by Jack Stout

Emergency Vehicle Driver Training

Two Schools of Thought

My wreck happened early one morning in the winter of 1960. The streets of Falls City (Neb.) were literally sheets of ice. I carefully crossed the intersection, steered my father's mint condition 1953 Cadillac slowly toward the stop sign at the foot of the hill, and discovered I could neither stop nor significantly alter my trajectory. Thus, in excruciating slow motion, I creamed nice Mrs. Johnson's brand new Buick which was stopped at the bottom of the hill.

Lucky for me, human necks were more durable in 1960 than they are today, so Mrs. Johnson demanded only the repair of her bumper and trunk lid. Back home, I began to explain the inevitability of this event to my father (i.e., if God had been driving, it still would have happened) but was rudely interrupted. Dad asked one question: Was I behind the wheel at the time of the accident? I admitted I was. "Then you are at fault," said my father. "From now on, when accidents happen, be somewhere else." He wasn't joking.

During the years that followed, I was blessed with a marvelous opportunity to develop my ability to "be somewhere else" when accidents happened. I worked as a "roughneck" on oil drilling rigs, day shifts in summers and, when a rig was drilling close to town, night shifts when high school was in session. Being the only crew member who was not only willing to drive, but who actually wanted to drive on two-lane highways and miles of gravel roads, I usually drove. As the regular chauffeur for three grizzled "oil patch" veterans – men with the absolute power to make my life pleasant or miserable – I learned to anticipate and avoid any situation requiring the sort of driving maneuvers which could cause the spilling of coffee or the interruption of hard-earned sleep.

Without knowing it, and at a rudimentary level, I was developing the skills and habits needed for high-performance, "low-forces driving." That is, the objective of my driving was to reach my destination in a timely manner without subjecting the vehicle or its passengers to the wear and tear of excessive G-forces. This objective could only be achieved by anticipating and avoiding every situation requiring rapid acceleration, rapid deceleration, or rapid change of direction. It also required gentle crossing of rough railroad tracks, washed-out sections of road, and other bumps and obstacles.

What, you may ask, does smooth, low-forces driving have to do with "being somewhere else" when an accident happens? The answer is this: by avoiding the need for high-forces driving maneuvers, one also avoids the kinds of situations which make accidents likely and sometimes inevitable.

Developing the skills, sensitivities, and awareness required to reliably anticipate and avoid such situations, even while driving ordinary automobiles under routine conditions, requires a substantial investment of effort and practice before the process becomes "second nature." An even more advanced level of low-forces driving skill is needed for "pursuit driving" of an emergency vehicle whose fully loaded weight approaches five tons – i.e., an ambulance.

While most driver-training programs employ, to some extent, a combination of high-forces and low-forces driving techniques, today's emergency vehicle driver-training programs fall into two distinct categories: those which focus primarily upon mastering the techniques of "high-forces driving" (e.g., the EVADE program – see March and May 1987 *JEMS*), and those which focus primarily upon mastering the techniques of "low-forces driving." These two driving strategies are not merely different methods of achieving the same objective. Rather, the objectives themselves are entirely different.

The primary objective of high-forces instruction is to become so skilled at executing dramatic maneuvers (e.g., rapid lane changes, skid pad recoveries, and off-road control) that it becomes possible to escape from dangerous situations after you are in them. The primary objective of low-forces instruction is to develop awareness, sensitivity, and driving skills to such a degree that heroic (i.e., high-forces) maneuvers are not required.

There are, of course, both competent and incompetent high-forces drivers, just as there are competent and incompetent low-forces drivers. The guy who coasts through a yellow light to avoid high-forces deceleration is just as incompetent and dangerous as the high-forces hotshot who applies maximum acceleration as soon as he sees the green light. High-forces driving is not necessarily "fast driving," just as low-forces driving is not necessarily "slow driving." Experience has shown that the response time performance of a highly skilled low-forces driver can equal or exceed that produced by high-forces tactics.

The following guest article was written at my request by Al Davenport, developer of the Failsafe Driving System, and co-authored by Gary Zeller, Failsafe's general manager. The Failsafe program is a premier example of a driver-training program based upon low-forces driving strategies. Al Davenport introduced the basic concept of low-forces driving to Greyhound Lines more than 20 years ago. For 10 years he wrote and produced all of Greyhound's driver training programs. Zeller has worked as an EMT, paramedic, instructor, manager and owner of ambulance services for more than 15 years. During his eight years with the ambulance division of Wishard Hospital in Indianapolis, Zeller developed a comprehensive emergency vehicle driving program which, in 1977, became the original EVADE program.

Jack Stout has been at the forefront of innovations in the design and implementation of EMS systems for the past dozen years. If you have a question, a problem, or a solution related to the public/private interface in prehospital care, address your letter to "Interface" jems, P.O. Box 1026, Solana Beach, CA 92075.

The Failsafe Driving System

by Al Davenport and Gary Zeller

High-forces driving is a scientific term for "hard driving." It usually means that drivers are pushing their vehicles to the limit. As a group, professional race car drivers are probably the best there is when it comes to skillful high-forces driving. For many of them, racing is something they do often enough to keep their high-speed, high-forces driving skills razor sharp.

Over the years there have been a number of design changes in race cars, restraint devices and protective clothing to help race car drivers survive those terrible crashes we've all seen on TV. Race car drivers also enjoy the advantages of driving in a uniform direction on uniform track surfaces with no cross traffic, and where all the drivers around them are also professional race car drivers. When an accident happens or an oil slick develops, the traffic is warned and slowed until the problem is corrected.

Given all of these advantages, you might expect that race car drivers would have a better accident record than the average driver on our streets and highways. But they don't. In fact, average drivers, with all of their faults and their horrendously more difficult driving conditions, have an accident record about 12 times better than the high-forces experts have on the race track. (Just for the record, average drivers are not all that safe to begin with. Well-trained professional fleet drivers are at least 12 times safer than average drivers.)

If the high-forces driving experts have this kind of an accident record under the ideal conditions of the race track, is it reasonable to expect that, in only a couple of days of training, any driving program can train an average driver to become skillful enough to pilot a 10,000-lb. ambulance safely through traffic using high-forces techniques, time after time, day and night, and in all kinds of weather?

The problem with high-forces driving in traffic is this: when we are racing through traffic using high-forces tactics, we will eventually get ourselves into situations which no amount of skill can get us out of. That's why race car drivers have a higher accident rate in spite of their superior high-forces driving skills, superior driving environment and far more agile equipment. By allowing themselves to approach the limits of their skills and equipment, they suddenly find themselves in situations they can't "drive themselves" out of.

So what's the answer? Do we just accept accidents as being part of the job? If so, shouldn't we reinforce the cab with roll bars, install crash absorbing bumpers, and wear helmets and special fire resistant clothes? And shouldn't we have special seat belts like the race car drivers wear? What shall we do about the innocent bystanders? And when en route to the hospital, how will high-forces driving affect patient care, not to mention patient comfort?

If there is an answer, it will not be found in mastering the skills of high-forces driving. So what is the answer? We believe it is the opposite of high-forces driving. It is mastering the skills required for high-performance, low-forces driving.

The low forces we are talking about are similar to the forces you would use if you were driving on snow. To be able to move rapidly, smoothly, and safely using low driving forces, we must learn to look far ahead for early clues of danger and make early gradual adjustments and compensations to minimize the need for high-force corrections. To see far ahead, we must stay back from the vehicle we are following so it cannot block our view. By making smooth,

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INTERFACE

low-forces moves in traffic, we must neither allow ourselves to become trapped nor trap other drivers.

Smooth, low-forces driving gives us and other drivers around us the advance notice needed to prevent collisions. Learning to do this well calls for development of a whole new set of driving skills and sensitivities. *We must learn to recognize and respond to — not just dangerous situations — but ordinary situations that are potentially dangerous.* To make this combination of knowledge, related skills and enhanced sensitivities second nature takes a lot of work and constant practice. The longer you work at it the better you become at smooth, low-forces driving, and the more it becomes an automatic part of your basic habit pattern.

The Failsafe Driving System was developed to present the basic knowledge and concepts of smooth, low-forces driving. This is done through videotaped training programs, instructors trained and certified by Failsafe Driving, and such advanced training devices as the Visual Forces Indicator and the Performance Driving Computer.

One of the problems with many driver-training programs is that they are one-shot training sessions with little or no follow-up. Even the learned skills soon deteriorate and drivers are back just about where they started. For a program to work well and produce dramatic improvements over a long period, it helps to have an ongoing monitor/training system like the Performance Driving Computer (PDC) — essentially a G-forces monitor and recorder.

From a learning point of view, the PDC works much like biofeedback. As long as the driver is operating within an acceptable low-force range, the PDC is silent. When the driver nears a pre-established threshold force, a ticking sound lets him know he is still okay but getting close to the limit. If the driver exceeds the threshold force, a low tone will sound and stay on until the forces again drop below the threshold level. Throughout the time of high-force activity, a counter is recording one count per second. Generally, from their previous training, drivers will know what they should have done differently to prevent the need for the high-force maneuver.

The tone lets drivers know that they didn't see something in time or didn't begin an action in time. With the right driver (and management) attitude, "biofeedback" from the PDC can continue

development of higher levels of awareness, sensitivity, and skill than could possibly be developed without the aid of an automated feedback device. (A few managers have made the mistake of attempting to use the PDC as "big brother" – an on-board management spy – rather than as a on-going training aid and feedback device. It doesn't work.)

Whenever the Failsafe Driving System is used correctly, it produces dramatic reductions in risk of a collision . . . never less than 50 percent and usually in the 70 to 90 percentile range and above. The very same kind of smooth, low-forces driving that reduces risk also reduces vehicle maintenance costs (20 to 50 percent), reduces fuel consumption (5 to 20 percent), increases the useful life of the vehicle (20 to 50 percent) – as well as its residual value when retired from the fleet, and reduces driver and passenger fatigue. The Failsafe Driving System was developed in 1978 and first installed in an ambulance fleet in 1979. Since that time we have accumulated numerous customer testimonials to the various advantages of the low-forces driving strategy.

However, not all ambulance fleets that purchased the Failsafe Driving System have been successful in implementing or maintaining it successfully. In the early years, management was not aware of the amount of effort required to change driver performance, and to maintain that change. Thus, a few managers underestimated the magnitude of behavioral change involved, and failed to plan for enough instructor time to help those drivers that needed it.

When the expected improvements weren't forthcoming, management became discouraged and eventually abandoned the system. Low-forces driving skills are not merely advanced versions of ordinary driving habits – they are instead an entirely new set of habits and sensitivities. A few other fleets did very well in the beginning and then became complacent and abandoned the training. This produced results that were disappointing and caused a couple of companies to give up on the system.

Most companies, though, have had varying degrees of success with their Failsafe Driving System. The more management backs the system and the more qualified training is provided for the drivers, the better the results. The typical payback for good training is four to five dollars saved for every dollar spent. It can and should be an all-win program. The drivers win because they are safer during their shift and less tired when it's over. The patients win because they are better cared for, and more comfortable en route. The public wins because they are not needlessly placed at risk by high-forces emergency drivers. The company wins because of a better public image and lower operating costs. Even the insurance company wins from reduced accident claims.

For most ambulance companies, the Failsafe Driving System will pay back the initial investment in equipment and in-house training within a year. Thus, the system is quite cost-effective. The nice part about cost-effective programs is that they don't need government funding to survive. They just need good management support and diligent training by well-qualified instructors of low-forces driving. The savings pay for the system, and then some.

An article by Thom Dick entitled "Best Drivers in the Business" (May 1987 *JEMS*) tells about another driving program called EVADE. The original EVADE program was developed in 1977 by Gary Zeller who was at that time a paramedic and staff instructor for Wishard Memorial Hospital, Indianapolis, Indiana. With a 16-hour program, consisting of eight hours of defensive driver instruction, four hours of EVADE classroom instruction, and four hours of EVADE range driving practice, Zeller reduced Wishard's accident-related losses from $30,000 in 1977 to $67 in 1980. He purposely left out tire blowout training, high-speed maneuvers and double-lane changes because he felt they should not be a part of safe ambulance driving training. Even then, without saying it in so many words, Gary was teaching a rudimentary form of low-forces driving.

Thom Dick stated that EVADE, as it is practiced in Phoenix, placed some emphasis upon vehicle familiarization, which these authors agree is especially helpful to new drivers. It is the part of the training program that could be responsible for the significant drop in the little "dings and scratches" mentioned in his article. This is a worthwhile achievement, but has little to do with the safety of the medic and others who might be injured in a high-forces collision.

Southwest Ambulance Service's collision-related losses dropped by 50 percent, according to Thom Dick's article. This is better than a number of programs we are familiar with, but doesn't begin to match the results obtainable from a well-managed Failsafe Driving System, or even those obtained by the original EVADE program. When a driver training program is truly cost-effective, the government support called for by Thom Dick will not be needed. □