Investigative
REPORT

FIFTEEN GREAT AMERICAN CRASHES

An excerpt from a study of 230 metal-rending impacts in which only two were killed.

You're trapped. No place to go. Seventy-mile-per-hour freeway traffic has you boxed in on all sides and just ahead a car on the opposite side of the road is starting across the median. The driver is drunk or asleep but what does it matter, the impact is still going to multiply out to well over 70 mph.

If you aren't killed, your body — lacerated, distorted, and contused — will be laid out on the cold freeway asphalt under the jaded, watchful eyes of a highway patrolman. He'll be asking you why in Hell you weren't wearing your seat belt. What are you going to say? That putting on a belt was too much work? That you don't like the way belts restrict your movements and why get used to them anyway because it's just a matter of time before air bags are installed on all cars?

Friend, if you're gambling on the air bag as the future protector of life and limb, you've got your money on the wrong horse. In fact, the air bag may be the biggest boondoggle, the cruelest hoax, ever laid at the feet of the American driving public by this country's growing and elusive transportation-industrial complex.

The mandatory air bag installation date has already been moved up two years from 1974 to 1976, and will be moved still further into the future until the concept is dropped altogether. When all the politicians, public relations men, and corporate officers have milked the air bag issue dry, and when the government and industry lawyers have come to a grinding halt after months of attempting to answer the obvious liability questions should an air bag fail to open in an accident, the whole concept will have died an early death for one outstanding reason — air bags don't adequately do the job for which they were designed.

In theory the air bag (or passive restraint) is to lie dormant under the dashboard until the moment of impact, then instantly inflate with a bang. The car's occupant is theoretically held in place during the impact, then set free seconds later when the bag deflates.

There are some obvious, but still unanswered, questions raised by air bags. When the impact comes (perhaps after driving a car 50,000 miles without an accident) will the long dormant air bag actually inflate? If it does inflate, what damage will humans sustain from the passenger compartment being filled with a huge balloon in a half-second's time? In a multiple impact accident (a third of all accidents are estimated to be of this type), will the air bag inflate when the car hits a mail box, then instantly deflate (as it's designed to do) leaving the victims defenseless when their car careens into a tree? Finally, do air bags provide adequate lateral protection, or will the victims fly out a window during a roll-over only to be crushed by their own car as it completes its roll as has happened to air-bag protected live apes in roll-over testing?

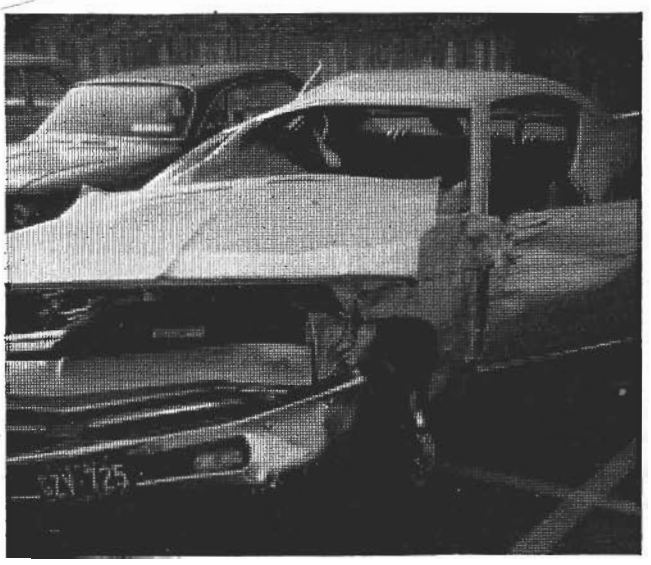
The auto industry is aware of all these limitations of the air bag system and they've made their doubts known to the government but, the testing continues and the results are still disheartening.

General Motors, a strong opponent of air bags, began to wonder how well the lap-shoulder belts they installed in all new cars since January 1968 were protecting accident victims. Maybe adequate accident protection already existed in cars and people just weren't using the available protection. Maybe the air bag was superfluous.

So, W.D. Nelson, an engineer at GM's Safety and Research Labs was put on the project and during the past three years he has studied more than two hundred accidents in which the victims were wearing either lap or lap-shoulder belts. The results of Nelson's study were presented in two papers during 1971. One (a study of 160 accidents) was delivered before the Society of Automotive Engineers, and the other (a study of 230 accidents) was presented before the American Association for Automotive Medicine. Nelson could report the following: 25 percent of the cars involved received major damage; 61 percent of the victims received no injury; 37 percent of the victims received minor injury; and only *one* percent of the victims received fatal injuries.

With thanks to General Motors, the Society of Automotive Engineers, and W.D. Nelson, we present 15 cases culled from Nelson's engineering papers. If these cases don't convince you shoulder harnesses are as good as anything else likely to come along, then there's no hope for any of us.

— *Chris Packard*



The female driver of this vehicle stated that she was traveling down the highway at approximately 60-65 mph, when a pet cat in the rear seat area suddenly jumped into the driver's lap and began biting and clawing. When the driver attempted to remove the cat, she lost control and the vehicle rolled over. The driver, a female, 54 years old, 5 ft. 2 in., 135 lb. was using a lap-shoulder belt. She had a small cut on the ear from flying glass and a large cut on the hand requiring stitches. The laceration on her hand was produced by the cat and she was required to stay in the hospital by her doctor for observation of the cat-inflicted injuries. The right front passenger, a 23-year-old, 5 ft. 10 in., 168-lb. male, was unrestrained. He was hospitalized for three days. His injuries consisted of loss of blood due to a severe laceration of the neck and a slight concussion.

There were four occupants in this 1969 Firebird — all using some type of webbing restraint system. The vehicle was traveling at approximately 45 mph when a passenger car made an unexpected, quick turn across the path of the Firebird. The unrestrained driver of the other car was killed. The vehicle deformation of the Firebird was 65 in. The driver, who was a 21-year old, 175-lb. 6 ft. 1 in. male, was wearing a lap belt with a loose shoulder belt. He was hospitalized for three hours with sore ribs from the shoulder strap, a slight sprain on the right knee, and a sprain on the left knee and left ankle. His right front passenger, an 18-year old female, who weighed 130 lb. and was 5 ft. 7 in. tall, was wearing a shoulder and lap belt with the shoulder strap adjusted loosely. She was hospitalized for four hours with lacerations to the top of the head, face, and hand. All of these injuries were related to the door glass or windshield. The right rear passenger, a 19-year old, 165-lb., 5 ft. 8 in. male, was wearing a lap belt. He had no injury. The left rear passenger, a 17-year old female, 130-lbs., 5 ft. 8 in. tall was also wearing a lap belt. She was hosiptalized for internal injuries.

The untrained driver of this vehicle lost control of the car at 60 mph when she experienced a left rear tire blowout. The car left the roadway and rolled over two or three times. The roof deformation was 16 in. on the right side of the vehicle but all areas of the roof were deformed. The 29-year old, 123 lb. 5 ft. 7 in. female driver was using a lap and shoulder belt and was hospitalized with the following injuries; cuts and scratches to the head, both hands, both feet, both knees were bruised and bruises from the lap belt were noted in the abdominal area. The left shoulder was bruised with muscle and tendon injuries and she complained of soreness in her back.

The vehicle in this case was attempting to pass a car traveling 50 mph, pulling a four-wheel farm trailer loaded with corn. The trailer began to whip and "fishtail" and was struck by the overtaking car causing 13 in. of deformation into the right side and the tearing away of some of the side structure. Only the two rear seat occupants, of the four occupants in the car, were injured. The driver, a person of small stature, was unrestrained and probably protected from injury by the 185 lb., 6 ft. 3 in. right front passenger who was using both the lap and shoulder belt. The full restraint possibly prevented the ejection of both front seat occupants. Both rear occupants were unrestrained and ejected from the vehicle. The left rear occupant suffered abrasions to his back while the right rear occupant was hospitalized for four days for treatment of a leg facture and lacerations. ⟩⟩⟩

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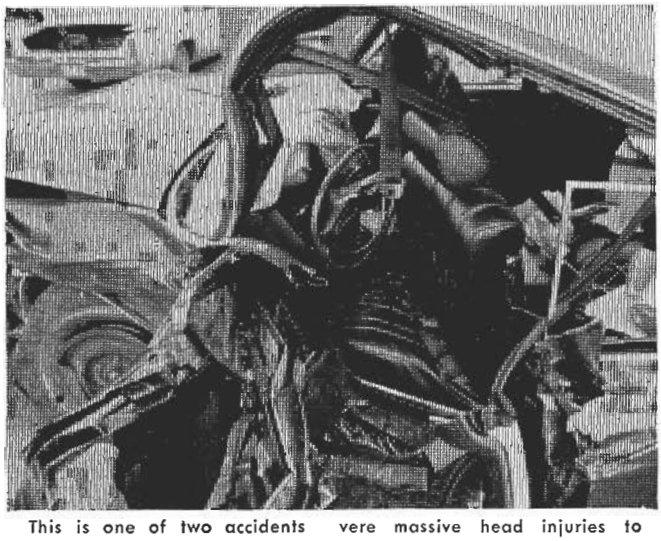
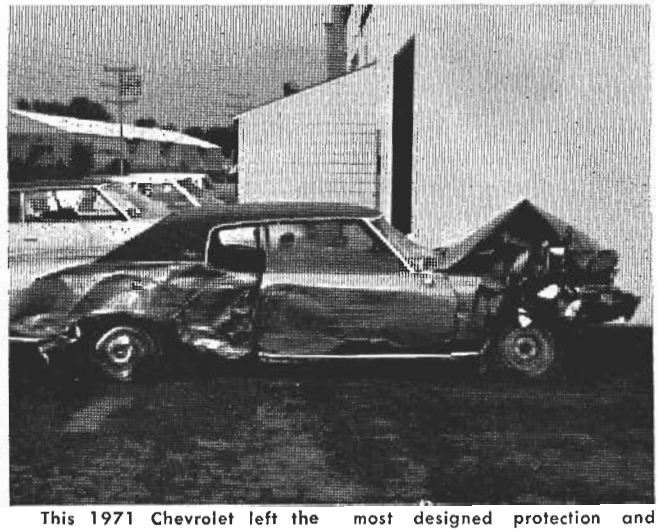
The driver in this case was returning from a skin-diving training session when he attempted to exit at an interstate roadway ramp at 70 mph plus. After leaving 146 ft. of locked-wheel skid marks on the pavement, the vehicle struck the guardrail. The combination of the exit ramp fill section and the vaulting effect of the guardrail caused the car to become airborne for approximately 70 ft. clearing a group of small children playing along the side of the expressway. The car then rolled approximately 200 ft. end-over-end and side-over-side before coming to rest. The roof deformation was 27 in. The lap-shoulder belted driver, a 27-year old, 163-lb., 6 ft. male received the following injuries: abrasion to the left side of the head and right arm, fractures of the scapula and vertebral column, and a contused heart.



This is one of two accidents involving a fatality to a lap-shoulder belt user. This 1969 Continental was traveling at approximately 70 mph on an interstate type roadway when another vehicle traveling in the opposite direction skidded across the median directly onto its path. The deformation of the struck vehicle was so great that the right rear sail panel area and rear deck lid entered the normal passenger compartment area of the Lincoln. This encroachment of the habitable space resulted in severe massive head injuries to the driver who was restrained with a lap-shoulder belt.

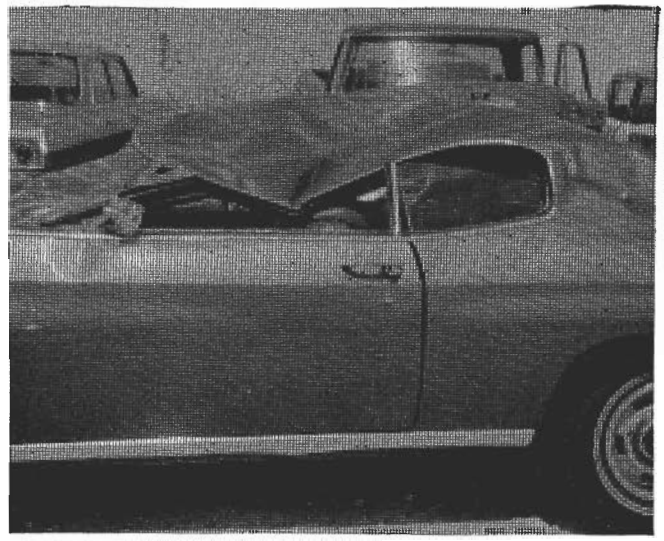
Although a state trooper reported removing the restraint combination from the driver, the unusual location of the upper torso belt on its storage hanger raises a question of its usage.

The right front passenger in the Lincoln was hospitalized for a prolonged period with multiple body injuries. The single driver occupant of the opposing vehicle, although lap belted, was ejected and fatally injured.



This 1971 Chevrolet left the road on a curve, struck a large mail box, struck a 20-in. dia. tree with the right front corner of the vehicle, continued on side-swiping three more 20-in. dia. trees with the right side of the vehicle before eventually coming to rest. Multiple impact collisions such as this accident can force an unrestrained occupant from the area where he has the most designed protection and therefore, is apt to increase injuries as well as the possibility of ejection. The driver in this particular accident was wearing both a lap and shoulder belt and remained in the driver's seated position. The 40-year old, 245-lb., 5 ft. 10 in. male received bruises to the nose, the areas around both eyes and a minor laceration of the left hand.

In 1970 the U.S. had 16 million crashes—1,300,000 injured, 54,800 dead

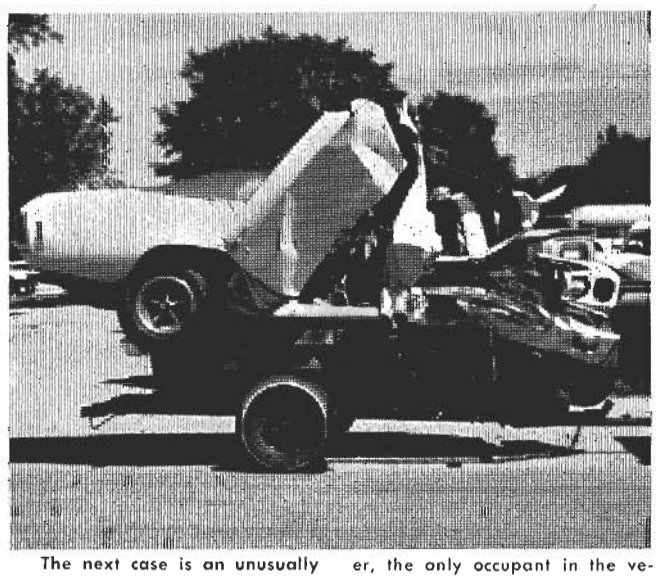


This is a single-car accident involving a drinking driver. The vehicle left the roadway when the driver reached down to get something from under the seat, went through a fence, rolled over and came to rest, wheels on top of a large gas meter. Both occupants were wearing both the lap and shoulder belts and received minor injuries. The driver, age 20, 150 lbs., 5 ft. 7 in. tall had a minor cut on the left forearm, a bruise on the right thigh, and complained of soreness on the right side of his neck for about 24 hours. The right front passenger, a 15-year old, 170 lbs., 6 ft. 1 in. tall male, complained of pain at the back of his neck for about 16 hours. The roof deformation was 18 in. Note that the area directly above the driver's seating area has been pushed down to and past contact with the headrest.

This 1969 Chevelle was forced off the roadway by an oncoming car while it was traveling at approximately 60 mph. The driver lost control of the vehicle on the shoulder material and struck a cypress tree approximately 6 ft. in diameter at an estimated speed of 40 mph. Vehicle deformation as 37 in. The 38-year old driver, 165 lb. 5 ft. 9½ in. tall, was wearing a lap belt with a shoulder belt adjusted loosely. He required first aid for a one-inch cut over the right eye, a minor abrasion on the right cheek, a minor bruise on the right elbow, sore shoulder muscles on the left side, and minor bruises to both knees.

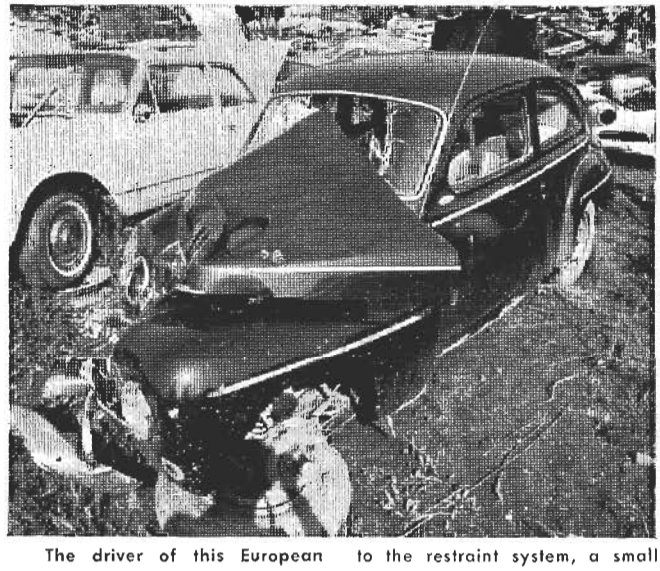
This 1971 Chevrolet four-door hardtop proceeded to cross an intersection after stopping at a stop sign and was struck in the right side by another passenger car traveling 60 mph. Exterior deformation was about 25 in. The driver was the only occupant in this vehicle and he was wearing a lap and shoulder belt. He was 42 years old, 140 lbs., 5 ft. 8 in. tall. His injuries consisted of a minor laceration on the forehead requiring four stitches, bruises on the right shin, left knee, and finger of the left hand.

Seven of eight cars have seat belts yet only 40% of the belts are used regularly



The next case is an unusually severe, single-car collision, head-on with a concrete bridge. Vehicle deformation was 95 in. Note that the right front wheel has been forced back into the rear seat area. The driver of the vehicle alleges that he was dodging an oncoming truck that was passing another truck. The driver, the only occupant in the vehicle, was wearing both a lap and shoulder restraint. He was 21 years old, 150 lbs. 6 ft. tall. His injuries consisted of a fractured jaw, multiple cuts on the neck and jaw, complaints of pain in the chest region, plus dislocations of the right hip and right knee.

Fewer than 10% of the drivers whose cars have shoulder belts actually wear them



The driver of this European car survived a moderately severe frontal collision with the corner of a concrete wall, resulting in 24 in. of frontal deformation. The driver, age 23, 163 lbs., 5 ft. 11 in. male was wearing the three-point shoulder system tightly. His injuries consisted of a small laceration of the chin, a left clavicle bruise, left pneumothorax, abrasions on the right iliac crest, all probably related to the restraint system, a small laceration on the left wrist and a comminuted fracture of the femur. His injuries are not typical of lap-shoulder belt usage and were intensified because the webbing (lap and shoulder belt are one continuous piece) separated at its routing on the left side of the seat during the collision. The chest and leg injuries may be related to this separation.

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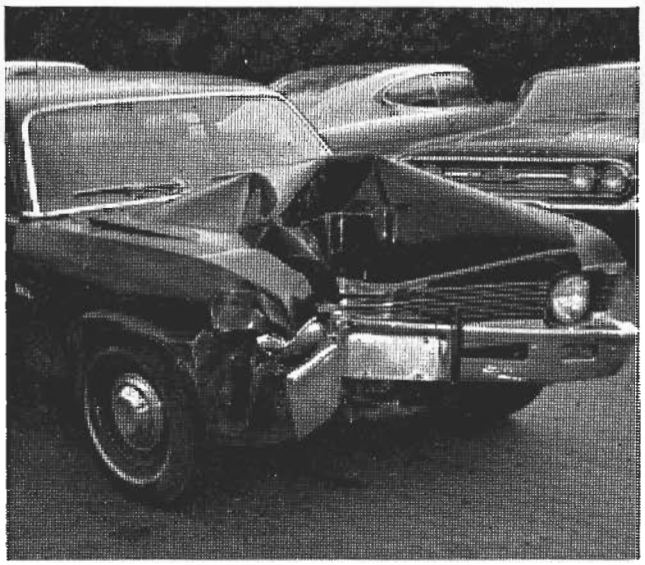
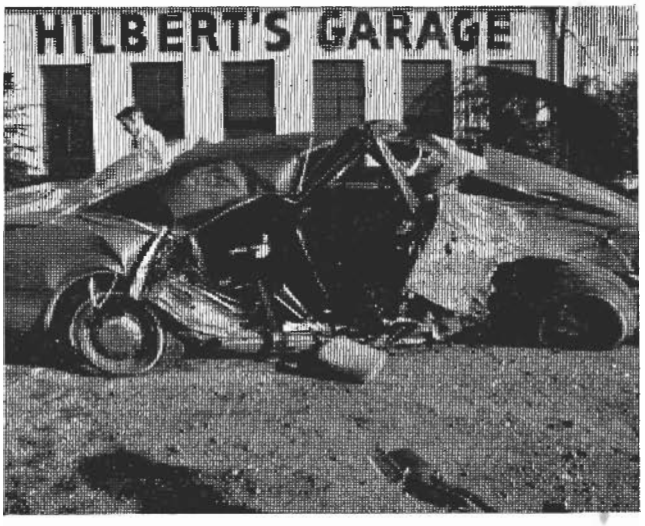


The driver of this vehicle fell asleep as his vehicle was entering a curve. The 1969 Chevy II struck a concrete bridge abutment at an estimate speed of 35 mph resulting in a frontal crush of 20 in. The lone occupant, who was a 23-year old, 6 ft. in., 210-lb male, wearing a lap-shoulder belt, had bruises on both knees.

We estimate the use of seat belts save 2,800 -3,500 lives in 1970.

This collision occurred in a heavy fog when the vehicle ran off the right shoulder at approximately 45 mph, sideswiped a metal post at the right side of the car, and was eventually stopped when it impacted the rear of a parked car. Deformation at the center front of the vehicle was 25 in. The lone occupant of the vehicle, a 20-year-old, 140-lb., 5 ft. 9 in. male, was wearing the lap and shoulder belt. He was treated at the hospital for a scratch on the jaw and soreness in the fingers of his right hand. Total damage to the car was $3,497.99.



This is one of the few lap-shoulder belt cases involving a fatality. It is a sideswipe type car-to-tree collision which occurred at an estimated speed of 60 mph. The collision seriously encroached on the right passenger space, and it is doubtful that the lap-shoulder belt combination in any way altered the fatal injury pattern. There were three occupants in this vehicle all using some form of restraint system. The driver, a 19-year old, 120-lb., 5 ft. 5 in. tall male, was using the shoulder belt only. This is not recommended usage and may increase the injury risk. The longitudinal deceleration of the vehicle was not large enough to induce any significant shoulder strap loads; consequently; the driver received only a bruise and abrasions to the left elbow and right index finger. The right front passenger was 26 years old, 135-lb. and 5 ft. 8 in. tall. He was using the complete lap-shoulder belt system. His injuries consisted of an abrasion of the right side of the face, multiple puncture wounds of the right elbow with avulsion of tissue, right shoulder severely lacerated, puncture wound of right chest wall, small abrasion on left nipple, and a small abrasion on right superior iliac spine. The latter two injuries were associated with the lap-shoulder belt. Other serious injuries consisted of a lacerated aorta, separation of the sternoclavicular joint, fractures of ribs 1-4 on the right side, fracture of the right iliac crest. He was pronounced dead at the scene. His injuries were belived to have been causd by direct body contact with the tree.

The right rear passenger, a 21-year old male, 145-lb., 5 ft. 1 in. tall, was using a lap belt. He received dangerous-to-life injuries consisting of avulsion of the right arm near the elbow, almost complete amputation of the right leg, fracture of the maxilla, a fractured dislocation of the right elbow, and comminuted fracture of the right femur.

If everyone wore seat belts, there would be 8-10,000 fewer deaths.

Statistics and opinions from the National Safety Council

U.S. seat belt manufacturers

American Safety Equipment Corp.
16055 Ventura Blvd.
Encino, Calif. 91316

General Safety Corp.
23001 Industrial Drive West
St. Clair Shores, Mich. 48080

Hamill Manufacturing Co.
61166 Van Dyke Ave.
Washington, Mich. 48094

Irvin Industries Inc.
1315 Versailles Rd.
Lexington, Ky. 40501

Jeffrey-Allan Industries Inc.
2100 Greenleaf St.
Evanston, Ill. 60202

Pontonier Division
Gateway Industries Inc.
8825 South Greenwood Ave.
Chicago, Ill. 60619

Jim Robbins Seat Belt Co.
332 Cass Ave.
Mt. Clemens, Mich. 48043

Superior Industries International Inc.
14721 Keswick St.
Van Nuys, Calif. 91409

Deist Manufacturing Co.
911 South Victory Blvd.
Burbank, Calif. 91502