

# SPECIAL PURPOSE VEHICLES

## 1 Introduction

According to data compiled by the Japan Automobile Dealers Association (JADA), the number of truck registrations increased in 2015. For example, the number of large truck registrations increased by 101.4% from 2014 to 89,321 units and the number of small truck registrations increased by 102.8% to 259,936 units. This was the sixth consecutive year-on-year increase in large truck registrations since 2009.

Although production of special purpose vehicles increased in 2015 compared to 2014, the increase reflected the slight 101.4% increase in registered large truck sales. Production of these vehicles seems to have reached a plateau in 2015 after the recent high rates of increase.

This article describes the main special vehicle trends based on data compiled by the Japan Auto-Body Industries Association (JABIA), the Japan Construction Equipment Manufacturers Association (CEMA), and the Automobile Inspection and Registration Information Association (AIRIA).

## 2 Market Trends

Production of special purpose vehicles in 2015 increased for the sixth consecutive year after reaching a low point in 2009. However, different categories of these vehicles saw different results. For example, although production of concrete pumping trucks and dump trucks fell substantially from 2014, this was offset by a 110% increase in production of aerial work platforms, detachable container trucks, and tanker trucks.

Figure 1 shows the 2015 production results of special purpose vehicles per vehicle type. Compared to 2014, van production increased by 3,464 units to 68,423 units (105.3%). Dump truck production decreased by 4,241 units to 42,170 units (90.9%). Within the dump truck category, large falls were recorded in both large and small dump truck production. The largest production increase

was achieved by aerial work platforms, which rose by 135.3% to 9,359 units, followed by detachable container trucks (2,406 units, 121.6%), and tanker trucks (2,674 units, 110.8%). In addition, sanitation vehicles, trailers, tailgate lifters, vans, and concrete mixing transport trucks all recorded further year-on-year increases continuing from 2014. In contrast, production fell in the following categories: concrete pumping trucks (258 units, 83.5%), truck-mounted cranes (15,610 units, 92.7%), and bulk carriers (681 units, 95.4%). Overall, production of the thirteen types of vehicles shown in Fig. 1 increased for the sixth consecutive year by 101.9% to 187,689 units.

Figure 2 shows the production trends for five typical products (vans, dump trucks, tailgate lifters, truck-mounted cranes, and aerial work platforms) with annual production in 2015 of more than 10,000 units over the

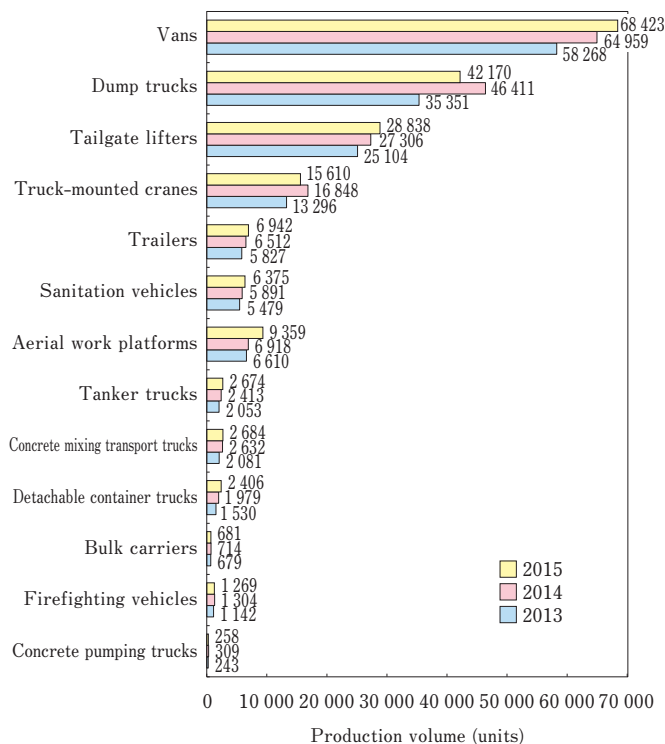


Fig. 1 Production results of special purpose vehicles per product type.

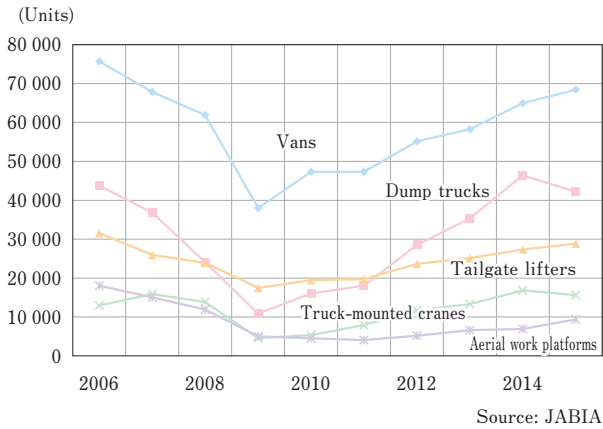


Fig. 2 Production trends of five typical special purpose product types.

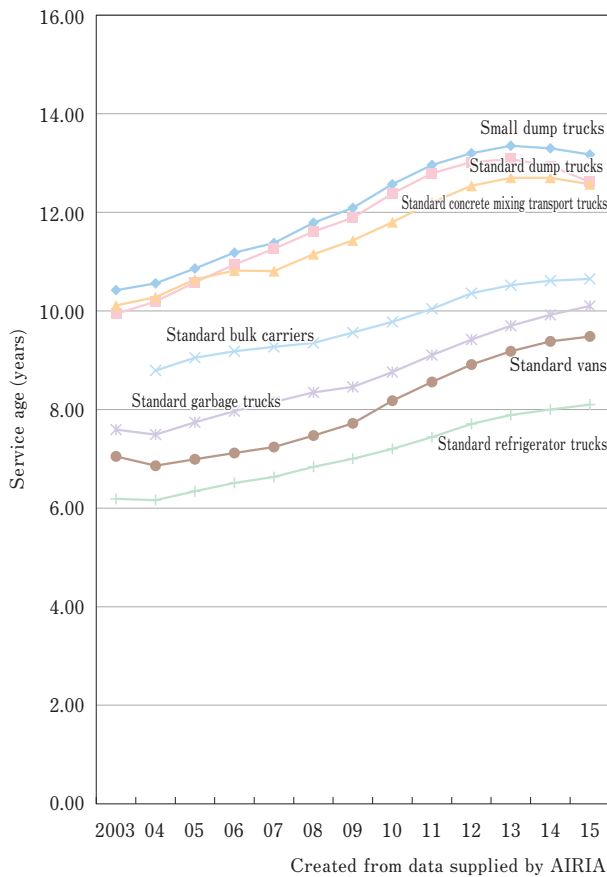


Fig. 3 Average service age from initial registration.

past ten years. Van production, which has increased every year since hitting bottom in 2009, has rebounded by 180.1% between 2009 and 2015. Tailgate lifter production has increased by 165.0% in the same period. Although dump truck production had increased for five consecutive years, production fell in 2015. The dump truck production trend has a distinct V-shape. For example, in 2009, production slumped to 24.8% of the level in 2006

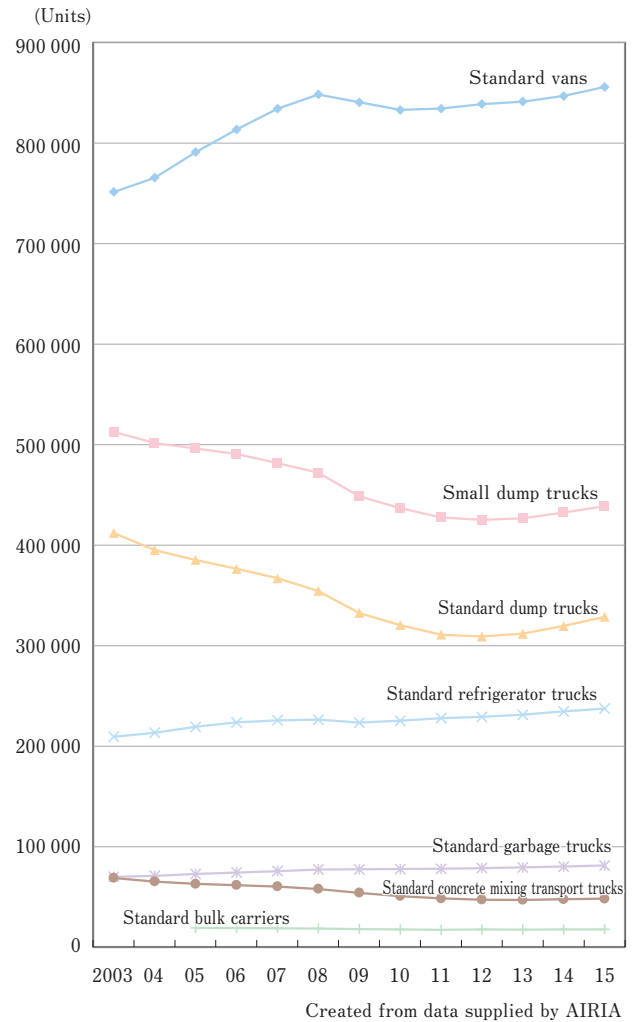


Fig. 4 Trends for overall number of special purpose vehicles in Japan.

before the global financial crisis, before rebounding to 106.0% in 2014. In 2015, production was 96.3% of the 2006 level, which probably indicates the ending of the recovery in this segment.

Figure 3 shows the trends for the average number of years in service from initial registration. Although the service age of each of these seven vehicle types has been increasing since 2004, the service age of small dump trucks has fallen from 13.35 years in 2013 to 13.30 in 2014, and 13.17 in 2015. The service age of standard dump trucks has also fallen for two consecutive years, from 13.08 in 2013 to 12.94 in 2014, and 12.62 in 2015. This is probably because the increase in dump truck production over the last few years has decreased the proportion of dump trucks with longer service lives. Although it is likely that the fall in the service age of dump trucks is not likely to continue for much longer and will probably start to increase again, it is hoped that the service age of

this category will remain between 12 and 13 years.

However, the service age of construction vehicles such as dump trucks and concrete mixing transport trucks remains around two years longer than other logistics-related vehicles. It is likely that this clearly separated dual trend will continue in the future.

This graph was prepared from registration data provided by AIRIA. The original registration data includes the number of registered vehicles at the end of March 2015 for each registration year between 1997 and 2014, and as collected data prior to 1996 (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. Although the number of standard vans increased from 2003 to 2008, it has hardly increased since then. The number has increased slightly from the low point of 832,809 recorded in 2010 to 855,737 in 2015. Although small dump trucks decreased from 512,548 in 2003 to 425,169 in 2012, the number rose between 2013 and 2015 to 438,632. Standard dump trucks decreased from 412,037 in 2003 to 309,184 in 2012. Since then, the number increased slightly for three consecutive years, reaching 328,703 in 2015. Standard concrete mixing transport trucks decreased from 68,897 in 2003 to 47,104 in 2013. However, this figure increased to 48,377 in 2015, following the same trend as dump trucks. The numbers of construction related vehicles such as dump trucks and concrete mixing transport trucks decreased sharply up to 2011. After hitting bottom in 2012 and 2013, the rebound in these vehicles is probably due to greater demand for special purpose construction vehicles for projects related to the 2020 Tokyo Summer Olympics and the like.

### 3 Special Purpose Construction Vehicles

#### 3.1. Dump trucks

Dump truck production in 2015 decreased to 42,170 units (90.9% of 2014). According to vehicle class, large dump trucks decreased by 1,867 units to 9,046 units (82.9%), medium dump trucks increased by 96 units to 17,444 units (100.6%), and small dump trucks decreased by 2,511 units to 14,486 units (85.2%). Overall dump truck production finally fell in 2015 after increasing for five consecutive years.

Table 1 shows the proportions of dump trucks produced in 2015 for transporting material other than earth

or sand (i.e., non-earth and sand dump trucks). The proportion of 4-ton vehicles was 4.8% in 2015, the proportion of trucks with a gross vehicle weight (GVW) of 20 tons was 4.4%, and the proportion of trucks with a GVW of 22 tons was 25.4%, following the same trend as the past four years. These figures indicate that the proportion of dump trucks produced for transporting earth or sand has continued to increase since these trucks are used to build infrastructure as part of earthquake recovery work. In addition, stainless steel (SUS) is used as a long-life corrosion-resistant body material for dump trucks. In the SUS body category, the proportions of each GVW category hardly changed from 2012 (GVW of 20 tons: 3.7%, GVW of 22 tons: 18.5%, GVW of 25 tons: 30.9%).

According to fuel, most dump trucks were equipped with diesel engines. No compressed natural gas (CNG) or liquefied petroleum gas (LPG) powered dump trucks were produced. One gasoline-powered 2-ton dump truck and two hybrid dump trucks were also produced in the same GVW category. None were produced in the 4-ton or heavier categories.

#### 3.2. Concrete mixing transport trucks

Production of concrete mixing transport trucks in 2015 increased by 102.0% from 2014 to 2,684 units. However, after hitting bottom in 2010, production in 2015 was virtually flat, continuing the trend from the gradually declining increases that were recorded in 2013 and 2014 after increases in excess of 150% in 2011 and 2012. According to class, production of large concrete mixing transport trucks decreased to 2,094 units (91.4% of 2014). However, medium concrete mixing transport trucks increased by 171.3% to 471 units, and small concrete mixing transport trucks increased by 177.6% to 119 units. Although the average service age since initial registration of concrete mixing transport trucks increased by 2.59 years in the eleven-year period from 2003 (10.11 years) to 2014 (12.70 years), it started to fall in 2015, dropping to 12.57 years. In addition, although the overall number of concrete mixing transport trucks declined by 31.6% from 68,897 in 2003 to 47,104 in 2013, it has now increased for two consecutive years, to 47,736 in 2014 and 48,377 in 2015.

### 4 Fixed Capacity Special Purpose Vehicles

#### 4.1. Tanker trucks

Production of tanker trucks in 2015 increased by

110.8% from 2014 to 2,674 units. According to class, production of large tanker trucks increased by 110.5% to 496 units and medium tanker trucks by 114.1% to 1,903 units. In contrast, production of small tanker trucks fell to 270 units (96.4% of 2014). Total production of tanker trucks has increased by 226.0% since dropping to 1,183 in 2009. Large (18.5%) and medium (71.2%) tanker trucks accounted for roughly 90% of production, a proportion that did not change from 2014.

A detailed analysis shows that oil tanker trucks decreased by 39 units to 1,438 units (97.4% of 2014). However, water spraying or water supply trucks increased by 308 units to 1,153 units (136.4%), contributing to the overall increase in tanker truck production.

According to use, since production of water spraying or water supply trucks increased, the proportion of oil tanker trucks fell slightly in 2015 to 53.8%.

#### 4.2. Bulk carriers

Production of bulk carriers in 2015 decreased to 681 units (95.4% of 2014). According to class, large bulk carriers accounted for at least 95% of this total, a proportion that remained unchanged. According to use, bulk cement carriers accounted for 60.1% of the total and bulk feedstuff carriers accounted for 30.7%.

The overall number of standard bulk carriers hit a low of 17,393 in 2011. Since then, the downward trend has ended and the number has remained virtually unchanged, increasing by 100.8% to 17,776 in 2014 and 100.4% to 17,859 in 2015.

#### 4.3. Vans

Van production in 2015 increased by 105.3% from 2014 to 68,423 units, the sixth consecutive year-on-year increase from a level of 37,984 in 2009. Production of each class of van increased compared to 2014. Production of large vans increased by 109.0% to 17,131 units, medium vans by 104.7% to 22,552 units, small vans by 102.9% to 27,127 units, and mini-vehicle vans by 118.8% to 1,613 units. According to use, production of ordinary goods vans increased by 104.9% from 2014 to 17,781 units, side-opening vans by 106.6% to 24,955 units, and refrigerator and freezer vans by 106.3% to 22,572 units. According to proportion of type, ordinary goods vans accounted for 26.0% of production, compared to 36.5% for side-opening vans and 33.0% for refrigerator and freezer vans. According to body material, steel accounted for 1,294 units (1.9%), aluminum for 60,309 units (88.1%), and fiber reinforced plastic (FRP) for 6,820 units (10.0%). There were

**Table 1 Production proportions of non-earth and sand dump trucks, and dump trucks with SUS or aluminum bodies.**

Vehicle type	Non-earth and sand	SUS	Aluminum
2-ton trucks	0.9%	1.4%	0.0%
4-ton trucks (GVW: less than 8 tons)	4.8%	0.8%	0.0%
GVW: more than 8 tons (6 to 8 tons)	9.3%	2.9%	0.0%
GVW: 20 tons	4.4%	3.7%	0.1%
GVW: 22 tons	25.4%	18.5%	1.2%
GVW: 25 tons	85.6%	30.9%	8.7%

Source: JABIA

no major changes in these proportions.

The overall number of standard vans has increased for five consecutive years from 832,809 units in 2010 to 855,737 units in 2015.

## 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 2015 increased by 108.2% from 2014 to 6,375 units. According to proportion of type, the production of garbage trucks increased by 110.2% from 2014 to 4,644 units and accounted for 72.8% of sanitation vehicle production. In addition, the production of cesspool emptiers, the next most prevalent type of sanitation vehicle (15.2%) increased by 64 units to 971 units (107.9%).

The overall number of standard garbage trucks has increased by 11,361 units from 70,042 units in 2003 to 81,403 units in 2015. Furthermore, the average service age from initial registration has continued to increase from 7.59 years in 2003, reaching 10.10 years in 2015, the first time that it has exceeded 10 years.

Figure 5 shows the production status of CNG and LPG garbage trucks, which have entered the market as environmental awareness has increased. However, annual production has continued to fall drastically since 413 units were produced in 2016. Production in 2015 was 48 units, a slight increase of 102.1% compared to 2014. Furthermore, production of small hybrid garbage trucks designed to reduce both fuel consumption and emissions was 135 units, an increase of 122.7% compared to 2014. However, this level is around half of the 246 units produced in 2009, a drop of around 130 units. The proportion of environmentally friendly low-polluting sanitation vehi-

cles including CNG, LPG, and hybrid trucks remains stuck at around 3.9% of the total segment.

### 5.2. Detachable container trucks

Production of detachable container trucks in 2015 increased by 121.6% from 2014 to 2,406 units. According to class, production of large detachable container trucks increased by 171.7% to 582 units, medium detachable container trucks by 115.2% to 1,537 units, and small detachable container trucks by 114.3% to 279 units. According to the proportion of each class, large detachable container trucks accounted for 24.2% of the total, medium detachable container trucks accounted for 63.9%, and small detachable container trucks accounted for 11.6%. There were no major changes in these proportions.

### 5.3. Aerial work platforms

Although the production of aerial work platforms fell to 4,065 units in 2011, production recovered to 5,185 units in 2012, 6,610 units in 2013, and 6,918 units in 2014. In 2015, production increased for the fourth consecutive year to 9,359 units (135.3% of 2015). However, as shown in Fig. 2, this figure is still substantially lower than the production of 18,049 units achieved in 2006. 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 engineering 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, which reached 15,876 units in 2007, fell as far as 4,565 units in 2009. Since then, the production of truck-mounted cranes increased for five consecutive years, reaching 16,848 units in 2014, before falling back to 15,610 in 2015 (92.7% of 2014).

### 5.5. Tailgate lifters

Tailgate lifters are mounted to the back of flat-bed trucks or vans as a typical labor-saving device for handling cargo. Production of tailgate lifters in 2015 increased by 105.6% from 2014 to 28,838 units.

According to type and use, vertical tailgate lifters increased by 105.8% to 10,267 units, tilting tailgate lifters increased by 100.7% to 7,423 units, and retractable tailgate lifters increased by 113.1% to 8,498. Production of

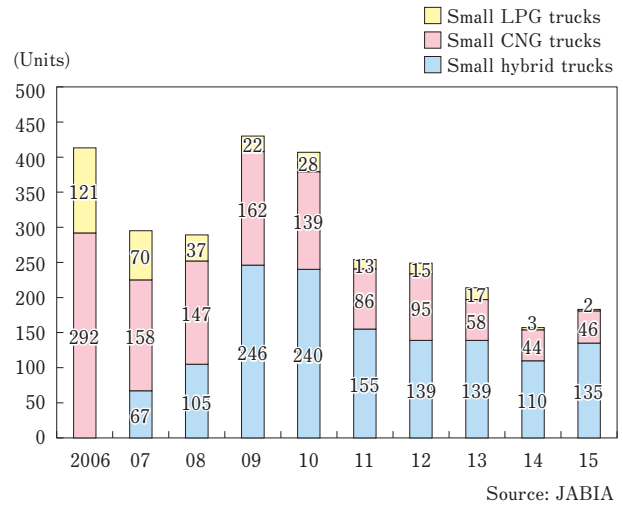


Fig. 5 Production volumes of hybrid and CNG garbage trucks.

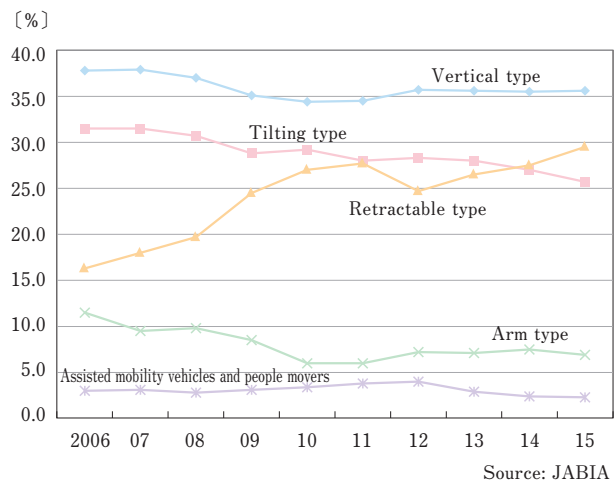


Fig. 6 Production proportion of tailgate lifters per type and use.

arm-type tailgate lifters fell to 1,981 units (96.8% of 2014) and tailgate lifters for assisted mobility vehicles and people movers increased by 100.5% to 669 units.

Figure 6 shows the production proportion of tailgate lifters per type and use. Vertical lifters accounted for the largest proportion (35.6%), followed by retractable (29.5%), and tilting types (25.7%). The proportion of retractable tailgate lifters continued to increase in 2015 after overtaking tilting tailgate lifters for the first time in 2014.

### 5.6. Trailers

Trailers are used to transport large volumes or heavy items. In 2015, production increased by 106.6% from 2014 to 6,942 units. According to type, production of low-bed trailers increased to 240 units (108.1% of 2014), flat-bed trailers increased to 1,691 units (100.2%), van-type trailers increased to 1,901 units (107.2%), trailers for containers

increased to 1,909 units (115.3%), tanker trailers decreased to 369 units (75.6%), dump trailers increased to 310 units (123.0%), vehicle carriers increased to 261 units (103.6%), and full trailers increased to 211 units (144.5%).

In contrast with the year-on-year fall in whole-vehicle large dump truck production, the production of dump trailers has increased for five consecutive years.