

SPECIAL PURPOSE VEHICLES

1 Introduction

This article covers the period from January to December 2019. The figures below are therefore not affected by the voluntary economic restrictions put in place after the Japanese government announced a state of emergency due to the novel coronavirus COVID-19 pandemic. Although the pandemic will have an undoubted impact in the future, its effects are not considered in this article. We hope that the pandemic comes to an end as soon as possible.

According to data compiled by the Japan Automobile Dealers Association (JADA), the number of heavy- and medium-duty truck registrations in 2019 increased to 93,173 units, 102.3% of the level in 2018. This rise was in contrast to 2018, in which registrations dropped by nearly five percent, the first such decline after several years of growth due to projects related to earthquake recovery and preparations for the planned 2020 Tokyo Summer Olympics. Although the figure in 2018 indicated a cooling off of demand for such projects, the increase in 2019 probably reflects the fact that current fleets are insufficient to meet the needs of the fundamentally robust freight shipment industry. However, this optimism must be tempered by concerns for the future, including an imminent labor shortage, a lack of young truck drivers due to changes in the driving license system, and the effects of the novel coronavirus COVID-19. Reflecting the overall increase, registrations of light-duty trucks in 2019 increased to 267,007 units, 103.3% of the level in 2018 and the second consecutive year-on-year increase.

In contrast, according to data compiled by the Japan Auto-Body Industries Association Inc. (JABIA), production of special purpose vehicles in 2019 failed to match the results of the previous year (102.3% of the level in 2017), falling to 98.9% of the level in 2018.

This article describes the main special vehicle trends based on data compiled by JABIA and the Automobile

Inspection and Registration Information Association (AIRIA).

2 Market Trends

In 2019, total production of the thirteen types of special purpose vehicles shown in Fig. 1 decreased by 2,197 units to 193,653 (98.9% of 2018). This was the second consecutive year-on-year decrease after the peak in 2017, which was reached after eight consecutive years of increase from the low point in 2009. Although production of ten out of the thirteen types of special purpose vehicles increased, the substantial drop in production of two types of vehicles that account for a high proportion of the total had a marked impact on the rate of growth.

Figure 1 shows the 2019 production results of special

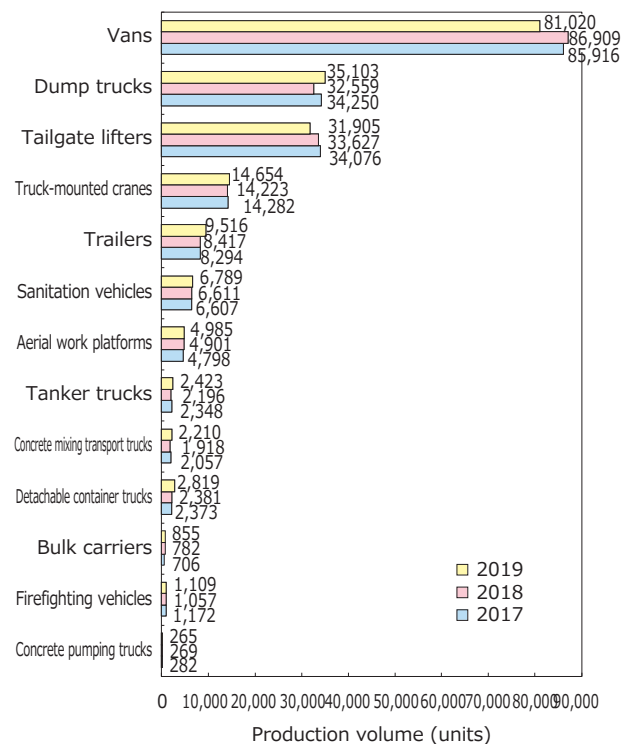


Fig. 1 Production Results of Special Purpose Vehicles per Product Type

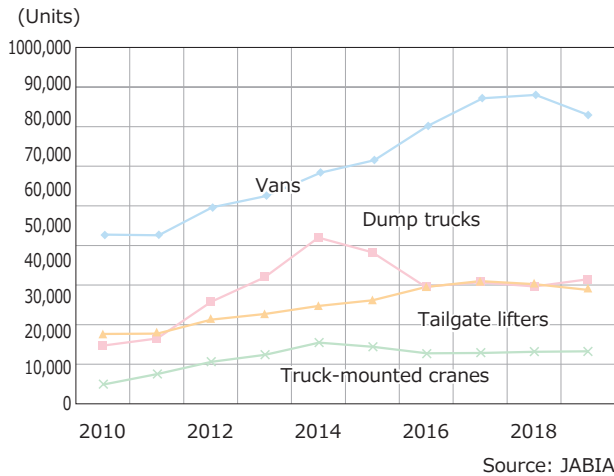


Fig. 2 Production Trends of Four Typical Special Purpose Vehicle Types

purpose vehicles per vehicle type. Compared to 2018, production of vans, which are the largest category of special purpose vehicles, decreased by 5,889 units to 81,020 (93.2% of 2018). Of the ten types of special purpose vehicles whose production increased compared to 2018, the highest rate of growth was achieved by detachable container trucks. Production of these trucks grew by 438 to 2,819 units, 118.4% of 2018. In addition, the production of three other types of special purpose vehicles also reached at least 110% of 2018. In sequence, production of the following types of vehicles increased: concrete mixing transport trucks (2,210 units, 115.2% of 2018), trailers (9,516, 113.1%), tanker trucks (2,423, 110.3%), bulk carriers (855, 109.3%), dump trucks (35,103, 107.8%), firefighting vehicles (1,109, 104.9%), truck-mounted cranes (14,654, 103.0%), sanitation vehicles (6,789, 102.7%), and aerial work platforms (4,985, 101.7%). In contrast, the production of three types of special vehicles decreased. In addition to vans, the production of tailgate lifters decreased to 31,905 units (94.9% of 2018) and the production of concrete pumping trucks decreased to 265 units (98.5%).

Figure 2 shows the production trends for four typical products (vans, dump trucks, tailgate lifters, and truck-mounted cranes) with annual production of more than 10,000 units over the past ten years. Van production, which had increased robustly since the low point in 2009, fell by 5,889 units. Tailgate lifter production has also decreased since its peak in 2017. Despite this situation, demand remains robust, with production in 2019 between 200% and 300% higher than the low point of 2009 in the wake of the global financial crisis.

Figure 3 shows the trends for the average number of

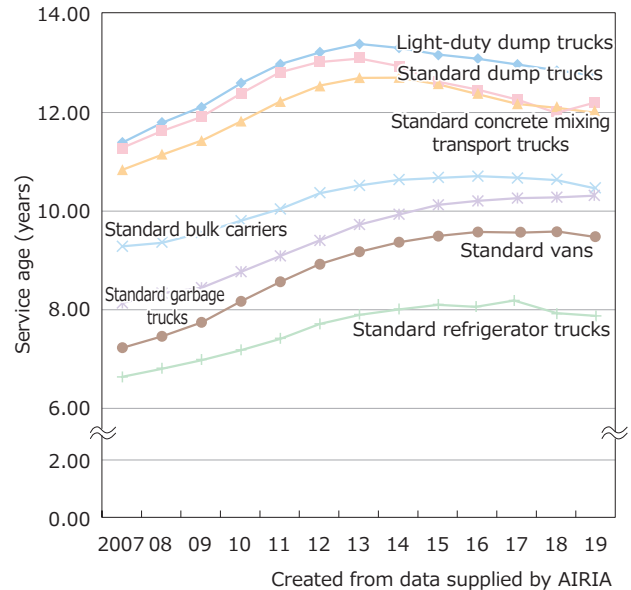


Fig. 3 Average Service Age from Initial Registration

years in service from initial registration. From 2007 to 2016, the service age rose. However, more recently, this increase has ceased for six out of seven of these vehicle types (excluding standard garbage trucks) and the average service age has begun to fall. This is probably because the increase in production over the last few years has increased the proportion of vehicles with shorter service lives, while reducing the high proportion of vehicles with service lives of over 10 years registered before the global financial crisis. However, as the rate of vehicles undergoing inspections and maintenance and the number of registered vehicles declines, the fall in the average service age is not likely to continue for much longer and will probably remain constant. Uniquely, the service age of garbage trucks has continued to increase. Vehicles in this category are now being used at least two years longer than was the case in 2007. Possible reasons for this increase include the development and adoption of more durable engines and frames, as well as improvements in the rate of vehicles undergoing inspections and maintenance.

The service age of construction vehicles including light-duty and standard dump trucks and concrete mixing transport trucks remains around two years longer than other logistics-related vehicles, which is affected by the distances driven and lengths of time that these vehicles are in operation, and it is likely that this clearly separated dual trend will continue in the future.

Note: The graph in Fig. 3 (average service age from

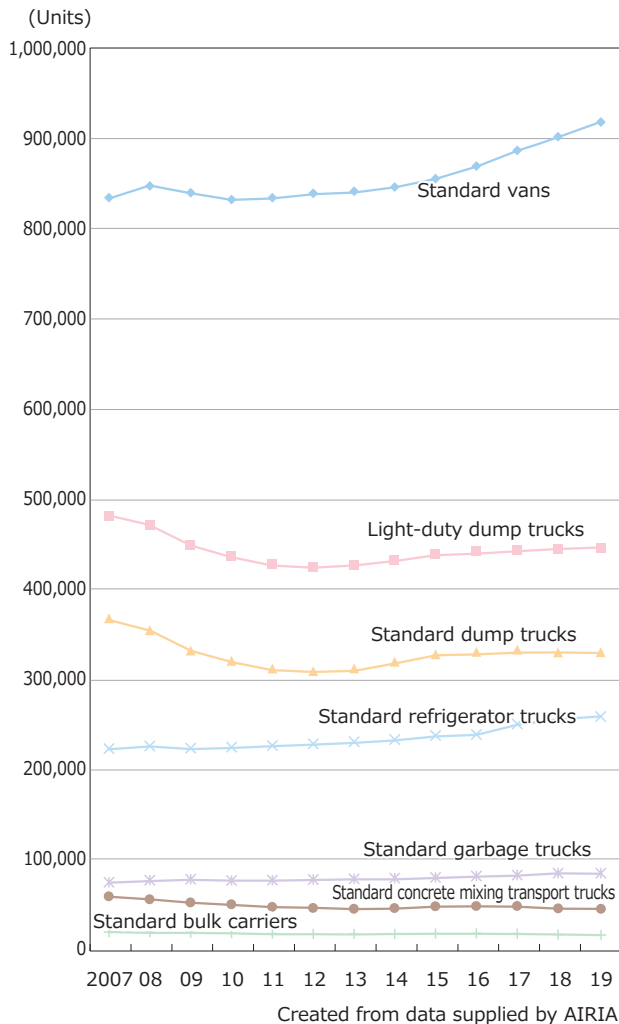


Fig. 4 Overall Numbers of Special Purpose Vehicles in Japan

initial registration) was prepared from registration data provided by AIRIA. The original registration data includes the number of registered vehicles at the end of March 2019 for each registration year between 2000 and 2019, and as collective data for 1999 and before (i.e., vehicles in service for more than 20 years). The average service age was extrapolated from these figures.

Figure 4 shows the overall number of each of these vehicle types in Japan at the end of March each year. Despite small decreases depending on the year, the total number of each vehicle type has continued to increase slightly. In 2019, the total number of logistics- and sanitation services-related vehicles such as standard vans, standard refrigerator trucks, and standard garbage trucks increased at least to 110% of the number in 2007, the highest level since that time. In contrast, the total numbers of small and standard dump trucks, standard concrete mixing transport trucks, and standard bulk car-

riers, which were all greatly affected by the drop in demand for construction after the global financial crisis, have still not recovered to the level in 2007, creating another clearly separated dual trend.

The numbers of construction vehicles such as dump trucks and concrete mixing transport trucks decreased sharply up to 2011. The increase in these vehicles after bottoming out in 2012 and 2013 may be attributed to greater demand for special purpose construction vehicles for projects related to earthquake recovery, the planned Tokyo Summer Olympics, infrastructure projects, and the like.

3 Special Purpose Construction Vehicles

3.1. Dump Trucks

Dump truck production in 2019 increased to 35,103 units (107.8% of 2018). Production of all classes of dump trucks increased: heavy-duty dump trucks by 202 units to 5,055 (104.0%), medium-duty dump trucks by 1,214 units to 14,901 (108.9%), and light-duty dump trucks by 1,243 units to 14,138 (109.6%). Although total dump truck production was significantly higher than the low of 10,853 units reached during the global financial crisis in 2009, manufacturers are predicting signs of a drop in future demand. With capital investment and employment growth in the industry unlikely, concerns are likely to grow. According to each class, the proportion of heavy-duty dump trucks fell from 15.5% to 15.0% between 2018 and 2019. In contrast, the proportion of medium-duty dump trucks increased from 42.0% to 42.4% and the proportion of light-duty dump trucks rose from 39.6% to 40.3%. As these figures show, the proportion of light-duty trucks is continuing to increase.

Table 1 shows the proportions of dump trucks produced in 2018 for transporting material other than earth or sand (i.e., non-earth and sand dump trucks). In 2018, a high proportion of dump trucks up to a gross vehicle weight (GVW) of 20 tons were used to carry earth and sand. In contrast, more than half of dump trucks with a GVW of 22 tons and 92.3% of dump trucks with a GVW of 25 tons were used to transport material other than earth or sand. Demand is rising for the transportation of comparatively heavy loads, such as industrial waste, debris, wood chips, and recycling materials. As a result, an increasingly high proportion of these dump trucks have long, heavy-duty bodies manufactured from corrosion-re-

Table 1 Production Proportions of Non-Earth and Sand Dump Trucks, and Dump Trucks with SUS or Aluminum Bodies

Vehicle model	Non-earth and sand	SUS	Aluminum
2-ton trucks	1.3%	0.3%	0.0%
4-ton trucks (GVW: less than 8 tons)	15.1%	1.4%	0.0%
GVW: more than 8 tons (6 to 8 tons)	26.6%	9.8%	0.0%
GVW: 20 tons	7.8%	5.6%	0.1%
GVW: 22 tons	54.3%	35.7%	1.3%
GVW: 25 tons	92.3%	40.4%	5.1%

Source: JABIA

sistant long-life stainless steel (SUS). The proportion of SUS-bodied dump trucks also rises in accordance with the proportion of non-earth and sand transportation (GVW of 22 tons: 35.7%, GVW of 25 tons: 40.4%). Aluminum bodies tend to be adopted by dump trucks with a GVW of 22 or 25 tons that transport comparatively heavy loads to reduce body weight and increase the carrying capacity of the truck.

Furthermore, all dump trucks produced in 2019 were equipped with diesel engines, and none were produced with compressed natural gas (CNG) or hybrid powertrains.

3. 2. Concrete Mixing Transport Trucks

Reversing the series of year-on-year declines since 2016, production of concrete mixing transport trucks in 2019 increased substantially to 2,210 units (115.2% of 2018). Production of all classes of concrete mixing transport trucks increased. Heavy-duty truck production increased to 1,453 units (104.5% of 2018), medium-duty truck production increased to 573 units (154.4%), and light-duty truck production increased to 183 units (117.3%). Additionally, the proportion of heavy-duty concrete mixing transport trucks fell and the proportion of medium-duty trucks rose substantially. This is probably a reflection of a shift from larger infrastructure projects toward medium sized and smaller projects. Although the average service age since initial registration of concrete mixing transport trucks increased from 10.81 to 12.70 years between 2007 and 2014, it has fallen since then, reaching 12.01 years in 2019. Furthermore, although the overall number of concrete mixing transport trucks in use fell greatly up to 2013, this number has not experienced major increases or decreases since then.

4 Fixed Capacity Special Purpose Vehicles

4. 1. Tanker Trucks

Production of tanker trucks in 2019 increased substan-

tially to 2,423 units (110.3% of 2018). According to class, production of heavy-duty tanker trucks increased to 597 units (111.0%), medium-duty tanker trucks to 1,506 units (107.6%), and light-duty tanker trucks to 311 units (137.6%). In addition, the proportion of production per size class remained virtually unchanged from 2018, with heavy-duty tanker trucks making up 25% of the total, and medium- and light-duty tanker trucks the rest. Within this distribution, the proportion of light-duty tanker trucks is increasing.

According to use, growth in oil tanker truck production has ceased and production fell for the second consecutive year (99.0% of 2018). However, the amount of oil being transported has not increased. The figures suggest that older trucks are probably being replaced in significant numbers. The production of water spraying or water supply trucks, which are in high demand for lease or rental, increased significantly to 1,119 units in 2019 (125.4% of 2018). Additionally, the production of tanker trucks for transporting poisonous materials or foodstuffs increased to 79 units (116.2% of 2018). In terms of use, the difference between the proportion of water spraying or water supply trucks and oil tanker trucks has virtually disappeared. Water spraying or water supply truck production has expanded to 46.2% of the total, with oil tanker trucks making up 48.8%.

4. 2. Bulk Carriers

Production of bulk carriers in 2019 increased substantially to 855 units (109.3% of 2018). According to class, heavy-duty bulk carriers accounted for approximately 98.1% of this total, demonstrating the dominance of heavy-duty vehicles in this segment. According to use, production of bulk cement carriers rose to 434 in 2019 (106.4% of 2018). The production of bulk feedstuff carriers also increased, by 4 units from 300 in 2018 to 304 in 2019. This demonstrates the underlying robust demand for bulk feedstuff carriers. For the same reasons as concrete mixing transport trucks, the recent increases in bulk cement carrier production might be attributed to continuing strong demand from infrastructure and private construction projects across the country.

4. 3. Vans

Production of vans in 2019 decreased by 5,889 units to 81,020 (93.2% of 2018). Van production had not been greatly affected by the global financial crisis and had increased for several years. This decrease marks a reversal of this trend. According to class, production of large

vans decreased to 22,243 units (96.8% of 2018), medium vans to 24,020 units (86.2%), and small vans to 31,992 units (94.7%). In contrast, the increase in mini-vehicle van production to 2,765 units (119.7%) stands out against the generally decreasing trend. This is probably due to the increase in demand for mini-vehicle delivery trucks as more goods are transported to private houses in urban areas. The proportion of large and medium vans is continuing to decrease, from 62.7% in 2017, 58.5% in 2018, and 57.1% in 2019.

According to use, production of ordinary goods vans decreased to 21,139 units (95.8% of 2018), refrigerator and freezer vans decreased to 23,403 units (91.1%), and side-opening vans decreased to 31,677 units (92.6%). In total, production of these main three types of vans fell by 5,755 units. Despite a large increase in 2018, production of walk-through trucks in 2018 was virtually zero. According to proportion of type, ordinary goods vans accounted for 26.1% of production, compared to 28.9% for refrigerator and freezer vans and 39.1% for side-opening vans. These main three types of vans accounted for nearly 95% of production. According to body material, steel accounted for 1,281 units (a proportion of 1.6%), aluminum for 70,893 units (87.5%), and fiber reinforced plastic (FRP) for 8,846 units (10.9%). These figures demonstrate the continuing shift toward lightweight aluminum and FRP van bodies.

The total number of standard vans in use has continued to increase, rising from 832,809 units in 2010 to 919,479 in 2019. The average service age of standard vans and standard refrigerator and freezer vans was 9.48 and 7.87 years, between two and four years shorter than that of special purpose construction vehicles, reflecting the long distances driven by these vehicles.

5 Other Special Purpose Vehicles

5. 1. Sanitation Vehicles

The category of sanitation vehicles includes garbage trucks, large capacity garbage dump trucks, cesspool emptiers (also known as vacuum trucks), as well as cleaning trucks and road sweepers (i.e., dewatering trucks and trucks that clean by spraying water or using suction). Production of these vehicles in 2019 increased to 6,789 units (102.7% of 2018). According to type, production of garbage trucks in 2019 increased to 5,020 units (101.8% of 2018), maintaining the recent increase in production of these vehicles. Production of cesspool emptiers, the next

most prevalent type of sanitation vehicle (proportion: 14.0%) increased to 953 units (103.5% of 2018).

The overall number of standard garbage trucks in use has continued to increase year-by-year, virtually unaffected by the state of the economy, rising from 75,797 units in 2007 to 86,059 units in 2019. Production in 2019 was 113.5% of the level in 2007. Furthermore, the average service age from initial registration has continued to increase from 8.15 years in 2007 to 10.31 years in 2019.

Figure 5 shows the production status of hybrid, CNG, and liquid petroleum gas (LPG) garbage trucks, which joined the market as environmental awareness increased. These trucks are currently produced only in the light-duty category. In 2019, production continued its recent year-on-year declining trend and fell to 67 units, 63.2% of the level in 2018. Production has stagnated to around 15% of the level in 2009 and 2010, when purchasing incentives were available. Furthermore, the proportion of low-polluting environmentally friendly garbage truck production has fallen to 1.3% of the whole, indicating that this type of truck has failed to find mainstream acceptance. Since the production of low-polluting environmentally friendly garbage trucks increased when purchasing incentives were available, this decline may be partly attributable to the price of these trucks. It is hoped that electric garbage trucks will find their way onto the market in the future.

5. 2. Detachable Container Trucks

Production of detachable container trucks in 2019 increased greatly to 2,819 units (118.4% of 2018). Production of all classes of detachable container trucks increased: heavy-duty trucks to 619 units (119.3%), medium-duty trucks to 1,707 units (114.9%), and light-duty trucks to 478 units (129.2%). According to the proportion of each class, large detachable container trucks accounted for 22.0% of the total, medium detachable container trucks for 60.6%, and small detachable container trucks for 17.0%. There were no major changes in these proportions from the previous year.

5. 3. Aerial Work Platforms

Production of aerial work platforms in 2019 increased slightly to 4,985 units (101.7% of 2018). This number has increased year-by-year since 2009 (1,566 units), more than tripling in the period up to 2019. Categories of aerial work platforms include truck-mounted and self-propelled types. Truck-mounted aerial work platforms are mainly used for electrical and communication system engineer-

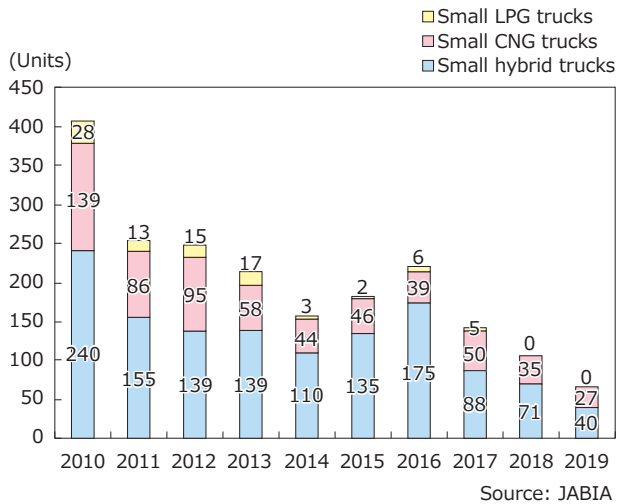


Fig. 5 Production Volumes of Hybrid, CNG, and LPG Garbage Trucks

ing work, whereas self-propelled aerial work platforms tend to be found on construction sites, inside buildings and so on.

5. 4. Truck-Mounted Cranes

This category of vehicle mostly comprises a crane mounted behind the cab of a flat-bed truck and is used for construction or building work, or for handling cargo. Production of truck-mounted cranes fell as far as 4,565 units in 2009 due to the slowdown in construction and building demand in the wake of the global financial crisis. Production then increased for five consecutive years, recovering to 16,848 units in 2014, before maintaining a stable level above 14,000 units between 2016 and 2018, and reaching 14,654 units in 2019 (103.0% of 2018).

5. 5. Tailgate Lifters

Tailgate lifters are mounted to the back of flat-bed vehicles or vans as a typical labor-saving device for handling cargo. Production of tailgate lifters decreased substantially by 1,722 units in 2019 to 31,905 units (94.9% of 2018). According to type and use, vertical tailgate lifters increased to 10,999 units (101.5% of 2018). However, tilting tailgate lifters decreased to 8,695 units (90.7%), retractable tailgate lifters decreased to 9,947 units (92.8%), arm-type tailgate lifters decreased to 1,630 units (89.3%), and tailgate lifters for assisted mobility vehicles and people movers decreased to 634 units (96.9%). The large decrease in van production probably had a major effect on the production of tailgate lifters. Future increases in tailgate lifter production likely depends on logistical demand, van production trends, as well as demand for la-

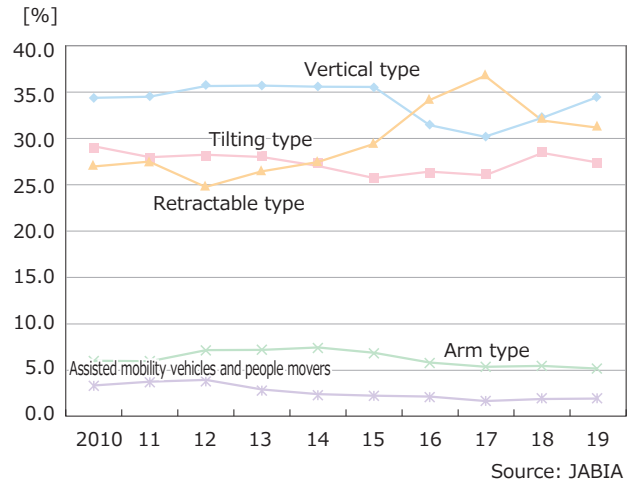


Fig. 6 Production Proportion of Tailgate Lifters per Type and Use

bor-saving devices.

Figure 6 shows the production proportion trends of tailgate lifters per type and use. Vertical tailgate lifters made up 34.5% of the total production, followed by retractable tailgate lifters (31.2%), and tilting tailgate lifters (27.3%). These three types continued to account for more than 90% of production. However, the production volume and proportion of retractable tailgate lifters attached to refrigerator and freezer vans both declined, reflecting sluggish growth in the production of temperature-controlled vehicles such as refrigerator and freezer vans.

5. 6. Trailers

Trailers are used to transport large volumes or heavy items. In 2019, production increased to 9,516 units (113.1% of 2018). According to type, production of low-bed trailers decreased to 240 units (93.0% of 2018), flat-bed trailers increased to 2,014 units (101.6%), van-type trailers increased to 3,133 units (120.4%), trailers for marine containers increased to 2,865 units (117.5%), tanker trailers increased to 484 units (116.1%), dump trailers increased to 236 units (113.5%), car carrier trailers decreased to 281 units (90.9%), and full trailers increased to 200 units (112.4%). Although the proportion of trailer types did not change greatly, the proportion of van-type trailers and trailers for containers increased. Furthermore, if flat-bed trailers are also considered, these three types of trailers continued to account for more than 80% of total trailer production. The increase in logistics volumes and number of large cargoes being transported indicates the presence of substantial underlying demand, suggesting that production will continue to rise in the future.