CALIFORNIA ASSOCIATION
OF ACCIDENT RECONSTRUCTION SPECIALISTS

SKIDMARKS

JUNE 2014 – VOLUME 16, NUMBER 2

GM chairwoman Mary Barra: Has GM pulled a Pinto?

In this issue:

THE BOARD BEAT

Membership

As we begin the second half of 2014 the organization is in the best shape ever. We are continuing to provide better, more cost effective training than any other organization in the industry. Membership is strong, and we average 10 new members each month. Our quarterly training days are consistently attended by about 100 members statewide.

We will be entering our membership renewal period at the end of June. Except for those who have paid in advance, all memberships will need to be renewed July 1st, 2014. Many of you have taken advantage of automatic renewal via PayPal and will receive an "early warning" that your card will be charged. Those of you who opt out of automatic payments will need to login and pay via PayPal or send a check to CA²RS Headquarters.

3rd Q Training

The subject of the 3rd Quarter training will be Forensic Mapping with a Total Station, presented by Joel Salinas. In the morning, Joel will provide classroom training on scene mapping before going outside to provide some practical training with your own total stations.

After lunch, Joel will cover vehicle damage profiling with a total station. Again there will be classroom lecture followed by practical experience. Damaged vehicles will be on hand for realistic training.

Bring your own total stations!

Northern California Training

August 5th, 2014,
JFK Library,
555 Santa Clara St, Vallejo, CA 94590

Southern California Training

August 7th, 2014
Location TBA

Annual Conference

The CA²RS 2014 Annual Conference is scheduled for October 23-25, 2014 in South Lake Tahoe, California. This conference should be one of the best we have had and will likely be a sell-out. We will have a limited number of seats for this event so don't delay in reserving your spot once we open registration.

We have top notch speakers scheduled for the conference this year. Gary Cooper, Roger Barrette and Adam Hyde of Cooper Barrette Consulting (http://cooperbarretteconsulting.com/) have agreed to present this year's program. These men are all affiliated with Northwestern University, one of the top institutions in the study of Accident Reconstruction.

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Day 1:

Gary Cooper: Accident reconstruction methods using momentum and energy and comparing it to CDR data using case studies.

Day 2:

AM: Roger Barrette: Accident reconstruction methods utilizing the Monte Carlo Method with case studies.
PM: Adam Hyde: Tire Mark Identification with case studies.

Day 3:

Adam Hyde: Accident reconstruction methods using Force Balance with emphasis on energy and stiffness coefficients for side impacts. Also, side impact force balance analysis and comparison to CDR data-case studies.

The ACTAR exam will be offered on Wednesday, October 22, 2014.

WREX 2016

Finally, mark your calendar and start saving for WREX 2016 to be held May 2-6, 2016, at the Rosen at Shingle Creek Hotel and Conference Center in Orlando, Florida.

What is WREX 2016? It is the World Reconstruction Exposition, a worldwide collision reconstruction expo. It is sponsored by (currently 16) collision reconstruction organizations from the U.S. and foreign nations. CA^{2}RS is involved in the planning of this event and is represented by CA^{2}RS Board Member Bill Focha.

There will be presenters and vendors from around the world. There will be a large vendor presence as most of the East Coast and Middle America collision groups will not have a conference in 2016. The crash day will have automobile, motorcycle and commercial vehicle collisions. There will be a second day of field exercises designed to cover issues such as scene mapping, vehicle inspection, headlight mapping and perception/reaction time.

You can go to http://wrex2016.com and register for emails to receive the latest information. The website will be up shortly and you will be able to register for the conference. CA^{2}RS members will be eligible for a discount on the registration. The registration fees are tiered to increase as the conference approaches, so sign up early.

The host hotel, The Rosen Shingle Creek (http://www.rosenshinglecreek.com), is an incredible property and is close to Disney world. The hotel rooms are greatly discounted with rooms starting at $149.00. There are a limited number of rooms blocked for Law Enforcement Officers at a Government Rate of $ 112.00.

Regards,

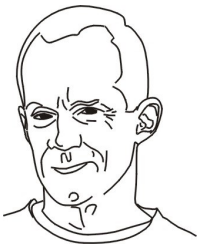
John Crews

CA2RS Board, Member at Large

Letter from the editor

Dear CAARS members,

This current stretch of time finds me in Italy on a longer-term research project. It has little to do with accident reconstruction, but I shall use the opportunity, probably in the next newsletter, to report on how accident reconstruction is carried out in Italy. My Italian academic colleagues are, however, somewhat involved in vehicle handling. I have already attended two PhD seminars on vehicle-related topics: 1) discussion of a new, high-tech motorcycle braking system and 2) presentation of a methodology for determining a vehicle's roll angle when it is in a banked turn. They tell me that our research group has connections with Brembo Brakes, used on all the professional Formula 1 cars and on Ferraris and many motorcycles, and with sensor companies that make *inertial platforms*, used in vehicles to determine accelerations in multiple directions.



Every quarter on this newsletters cover I try to put the topic that seems to have had the biggest hold on the press during the previous quarter. This time it's the GM recalls that appeared over and over in the press. Toyota has had and continues to have its own problems in this area too. Thus coverage of both appears here.

While traffic accidents are, as our community knows, an everyday event on California's streets, highways, and freeways, I include coverage this time of the horrendous FedEx truck/bus accident involving high school students from L.A., traveling to Arcata to visit Humboldt State as potential students there. This collision was bad enough that the NTSB is investigating it. It is still a mystery, as of this writing, why the southbound FedEx tractor-trailer crossed the median of I-5, precipitating the collision.

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Upcoming ACTAR Examination Dates and Locations

September 2014

28 September – Glendale, AZ, sponsor: SATAI. New applications must be received by 28 July. Exam registration cut-off date is 28 August. Held after the SATAI Fall Conference.

October 2014

3 October – Seattle, WA, sponsor: WAITAI. New applications must be received by 3 August. Exam registration cut-off date is 3 September. Held at Seattle PD—Airport Way Center.

22 October – South Lake Tahoe, CA, sponsor: CAARS. New applications must be received by 22 August. Exam registration cut-off date is 22 September. Held before annual CAARS conference, Embassy Suites hotel.

November 2014

12 November – Salem, OR, sponsor: OSP. New applications must be received by 12 September. Exam registration cut-off date is 12 October. Held at Oregon Public Safety and Standards Training Facility.

There are other tests offered in other parts of the country and Canada. Please go to ACTAR test website listed below for these dates. All test dates above subject to new testing regulations, which prohibit the use of electronic devices for testing. Go to www.actar.org/test.html for additional information.

I haven't driven much while here in Italy, but I did drive up over the Alps to Munich one weekend. Yes, often the Italians drive crazy, but they have nothing on the nuts playing bumper cars on the freeways of L.A.! At least the Italians maintain a semblance of order by driving on the right and passing on the left. I've mentioned this before. This orderliness in American driving habits seems to have gone by the board over the last 20 years. How did this driving habit disappear? This is a mystery to me. But it's one that ought to be brought back just for safety's sake. Simple rule: if you're not passing somebody and it doesn't look like you're going to any time soon, move to the right. What happens otherwise is that a perfectly good four-lane freeway becomes a clogged up artery, where the faster drivers have to weave right and left to get around slower people who are driving willy-nilly all over the road. Lane-changing is a maneuver where accidents occur, so it should be minimized in safe driving. It's maximized when drivers are driving randomly in all lanes of a freeway, not self-segregating by speed. Well, off the soapbox now; I've had my rant about this pet peeve.

Anyway, while coming back, some curious cars passed me. The German car companies use a crazy camouflage scheme when they put a prototype car on the road to test it out. The car is white with a black pattern (see photos below). Thus you see the car, but you really can't make out its shape. There are many, many cars with this camouflage rolling around the streets and roads of Bavaria, of course the "B" in "BMW". While going over the two-lane pass from Germany into Austria, I came across this scene. A hybrid BMW model was being accompanied by two other company cars, apparently outfitted with radio gear to monitor driving data coming from the "Hybrid Test Vehicle". All were going faster than they should have been and all three were pulled over, having tickets written by the Austrian highway patrol when I stopped. Anyway, maybe we'll see this car on the road in California next year or the year after.

Technical advances seem to be bringing driverless-cars closer and closer to reality. Two obstacles, besides technical ones, that seem to me to be still in the way are:

1) The law requires a driver to be at the steering wheel of a car to be able to take over the driving in the event of a failure of the automatic system. Here's the problem with this. A person in the driver's seat who is not driving may not be paying attention. He or she may then have to take over driving in the event of a system failure, having to make split-second decisions, perhaps in a very awkward moment, when the control is taken over from or handed over by the automatic system? This is not going to work very well. Aircraft accidents have already demonstrated this. Not so long ago an Air France flight from Rio to Paris disappeared over the Atlantic. As it turns out, the autopilot got confused because of failing speed sensors and dumped the airliner into the hands of and alert, seemingly ready-to-fly crew. But they too were confounded by the speed indications and wound up stalling the airplane into the middle of the Atlantic Ocean, killing everyone aboard. Dropping an automatic system out of auto and into man-

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ual mode in the middle of a crisis often does not end up very well. And it's not going to when a distracted John or Jane Doe takes over driving tasks in the middle of an emergency. How this problem will be solved is not so clear.

2) Legal questions remain about who will be held responsible in a crash when one of the vehicles is under automatic control. Is it the person sitting in the driver's seat? Is it the vehicle manufacturer? These questions remain unanswered. Driverless cars will make driving safer, I am convinced. Most accidents can be traced back to human error. It would be a shame if this technology could not be exploited because the legal issues cannot be resolved. More injuries and fatalities will occur if this issue is not resolved. Because of this, I can easily imagine the opposite situation in the future, where a driver is sued for NOT having the robotic driver engaged during a crash. Thus, driverless driving is a win-win situation for attorneys: they can sue if it's used and they can sue also if it's not used. Those crafty lawyers! Are they behind the development of driverless cars?

Last, to follow on from my article in the last newsletter about rotation during a skid, the Technical Corner this time deals with an application of controlling rotation, namely Electronic Stability Control. I had some questions running around in my head about this so decided to investigate it, and the results of this show very well the importance of understanding rotation in a skid.

Best wishes,

Frank Owen

editor@ca2rs.com

CAARS third quarter training

Topic: Forensic mapping with a total station

Presented by Joel Salinas in Northern California on Tuesday, 5 August 2014, from 0800 to 1700 at the JFK Library, 555 Santa Clara Street, Vallejo, California. Southern California presentation will be on Thursday, 7 August 2014, from 0800 to 1700 at a location TBA.

CAARS annual conference

Topic: Various accident reconstruction methodologies presented by instructors affiliated with Northwestern University's Center for Public Safety

The 2014 CAARS annual conference will be held 23-25 October (Thursday-Saturday) in South Lake Tahoe, California. Registration for the conference will be available at www.ca2rs.com. See this issue's Board Beat for details on the program. You must be a current CAARS member to get the membership price. Note also that the ACTAR exam will be offered Wednesday, 22 October.

World Reconstruction Exposition (WREX) 2016

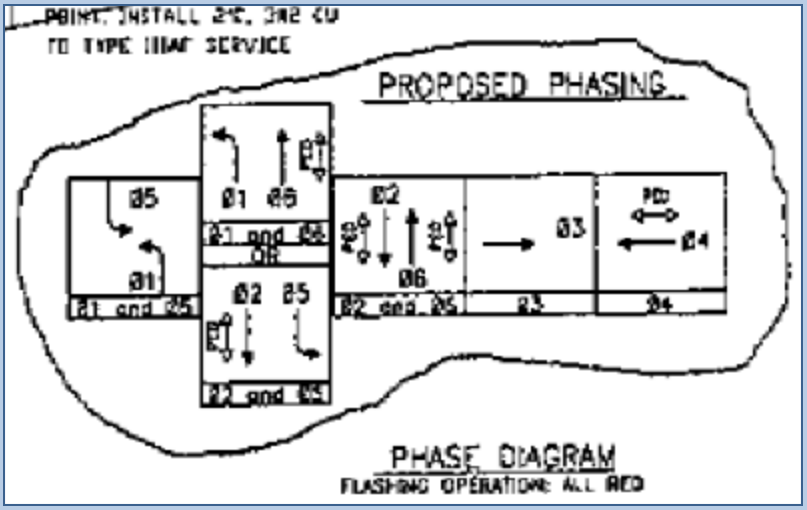
WREX 2016 will be held 2-6 May 2016 in Orlando, Florida. CAARS is a sponsor of this event. See this issue's Board Beat for further details on this exposition.

CAARS SECOND-QUARTER TRAINING

Red light, green light: Reconstruction of intersection collisions

By Roman Beck, Beck Forensics, Inc., San Diego, California

Figuring out who ran the red light is sometimes a matter of he said-she said. Today's traffic signals are not the same, dumb non-programmable devices of yesteryear. Today, many traffic signals are on-demand signals that sense a vehicle's presence and change state when there is a demand to do so—to turn left or to cross an intersection whose light, by default, remains red on a crossing street.



Phase diagram that shows sequence and duration of signal intervals

As is often the case in accident reconstruction, time, distance, and velocity are key players. And analysis involving a traffic signal means coordinating vehicles' motion with the automated timing of the stop light. Sometimes what a driver says doesn't match up with the timing and order of an intersection's traffic signals. That's the message given at the CAARS second-quarter training, held 29 April at the Davis PD and 9 May at USC. The presenter was Larry Neuman, PE of Loomis, California. Knowing how traffic signals systems work can often help the investigator determine who did and who did not run a red light.

Larry's presentation was built on a series of case studies and class problems, analyses he performed during the course of his 25 years of experience as a civil and traffic engineer handling intersection collisions. These examples contained key terms and illustrated potential pitfalls. Crucial to these analyses is obtaining the timing sheets and phase diagrams of the traffic signals, which can be done via polite phone calls, public records request, or subpoena. The next step is for the investigator to determine if the traffic signals are actuated by vehicle and/or pedestrian demand or if the signal timing is fixed. Because both types of traffic signals can vary in timing and order, depending on the time and day of the week, Larry suggests that the investigator visit the scene on a day and time comparable to that of the collision being investigated. Actuated traffic signals are far more common than fixed-length traffic signals, which are typically found in older, urban areas and usually lack the circular or octagonal loop detectors installed in the roadway.

The case studies were interesting because each was quite different from the others. A right-angle collision was the first case study presented. A trash truck and a passenger vehicle were traveling at 20 MPH through an intersection controlled by fixed-length traffic signals. The trash truck skidded 15 feet before impact. In this case, points of rest and witness statements were unreliable. Based upon the timing of the other intersections, the trash truck would have to travel 375 feet in either less than 5.5 seconds or more than 37 seconds, both of which were inconsistent with Larry's calculat-

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ed time of 19 seconds. Although he was not able to analyze the passenger vehicle's actions and it was not claimed that someone ran a red light, he did determine that the "description of movement by the trash truck driver is inconsistent with having a green light."

In another interesting case a southbound vehicle was traveling through an intersection controlled by actuated traffic signals and collided into a northbound vehicle that was turning left. The southbound driver claimed to have been traveling at the speed limit, which was 40 MPH; the northbound driver claimed to have been traveling at 20 to 25 MPH, and never slowed nor stopped. Both drivers claimed to have had a green light, and no witnesses were available. The default phase of the traffic light was a soft recall in the direction of the southbound vehicle. This was consistent with the southbound driver's statements. For the left turning vehicle to receive a left-turn arrow, it would have had to be stationary in the left-turn lane for at least 5.3 seconds. Given that the advance loop detector was 105 feet from the limit line, the left-turning vehicle was less than 3.6 seconds from the limit line and would have had to wait at least an additional 1.7 seconds before receiving the green arrow. Thus, the description of movement by the left-turning driver was inconsistent with how this traffic signal was programmed to work. If there had been another left-turning vehicle ahead and close to the left-turning accident vehicle, then it could have been that the southbound vehicle entered the intersection on a red light.

Larry gave the class fours problems to work on, which tested the attendees' skills. These problems included pedestrian-actuated signals, the importance of witnesses, and situations where no solution is possible.

Overall, the training session brought to light a specialized area of accident reconstruction that many are not aware of and illustrated how one analyzes a collision where the automated operation of modern traffic signals is necessary.

IN THE NEWS...

NHTSA is investigating delay of General Motors recall

by Jerry Hirsch, L.A. Times, 27 February 2014

The National Highway Traffic Safety Administration has launched an investigation into why General Motors Co. did not promptly recall more than 1.6 million vehicles after it learned that faulty ignition switches were causing fatal crashes.

GM on Thursday issued its second apology for not moving faster to fix the problem, which is linked to 13 deaths in the Chevrolet Cobalt and other small cars.

Safety experts praised the start of the investigation, which could result in up to a fine of up to $35 million, but faulted NHTSA for not taking action earlier, when it found out about the problem.

"This is a total failure of the recall system," said Clarence Ditlow, executive director of the Center for Auto Safety. "Both GM and NHTSA bear responsibility."

Sean Kane, who heads Safety Research & Strategies Inc., agreed.

"It is pretty apparent that the NHTSA enforcement division let this one slip on multiple occasions," Kane said.

After looking at the chronology of events behind the recalls this week, Sen. Edward J. Markey (D-Mass.) said the safety agency should improve the system for automaker reporting of potential safety defects.

"We need to overhaul the Early Warning Reporting system so that NHTSA is not looking at auto defects through a rear-view mirror," said Markey, a member of the Commerce, Science and Transportation Committee. "Making more infor-

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mation public can help prevent accidents and deadly crashes, and I look forward to hearing from NHTSA on this important matter."

In a statement, NHTSA said it constantly monitors a variety of data. "When the agency finds a trend that indicates a vehicle may be an outlier, we take action. The data available to NHTSA at the time did not contain sufficient evidence of a possible safety defect trend that would warrant the agency opening a formal investigation."

The agency also said that its investigators will now "determine whether GM properly followed the legal processes and requirements for reporting recalls."

Part of the problem is that NHTSA does not have a big enough budget to follow every lead, Ditlow said.

"NHTSA can't put a cop on every block," he said. "The system is built on trust that the manufacturer will do the right thing."

GM recalled the vehicles in two phases this month, but documents filed with the federal safety agency demonstrate that the automaker first learned of the problem in 2004.

The recall covers the 2005-07 Chevrolet Cobalt, 2007 Pontiac G5, 2003-07 Saturn Ion, 2006-07 Chevrolet HHR, 2006-07 Pontiac Solstice and 2007 Saturn Sky.

The ignition switches in the recalled vehicles can be inadvertently turned from the "run" position to the "accessory" position while the car is being driven. When this happens, the engine shuts off and safety systems — including power steering, anti-lock brakes and air bags — are disabled. This has led to at least 31 crashes and the 13 deaths.

The 2005-07 Chevrolet Cobalt is among the vehicle models being recalled by General Motors over faulty ignition switches. (Kamil Krzaczynski, European Pressphoto Agency)

News of the investigation prompted a second apology from GM on Thursday.

"We deeply regret the events that led to the recall and this investigation," the automaker said in a statement. "We intend to fully cooperate with NHTSA and we welcome the opportunity to help the agency have a full understanding of the facts. Today's GM is committed to learning from the past while embracing the highest standards now and in the future."

General Motors had acknowledged Tuesday that it reacted too slowly to the safety issue.

The automaker said the parts to fix the cars probably won't be available until early April. It plans to notify vehicle owners about when they can make repair appointments at dealers.

Until then, both NHTSA and GM are urging drivers of the cars to use only the ignition key, with nothing else on the key ring, when driving the vehicle. Heavier key rings can make the ignition switch more likely to fail.

According to documents filed with the safety agency, GM knew of the defective ignition switches as early as 2004, and issued a service bulletin for its dealers in 2005. GM encouraged dealers to tell affected customers to remove all unnecessary items from their key chains.

An analysis by the Center for Auto Safety found that a NHTSA Special Crash Investigations team first encountered the problem in a crash that killed a 16-year-old in 2005. The agency sent an information request to GM about a year later. Another NHTSA team began investigating a similar crash that killed a teenage girl in Wisconsin in 2006.

That team discovered that GM had issued the service bulletin to its dealers detailing the problem, but not a recall.

See full story.

L.A. TIMES: OPINION

Has GM made any cars recently that don't have to be recalled?

by Paul Whitefiild, L.A. Times, 20 May 2014

- **GM, the new poster boy for bad engineering and poor quality control**
- **With GM leading the way, 2014 is shaping up be a record year for vehicle recalls**
- **As vehicle recalls rise, will a future L.A. be a rail/bike/bus utopia? Are you crazy?**

It's odd, and I'm old, but I don't ever recall seeing so many carmaker recalls.

Or, put another way: Has General Motors built *any* cars recently that don't need to be recalled?

On Tuesday, the new poster boy for bad engineering and poor quality control (seizing the crown from former champ, uh, chump, Toyota) issued still another recall, this one involving 2.42 million vehicles for four separate issues. That's on top of the 2.6 million vehicles GM has recalled for faulty ignition switches, bringing its grand total this year to -- wait for it -- 13.1 million vehicles.

So if the crazy guy texting and weaving in the lane next to you doesn't kill you, your own car just might.

Though there is a silver lining in GM's recall cloud: It has (bad) company. As my colleague David Undercoffler reported: "This latest round of recalls puts 2014 on track to be the busiest recall year ever. With nearly 23 million vehicles recalled, the auto industry is well on pace to beat the 30.8-million vehicles recalled in 2004."

Whoopee. So if the crazy guy texting and weaving in the lane next to you doesn't kill you, your own car just might. It's (almost) enough to make you want to take the train (though not the bus; *never* the bus). Could we actually, shudder, be headed toward a day when biking to work is better?

Sorry. Got a little feverish there. This is L.A., land of the freeway, home of the Bimmer. Not gonna happen.

But the details of the GM recall do give one pause. As Undercoffler wrote:

"The most serious issue involved 1,402 Cadillac Escalades and Escalade ESVs from the 2015 model year. The hulking luxury SUVs have front passenger airbags that were not properly attached to the instrument panel. As a result, they may only partially deploy in a crash.

"Demonstrating the gravity of the problem, GM sent letters, emailed, and called all 224 owners of the vehicles and warned them not to drive with people sitting in the front passenger seat until the vehicles can be fixed. No accidents or injuries have been reported as a result of this issue, GM said."

Now, I suppose the good news is that GM discovered the glitch before anyone got hurt. Then again, that raises the question of why GM couldn't, or didn't, discover the glitch *before* it was a glitch.

The damage this is doing to GM is dramatic. The recalls have forced the company to take a $400-million charge against second-quarter earnings. Which is a lot, but it could well be chicken feed compared with the long-term damage to GM's reputation among the car-buying public.

But as Toyota's experience shows, you *can* both build faulty cars and still sell lots of cars. In fact, over at iSeeCars.com., they've helpfully compiled a list of the least and most recalled car makes since 1985 (a shout-out to Forbes contributor Jim Gor-

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zelany for finding this). Here's the list, with the recall rate versus sales in the U.S. from 1980 onward:

- Mercedes-Benz USA: 2.1 million recalled/5.2 million sold; 0.41 recall rate.
- Mazda Motor Corp.: 5.2 million recalled/9.4 million sold; 0.55 recall rate.
- General Motors: 99.3 million recalled/153.2 million sold; 0.65 recall rate.
- Nissan North America: 19.1 million recalled/26.8 million sold; 0.71 recall rate.
- Subaru of America: 4.3 million recalled/6.0 million sold; 0.73 recall rate.
- Kia Motors: 3.7 million recalled/4.9 million sold; 0.77 recall rate.
- Toyota Motor Corp.: 38.6 million recalled/48.1 million sold; 0.80 recall rate.
- BMW of North America: 5.1 million recalled/5.7 million sold; 0.90 recall rate.
- Ford Motor Co.: 97.0 million recalled/104.7 million sold; 0.93 recall rate.
- American Honda Motor Co.: 31.1 million recalled/32.9 million sold; 0.94 recall rate.
- Chrysler Group: 63.2 million recalled/63.2 million sold; 1.00 recall rate.
- Volvo Cars of North America: 3.3 million recalled/3.1 million sold; 1.05 recall rate.
- Volkswagen of America: 10.2 million recalled/9.7 million sold; 1.06 recall rate.
- Mitsubishi Motors North America: 5.3 million recalled/4.8 million sold; 1.09 recall rate.
- Hyundai Motor Co: 9.9 million recalled/8.7 million sold; 1.15 recall rate.

Kinda sobering. Though personally, I'm feeling OK.

You see, I drive a Mazda.

L.A. TIMES—OP-ED

Has GM pulled a Pinto?

by Jonathan Turley, L. A. Times, 14 April 2014

In the late 1960s, a charismatic vice president at Ford Motor Co. decided to bring out a low-priced car that could be produced for little money while bringing in huge profits. The executive's name was Lee Iacocca, and the Ford Pinto he championed became one of the most infamous models in U.S. automotive history. Why? Because to save money, Ford released a car that could explode in even low-speed rear-end collisions.

I still teach the Pinto case to my law students as an example of how profits sometimes overwhelm principle. Even a savings of a couple of bucks per vehicle becomes significant when multiplied over the course of production.

Recently, another Detroit CEO, Mary Barra, sat before a congressional committee answering withering questions

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about the Cobalt, a low-cost car produced by General Motors with a design flaw that the company acknowledges was responsible for more than a dozen deaths. For those of us who teach the Pinto case, the similarities are unsettling.

As with the Pinto, the problem with GM's Cobalt involved a design flaw — in this case, a faulty ignition switch that could shift, under certain circumstances, from the "run" position to the "accessory" position while the car was being driven. This led to a loss of power and a shutdown of both the power-steering and air-bag systems. Documents indicate that GM knew of the defect as far back as 2004, but the company did not recall vehicles until February of this year. By that time, the flaw had been implicated in at least 13 deaths and 31 crashes.

So, has GM pulled a Pinto? You be the judge.

The impetus for Ford's making the Pinto came from Iacocca himself, who wanted to achieve a 2,000/2,000 car: a vehicle that would weigh less than 2,000 pounds and could be sold for less than $2,000. That was the holy grail of the industry, considered a sure bet to make a fortune.

To meet those goals, however, the Pinto was stripped of some basic safety elements. The car was fitted with a flimsy chrome bumper located just inches from the gas tank, which had design flaws of its own. The combination of problems meant that the gas tank was likely to rupture and explode in even low-speed collisions. This risk could have been largely abated by an inexpensive standard gas tank liner and other simple, non-costly fixes, including some costing as little as a couple of dollars per car.

A driver's warning on the backside of her car in 1976 reflects the fact that the gas tanks in several Ford Pintos exploded after rear-end collisions. (Los Angeles Times)

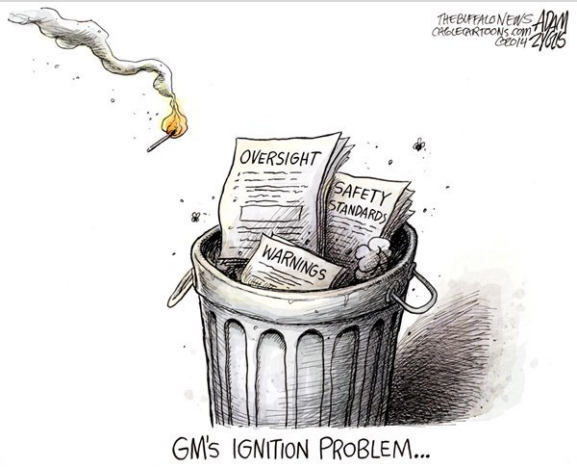
The company's own crash tests before the Pinto's release made clear that the gas tank was subject to rupture in a rear-end crash at relatively low speeds. But a reluctance to add cost to the car — a production-line fix would have added, by Ford's estimate, about $11 a car — kept the company from addressing the problem in advance. Later, when the scope of the problem was becoming clear, Ford executives calculated that it would be cheaper to pay out damages than to spend the money to protect drivers and passengers.

By the time the Pintos were coming off the line, its chief champion, Iacocca, had been named president of Ford. Later, he headed Chrysler, where he was credited with bringing the company back from the financial brink and was embraced by presidents and the public as an icon of the industry.

Iacocca fared a lot better than some Pinto owners. One case we study in class is that of Grimshaw vs. Ford Motor Co. The case was brought on behalf of Richard Grimshaw, who was 13 and riding in his neighbor's Pinto when it was hit from behind after stalling on a road. The driver suffered severe burns to her entire body, which led to her dying shortly thereafter from heart failure. Grimshaw survived but with permanently disfiguring burns to his entire body. The jury appeared as horrified by Ford's disregard of customer safety as it was by the crash itself. It hit Ford with a $122-million punitive award, which the court later reduced to $3.5 million.

According to documents, it appears that GM identified the problem with the Cobalt in the early 2000s but rejected a fix due to a "tooling cost" deemed too high. The families and friends of those who died because of the Cobalt's design flaws — like those who lost loved ones in Pintos — would certainly disagree.

Jonathan Turley is a law professor at George Washington University.



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(SANTA ROSA) PRESS DEMOCRAT EDITORIAL (4 APRIL 2014)

Fatal failures by GM and its watchdog

General Motors gambled, and Amber Marie Rose lost.

So did at least a dozen other people, many of them young women, all of them victims of fatal crashes involving Chevrolet Cobalts and other small cars made by GM.

As much as three years before the Cobalt's introduction in 2004, the automaker discovered a faulty ignition switch that can cause the car to shut off, disabling the power steering, power brakes and air bags.

Repairing the defect takes about an hour and, according to some reports, the replacement part costs less than $1. Yet a GM executive rejected a proposal to fix the switch in 2005. Evidently, it was more cost effective to quietly settle lawsuits. Crash victims were collateral damage for a company struggling, unsuccessfully, to avoid bankruptcy.

GM waited more than a decade to initiate a recall that now extends to 2.6 million vehicles. But GM isn't alone in its reckless disregard for its customers. The National Highway Transportation Safety Administration failed, too.

Despite accident reports, consumer complaints and a recommendation from a top staff member, the watchdog agency twice opted against opening an investigation of GM.

Rose's mother investigated, finding that a disproportionate number of victims were teenagers — her daughter was 16 when she was killed in 2005 — or young women. Because of their inexperience behind the wheel, safety experts say, these drivers may have been especially vulnerable when their cars unexpectedly lost power.

GM is in crisis mode: expressing remorse, pledging accountability, hiring a lawyer specializing in disaster payouts.

“Mistakes were made in the past,” GM chief executive Mary Barra told the House Energy and Commerce Committee this week. “We will not shirk from our responsibilities now and in the future.”

Congress can help Barra keep her promise. First, it must demand answers from NHTSA officials about their failure to pursue complaints about the Cobalt and other GM cars. Consumer groups say the agency is too cozy with the auto industry.

“They now refer to the auto companies as 'their customers,'” Clarence Ditow, executive director of the Center for Auto Safety, told CNBC recently. “The American public is their customer. They regulate the auto industry.”

Changing that attitude is a start, but Congress also must address its failure to provide adequate financial and legal resources for the task.

Continued on next page...

In 2010, Congress rejected legislation to boost funding for auto safety investigations. And while automakers must report safety defects to the NHTSA, there isn't a criminal penalty for failure to comply.

Moreover, much of the information held by the NHTSA isn't subject to disclosure under the Freedom of Information Act, leaving people such as Laura Christian, Rose's mother, to rely on media reports and Facebook posts for information about auto safety defects.

Automakers would be required to report fatal accidents, and the NHTSA would be allowed to provide more information to the public, under legislation proposed by Sens. Edward Markey, D-Mass., and Richard Blumenthal, D-Conn.

Their bill won't help Amber Marie Rose, but it might save someone else's daughter.

BUT G.M. ISN'T ONLY AUTOMAKER WITH RECALL WOES

Toyota admits deceiving consumers; $1.2-billion penalty is record

by Jerry Hirsch, L.A. Times, 19 March 2014

Carmaker says it misled consumers and regulators about two defects that caused sudden-acceleration incidents. 'Toyota put sales over safety, and profit over principle,' FBI says.

In a landmark settlement of criminal charges, Toyota Motor Corp. admitted deceiving regulators about deadly safety defects and agreed to pay $1.2 billion, the largest penalty ever imposed on an automaker.

In the unprecedented deal with the U.S. Justice Department, the world's largest automaker admitted it misled consumers about two defects that caused unintended sudden-acceleration incidents — sticking gas pedals and floor mats trapping the pedals.

"Toyota put sales over safety, and profit over principle," said George Venizelos, assistant director of the FBI. "The disregard Toyota had for the safety of the public was outrageous. Not only did Toyota fail to recall cars with problem parts, they continued to manufacture new cars with the same parts they knew were deadly."

The agreement underscores a new era of aggressive crackdowns on automakers accused of covering up safety concerns, with criminal charges as the primary deterrent. As prosecutors embark on a new criminal inquiry into delayed recalls by General Motors, the Toyota settlement hands safety advocates two hard-won victories — unlimited criminal and civil penalties.

The criminal investigation resulted in a fine that's 35 times the maximum penalty that the National Highway Traffic Safety Administration can levy against an automaker.

"That will change their behavior far more than a civil penalty ever will," said Clarence Ditlow, executive director for the Center for Auto Safety. "It is a game changer."

Prosecutors also forced Toyota into a rare agreement not to claim the settlement as a tax-deductible expense. That will save taxpayers an estimated $420 million, according to the U.S. Public Interest Research Group.

Federal officials said the settlement proceeds will go into a general "asset forfeiture" fund at the Justice Department and that people who believe they were hurt by Toyota's actions could apply for compensation.

The settlement brings Toyota's tab for the sudden-acceleration ordeal to about $5 billion in fines, settlements, repair costs and lost sales. To be sure, Toyota can afford to pay: The automaker is expected to announce a profit of nearly $19 billion for the fiscal year ending March 31.

Toyota was formally charged with one count of wire fraud, which will be dismissed after three years if the automaker

Continued on next page...

abides by the settlement terms. Prosecutors typically charge wire fraud in cases in which they suspect the use of phones, email and other electronic communications for criminal purposes.

“Entering this agreement, while difficult, is a major step toward putting this unfortunate chapter behind us,” said Christopher P. Reynolds, chief legal officer of Toyota Motor North America. “In the more than four years since these recalls, we have gone back to basics at Toyota to put our customers first.”

Reynolds said the automaker has improved quality control by responding more quickly to customer concerns and giving more autonomy to regional managers.

Toyota's lengthy history of sudden acceleration was the subject of a series of Los Angeles Times articles in 2009, after a horrific crash outside San Diego that took the life of an off-duty California Highway Patrol officer and his family.

The Times reports examined the long history of sudden acceleration in Toyota vehicles and the growth of the problem after the automaker moved to electronic throttle systems.

Toyota, which has blamed the problem on mechanical rather than electronic issues, said the acceleration issues are responsible for five documented deaths. But the Center for Auto Safety estimates that the problem has caused hundreds of fatalities and injuries.

Prosecutors said Toyota executed a “campaign of disinformation” to fool regulators and consumers about the depth of the safety problems.

Toyota “cared more about savings than safety, because it cared more about its own brand and bottom line than the truth,” U.S. Atty. Preet Bharara said.

As far back as 2007, Toyota knew that its gas pedals could become stuck under floor mats and had internal reports that identified design problems, prosecutors said. But Toyota resisted recall suggestions, instead negotiating with the National Highway Traffic Safety Administration to call back only a limited number of extra-thick all-weather floor mats rather than actual vehicles.

“Toyota was positively jubilant about that result, noting in an internal email that it had saved ‘$100 million plus in unnecessary costs,'” Bharara said.

That agreement paved the way for the 100-mph crash of the Toyota-built Lexus ES that killed the Highway Patrol officer and his family, Bharara said. Investigators believe the sedan went out of control after a floor mat jammed the gas pedal in the open position, but the car was too badly damaged to know for sure.

Following the crash, Toyota recalled eight models that NHTSA said had floor mat problems, but the automaker failed to recall three other models — including the popular Corolla — even though Toyota engineers knew they were vulnerable, prosecutors said.

“So the truth is that Toyota hadn't fully addressed the problem after all, despite all the public pronouncements,” Bharara said.

Toyota admitted in the settlement that it pursued a similar strategy in handling related problems with a gas pedal mechanism that could make the accelerator stick.

The automaker kept that issue hidden from U.S. regulators even though it had ordered a design change for cars in Europe and had scheduled a fix for U.S. cars as an “urgent” measure, the U.S. attorney said.

“In the midst of the firestorm over the San Diego accident and unwanted acceleration problems, what did Toyota do? It quietly canceled the ‘sticky pedal' fix in America,” he said. “Toyota executives directed employees not to put anything about the cancellation in writing and to avoid a paper trail.”

Analysts say General Motors Co. has kept an eye on Toyota as it faces its own crisis. GM is now under fire for waiting a decade to recall cars that have an ignition switch problem linked to at least 12 deaths. It's clear that GM took lessons from Toyota's early resistance to taking responsibility for safety defects.

See full story.

Toyota payment could be glimpse into GM's future

by Tom Krisher, Associated Press, 19 March 2014

DETROIT — General Motors, beware.

Wednesday's announcement that Toyota will pay $1.2 billion to avoid criminal prosecution for hiding information in a recall case could be a glimpse into your future. It's also a warning to anyone selling cars in the U.S.: Although the federal government's road-safety watchdog doesn't have big fangs, the Justice Department does.

The National Highway Traffic Safety Administration's maximum fine for hiding information is $35 million, a pittance to automakers. But the Justice Department can reach deeper into your wallet and hurt your reputation with damning public statements.

Attorney General Eric Holder announces a $1.2 billion settlement with Toyota over its disclosure of safety problems, Wednesday, March 19, 2014, during a news conference at the Justice Department in Washington. (AP Photo/Susan Walsh)

Shortly after the announcement, Attorney General Eric Holder issued an apparent warning to GM and other automakers, saying the Toyota deal was "not necessarily the only time we will use this approach."

General Motors Co., which is facing a federal criminal probe over delays in recalling small cars with a deadly ignition switch problem, has many parallels to the Toyota case.

Toyota got into trouble for withholding information from NHTSA about floor mats that can trap gas pedals and make cars accelerate wildly, and for concealing a problem with sticky gas pedals that can cause unwanted acceleration. According to court records, the company recalled some models for the floor mats while knowing that others had the same problem.

At GM, the company has admitted knowing about the ignition-switch problem for more than a decade, yet it failed to recall 1.6 million small cars until last month. During the wait, at least a dozen people died in crashes because the faulty switches moved out of the run position, disabling power steering and brakes. Air bags also didn't inflate.

"We now see what GM may be facing," said Peter Henning, a law professor at Wayne State University in Detroit and a former Justice Department prosecutor. "If you have comparable conduct inside the company, the government is going to come down hard."

The Toyota payment changes the model for regulating auto safety in the U.S. Before Wednesday, safety issues had been almost the exclusive domain of NHTSA. Now, the government has raised the stakes with criminal actions, Henning said.

"GM has to be concerned what kind of a hit there is going to be to the bottom line," said Henning, who predicted that GM's penalty could rise toward $2 billion because its recall delays lasted longer than Toyota's.

The Toyota penalty is a "game changer" that will force automakers to take notice, said Clarence Ditlow, executive director of the nonprofit Center for Auto Safety. "Until today, automakers faced insignificant fines and no criminal penalties," he said.

Even with a $1.2 billion penalty, the bigger issue for both GM and Toyota is damage to reputations.

Before a highly publicized 2009 unintended acceleration crash that killed a California Highway Patrol officer and three family members, Toyota was known by all for reliability, and it was gobbling up sales and market share in the U.S.

See full story.

HORRENDOUS SEMI/BUS CRASH IN ORLAND KILLS 10, CAUSE STILL UNKNOWN

NTSB: No evidence of fire before FedEx truck crashed into students' bus

by Alan Duke, CNN, 13 April 2014

Cell phone video recorded from inside a car clipped by a FedEx tractor-trailer truck before it slammed into a bus carrying students in Northern California is being reviewed by investigators, the National Transportation Safety Board said Sunday.

The driver of the Nissan Altima that passed the bus just before the crash reported seeing flames coming from underneath the FedEx truck, but investigators have found no physical evidence of a fire before the collision, said Mark Rosekind, an NTSB board member.

The truck clipped the car occupied by Joe and Bonnie Duran before it crashed into the bus Thursday evening, killing 10 people -- five high school students, three chaperones and the drivers of both vehicles. More than 30 people, mostly teenagers, were taken to local hospitals.

Bonnie Duran told the CNN affiliate KOVR the truck was on fire before it hit the bus. She said she made a quick decision to swerve to avoid a direct hit from the truck, sending their rental car into a ditch. The video captured from inside the Durans' vehicle is being examined for clues, Rosekind said.

A CBS News animation shows close the car being driven by Bonnie and Joe Duran (right) came to colliding with the trailer-truck. Bonnie said the truck was on fire before the crash. (Ed: This has been disputed by the NTSB.)

Despite the initial lack of physical evidence of a fire before the crash, "nothing is ruled out yet," Rosekind told reporters at a news conference Sunday.

The NTSB team is looking at the FedEx driver's last 72 hours to determine whether he had enough rest and whether he was using his cell phone when he lost control of his truck, Rosekind said. "Fatigue, distraction and other human performance issues are at the top of our list."

Dash-camera video from the first California Highway Patrol vehicle on the scene could also help investigators understand what happened in the minutes after the crash as both vehicles burned, he said.

Investigators are interested in knowing whether passengers on the bus, which was new, were wearing seat belts, Rosekind said. Some bus passengers were ejected from the vehicle, including the ones who died, he said.

The investigation shows the southbound truck did not brake as it crossed the median at a 10-degree angle and entered the northbound lanes, Rosekind said Saturday. Investigators found 175 feet of tire marks left by the bus, indicating the driver tried to avoid crashing into the truck.

A computer on the truck that could have revealed how fast the truck was traveling -- known a the electrical control module -- was destroyed by fire, he said. The electrical control module on the bus survived but has not yet been examined, he said.

See full story.

Mother of student who died in fatal bus crash sues for $100 million

by Christine Mai-Duc, L.A. Times, 23 April 2014

The mother of a 17-year-old student who died when a FedEx freight truck slammed into a college-bound bus in Northern California, creating a fireball of wreckage, has filed a wrongful death lawsuit, claiming the company's vehicles have a history of catching fire.

The lawsuit, filed Tuesday in Los Angeles County Superior Court, is the first to be filed since the April 10 collision, which occurred after the FedEx truck crossed a median. Five students from Southern California high schools and three adult chaperons bound for Humboldt State University perished in the fiery crash, as did both the drivers.

Rosa Rivera, the mother of Dorsey High School student Jennifer Bonilla -- described by friends and teachers as a bright, spunky teenager on the brink of going to college -- is seeking $100 million in general and punitive damages, said attorney A. King Aminpour.

See full story.

Flames engulf the vehicles just after a head-on crash near Orland, Calif., involving a FedEx truck and a bus carrying Los Angeles-area high school students on a visit to a college. (Jeremy Lockett / Associated Press)

Student violinist injured in Northern California crash sues FedEx

by Joseph Serna, L.A. Times, 7 May 2014

A student injured in a deadly bus crash last month between a FedEx truck and a charter bus carrying prospective college students to Humboldt State University has filed a lawsuit in Los Angeles County.

Miles Hill, 18, filed a suit Tuesday that seeks unspecified damages against FedEx and Silverado Stages, the bus company that was shuttling dozens of students from Southern California to Humboldt for a weekend tour.

In the suit, Hill blames FedEx for causing the April 10 crash, in which the truck sped out of control across a highway median and slammed head-on into the charter bus, killing the two drivers and eight others, including five students.

See full story.

Another student's family sues FedEx in deadly Humboldt-bound bus crash

by Joseph Serna, L.A. Times, 20 May 2014

e family of a Los Angeles student killed last month when the charter bus he was in was hit by a FedEx truck in Orland, Calif., is filing a wrongful death lawsuit.

Ismael Jimenez, 18, was among 10 people killed April 10 when a FedEx truck on southbound Interstate 5 crossed the highway into oncoming traffic and slammed head-on into the charter bus that was carrying students headed to Humboldt State University for a weekend tour.

See full story.

TECHNICAL CORNER

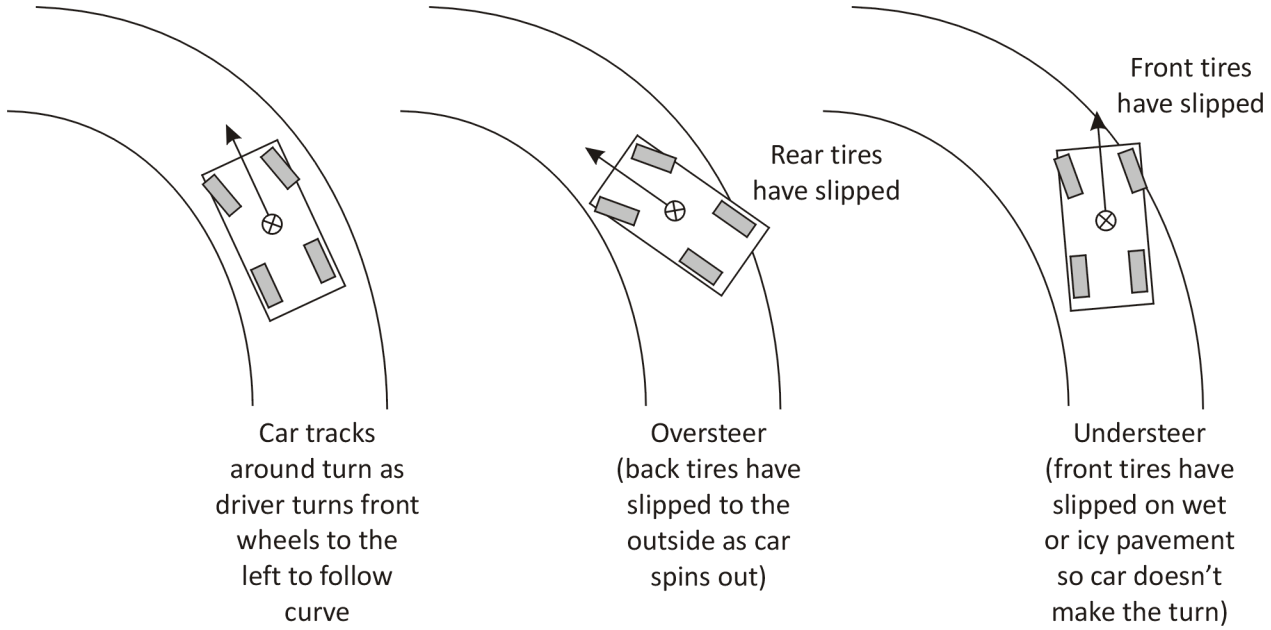
Electronic stability control

by Frank Owen, Alpha Omega Engineering, Inc., San Luis Obispo, California

In the spring newsletter I made an initial stab at explaining the dynamics of rotation while skidding. This explanation will be on-going and will become more thorough in subsequent newsletters. Since that explanation might leave you thinking, "What's a useful application of this?", it's worthwhile to see how it is indeed employed in Electronic Stability Control (ESC). This system is commonplace in today's vehicles. In fact it became mandatory in 2012. It's also not very well understood by accident reconstructionists, so it's worthwhile to gain a little understanding of it and also to see how it springs into action to prevent the loss of control.

All control systems function by sensing a *desired value* and comparing it to an *actual value*. They take action when these two are not the same. A very good example of this is a cruise control system on a car. The driver sets the speed by engaging it at the desired speed. If this speed changes—for example when the car comes to a grade—the speedometer senses this, that there is a difference between desired and actual values—and the throttle is applied to bring the car back up to the desired speed, even on the grade. This is a simple control system because there is one input, the speed sensor, and one output, the throttle.

An ESC system is a little more complicated because more sensors are needed to detect when the car is out of control or about to be out of control. This, in fact, is a big part of the problem with loss of control. It happens so quickly that a human controller (the driver) can't detect and comprehend what's happening until it's too late. Thus one important feature of ESC is that, since it's a computer-controlled system, it's fast, very fast, in fact much faster than a human. So it can detect, comprehend, and react in a split second. In accident reconstruction in a normal, standard braking situation, we know that it takes a driver about a second or a little longer even to perceive a hazard and decide



Normal steer, oversteer, and understeer

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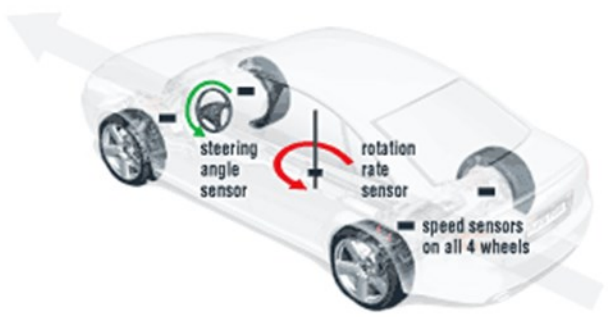
to react to it, then it takes a little more time (0.25-0.5 seconds) for him/her to actually go to full braking. In a skidding situation, this type of delay is the difference between remaining under control and skidding out off the road into a tree or ditch.

For an ESC system, the desired value is the *yaw rate*, i.e. how fast the car is rotating about a vertical axis through its center. You might think, "Well, the yaw rate should always be 0." But when you steer around a curve, the direction of travel is changing at a certain rate. Thus the car is rotating about its vertical axis at some (slow) predetermined rate. If the back wheels skid out, the car yaws faster than it should. This is called *oversteer*. If the front wheels skid, common when you hit a patch of ice, the car continues forward and doesn't go around the curve as desired but heads instead for the outside of the curve. This is called *understeer*. Thus you can think of ESC simply as a system to avoid oversteer and understeer. That is, the ESC system checks to see what direction the driver wants to go in, from this can detect the desired yaw rate (turning speed), can sense the actual yaw rate, and then can spring into action if the two are not the same.

Another way to put this is to say that the car's computer can determine the shape of the road by looking and seeing what angle the driver has set the steering wheel at. If the car is not following the desired pathway—i.e. it's over-steering or understeering—the ESC springs into action to bring the car back into the path desired by the driver.

Obviously, then, we need some sensors. One sensor needed is a steering wheel angle sensor. The direction desired by the driver is determined by what angle he/she has set the steering wheel at. The desired yaw rate is determined by this sensor. To be able to compare this desired yaw rate with the actual yaw rate, a yaw-rate sensor is needed. This is a little electronic device placed very close to the central vertical axis of the car—that is, right in the middle between the four wheels. These two sensors determine what we want and what we have. A third sensor (really a set of four sensors) senses whether or not a wheel is slipping. Any braking that is done needs this sensor, because it is part of the automated braking system (ABS), and that is needed to prevent any skidding. Thus any braking that is applied (see below) is administered under the control of ABS to prevent any slipping.

But then how does the car react to get us out of a skid? This is the *actuation* part of the control system. And this is what pertains to the article on rotation in the spring issue of the CAARS newsletter. The key to correcting for oversteer or understeer is to be able the brake on a single wheel, something the driver cannot do. Theoretically it would be possible to put this capability into the driver's seat, but imagine being in a skid or on the verge of a skid with four brake pedals and having to decide in an instant which one or ones to push. That wouldn't work very well.



Three primary sensors for electronic stability control

As was described above, oversteer occurs when the rear wheels skid sideways toward the outside of a curve. In this situation, the rear wheels, which are skidding, are not very effective if braking is applied to them. To correct oversteer, braking on a front wheel must be done. On the other hand, understeer is the result of the front wheels skidding and not following the curve in the road. Thus the front wheels are not effective, and braking needs to be applied on a rear wheel. The figure below shows this.

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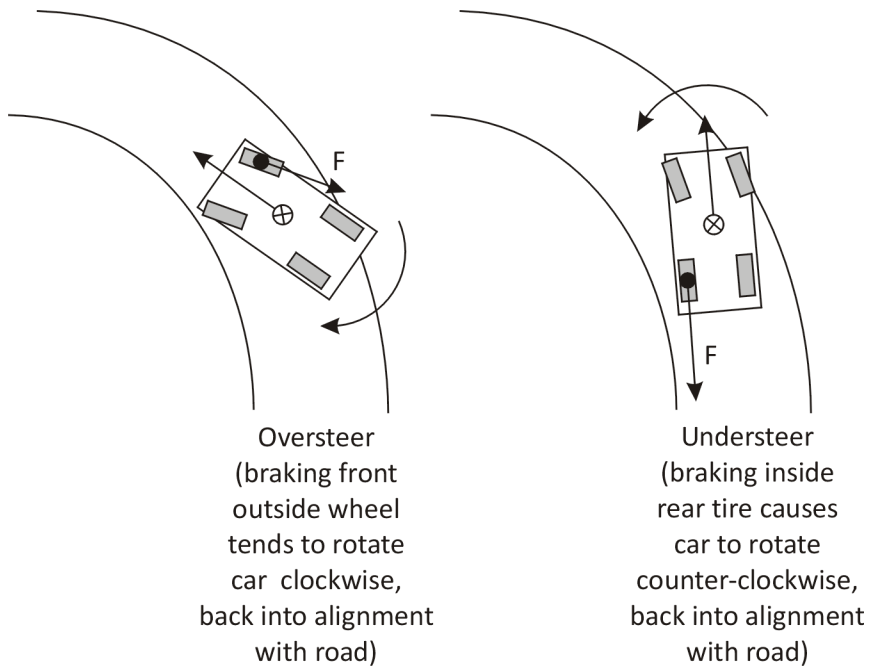
In oversteer, shown on the left, the back wheels are slipping sideways toward the curve. Braking is thus applied to the outer, front wheel. This exerts a clockwise torque on the car (shown by the curved arrow), and this brings the car back into alignment with the road. In understeer, shown on the right, the front wheels are slipping out toward the outside of the curve. Braking is applied to the inner rear wheel, which exerts a counterclockwise moment on the vehicle (shown by the curved arrow), and this brings the car back into alignment with the road.



Braking corrections for oversteer and understeer

A big caveat: This is highly simplified and leaves out some important phenomena, like the slip angle, due to the flexibility of the tires, and fore/aft traction control that is found on four-wheel-drive vehicles. But the description here does cover the detection of and reaction to skidding for two-wheel-drive vehicles and shows how individual wheel braking does tend to twist the car back into alignment with the roadway. Stay tuned for more on rotation, i.e. yawing, and how it affects a skidding vehicle.

The last rescue: when the accident is unavoidable

by Richard von Frankenberg

translated from the German by Frank Owen, Alpha Omega Engineering, Inc.

Note: This article appeared in the October 1956 edition of the German magazine Gute Fahrt (Nice Driving, which describes itself as "the magazine for VW drivers"). I found this magazine at a bi-annual flea market called the Auer Dult in Munich in April 2014. It is a real piece of history, taken from the days when it was still commonly asked, "Are seat belts really necessary in passenger cars?" Since this article is so long, I'm serializing it into multiple issues.

There are indeed very few people, who have been involved often enough in bad traffic accidents, that they can say something useful about the sequence of events at the instant of the accident. It would be very hard indeed to find an author with enough experience for an article on this topic. We believe, however, that we have found the right such person in Richard von Frankenberg, because he found himself in the course of his racing career more often in dangerous situations than a good, upstanding, law-abiding driver. Not to mention the times in which he was known as "der Schreckensteiner". (Ed: this is very hard to translate, but it conveys von Frankenberg's reputation as a no-holds-barred race car driver in the 1950s.) That his tips here are good, he has just proven, as he flew out of the Avus protection wall at 180 kph (112 mph) and had only a little head jarring and a few bruises.

Do you like to talk about accidents? Do you like to look at pictures of accidents?

Since you asked, I'd have to say no. I also don't put a lot of value on traffic training by using horrific photos. (I think the Americans invented this. I remember seeing somewhere a photo of a Jeep that had rolled over three times, and a dummy with dislocated arms and legs hangs out from it, and under it it says: "This will happen to you too if you drive too fast." Also a poster, showing someone passing, horrible, one sees a pool of blood and seems to be able to hear the screaming.) There are a lot of people who look at something for an instant to satisfy a need for sensationalism (or whatever you want to call it). Otherwise you wouldn't see the afternoon newspapers and the photo magazines publish such pictures: they know exactly what the reader wants, right? But even people who like to look at such photos are in no way educated to be more careful. Above all: a person forgets negative, aesthetically disgusting and shocking pictures much easier than positive memories. Thus is human nature constructed. A picture of a nice piece of cake with whipped cream stays more intensively in the memory than the picture of a traffic accident.

I was just in Sweden, where one comes across many "American" things. On a main street of Malmö every 300 or 500 meters there is a big photo. On one there is a fully wrapped head of a young girl. On the next one the leg cast of a boy. And then 500 meters further a broken arm, all larger than life-size. I find that horrible, to say it briefly. But it does nothing for traffic training.

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That was the introduction. I am supposed to write about traffic accidents and, above all, about how to behave during traffic accidents. Please, literally: "during". That means in the instant in which an accident occurs. It's therefor hard to write about this—people don't want to hear about this. I would like to assert the following: a lot less would happen if people now and then thought about the theory of an accident, if people earnestly put the question before themselves: what would I do if things really started crashing?

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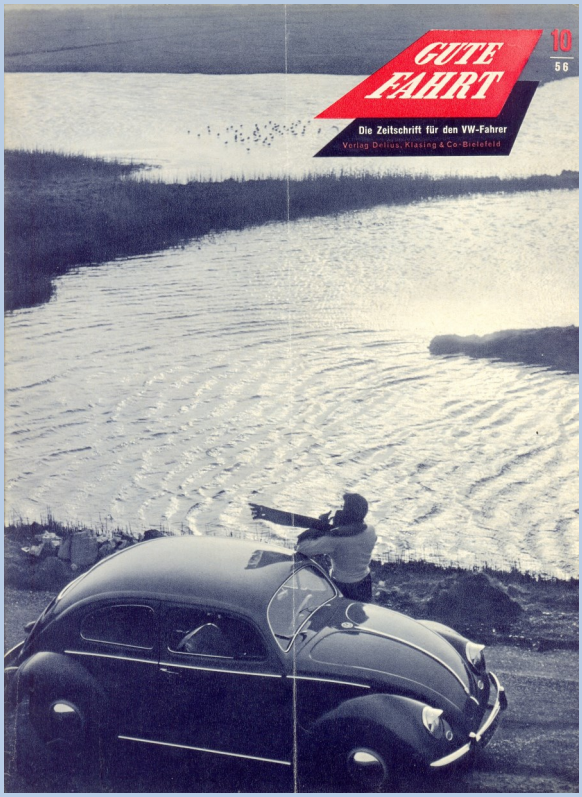
One would rather not address this unpleasant question, for who likes to think about accidents?

Besides, there is a certain vanity in many drivers that whispers to him secretly: "If you think about accidents, then maybe you'll have one! Anyway, haven't you already driven eight years without an accident?"

Another vanity (completely false, I need not emphasize) can be found when talking to the sales directors of many large auto manufacturers. It centers namely on the question, "Should one put a safety belt on the list features of a production car or not?"



Cover of October 1956 issue of Gute Fahrt, the magazine for VW drivers.

Why shouldn't they? It's simple—for then the customer would say: "Aha! They sell a safety belt as a feature for this car. It must not be very safe, if someone needs a safety belt."

On this point it seems to me that the Americans are much more sympathetic. For almost two years now with most big manufacturers one can order a safety belt just like one can order a radio, and often both of these are already included in the purchase price. And for children these belts have been available already for a number of years. And people are very satisfied with this.

Thus I am already in the middle of the subject I wanted to talk about. That wasn't really my intention. I wanted first to sketch out the method by which we go forward with this topic. One must first clearly separate three processes from each other. First, there are driving technics that one can use in an accident, which is no longer avoidable, to reduce its severity. Second, there are adjustments that one can make in a car that lend themselves to protecting the lives and health of the passengers. Third, there are actions for the driver and passengers that during an accident seem appropriate but that really are not so appropriate.

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Let's start with the driving techniques. The fundamental principle in an accident is: It is better to crash into something that is not moving than it is to crash into a vehicle that is coming at you. The most horrible accidents are head-on collisions where the two cars are coming at each other at speed. Expressed concretely: Better to crash head-on into a tree than to crash into a car that is coming at you at 60 kph (38 mph) or 80 kph (50 mph). The so-called "passing accidents" are the worst. Someone is passing and another is coming in the opposite direction. The passing driver made a mistake—he mis-estimated, was careless, or was just dumb. He had only a small interval and he didn't have enough acceleration. The car coming opposite brakes, but that isn't enough anymore either. Then, usually, the road isn't wide enough to accommodate three vehicles abreast, even when the passing car presses close against the tractor-trailer that the driver wanted to overtake. Then there is only one thing for the on-coming car to do: get off the road. Avoid a head-on collision at all costs!

This "get off the road" is easier said than done, for on the edge of the road this is often some kind of obstacle in the form of a sidewalk, grass, or a curb. To be able to come up on this obstacle, one must jerk and hold the steering wheel sharp-

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ly for a rather long moment, so that the wheels develop a pretty good angle toward the obstacle. If this isn't done, then the care just slides along the obstacle and the car doesn't come up onto the obstacle. Worst yet, this leads to the development of a roll-over torque.

After this short jerk on the steering wheel, the driver shouldn't then just let the car be catapulted off into the countryside. For often the "countryside" consists of ditches, trees, and drop-offs, which, however, are all better than an oncoming car, even thought that is small comfort. One should try to stay as close to the road as possible and to come back onto the road as soon as possible. In the "ideal case" (if one would like even to use this phrase at all in the event of a crash), one should only give way enough to avoid the head-on crash with the other car. A corner-to-corner crash is always better than a head-on, frontal collision: the corner-to-corner crash always is followed by a skidding movement. The kinetic energy of the vehicle is thus not dissipated all at once. Thus the passengers and driver are exposed to a much smaller crash than in a head-on collision.

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I recall a situation related to this that I encountered one winter. The road was dry, but right and left the snow was piled rather high, also on the grass strip at the edge of the road. This snow intruded onto the roadway, so that it seemed a little narrow than usual. Coming towards me was a car that was overtaking a truck. I was driving about 80 kph (50 mph) or 90 kph (55 mph). The road was good and also clear. I saw already from the distance that the car was overtaking the truck with some difficulty—at say 50 khp (30 mph) or 60 kph (38 mph). So I let off the gas, so that the overtaking car would have enough room to pass the truck. Who can describe my surprise, as I saw—originally not visible—a second car in the wind shadow of the slowly overtaking car that, in all peace of mind, wanted also to overtake the truck, even without having any visibility forward?

There was no way that this second car had enough room to get by the truck. And it was so close by now, that there wasn't even anything that could be done just by braking. There we were, each of us at 50 or 60, heading at each other head-on! I tried then the single possibility that still remained, to the right into the snow, with a single quick jerk. It worked, and, thank God, the ditch was so full of snow, that I easily went over it. Then came an embankment, which the car went down like a bobsled. After 30 or 40 meters excursion, we came back to the road unscathed…whereupon I immediately braked, in order to turn around to drive back to confront the other driver, whom I called something that cannot repeat here! He had, however already voluntarily stopped. But from shock he was unable to get out of his car, because he had already imagined me in a fully destroyed car.

Ed: To be continued…

"What the...? Can't you see that I'm trying to make a call here?"

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