

Occupational Injuries, Illnesses, and Fatalities to Automotive Service Technicians and Mechanics, 2003 to 2005

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Mechanics are more likely than the average worker to be injured or killed on the job, as evidenced by higher rates of fatalities and injuries and illnesses. For both fatal and nonfatal injuries, contact with objects and equipment, such as parts and materials and vehicles, represents a significant hazard. Many of the remaining nonfatal cases are due to overexertion and sprains and strains; assaults and violent acts are a leading cause of workplace fatalities.

In 2005, there were 954,000 automotive service technicians and mechanics (henceforth to be referred to as "mechanics") employed in the United States.¹ Mechanics are responsible for keeping the Nation's more than 135 million automobiles in running condition.² As vehicle components have become more complex and computerized, the job of a mechanic has increasingly become a high technology job.³ Mechanics have often specialized in a specific type of automotive repair, becoming experts in engine, transmission, brake, front end, or air-conditioning repair. More than 290,000 mechanics are ASE certified, a nationally recognized certification program that tests a mechanic's knowledge every 5 years.⁴

From 2003 to 2005, 147 mechanics were killed on the job.⁵ Their fatality rate was 5.3 per 100,000 employed in 2005, which was higher than the rate of 4.0 per 100,000 employed for all occupations combined. (See table 1.) There were 15,680 nonfatal injuries and illnesses to mechanics involving days away from work in 2005, about the same as in 2004, following a decline of 9.8 percent from 2003 to 2004. Among all occupations, mechanics ranked 14th in terms of the number of injuries and illnesses involving days away from work in 2005, the same as in 2004. (Mechanics ranked 13th in 2003.) The median number of days away from work for injured or ill mechanics in 2005 was 5 days, less than the median of 7 days for all occupations.

Industry

Typically, mechanics worked in automotive repair and maintenance shops (34.9 percent) or for automobile dealers (33.9 percent); 8.8 percent worked for parts, accessories, and tire stores.⁶

In 2005, 47.0 percent of the mechanics who incurred a nonfatal injury or illness involving days away from work were employed by automobile dealers, 17.8 percent worked for automotive repair and maintenance establishments, and 7.4 percent were employed by automotive parts, accessories, and tire stores. A small number were employed in goods-producing industries such as manufacturing (4.2 percent) and construction (0.8 percent). Of the 147 fatal incidents that took place from 2003 to 2005, 72.1 percent occurred in the automotive repair and maintenance industry, and 9.5 percent occurred in automobile dealerships. All were employed in private industry.

Demographic Characteristics

All of the mechanics who were fatally injured over the 2003-05 period were men. Similarly, the vast majority (more than 95 percent) of mechanics who were nonfatally injured during the period were men. More than two-thirds (69.4 percent) of the fatally injured mechanics were wage and salary workers, and nearly a third (30.6 percent) were self-employed.

Nearly 4 in 5 of the nonfatally injured mechanics in 2005 were non-Hispanic whites, 14.7 percent were Hispanics, and 4.0 percent were non-Hispanic blacks.⁷ Similar to the nonfatally injured mechanics, non-Hispanic whites made up 71.4 percent of the fatalities in this occupation from 2003 to 2005. Hispanics accounted for 12.9 percent of fatalities—less than their share of employment in this occupation (17.7 percent). Non-Hispanic blacks represented 7.3 percent of employment among mechanics, but they suffered 12.2 percent of the fatalities.

Circumstances Of The Injuries, Illnesses, And Fatalities

Nonfatal injuries and illnesses. As can be seen in chart 1, most of the injuries and illnesses to mechanics in 2005 were due to contact with object or equipment (44.5 percent) or to overexertion (21.6 percent). Contact with object includes being struck by an object (22.0 percent of the total), struck against an object (11.3 percent), and caught in an object, equipment, or material (5.6 percent).

For injuries and illnesses involving contact with object and equipment, 19.5 percent involved vehicles, 13.9 percent involved hand tools, nonpowered, and 9.2 percent involved engine parts. (See table 2.) Injuries that were due to the worker being struck by an object accounted for 22.0 percent of the injuries and illnesses to mechanics, but only 13.6 percent of injuries and illnesses to all occupations. For overexertion injuries, 31.0 percent involved tires and wheels, and 23.6 percent involved engine parts and accessories. More than half (59.3 percent) of the overexertion injuries were due to overexertion in lifting objects.

The *source* of injury or illness is the object, substance, exposure, or bodily motion that directly produced or inflicted the disabling condition. The leading source of injury or illness to mechanics in 2005 was parts and materials (26.7 percent), followed by vehicles (14.4 percent); the comparable rates for all occupations were 10.4 percent and 8.9 percent, respectively. For injuries involving vehicles, 25.2 percent were due to transportation accidents, and 60.2 percent were due to contact with objects and equipment, such as being struck against a stationary object (33.6 percent), caught in or compressed by equipment or object (10.6 percent), and struck by an object (10.2 percent).

The *nature* of injury or illness names the principal physical characteristic of a disabling condition. The leading nature of injury or illness to mechanics in 2005 was sprains and strains (32.6 percent), which was less than the comparable rate for all occupations (40.8 percent). Sprains were followed by cuts, lacerations, and punctures (15.9 percent), which was higher than the 9.6-percent rate for all occupations. Bruises and contusions accounted for 10.6 percent of the injuries to mechanics.

Injuries to the upper extremities accounted for 34.9 percent of injuries and illnesses to mechanics in 2005, followed by 29.0 percent to the trunk and 15.6 percent to lower extremities. Trunk injuries include injuries to the back, which accounted for 16.3 percent of all injuries to mechanics. Eye injuries accounted for 7.8 percent of injuries to mechanics, compared with just 2.8 percent among all occupations.

The days with the largest number of nonfatal injuries and illnesses to mechanics in 2005 were Thursday and Tuesday, with 3,250 and 3,160 cases respectively. The day with the fewest injuries was Sunday (680), followed by Saturday (1,110).

Fatalities. Assaults and violent acts accounted for 29.3 percent of the workplace fatalities among mechanics during the 2003-05 period, compared with 14.7 percent among all occupations. Of these, 44.2 percent were homicides and 55.8 percent were self-inflicted wounds. (See chart 2.) Self-inflicted fatalities represented 16.3 percent of all fatalities to mechanics, but only 3.5 percent of fatalities to all workers. Nearly half (45.8 percent) of the self-inflicted fatalities were by self-employed mechanics, although only 16 percent of mechanics are self-employed. Gunshot wounds accounted for 19.7 percent of the fatalities to mechanics, compared with 9.9 percent for all occupations.

The leading *event or exposure* for workplace fatalities during the 2003-05 period was contact with objects and equipment (31.3 percent); the comparable figure for all occupations was 17.1 percent. The leading *sources* of fatalities were vehicles (44.9 percent), bullets (19.0 percent), and parts and materials (10.2 percent). Among the 66 cases with vehicles as the source of the fatality, 40.9 percent were transportation incidents and 34.8 percent were from being struck by falling objects, such as a car falling off a lift, rack, or jack. Asphyxiations and suffocations accounted for 15.6 percent of the fatalities to mechanics during the period.

Conclusion

Mechanics are more likely than the average worker to be injured or killed on the job, as evidenced by higher rates of fatalities and injuries and illnesses. For both fatal and nonfatal injuries, contact with objects and equipment, such as parts and

materials and vehicles, represents a significant hazard. Many of the remaining nonfatal cases are due to overexertion and sprains and strains. Assaults and violent acts are a leading cause of workplace fatalities.

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Notes

1 Employment data are from the Bureau of Labor Statistics, [Current Population Survey \(CPS\)](#). Employment of automotive service technicians and mechanics aged 16 years and older was 954,000 in 2005.

2 According to the [Federal Highway Administration](#), there were 135,192,288 private and commercial automobile registrations in the United States in 2005.

3 Bureau of Labor Statistics, [Occupational Outlook Handbook](#), 2006-07 edition.

4 National Institute for Automotive Service Excellence (ASE).

5 Data on fatalities are from the Bureau of Labor Statistics, [Census of Fatal Occupational Injuries \(CFOI\)](#). Fatalities in this study are based on revised counts for 2003 through 2005. Data on nonfatal injuries and illnesses are from the [Survey of Occupational Injuries and Illnesses \(SOII\)](#) program, which collects data from a sample of business establishments in the United States. For more information on both the CFOI and SOII programs, see "Chapter 9, Occupational safety and health statistics," in [BLS Handbook of Methods](#), available on the Internet at <http://www.bls.gov/opub/hom/home.htm>. The [Injuries, Illnesses, and Fatalities \(IIF\)](#) program uses the [Occupational Injury and Illness Classification System \(OIICS\)](#) to define event or exposure, nature, part of body, and source. Occupation is defined using the [Standard Occupational Classification \(SOC\)](#) system, and industry is defined using the [North American Industrial Classification System \(NAICS\)](#).

6 Data for employment by industry are for 2005 and come from Bureau of Labor Statistics [Occupational Employment Statistics](#) program. These data exclude self-employed workers.

7 Note that race was not reported in 17.7 percent of the nonfatal cases for this occupation in 2005. Also, persons identified as Hispanic, an ethnic category, can be of any race.

Table 1. Injuries, illnesses, and fatalities to automotive service technicians and mechanics, 2003 to 2005

Year	Injuries and illnesses	Fatality count	Fatality rate
2003	17,240	57	6.4
2004	15,550	39	4.2
2005	15,680	51	5.3

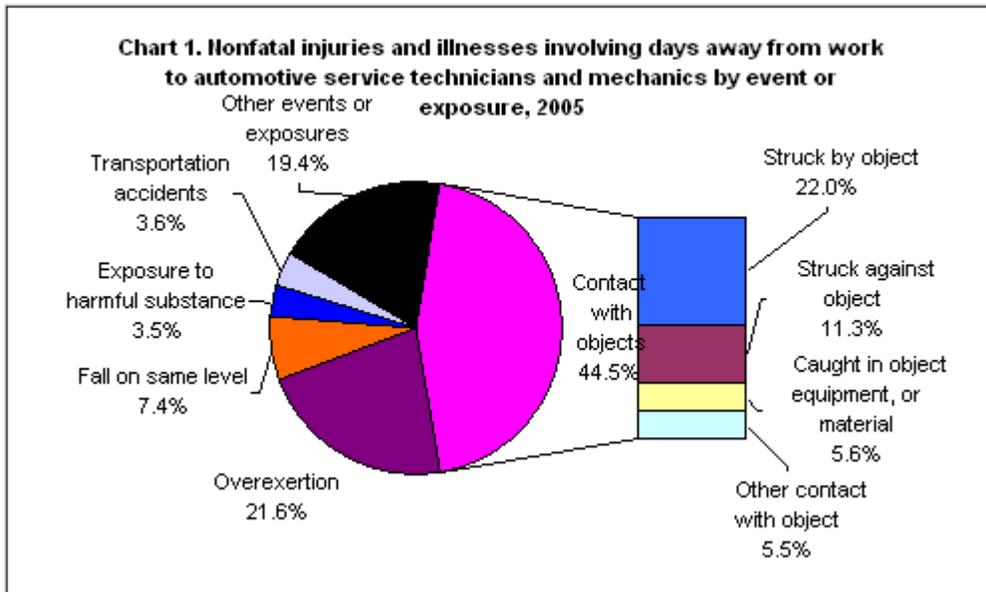
Table 2. Nonfatal injuries and illnesses involving days away from work to automotive service technicians and mechanics involving contact with objects and equipment by source of injury or illness, 2005

Source of injury or illness	Number	Percent of total
All	6,970	100.0
Vehicles	1,360	19.5
Parts and Materials	1,900	27.3
Engine parts and accessories	640	9.2
Tires, inner tubes, wheels	360	5.2
Vehicle and mobile equipment parts, n.e.c.	240	3.4
Other parts and materials	660	9.5
Machinery	540	7.7
Tools, instruments, and equipment	1,600	23.0
Handtools, nonpowered	970	13.9

Note: n.e.c. = not elsewhere classified

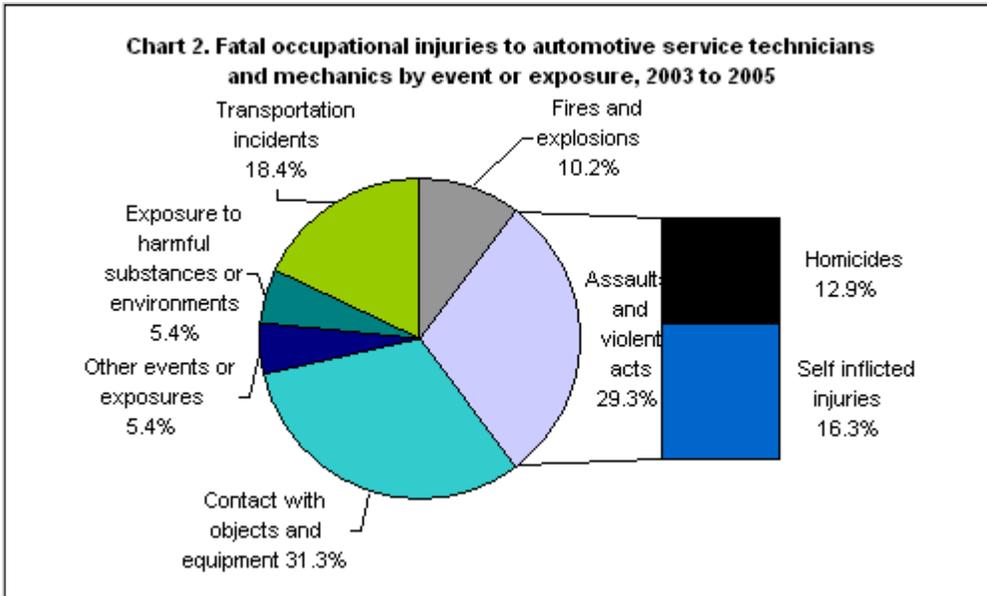
Source of injury or illness	Number	Percent of total
Handtools, powered	370	5.3
Other sources	1,570	22.5
Chips, particles, splinters	830	11.9

Note: n.e.c. = not elsewhere classified



Data for Chart 1. Non-fatal injuries and illnesses involving days away from work to automotive service technicians and mechanics by event or exposure, 2005

Event or exposure	Number
All	15680
Overexertion	3390
Fall on same level	1160
Exposure to harmful substance	550
Transportation accidents	570
Other events or exposures	3040
Struck by object	3450
Struck against object	1770
Caught in object equipment, or material	880
Other contact with object	870



Data for Chart 2. Fatal occupational injuries to automotive service technicians and mechanics by event or exposure, 2003-2005.

Event or exposure	Number
All	147
Contact with objects and equipment	46
Other events or exposures	8
Exposure to harmful substances or environments	8
Transportation incidents	27
Fires and explosions	15
Homicides	19
Self inflicted injuries	24