# MAINTENANCE AND SERVICEABILITY

## 1 Introduction

### 1. 1. Vehicle market in 2015

In 2015 5,046,510 new vehicles were sold in Japan. This was a significant decrease of 516, 378 vehicles or 9.3% compared to the previous year when 5,562,888 new vehicles were sold.

A more detailed analysis of new vehicle sales reveals that the number of registered vehicles was 3,150,310, a decrease of 139,788 (4.3%) from the previous year.

Annual sales of mini-vehicles in Japan in 2014 set a new record high for a calendar year. However, in 2015 there was a complete reversal of this trend as the number fell by 376,590 vehicles or 16.6% compared to 2014, down to 1,896,200 mini-vehicles.

The sales of mini-vehicles in Japan began in earnest in the year 1960 and this is the most significant decrease in their annual sales numbers since that year.

In terms of used vehicle sales, the number of registered vehicles was 3,732,148, a decrease of 19,358 (0.5%) from the previous year. Used mini-vehicle sales were 3,054,666, a decrease of 33,975 (1.1%) from the previous year. However, the sales of used mini-vehicles in 2014 set a new record high, so the level of sales in 2015 was actually the second highest in history. Sales of used mini-vehicles have exceeded 3 million vehicles for 3 years in a row.

The total combined sales of both new and used registered vehicles and mini-vehicles in Japan in 2015 was 11,833,324 vehicles and this was a decrease of 566,738 vehicles (4.6%) compared to the previous year.

The number of domestically-produced hybrid vehicles (HV and PHV) sold in Japan in 2015 was 938,145 vehicles and this was a decrease of 7.9% compared to the previous year in which sales of hybrid vehicles exceeded 1 million vehicles for the first time. The number of imported hybrid vehicles was 5,625 and this was an increase of 3.3% compared to the previous year.

The total number of registered hybrid vehicles sold in Japan in 2015 was 963,057 vehicles and when this total is broken down according to the type of vehicle, it results in the following: 938,145 HV, 14,222 PHV, 10,279 EV, and 411 FCV.

### 1. 2. Vehicle ownership trends in 2015

At the end of December 2015 the number of vehicles owned in Japan was 81,297,454, marking six consecutive years that this number had increased since 2010. The first time in history that this number had exceeded the 80 million vehicle mark was in 2013, and it is only continuing to increase. Compared to the previous year (2014), this was an increase of 287,900 vehicles (0.4%) and this set a new record for the number of vehicles owned in Japan for the calendar year.

When ownership is broken down according to model type, the number of 4-wheeled registered vehicles was 47,267,441, a decline of 195,393 (0.4%) from the previous year.

Although there has been a slowing in the overall downward trend in the number of vehicles owned, this was the tenth consecutive year-on-year decline.

The sales of new mini-vehicles in Japan had exceeded the 2 million vehicle mark for two years in a row, but this completely changed in 2015 and it declined significantly. Even so, the number of 4-wheeled mini-vehicles owned in Japan finally broke through the 30 million vehicle mark to reach 30,299,240 vehicles. This was an increase of 413,745 vehicles (1.4%) compared to the previous year, but this growth rate was approximately half what it had been the previous year and it seems to be getting closer to a plateau.

The number of inspected 2-wheeled vehicles owned in Japan also increased to 1,657,263, or 20,341 (1.2%) more than the previous year. The number of 2-wheeled mini-vehicles owned in Japan is 2,056,119, an increase of 48,129 (2.4%) from the previous year, which shows some regained momentum.

The number of mini-vehicles owned in Japan as a percentage of the total number of registered and 4-wheeled mini-vehicles rose by 0.5% from the previous year and is now at 39.1%, 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 2015 was 8.29 years. This is 0.16 years longer than the previous year and also means that the average vehicle age has continued to grow for the past 23 years in a row. This is the highest average vehicle age in history and a new record has been set for the past 21 consecutive years. The average vehicle age has increased by 1.52 years compared to 10 years ago in 2005.

The decrease in the number of vehicles owned in Japan over the one-year period from April 2014 to March 2015 is regarded as the number of vehicles scrapped in a one-year period. If these vehicles are then examined to determine the average number of years of usage (the average number of years from when the vehicle was registered as a new vehicle in Japan until it was registered as being scrapped: equivalent to the average life span of a human being), this comes to 12.38 years. That is a decrease of 0.26 years compared to the value from the previous year of 12.64 years and is the first time in three years that this value has decreased. This result is probably due to the fact that the proportion of vehicles aged 12 years and over within the total number of vehicles that were scrapped has decreased in comparison to the previous year (Fig. 1).

The average age of registered trucks at the end of March 2015 was 11.09 years. This increased by 0.16 years compared to the value of the previous year of 10.93 years and is now the highest age in history after increasing for the past 22 years in a row. This seems to indicate that trucks are now also being used for longer periods of time. This average age has increased by 2.73 years in comparison to that of ten years ago.

The average age of buses in Japan was 11.76 years. This was an increase of 0.20 years compared to the previous year and is now the highest age in history after increasing for the past 26 years in a row. This average age has increased by 2.23 years in comparison to that of ten years ago.

In addition to these, the average age of special-purpose vehicles in Japan in 2015 was 10.73 years and this was an increase of 0.16 years compared to the previous year.

According to a study by the Light Motor Vehicle Inspection Organization, the current average age of passenger mini-vehicles at the end of December 2015 is 7.97 years. This is 0.17 years longer than the average age recorded in 2014 of 7.80 years. This organization first started recording this data for mini-vehicles in 2005 (10 years ago) and the average age that year was 6.13 years. This means that the average age of mini-vehicles has increased for the past 10 years in a row by a total of 1.84 years or approximately 30.0%.

The average age of mini-vehicle trucks at the end of December 2015 was 12.04 years. This is 0.26 years longer than the average age recorded in 2014 of 11.78 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 10 years in a row, the same as with passenger vehicles, by a total of 2.71 years or approximately 29.0%.

The average number of years of usage of passenger mini-vehicles was 13.83 years at the end of December 2014. In 2015 this had increased by 0.20 years to 14.03 years. The average number of years of usage 10 years ago in 2005 was 11.49 years. Therefore, in comparison to this, the average number of years of usage has increased by 2.54 years. The same trend is seen in the average number of years of usage of mini-vehicle trucks. In 2014 it was 15.37 years, but this had increased by 0.36 years to 15.73 years by 2015. This represents a total increase of 2.95 years compared to the average number of years of usage recorded in 2005 of 12.78 years.

The total number of registered passenger vehicles owned in Japan at the end of March 2015 was 39,491,117 vehicles, and this was a decrease of 329,926 vehicles (0.8%) compared to the previous year. Within that total, standard-sized passenger vehicles accounted for 17,717,203 vehicles, which was an increase of 131,075 compared to the previous year, while small-sized passenger vehicles accounted for 21,773,914 vehicles, which was a decrease of 461,001 compared to the previous year. Although the number of standard-sized passenger vehicles is continuing to increase, the number of small-sized passenger vehicles is continuing to decrease significantly. In addition, the number of light passenger vehicles (mini-vehicles) owned in Japan was 21,026,132 vehicles and this was an increase of 795,837 compared to the previous year. The total number of passenger vehicles owned in

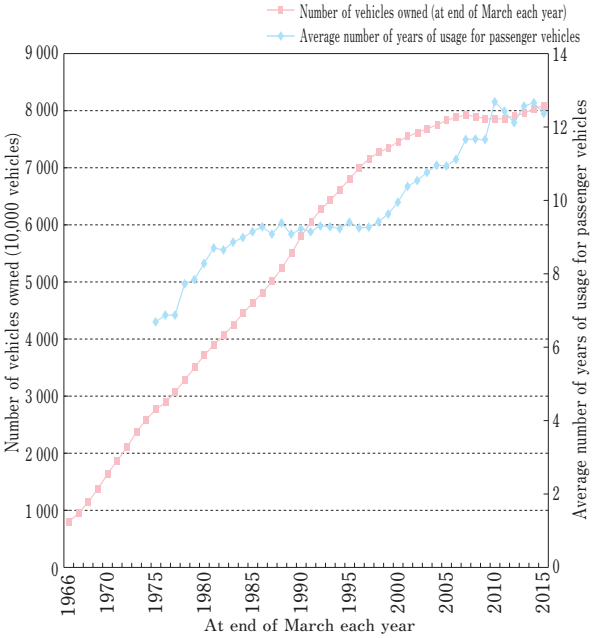


Fig. 1 Trends for number of vehicles owned and average number of years of usage (average vehicle age) for passenger vehicles.

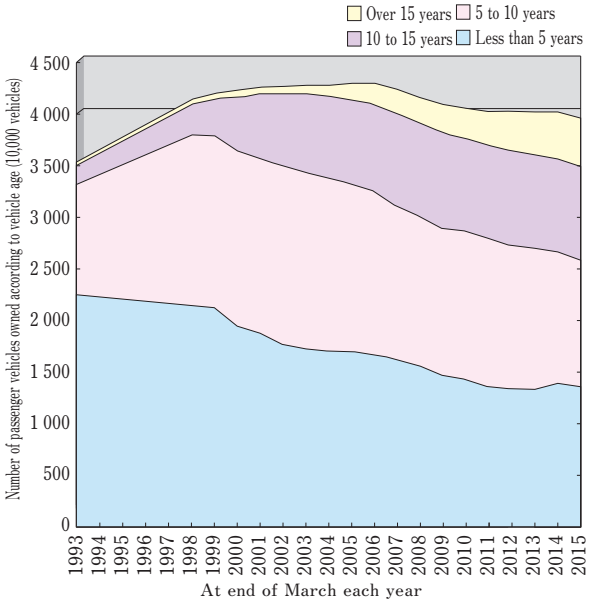


Fig. 2 Trends in vehicle age breakdown amongst total number of passenger vehicles owned.

Japan was 60,517,249 vehicles and this was an increase of 465,911 vehicles (0.8%) compared to the previous year.

The number of older vehicles within the total number of vehicles owned in Japan and the proportion of the total number that these older vehicles account for have both continued to increase. The number of vehicles with an age of 10 years or more was 13,868,832 and this was an increase of 403,485 vehicles (3.0%) compared to the previous year These older vehicles accounted for 35.1% of the total number of registered passenger vehicles and this was an increase of 1.3% (Fig. 2).

The total number of hybrid vehicles (HV and PHV) owned in Japan at the end of March 2015 was 4,706,443 and this was an increase of 863,055 vehicles or 22.5% compared to the previous year. The number of electric vehicles (EV) owned in Japan was 53,373 and this was an increase of 14,205 vehicles or 36.3% compared to the previous year.

At the end of March 2015, the number of HV, PHV, and EV owned in Japan accounted for 5.9% of the total number of vehicles owned in Japan and this was an increase of 1.1 percentage points from the previous year of 4.8%.

## 2 Recent Trends in Vehicle Maintenance Industry

The Japan Automobile Service Promotion Association (JASPA) conducted its 2015 survey of the vehicle repair and maintenance industry at the end of June 2015. 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 92,160 businesses according to their business category and size, and valid responses were received from approximately 10% or 8,730 of all those 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 2015 (e.g., from the 2014 fiscal year). According to this survey, the total maintenance sales were 5 trillion 513.3 billion yen and this was a slight decline of 3.6 billion yen (0.1%) compared to the results in the survey from the previous year, so this result is essentially holding steady.

For the purpose of the 2014 vehicle repair and maintenance industry survey, the target vehicle repair and maintenance businesses were divided up and classified as follows: full-time vehicle maintenance shops (workplaces other than at automobile dealers where the automobile maintenance sales account for over 50% of total sales), maintenance shops that were run as an additional business (workplaces where the sales from another business, such as automobile sales, parts and accessory sales, insurance sales, or gasoline sales, account for over 50% of total sales), maintenance shops at vehicle dealers (workplaces at companies that signed an exclusive distributor

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 year | 1 year | Subtotal | 1 year | 6 months | 3 months | Total | | | | | |
| Full-time | Sales volume | 5 946 | 3 418 | 9 364 | 364 | 101 | 263 | 728 | 4 308 | 5 824 | 20 224 | 57 024 | 166 150 |
| | Change in sales volume compared to previous year | −386 | 105 | −281 | −13 | −4 | 32 | 15 | −53 | −425 | −744 | −19 | −752 |
| | Composition ratio | 29.4% | 16.9% | 46.3% | 1.8% | 0.5% | 1.3% | 3.6% | 21.3% | 28.8% | 100.0% | 61.9% | 48.9% |
| | Ratio of increase or decrease compared to previous year | 93.9% | 103.2% | 97.1% | 96.6% | 96.2% | 113.9% | 102.1% | 98.8% | 93.2% | 96.5% | 100.0% | 99.5% |
| Additional business | Sales volume | 2 591 | 696 | 3 287 | 179 | 36 | 36 | 251 | 1 421 | 2 219 | 7 178 | 15 210 | 49 198 |
| | Change in sales volume compared to previous year | 198 | 34 | 232 | 22 | 3 | −3 | 22 | 71 | 298 | 623 | 29 | 213 |
| | Composition ratio | 36.1% | 9.7% | 45.8% | 2.5% | 0.5% | 0.5% | 3.5% | 19.8% | 30.9% | 100.0% | 16.5% | 14.5% |
| | Ratio of increase or decrease compared to previous year | 108.3% | 105.1% | 107.6% | 114.0% | 109.1% | 92.3% | 109.6% | 105.3% | 115.5% | 109.5% | 100.2% | 100.4% |
| Full-time + additional business | Sales volume | 8 537 | 4 114 | 12 651 | 543 | 137 | 299 | 979 | 5 729 | 8 043 | 27 402 | 72 234 | 215 348 |
| | Change in sales volume compared to previous year | −188 | 139 | −49 | 9 | −1 | 29 | 37 | 18 | −127 | −121 | 10 | −539 |
| | Composition ratio | 31.2% | 15.0% | 46.2% | 2.0% | 0.5% | 1.1% | 3.6% | 20.9% | 29.4% | 100.0% | 78.4% | 63.3% |
| | Ratio of increase or decrease compared to previous year | 97.8% | 103.5% | 99.6% | 101.7% | 99.3% | 110.7% | 103.9% | 100.3% | 98.4% | 99.6% | 100.0% | 99.8% |
| Dealer | Sales volume | 6 874 | 1 420 | 8 294 | 1 852 | 279 | 178 | 2 309 | 5 377 | 9 384 | 25 364 | 16 221 | 108 903 |
| | Change in sales volume compared to previous year | 122 | 85 | 207 | 114 | 52 | 52 | 218 | −645 | 389 | 169 | 42 | −1 027 |
| | Composition ratio | 27.1% | 5.6% | 32.7% | 7.3% | 1.1% | 0.7% | 9.1% | 21.2% | 37.0% | 100.0% | 17.6% | 32.0% |
| | Ratio of increase or decrease compared to previous year | 101.8% | 106.4% | 102.6% | 106.6% | 122.9% | 141.3% | 110.4% | 89.3% | 104.3% | 100.7% | 100.3% | 99.1% |
| Private owner-run | Sales volume | 688 | 255 | 943 | 86 | 25 | 19 | 130 | 472 | 822 | 2 367 | 3 705 | 15 748 |
| | Change in sales volume compared to previous year | 0 | 48 | 48 | −14 | 4 | −26 | −36 | −98 | 2 | −84 | −27 | −921 |
| | Composition ratio | 29.1% | 10.8% | 39.8% | 3.6% | 1.1% | 0.8% | 5.5% | 19.9% | 34.7% | 100.0% | 4.0% | 4.6% |
| | Ratio of increase or decrease compared to previous year | 100.0% | 123.2% | 105.4% | 86.0% | 119.0% | 42.2% | 78.3% | 82.8% | 100.2% | 96.6% | 99.3% | 94.5% |
| Total | Sales volume | 16 099 | 5 789 | 21 888 | 2 481 | 441 | 496 | 3 418 | 11 578 | 18 249 | 55 133 | 92 160 | 339 999 |
| | Change in sales volume compared to previous year | −66 | 272 | 206 | 109 | 55 | 55 | 219 | −725 | 264 | −36 | 25 | −2 487 |
| | Composition ratio | 29.2% | 10.5% | 39.7% | 4.5% | 0.8% | 0.9% | 6.2% | 21.0% | 33.1% | 100.0% | 100.0% | 100.0% |
| | Ratio of increase or decrease compared to previous year | 99.6% | 104.9% | 101.0% | 104.6% | 114.2% | 112.5% | 106.8% | 94.1% | 101.5% | 99.9% | 100.0% | 99.3% |

agreement with an automobile manufacturer or a domestic exclusive retailer), and private owner-run maintenance shops (mainly workplaces that perform maintenance work on vehicles that are owned by their own company).

The values for data, such as sales figures, number of vehicles brought in for service, and number of mechanics, were calculated by the people who conducted the survey from their analysis of the survey results.

### 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 73,630 at the time of the survey on June 30, 2015, a decrease of 65 businesses (0.1%) compared to the previous year.

The total number of workplaces (number of certified maintenance shops) also increased for the third year in a row. The number of shops increased slightly by 25 from the previous year and now stands at 92,160. This broke the record from last year and set a new record for the largest number of shops in history (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 57,024 (61.9% of the total number of workplaces). This represented a small decrease of 19 workplaces from the previous year. Maintenance shops that were run as an additional business accounted for 15,210 workplaces (16.5% of the total). This was a slight increase of 29 workplaces from the previous year.

The number of maintenance shops at vehicle dealers was 16,221 (17.6% of the total), an increase of 42 (0.3%) from the previous year. Consequently, the number of dealer-based maintenance shops has increased for three years in a row. The number of private owner-run maintenance shops was 3,705 (4.0% of the total). This number decreased by 27 (0.7%) 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 is setting a new record every year. In the 2015 survey the number of such workshops reached 29,737. This is an increase of 95 (0.3%) from the previous year. The number

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 | 51 283 | 36 685 | 3 618 | 437 | 137 | 92 160 | 25 | 100.0% |
| Number of shops that obtained designation | | 26 688 | 2 632 | 317 | 100 | 29 737 | 95 | 100.3% |
| Acquisition ratio | | 72.7% | 72.7% | 72.5% | 73.0% | 32.3% | | |
| Total number of personnel | 167 352 | 291 211 | 66 783 | 14 180 | 7 416 | 546 942 | 1 810 | 100.3% |
| Number of female personnel within that total | 30 096 | 38 385 | 5 770 | 985 | 395 | 75 631 | 2 775 | 103.8% |
| Total number of maintenance personnel | 121 405 | 213 621 | 49 625 | 10 657 | 5 693 | 401 001 | −84 | 100.0% |
| Number of female maintenance personnel within that total | 9 990 | 5 772 | 744 | 138 | 44 | 16 688 | 217 | 101.3% |
| Number of Class 1 auto mechanics | 1 415 | 5 425 | 1 591 | 175 | 154 | 8 760 | 174 | 102.0% |
| Number of female mechanics within that total | 22 | 74 | 26 | 0 | 0 | 122 | 53 | 176.8% |
| Number of Class 2 auto mechanics | 78 435 | 155 873 | 35 326 | 7 127 | 3 054 | 279 815 | −1 135 | 99.6% |
| Number of female mechanics within that total | 1 795 | 1 476 | 330 | 21 | 1 | 3 623 | 230 | 106.8% |
| Number of Class 3 auto mechanics | 19 839 | 24 686 | 4 723 | 1 348 | 828 | 51 424 | −1 526 | 97.1% |
| Number of female mechanics within that total | 5 173 | 1 613 | 49 | 15 | 8 | 6 858 | 795 | 113.1% |
| Total number of mechanics | 99 689 | 185 984 | 41 640 | 8 650 | 4 036 | 339 999 | −2 487 | 99.3% |
| Number of female mechanics within that total | 6 990 | 3 163 | 405 | 36 | 9 | 10 604 | 1 078 | 111.3% |

Survey in June 2015 : The number of women was also surveyed.

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 | 36 877 | 14 403 | 4 686 | 2 503 | 2 641 | 1 851 | 2 057 | 2 718 | 2 035 | 69 771 | 407 | 70 178 |
| June 2014 | 40 101 | 16 074 | 5 365 | 2 433 | 2 295 | 1 859 | 1 620 | 2 197 | 1 269 | 73 213 | 417 | 73 630 |
| Change | 3 224 | 1 671 | 679 | −70 | −346 | 8 | −437 | −521 | −766 | 3 442 | 10 | 3 452 |

of workplaces that have obtained this designation (i.e., the designation acquisition ratio) is 32.3% of the total number of workplaces (Table 2).

If the designation acquisition ratio is examined according to the different types of businesses, then 13,489 out of the total number of full-time vehicle maintenance shops (57,024) have obtained the designation and this set a new record. This is an increase of 118 (0.9%) from the previous year and represents a designation acquisition ratio of 23.7%. This number has been increasing steadily and the total number of full-time vehicle maintenance shops that have obtained this designation has increased by 2,106 shops (18.5%) over the past 10 years since 2005.

For maintenance shops run as an additional business, 4,562 out of the total of 15,210 have obtained the designation. This is an increase of just 2 shops from the previous year and represents a designation acquisition ratio of 30.0%. It also represents a decrease of 56 shops (1.2%) compared to the number in 2005.

There were a total of 16,221 maintenance shops at vehicle dealers and of these 10,441 have obtained the designation. This is a decrease of 23 (0.2%) from the previous year and represents a designation acquisition ratio of 64.4%. It also represents a decrease of 799 shops (7.1%) compared to the number in 2005.

In the case of private owner-run maintenance shops, 1,245 out of the total of 3,705 have obtained the designation. This is a decrease of 2 (0.2%) from the previous year and represents a designation acquisition ratio of 33.6%. It also represents an increase of 14 shops (1.1%) compared to the number in 2005.

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

At the time of this survey in June 2015, the number of private companies was 73,213 after subtracting the number of public offices. However, at the time of the June 2005 survey 10 years ago, the number of private companies was 69,771 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 2015 survey, the number of maintenance-related personnel was 546,942. This was an increase of 1,810 (0.3%) from the previous year.

When these changes in the numbers of maintenance-related personnel are examined by business type, the full-time vehicle maintenance businesses employed 262,818 people, an increase of 2,503 (1.0%) from the previous year. This was the third year in a row that this number increased. Vehicle maintenance businesses that are run as an additional business employed 86,819 people, and this was 598 (0.7%) more than the previous year. In addition, the number of maintenance-related personnel at maintenance shops at vehicle dealers increased to 161,182 people, 5,100 (3.3%) more than the previous year. For private owner-run maintenance shops, the number of maintenance-related personnel once again decreased significantly for the fourth year in a row down to 36,123 people, or 6,391 (15.0%) less than the previous year.

The number of maintenance personnel (shop workers) was 401,001, a decrease of 84 people from the previous year.

The number of mechanics was 339,999 a decrease of 2,487 (0.7%) from the previous year. The number of female mechanics within this total was 10,604, an increase of 1,078 (11.3%) in comparison to the results in the survey taken in June of 2014.

The number of personnel who obtained the Class 1 vehicle mechanic qualification was 8,760 people, an increase of 174 (2.0%) from the previous year. The number of female mechanics within this total who also obtained the Class 1 vehicle mechanic qualification was 122 people, an increase of 53 (76.8%) from the previous year.

The number of personnel who obtained the Class 2 vehicle mechanic qualification was 279,815, a decrease of 1,135 (0.4%) from the previous year. The number of female mechanics within this total who also obtained the Class 2 vehicle mechanic qualification was 3,623 people, an increase of 230 (6.8%) from the previous year. The number of personnel with the Class 3 vehicle mechanic qualification was 51,424 a decrease of 1,526 (2.9%) from the previous year. The number of female mechanics within this total who also obtained the Class 3 vehicle mechanic qualification was 6,858 people, an increase of 795 (13.1%) from the previous year (Tables 1 and 2).

The number of female mechanics in each of the classes is increasing, but there are a larger number of male mechanics in each of those classes and their numbers are decreasing. The number of vehicle mechanics in Japan as a whole has been decreasing for the past 4 years in a row.

In addition to the retirement of many mechanics in the baby boom generation, it has started to become quite difficult to recruit and replenish the number of vehicle mechanics due to the highly specialized nature of their skills and decreasing enrollment at automotive technical schools. One possible solution to this shortage of mechanics is to open up hiring opportunities to young people who have graduated from a general high school and do not yet possess a mechanic qualification. Such new hires would be aided in obtaining the mechanic qualifications through training at secondary training facilities run by JASPA after joining their company. Another factor influencing these efforts by JASPA is the fact that even though the number of mechanics is decreasing, the number of maintenance personnel in Japan continues to hold steady at more than 400,000 people.

The average age of maintenance personnel has continued to rise consistently, but a decline was recorded for the first time since the first survey conducted in 2010. The average age started to increase once again in 2011 and in 2015 the average age of maintenance personnel in Japan was 44.3 years, an increase of 0.5 years from the previous year.

### 2. 1. 3. Measures to help ensure sufficient numbers of trained mechanics

According to the School Basic Survey of the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT), in FY 2015 the number of students admitted to the vehicle maintenance departments of vocational schools that train mechanics was 9,335 out of the total student capacity for those departments of 12,997. The lowest number of students admitted to these departments was 8,669 back in 2012, but this increased the next year by 460 students (5.3%) to 9,129 students in 2013. There was a slight increase in 2014 to 9,193 admitted students (an increase of 64 students or 0.7%) and again in 2015 when the number of students who were admitted increased by 142 (1.5%) compared to the previous year. This means that the number of such students has increased for the past three years in a row.

JASPA conducts a registration test to help people obtain the qualifications to be a mechanic. The number of

people taking this test peaked in 2004 at 72,623 people, but since then the number has continued to decrease and had dropped to 43,863 people in 2013. In 2014 the number of people taking the test increased by 1,517 (3.5%) compared to the previous year and stood at 45,380 people.

In April 2014, fifteen different automobile-related organizations, such as JASPA, the Japan Automobile Dealers Association (JADA), the Japan Automobile Manufacturers Association (JAMA), and the Japan Automobile Education Foundation (JAEF), obtained the cooperation of the Japanese Ministry of Land, Infrastructure, Transport and Tourism (MLIT) and established the Council to Promote the Recruitment and Training of Automobile Maintenance Personnel. In addition, local liaison committees were established in each transportation bureau unit. The Transportation Bureau Chiefs and other members of the automobile industry then visited high schools to give presentations and provide information about becoming mechanics in an effort to recruit new personnel into the field of automobile maintenance.

### 2. 2. Demand for vehicle maintenance

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

The total maintenance sales volume in the 2015 survey (results from the 2014 fiscal year) was 5 trillion 513.3 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 (e.g., extraordinary maintenance due to a breakdown or malfunction, simple maintenance such as oil changes, voluntary inspection and maintenance requested by the vehicle's owner, re-inspection of a vehicle that has been issued a limited vehicle inspection certificate, and customization services).

When the total vehicle maintenance sales are examined by business type, the maintenance sales at full-time vehicle maintenance businesses accounted for 2 trillion 22.4 billion yen, a decrease of 74.4 billion yen (3.5%) compared to the previous year. If the maintenance sales at full-time vehicle maintenance businesses are then broken down according to the different kinds of maintenance work, the *shaken* vehicle inspection and maintenance sales amounted to 936.4 billion yen and this accounted for 46.3% of the total maintenance sales. This is a decrease of 2.9% compared to the previous year. The regular inspection and maintenance sales amounted to 72.8 billion yen, which accounted for 3.6% of the total, and was an increase of 2.1% compared to the previous year. Collision repairs amounted to 430.8 billion yen, which accounted for 21.3% of the total, and was a decrease of 1.2% compared to the previous year. Finally, other maintenance sales amounted to 582.4 billion yen, which was 28.8% of the total, and this was a decrease of 6.8% compared to the previous year.

The maintenance sales at vehicle maintenance businesses that are run as an additional business amounted to a total of 717.8 billion yen and this was an increase of 62.3 billion yen (9.5%) compared to the previous year. If the maintenance sales at vehicle maintenance businesses that are run as an additional business is then broken down according to the different kinds of maintenance work, the *shaken* vehicle inspection and maintenance sales amounted to 328.7 billion yen. This accounted for 45.8% of all their maintenance sales and is an increase of 7.6% compared to the previous year. The regular inspection and maintenance sales amounted to 25.1 billion yen, which accounted for 3.5% of the total, and was an increase of 9.6% compared to the previous year. Collision repairs amounted to 142.1 billion yen, which accounted for 19.8% of the total, an increase of 5.3% compared to the previous year. Finally, other maintenance sales amounted to 221.9 billion yen, which was 30.9% of the total, and this was an increase of 15.5% compared to the previous year.

In the case of vehicle maintenance sales at the maintenance shops at vehicle dealers, the total amounted to 2 trillion 536.4 billion yen. This was an increase of 16.9 billion yen (0.7%) compared to the previous year. If the maintenance sales at the maintenance shops at vehicle dealers are then broken down according to the different kinds of maintenance work, the *shaken* vehicle inspection and maintenance sales amounted to 829.4 billion yen. This accounted for 32.7% of all their maintenance sales and is an increase of 2.6% compared to the previous year. The regular inspection and maintenance sales amounted to 230.9 billion yen, which accounted for 9.1% of the total, and was an increase of 10.4% compared to the previous year. Collision repairs amounted to 537.7 billion yen, which accounted for 21.2% of the total, and was a de-

crease of 10.7% compared to the previous year. Finally, other maintenance sales amounted to 938.4 billion yen, which was 37.0% of the total, an increase of 4.3% compared to the previous year.

The total vehicle maintenance sales at private owner-run vehicle maintenance businesses were 236.7 billion yen. This was a decrease of 8.4 billion yen (3.4%) compared to the previous year. If the maintenance sales at private owner-run vehicle maintenance businesses are then broken down according to the different kinds of maintenance work, the *shaken* vehicle inspection and maintenance sales amounted to 94.3 billion yen. This accounted for 39.8% of all their maintenance sales, an increase of 5.4% compared to the previous year. The regular inspection and maintenance sales amounted to 13.0 billion yen, which accounted for 5.5% of the total, a decrease of 21.7% compared to the previous year. Collision repairs amounted to 47.2 billion yen, which accounted for 19.8% of the total, a decrease of 17.2% compared to the previous year. Finally, other maintenance sales amounted to 82.2 billion yen, which was 34.7% of the total, an increase of 0.2% compared to the previous year.

The total maintenance sales volume in 2015 was 5 trillion 513.3 billion yen. When this total is broken down according to the different kinds of maintenance work performed, the *shaken* vehicle inspection and maintenance sales amounted to 2 trillion 188.8 billion yen and this accounted for 39.7% of the total maintenance sales. This is an increase of 20.6 billion yen (1.0%) compared to the previous year. The regular inspection and maintenance sales amounted to 341.8 billion yen, which accounted for 6.2% of the total, an increase of 21.0 billion yen (6.8%) compared to the previous year. Collision repairs amounted to 1 trillion 157.8 billion yen, which accounted for 21.0% of the total, a decrease of 72.5 billion yen (5.9%) compared to the previous year. Finally, other maintenance sales amounted to 1 trillion 824.9 billion yen, which was 33.1% of the total, an increase of 26.4 billion yen (1.5%) compared to the previous year.

The maintenance sales from collision repair work have decreased significantly for two years in a row, and over those two years the total decrease amounts to 116.3 billion yen.

The demand for one-year *shaken* vehicle inspections of large-size trucks is expanding. In order to maintain the high operating rates of these vehicles, preventive maintenance to replace consumable parts and help prevent catastrophic breakdowns are essential. This means that the demand for preventative maintenance is increasing and the unit price rose. A rise in the unit price for three-month regular inspections was also seen, and especially in the case of the maintenance shops at vehicle dealers, this rise in the unit price exceeded 40%.

#### 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 service per shop during the year was 1,605. This was an increase of 19 vehicles (1.2%) from the previous year. When the number of vehicles is broken down according to the content of the work that was performed on them, the average number of vehicles brought in for *shaken* vehicle inspection and maintenance service per shop was 350. This was a decrease of 9 vehicles (2.5%) from the previous year and accounted for 21.8% of the total number of vehicles that were brought in (1,605 vehicles). The average number of vehicles brought in for regular inspection and maintenance per shop was 235. This was an increase of 15 vehicles (6.9%) from the previous year and accounted for 14.6% of the total number of vehicles brought in. The average number of vehicles brought in for collision repairs per shop was 94. This was a decrease of 7 vehicles (6.9%) from the previous year and accounted for 5.9% of the total number of vehicles brought in. The average number of vehicles brought in for other maintenance per shop was 926. This was an increase of 19 vehicles (2.1%) from the previous year and accounted for 57.7% of the total number of vehicles brought in.

Looking at the average number of vehicles brought in for maintenance per shop during the year according to the type of business, the average number of vehicles brought into full-time vehicle maintenance businesses was 795. This was a decrease of 17 vehicles (2.1%) from the previous year. The average number of vehicles brought into maintenance shops run as an additional business was 1,251 per shop, an increase of 82 vehicles (7.0%) from the previous year. The average number of vehicles brought into maintenance shops at dealers was 4,795 per shop, an increase of 47vehicles (1.2%) 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 *shaken* vehicle inspection and maintenance during the year was 265 per shop. This was a decrease of 14 vehicles (5.0%) from the previous year. This also accounted for 33.3% 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, an increase of 8 vehicles (2.4%) from the previous year. This accounted for 26.9% 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 *shaken* vehicle inspection and maintenance was 663. This was a decrease of 7 vehicles (1.0%) from the previous year and accounted for 13.8% 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 78 vehicles per shop. This was an increase of 3 vehicles (4.0%) from the previous year and accounted for 9.8% 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 104 vehicles per shop, an increase of 8 vehicles (8.3%) from the previous year. This accounted for 8.3% of the vehicles brought into those shops for maintenance. The average number of vehicles brought into maintenance shops at dealers was 911 vehicles per shop, an increase of 59 vehicles (6.9%) from the previous year. Every year the percentage of vehicles brought into dealers for regular inspection and maintenance is increasing and in the results of this most recent survey they accounted for 19% of the vehicles brought into those shops for maintenance.

The average number of vehicles brought in for collision repairs during the year was 70 vehicles at the full-time vehicle maintenance businesses. This was an increase of 1 vehicle per shop (1.4%) from the previous year. This accounted for 8.8% 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 74 vehicles. This was an increase of 2 vehicles per shop (2.8%) from the previous year and accounted for 5.9% of all the vehicles brought in for maintenance service. The average number of vehicles brought into maintenance shops at dealers was 197 per shop. This was a large decrease of 41 vehicles (17.2%) from the previous year and accounted for 4.1% 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 382 per shop. This was a decrease of 6 vehicles (1.5%) from the previous year and accounted for 48.1% 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 737 per shop, an increase of 66 vehicles (9.8%) from the previous year. This accounted for 58.9% 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 3,023 per shop, an increase of 36 vehicles (1.2%) from the previous year. This accounted for 63.1% 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 inspection fees are compared at the different types of businesses, the unit price at the full-time vehicle maintenance businesses was 51,796 yen, which was a decrease of 37 yen (0.1%) over the unit price of the previous year. The unit price at the maintenance shops run as an additional business was 59,216 yen, which was an increase of 2,918 yen (5.2%) over the unit price of the previous year. In contrast, the unit price at the maintenance shops at dealers was 71,391 yen, which is an increase of 1,899 yen (2.7%) from the unit price of the previous year.

The price difference for the 2-year *shaken* vehicle inspection fees at full-time vehicle maintenance businesses and maintenance shops at dealers shrunk from 22,201 yen in FY 2012 to 20,089 yen in FY 2013. This price difference continued to shrink further and was 17,659 yen in FY 2014, but in the FY 2015 survey the prices difference once again increased up to 19,595 yen.

One-year vehicle inspections account for approximately three-quarters of the regular inspection and mainte-

nance 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 20,035 yen according to the FY 2012 survey and 20,953 yen according to the FY 2013 survey. Furthermore, the average unit price according to the FY 2014 survey was 21,150 yen, but in FY 2015 it was 20,973 yen, so it has decreased by 177 yen (0.8%) compared to the previous year.

The average unit price of a one-year vehicle inspection at the maintenance shops run as an additional business was 16,266 yen according to the FY 2012 survey, 18,087 yen according to the FY 2013 survey, 18,214 yen according to the FY 2014 survey, and in FY 2015 it was 18,805 yen. This represents an increase of 591 yen (3.2%) over the price from the previous year. The average unit price of a one-year vehicle inspection at the maintenance shops at dealers was 18,208 yen according to the FY 2012 survey, 17,117 yen according to the FY 2013 survey, 17,181 yen according to the FY 2014 survey, and in FY 2015 it was 17,896 yen. This represents an increase of 715 yen (4.2%) over the price from the previous year.

### 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 FY 2015 the number of FAINES subscribers had reached 33,128 businesses, an increase of 991 (3.8%) from the previous year.

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, to approximately 700,000 times in 2013, then to about 850,000 times in 2014, and finally to approximately 930,000 times in 2015.

The number of times that FAINES was used each month per business was 24 times a month in 2011, 25 times a month in 2012, 30 times a month in 2013, 28 times a month in 2014, and then also 28 times a month in 2015.

The types of information accessible via FAINES that were used most often each month are as follows: the "Vehicle maintenance standard work points table", which was accessed most often, at 400,000 times a month, followed by "Maintenance manual information", which was accessed 280,000 times a month, then "Examples of breakdown repairs and maintenance advice", which was accessed 110,000 times a month, and finally "Service data for Japanese and imported vehicles", which was accessed 90,000 times a month.

The types of information that FAINES provides and the data stored in its system are as follows: (1) Maintenance manual information: 1,297 pieces of data, 557 vehicle models (last year: 1,205 pieces of data and 528 models), (2) Vehicle maintenance standard work points table: 5,189 pieces of data from the 1995 version to the 2015 version (last year: 4,983 pieces of data), (3) Examples of breakdown repairs and maintenance advice: 5,838 pieces of data (last year: 5,327 pieces of data), (4) Vehicle data (sampling data) from registered vehicles equipped with OBD, mainly vehicles compatible with J-OBD II: 209 pieces of data (last year: 209 pieces of data), (5) Technical information: 1,609 pieces of data (last year: 1,535 pieces of data), (6) Service data for Japanese and imported vehicles: (e.g., main specification values and inspection standard values for vehicles, engines, and chassis) 2,959 pieces of data (last year: 2,774 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: 601 pieces of data (last year: 601 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 (updated to the latest version in conjunction with publication of new service data): 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).

The information in (1) "Maintenance manual information (1,297 pieces of data, 557 vehicle models)" covers approximately 90% of all the vehicles that are owned and on the road in Japan since 1995.

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 2015, some 36,139 maintenance shops (23,515 full-time vehicle maintenance businesses and vehicle maintenance businesses that are run as an additional business, 12,624 maintenance shops at vehicle dealers, etc.) had registered to use this system and during that same year there were 1,525,612 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 2016 there have

been a total of 14,192,761 queries entered into the system (6,745,020 inquiries from full-time vehicle maintenance businesses and vehicle maintenance businesses that are run as an additional business, and 7,447,741 inquiries from maintenance shops at vehicle dealers).

## 3 Inspection and Maintenance System Trends

### 3. 1. Vehicle inspections

In 2015 the total number of *shaken* renewal inspections (sum of data from the Japanese Ministry of Land, Infrastructure, Transport and Tourism (MLIT), the National Agency for Automobile and Land Transport Technology (NALTEC) (the former National Agency of Vehicle Inspection), and the Light Motor Vehicle Inspection Organization) was 32,308,179 cases, an increase of 384,494 cases (1.2%) compared to 2014. This is the first time in five years that the number of these renewal inspections increased.

The total number of registered vehicles and mini-vehicles specified to receive maintenance was 23,219,216, an increase of 357,988 vehicles (1.6%) compared to 2014. The specified maintenance rate rose by 0.3% from the previous year to 71.9%.

Closer analysis of the data for registered vehicles shows that the number of registered vehicles subjected to a *shaken* renewal inspection was 20,869,745, a decrease of 191,395 vehicles (0.9%) compared to 2014. The number of registered vehicles specified to receive maintenance was 15,666,291 and the specified maintenance rate increased by 0.3% to 75.1% from the previous year.

In 2015, the number of inspections conducted by the National Agency for Automobile and Land Transport Technology (NALTEC) (during FY 2015 it was still known as the National Agency of Vehicle Inspection) at inspection centers throughout Japan to assess compliance with the Japanese Safety Regulations for Road Vehicles (total number of new inspections, *shaken* renewal inspections, structural change inspections, and re-inspections) was 6,930,272. This was a decrease of 67,819 inspections (1.0%) compared to 2014.

The number of on-street inspections was 111,361, a decrease of 7,632 (6.4%) compared to 2014.

The breakdown of the number of the different types of inspections indicates that there were 1,026,845 new inspections (including preliminary inspections), an increase of 46,057 (4.7%) compared to 2014. The number of *shaken* renewal inspections was 5,203,454, a decrease of 55,810 (1.1%) compared to 2014. The number of structural change inspections was 63,755, an increase of 1,795 (2.9%) compared to 2014.

There were 636,218 re-inspections in 2015, a decrease of 59,861 (8.6%) compared to 2014. This decrease in the number of re-inspections has continued for 10 years in a row since 2006.

When the data for mini-vehicle inspections is examined, there were 11,438,434 *shaken* renewal inspections, a significant increase of 575,889 (5.3%) compared to 2014. The number of *shaken* renewal inspections for mini-vehicles first exceeded 10 million in 2010 and continued to increase yearly until the decrease in 2014. Despite this, the number of such inspections started to increase again in 2015 and it now exceeds 11 million.

The number of mini-vehicles specified to receive maintenance was 7,552,925 and the specified maintenance rate was 66.0%, an increase of 1.0% from the previous year.

The number of vehicles brought into the Japan Light Motor Vehicle Inspection Organization for a *shaken* renewal inspection was 3,885,509. This total consisted of 2,732,383 vehicles that were brought in by maintenance personnel and 1,153,126 vehicles that were brought in by the owner for vehicle inspection and maintenance.

### 3. 2. Establishment of a Comprehensive Automotive Technology Agency

The former National Agency of Vehicle Inspection was established on July 1, 2002. This agency carried out vehicle inspections at District Transport Bureaus and registered inspection offices throughout Japan to assess vehicle compliance with the Japanese Safety Regulations for Road Vehicles. On April 1, 2016 this former agency was merged with the National Traffic Safety and Environment Laboratory and a new organization called the National Agency for Automobile and Land Transport Technology (NALTEC) was established to carry on the duties of the previous two entities. The Japanese Minister of Land, Infrastructure and Transport, Keiichi Ishii, appointed Hisaharu Yanagawa, who served as a Managing Executive Officer and the Chief Director of the Research and Development Division of Furukawa Electric Co., Ltd., as the first chairman of NALTEC.

The objectives of this new agency are manyfold. It performs vehicle inspections to determine whether or not vehicles are compliant with the Japanese Safety Regulations for Road Vehicles. It carries out comprehensive

testing, surveys, and research and development activities concerning automotive technologies to help ensure the safety of automotive transportation. And it works to ensure that vehicle fuel resources are used effectively, to prevent public noise pollution, and to help conserve the environment. To this end, this new agency not only continues to carry out the duties of the former National Agency of Vehicle Inspection, such as new inspections, *shaken* renewal inspections, structural change inspections, and roadside inspections, but also the duties of the National Traffic Safety and Environment Laboratory, such as research concerning the setting of new standards, type approval for new vehicles, and technical verifications related to recalls, etc.

New technologies for automated driving and environmentally-friendly vehicles are being developed and put into practical use at a rapid pace both within Japan and overseas. Therefore, when the standards for these new technologies are determined, every stage from initial vehicle design up to actual vehicle use must be considered. In addition, it is also essential to examine the processes used at the time of vehicle inspection and to ensure that there are concrete and highly effective inspection methods when structural changes are made to the vehicles, not just when new vehicles are considered for type approval. The information obtained from the inspection divisions should then be utilized to promote the development of even more highly effective standard setting procedures.

## 4 Measures for Diagnostic Equipment and Electronic Maintenance

In the 2015 Vehicle Repair and Maintenance Industry Survey, the ownership and usage of the scanning tool by automobile maintenance businesses was also surveyed. Of the 8,730 workplaces that sent back valid responses, 79.6% (or 6,951 businesses) answered that they owned the scanning tool.

If the rate of ownership of the scanning tool is then broken down according to the types of businesses, the survey results indicated that the scanning tool was owned by 72.5% of full-time vehicle maintenance businesses and vehicle maintenance businesses that are run as an additional business, 94.5% of maintenance shops at vehicle dealers, and 55.1% of private owner-run maintenance shops. These results suggest that the scanning tool is an essential piece of equipment for dealers selling new cars equipped with the latest electronic control systems.

If the number of scanning tool devices per workplace is then examined, the survey results show that 45.8% of respondents have one device, while 32.8% have two scanning tools. When these results are broken down further according to the types of businesses, the percentage of full-time vehicle maintenance businesses and vehicle maintenance businesses that are run as an additional business that own one scanning tool is 53.6%, while 28.9% own two scanning tools, and 2.5% responded that they own five or more of these devices.

For maintenance shops at vehicle dealers, the percentage that said they own one scanning tool is 33.7%, while 39.1% own two scanning tools, and 5.1% responded that they own five or more of these devices.

The survey also looked at the different kinds of scanning tool that were owned. Among the full-time vehicle maintenance businesses and vehicle maintenance businesses that are run as an additional business, 60.7% of these respondents said that they owned the standard model, followed by 18.4% who said they have the code reader, and 18.3% who said that they own a scanning tool exclusively for use with one manufacturer's vehicles.

Among the maintenance shops at vehicle dealers, 93.6% responded that they own the scanning tool exclusively for use with one manufacturer's vehicles, while 4.2% own the standard model, and 1.8% own the code reader.

Among private owner-run maintenance shops, 59.2% responded that they own the standard model, while 34.6% said that they own the scanning tool exclusively for use with one manufacturer's vehicles.

In this survey, 1,478 businesses responded that they did not own the scanning tool and nearly half of these respondents said that the reason for this was because of an external request. Furthermore, nearly 35% of respondents who did not own the scanning tool said that the price was too high and they could not afford to purchase one, while 8.7% said that it was too complicated to use, and 4.7% said that the tool did not have any functions that they needed.

According to the survey, the average number of times that the scanning tool was used each month was 50.0 times per month. When the results were looked at according to the types of businesses, a huge difference was found. Full-time vehicle maintenance businesses and ve-

hicle maintenance businesses that are run as an additional business said that they used the scanning tool an average of 14.5 times/month, while the maintenance shops at vehicle dealers said they used it an average of 101.1 times/month. The probable reasons for the difference are that the number of vehicles that are brought in to maintenance shops at vehicle dealers is larger and that the number of opportunities that they have to use the scanning tool for repairing malfunctions and troubleshooting is also greater.

According to the survey results, the overwhelming majority of respondents from all of the different types of businesses, more than 90%, said that their main reason for using the scanning tool was to seek out the source of the problem when a vehicle malfunction occurred. However, 18.8% of full-time vehicle maintenance businesses and vehicle maintenance businesses that are run as an additional business said that they used it to try and confirm malfunctions in advance during *shaken* inspections and regularly scheduled inspections, while maintenance shops at vehicle dealers used it for this reason 54.2% of the time. In addition, 23.2% of full-time vehicle maintenance businesses and vehicle maintenance businesses that are run as an additional business said that they used it for the liability malfunction diagnosis menu, while maintenance shops at vehicle dealers used it for this reason 46.4% of the time. The survey results clearly show that the maintenance shops at vehicle dealers use the scanning tool quite frequently to support their work and to perform other tasks. They are obviously making good use of this tool on a daily basis.

## 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 2014 (from April 2014 to March 2015).

In 2014, total automotive machine tool sales amounted to 101 billion 599.77 million yen, a decrease of 1 billion 413.39 million yen (1.4%) compared to the previous fiscal year. However, the total sale of automotive machine tools has now exceeded 100 billion yen for two years in a row.

The sales of automotive machine tools had been increasing at a high growth rate for 4 years in a row, but the increase in the consumption tax rate in Japan to 8% in April of 2014 is thought to have caused last-minute demand and purchasing during FY 2013 and then led to restrained purchasing in FY 2014, which of course affected these sales.

The shortage of trained mechanics and the aging workforce in Japan have prompted a shift by manufacturers towards labor-saving machinery and tools that can help to compensate for the lack of human resources. Automobile dealers are receiving strong demand for large-size vehicles, so there has been strong growth in machinery and tools purchases from these dealers who want *shaken* inspection systems for large-size vehicles and also want machinery that will help them reduce the amount of required labor. Some examples of machinery that have experienced a recent surge in sales growth include: car washing machines that help dealers increase their added value, headlight testers that can be used on newer LED headlights, and vehicle painting booths that can handle the new more environmentally-friendly water-based paints.

The sales results of the 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. In FY 2013 the sales volume was 22,530 tools at an average price of 141,000 yen. In FY 2014 the sales volume was 13,239 tools and the average unit price was 131,000 yen. Obviously, the number of units being sold has decreased significantly and the price has also dropped by approximately 10,000 yen.

According to the analysis of the Japan Automotive Service Equipment Association, the MLIT program to provide businesses with a subsidy so they can buy the scanning tool have not been sufficiently utilized and most automobile maintenance shops feel that they have already bought as many of these tools as they need and can use, so new sales of this device did not increase as hoped.

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