investigative commission (Chairman: Yoshihiro Suda) was also set up based on the results of the investigative commission mentioned above. The purpose of this new commission was to carry out even more detailed investigations and examinations of the best ways to advance maintenance technologies, and to come up with concrete measures to accomplish these goals. This commission issued an intermediate report of its findings, including the standard specifications for the scanning tools, in July 2012.

JASPA has established a training program to promote the spread and use of generic scanning tools. The same report from the commission also proposed that the vehicle maintenance industry create a technical skill certification system for maintenance shops. Therefore, scanning tool basic training courses were held by the vehicle service promotion associations in each region starting in 2012 and scanning tool application training courses also began in 2013. Of the scanning tool training courses held by each of the regional service promotion associations during that same year, the basic training course was held 172 times and attended by 2,270 participants, while the application training course was held 494 times and attended by 8,227 participants.

In addition to, starting in 2013, JASPA created a system of certification for computer and system diagnostics for maintenance shops capable of diagnosing the functions of automotive electronic control systems. This was done in an effort to make more effective use of scanning tools and 4,298 maintenance shops were certified during 2013. One of the conditions for receiving this certification is that 1 or more people working at the shop must have completed the scanning tool application training course or be a Class 1 vehicle mechanic. Of all the shops that

received certification, the number that were certified due to the presence of an employee who had completed the scanning tool application training course was 3,904 (3,818 full-time maintenance shops and 86 maintenance shops at dealers), while the number that were certified due to the presence of a Class 1 vehicle mechanic was 394 (357 full-time maintenance shops and 37 maintenance shops at dealers).

MLIT published the final report of the vehicle maintenance technology advancement investigative commission on September 10, 2013. This report was subtitled, "direction of working environment improvement and human resource development".

In this report, the use of the scanning tools in coordination with the FAINES vehicle maintenance information search system was positioned as an indispensable item and it suggested that the aim should be to construct a system that can accurately carry out the inspection and maintenance of any vehicle.

The report stated that Class 1 vehicle mechanics would be given the leading role in performing maintenance on vehicles containing a high level of electronic controls. In addition, to promote the advantage of obtaining a Class 1 vehicle mechanic qualification, when this qualification is obtained by a vehicle inspector (who must be appointed in every specified maintenance shop), the work experience of the maintenance chief and the vehicle inspector training methods would be considered for a thorough review.

The same report also touches on topics such as making multilateral use of the FAINES information via the internet, sharing inspection and maintenance information effectively, and constructing a new vehicle mechanic system with Class 1 vehicle mechanics at the top. The report suggests that new human resources will need to be obtained and developed to accomplish these goals, and that this can only happen if the proper working environment is also maintained. The report draws an entirely new picture of what a mechanic should look like.

On November 29, 2013, MLIT revised the guidelines for handling information related to inspection and maintenance that utilizes J-OBD II (2011, MLIT Notification No.196). In addition to changing the object of the notice from J-OBD II to on-vehicle failure diagnosis devices, the vehicles covered by the notice were also changed. Previously, it applied only to passenger vehicles and other vehicles equipped with J-OBD II that had an occupant

capacity of 10 people or less, and gasoline and LPG vehicles with a gross vehicle weight of 3.5 tons or less. Now however, it also applies to diesel trucks and other vehicles equipped with J-OB D I with a gross vehicle weight of 3.5 tons or more that are subject to the new long-term exhaust emissions regulations.

As a result of the revisions, all diesel vehicles produced after October 1, 2005 (after September 1, 2007 for continuous production vehicles and imported vehicles) that are subject to the new long-term exhaust emissions regulations (ordinary vehicles and small vehicles with a gross vehicle weight of 3.5 tons or more) are also subject to these guidelines. Furthermore, automakers are obliged to provide information obtained when using the scanning tools to perform inspections and maintenance, as well as the necessary information to develop the scanning tools

These handling guidelines stipulate the rules for providing the necessary information for the inspection and maintenance of exhaust emissions venting prevention devices and other equipment, as well as the rules for information that does not have to be provided, such as information related to theft prevention devices and unauthorized engine power modification.

These guidelines went into effect starting on January 1, 2014 and will go into effect for imported vehicles starting 2 years later on January 1, 2016.

5 Machine Tools

Every year at the end of July, the Japan Automotive Service Equipment Association examines and then announces the actual results of the automotive machine tool sales from the previous fiscal year. The latest machine

tool sales that have been announced are those from fiscal year 2012 (from April 2012 to March 2013).

In 2012, total automotive machine tool sales amounted to 98.712 billion yen, an increase of 8.27145 billion yen (9.1%) compared to the previous fiscal year. The total sales of automotive machine tools has increased for 3 years in a row and the amount of this increase has also gone up from the 3%-level in 2010 and 2011 to the 9%-level in 2012. This indicates a strong recovery in the market for machine tool sales.

The major factors behind this increase are the increases in new vehicle sales, partly as a result of measures taken by the government to stimulate demand, improved profitability, mainly of vehicle dealers, and progress being made in updating aging equipment.

However, demand for production equipment for automakers has shifted from inside to outside Japan. In addition, there was also the impact from the strong yen during the 2012 fiscal year. As a result, over 40% of the corporate members of this association experienced a slump in sales.

The sales results of scanning tools show that, in fiscal year 2011 slightly fewer than 56,000 tools were sold at an average unit price of 39,000 yen. In fiscal year 2012 sales dropped to 31,984 tools and the average unit price rose to 65,000 yen. This reflected a change in the product content. Even though a shift in the demand for the scanning tools was seen in the second half of fiscal 2012 to tools that have standard features and a unit price of 150,000 to 200,000 yen, the demand for these tools is expected to remain stagnant until the standard specifications and Japanese government subsidies are clearly determined.