

# HOW TO BUY EXCEPTIONAL SAFETY EQUIPMENT AND STILL LEAVE ENOUGH MONEY IN YOUR POCKET TO GO RACING

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## STATEMENT OF NONLIABILITY

One word about the information provided here. This report represents the opinions of the author and will not necessarily be agreed to by everyone in the safety equipment field. In our society today there are those who would bring a lawsuit because you took the advice written here and were injured in a racing incident regardless of the reason. For this reason you are advised that all forms of racing are dangerous and that you can be injured or killed. Should you be hurt in a racing accident it will be because of your own choices and not because of the advice offered in this report. I claim no responsibility for your actions; for the manufacturers of the safety equipment mentioned here; or for your accident.

## INTRODUCTION

You are going racing! At last you have made the commitment of time and money to participate in an activity that you've dreamed about for years and only thought was possible for someone else but not you, and now you've pushed through the bureaucratic maze of the sanctioning bodies to finally get out there and do it. First you have to make a decision on a car. Do you buy or do you rent? Next you must decide what type of car to race, open wheeled formula car or a stock sedan. Now you're ready for your safety equipment but you don't know what to buy, where to buy it or what you actually need. Often the first time a new racer checks into the cost of safety equipment the price nearly scares them right out of racing. Of course the supplier helps by asking you questions like how much is your head worth or regales you with stories of crashes and fires and then sets about to empty your pockets of money for safety equipment so that there is none left to spend on the car.

The purpose of this report is to examine your options within the rules and balance quality with price. After you have read this report, you should have a clearer understanding of what you really need and what it cost, and then you can make an educated decision of what to buy so that your budget is not blown before you even start.

## Rules

The Sports Car Club of America (SCCA), The International Conference of Sports Car Clubs (ICSCC), The Society of Vintage Race Enthusiast (SOVREN), and other sanctioning bodies differ on their rules concerning required safety equipment. Knowing the rules for the organization that you are going to race with will save you anxiety and grief when you show up at the track, by ensuring you have all the required equipment. In this report we will speak primarily to SCCA and ICSCC rules although SOVREN rules will be mentioned as appropriate.

Typically stock car track operators are much more lenient than the sports car sanctioning bodies when it comes to required safety equipment. So if you are going to race stock cars, this report will also provide excellent guidance in helping you select your safety equipment.

## Equipment

Everyone who races must have a helmet, and a fire suit. This is universal even for circle track racers. Since both of these items of equipment are the fairly expensive, they will be covered in detail. Then we'll cover socks, shoes, balaclavas, and gloves, which are mandatory. Finally, we'll touch on optional equipment.

### **Personal Safety Equipment**

#### Helmets

SCCA, ICSCC, and SOVREN require that helmets carry a "Snell Sticker" inside and that this sticker indicates the rating of this helmet. What does all this mean? The Snell Memorial Foundation was created over 25 years ago to test helmets since up to that time there were no standards. Today, the Snell Foundation, working in conjunction with the helmet manufacturers, establishes the standards. When a helmet is tested and proved to be within the specifications of the Snell Foundation, a sticker is placed inside the helmet, under the inside liner, signifying that the helmet has passed. Starting in 1985, Snell created a rating for motorcycle helmets "M85" and one for car racing "SA85". "SA" stands for Special Application and is a requirement of SCCA and ICSCC. Thus, when you shop for a helmet, be sure it has an SA rating. Approximately every 5 years Snell creates a new specification. While SCCA and ICSCC require a SA2000 or newer helmet, the SA05 helmets are designed and built to the newer specification and therefore are safer. It is your head, so I recommend buying a helmet built to the most current standards.

The SFI Foundation at the request of several sanctioning bodies and manufacturers also created a specification for helmets, as there was concern that after losing the bicycle helmet market, the Snell Foundation might go out of business. SFI has two specifications; 31.1, the same as SA and 41.1, the same as M. Beginning in 2005, the SFI labels are dated and will be changed every 5 years. Currently SCCA, ICSCC, and SOVERN require Snell SA rated helmets, but that could change so you should at least be aware of the SFI rating.

Often racers ask how soon their helmet will become obsolete. There almost seems to be paranoia at the thought of getting stuck with an out of date helmet. October 2005 was the first chance to purchase a helmet with an SA2005 rating and both SCCA and ICSCC allowed SA95 helmets to be worn through December 2006 to allow time for racers to purchase a new helmet. Thus you should have no concerns about buying an SA05 helmet, as it will be legal for many years (probably through 2015). Ultraviolet sunlight, solvents and glues used in helmet construction as well as rough handling will adversely affect the helmet. It is for this reason that you should consider replacing your helmet every 5 years even if it is still legal.

There are two types of helmets; full-face and open-face (see figures 1 and 2), and there are generally 3 types of construction materials; standard fiberglass, Kevlar® or carbon fiber. Rules for ICSCC require full-face helmets for open cockpit cars. SCCA and SOVREN require goggles or face shields for drivers of open cockpit cars, but it only makes sense if you are in an open cockpit car to wear a full-face helmet since you are susceptible to being hit in the head/face with a piece of debris off the track. The chin bar on the full-face helmet is designed to prevent your chin from contacting the steering wheel or your breastbone in the event of an accident and thus causing neck and spinal injuries. More importantly a full-face helmet can reduce the possibility of an injury resulting from your chin hitting the steering wheel. Thus it is strongly recommend that you wear a full-face helmet no matter what type of car you race. Driving schools sometimes

use open face helmets for both their instructors and students when driving a sedan. This is done because it is easier to talk to each other with an open face helmet.

Since we are concerned with cost, an open-faced helmet is considerably less money than a full-face, but this is not a good place to save a buck. Further, one day you might want to race an open cockpit car.

If you wear glasses you may have a little trouble putting your glasses on with a full face helmet. If your glasses have sides that wrap around your ears you may not be able to get your glasses on inside your helmet, in this case you may consider new frames for your glasses. Another consideration is the size of the eye opening in the helmet. Helmets designed for open cockpit cars typically have narrower eye ports than helmets for close cockpit cars. Ask about the size of the eye port when you are looking to buy.



Figure 1  
Bell M3 Full-Face Helmet



Figure 2  
Bell Mag 4 Open-Face Helmet

Concerning fiberglass versus Kevlar/carbon fiber helmets, the major difference is weight. Of course weight plays a factor in reducing injuries in an accident (the lighter the better), but just as important to some racers is that a lighter helmet reduces fatigue. Fiberglass helmets have been around a long time and are strong as well as reasonably light. When choosing a helmet based on a budget, you are well served with one made of fiberglass. If you have the money, however, you'll never regret spending it on a lighter helmet. Carbon fiber helmets are very lightweight and way cool but are expensive.

Two additional notes about helmets. They protect your head so you should consider the purchase of a helmet bag to keep your helmet in good condition. Since this is a report about saving money, remember that you can always keep the helmet in the box for a while and maybe later pick up a helmet bag. Beware of off brand helmets. Someday, you may need a new visor and if you bought a helmet from a small, little known company, you may have a hard time finding a one. This little item is no joke because if your current visor is scratched, you can't see and you can't buy a replacement! Note too that visors come in various tints from clear to dark smoke and even iridium, gold, silver and amber. Usually a new helmet will come with a clear visor but a dark visor is really easy to see out of, hard to see in (thus keeping your competitor from seeing your eyes) and very useful on bright days so you don't have to wear sunglasses inside the helmet. Visors are easy to replace so having a clear and a smoked visor is a good idea depending on the weather. Plus if you have a second visor and your primary one is damaged, you can quickly replace it with a good one. To get started just go with the visor that comes with the helmet and buy a smoked one later.

### Driving Suits

You only need a driving suit once and that is in a fire, and it had better work. Fire is a scary thing but fire in a racecar can be fatal. Most fires I have seen in my more than 12 years as a Turn Marshall occurred not as a result of an accident, but rather as a result of a mechanical failure. When you are at speed and a fire breaks out in your car, you must bring the car to a stop and get out as quickly as you can. This can take 15 seconds or more. Thus, you need a quality suit to protect you for the one time that you do have a fire.

Suits may be tested to standards established by the SFI Foundation, and if so will carry an SFI patch on the sleeve. This patch indicated that the suit has met the minimum level of safety. The specification for suits by SFI is numbered 3-2A/ X where X is a number indicating the level of protection. The lowest rated SFI suit is 3-2A/1, then /5, /10, /15, and /20. The professional Funny Car drag racers are required to wear a SFI 3-2A/20 suit and it is so heavy and bulky about the only thing you can do in that suit is drive a straight line! For sports car racing, most suits vary between a SFI/1 and a SFI/5. While the rules do not require the patch, it is a good idea to buy a SFI rated suit because then you can be sure that it will be safe and will pass tech.

Suits may also be tested by the FIA (Federation International du Automobile). These suits are embroidered on the back of the collar with the Standard (FIA 8856-1986 or FIA 8856-2000).

ICSCC requires fire resistant underwear with a 1-layer suit but not with a 2 or more layer suit. SCCA requires underwear with a 1 or 2-layer suit unless the suit has a SFI 3-2A/5 patch but will allow use of a three-layer FIA suit without underwear. More and more racers are wearing underwear because it provides a layer of protection as well as an air gap between the suit and your skin. This air gap increases your protection in a fire. Thus, adding a layer of fire resistant underwear will enhance any 1, 2, or 3 layer suit's fire protection. Also, some racers feel that it is easier to put on and take off their suit if they are wearing underwear because the suit doesn't stick to their sweaty body. This is countered by the fact that all driving suits are hot and adding a layer of underwear simply makes them hotter but hot is better than getting burned.

Now let's talk cost of the suit and factors to be considered. Strictly speaking, 1 layer suits cost less than a 2 or 3-layer suit. A 1-layer suit with underwear is the least expensive way to get into racing, but not necessarily the safest. A good compromise is a SFI/5 rated suit without underwear. The cost is only slightly more than a 1 layer suit with underwear, and you get a lightweight suit with reasonably good fire protection. To really be safe, however, a 2 layer SFI /5 suit with underwear or a layer 3 suit is best. The cost between a 2 layer SFI/5 suit with underwear and a 3-layer suit is nearly the same and, on a really hot day, you can always leave off the underwear.

Four factors determine the cost of your suit regardless of how many layers it has: styling, weight, features, and name recognition. To some racers, their suit makes a very important statement about who they are, what they drive, and who their sponsors are. Many of the more stylish suits are made in Italy and have a very distinctive look to them. Styling costs money. Next is weight, where typically the lower the cost of the suit the heavier it is. An ultra lightweight 3-layer suit cost in the neighborhood of \$1700 but a lightweight suit is very comfortable.

If you want a custom suit, you will pay more for it than a standard suit. It is not safer, just customized to your specifications. Standard suits do not mean ugly, boring suits, it only means standard sizing. Another factor in suit cost is the features. Since I originally wrote this paper 15 years ago, manufacturers have incorporated new materials into driving suits. Special features cost money so evaluate your needs carefully. Features include 360° venting around the shoulders, box quilting, sewn in arm restraints, and boot cuffs to name a few. Perhaps a breathable, lightweight suit cost a little more but the comfort more than offsets the cost. The fourth factor is that of name recognition and that, too, will cost you money. Some racers simply must have a suit like Tony Stewart or Michael Schumacher so they must be willing to pay for the brand name.

Suits have differing features, which you should be aware of. First, there are one and two-piece suits. Today, most racers wear a once piece suit because it is safer (no gap in the middle). Next is venting. Driving suits, no matter how many layers they have, are hot. Suits with knit venting provide the same fire protection, but add a cooling factor. Vented suits should be considered when making a suit purchase since driver comfort equates to improved concentration for the duration of the race. Another very important feature on a suit is the material used for styling features such as striping, epaulets, billboards, piping and the like. Some suit manufacturers use Nylon for these features. While I personally don't like Nylon because it melts and burns, small amounts are OK just be sure that the suit is SFI rated. Lastly is suit material. The old standby is Nomex®, but suits are also made of Firewear®, PBI®, Carbon-X® and Kevlar®. Very low cost suits are made of fire retardant cotton called Proban and are SCCA legal only if they carry a SFI/1 or higher rating. Proban® suits wear out much faster than Nomex® suits and are usually heavy, thus I do not recommend them. Typically, suits advertised by mail order for a ridiculously low price are made of Proban®.

### Gloves

Here's an area where you can save money. The rules state that gloves must be made of fire resistant material and contain no holes. This means that you can wear 1 or 2 layer gloves; gloves with or without Nomex under the leather palm, or even all leather gloves as long as there are no holes. Thin single layer Nomex® gloves with leather palms are the least expensive but perhaps not the safest. Your hands are vitally important to your livelihood (you use your hands to work and thus make money) so you should protect them. My recommendation is to wear 1 or 2 layer gloves with at least an 8 oz. Layer of Nomex® on the back as they provide good protection for the money. Many gloves have Nomex® under the leather palms but are sometimes bulky and difficult to grip with. Of course, gloves that have Nomex® under the leather palm have great fire protection, but they cost more. SFI certifies gloves too and they have the same rating system as suits. Currently SFI rated gloves are not required. Some sanctioning bodies (not SCCA or ICSCC) require gloves with nomex under the leather in the palms. A fancy anatomic grip glove, that is a glove sewn with the fingers in a slight gripping position, are very comfortable but not necessary for a novice racer on a budget. Perhaps when you're ready for your next pair you can shoot for this type of glove. FIA certified gloves are required to limit the amount of non-fire retardant material to less than 20% of the glove. Thus these gloves have minimal leather on the palms. In short, buy reasonably priced gloves that you like as they will wear out in a few years and then you'll be more experienced and know exactly what you want.

## Shoes and Socks

You do not need to buy driving shoes! That's right, shoes just have to have leather uppers including the tongue or be made of a nonflammable material but the rules do not require special "driving shoes." Thus, if you own a pair of tennis shoes that are all leather you are already set and ready to go. A note about racing specific shoes is that they are usually narrower than street shoes, and are often made without a lip around the toe and they have a thin sole for enhanced pedal feel. These shoes make driving your car easier since some cars, especially formula type cars, have very small foot boxes and little room for your feet. Tennis shoes simply won't work here. You may also be surprised to learn that some racing shoes cost about as much as a good pair of name brand athletic shoes so in that case, you should go ahead and buy a driving shoe.

Both low top as well as high-top shoes are legal so choose the type you most prefer. Low top shoes are less expensive than high tops but nearly all racers choose the high tops.

There is nothing to say about fire resistant socks except that they are required by the rules and you must wear them.

## Balaclavas and Helmet Skirts

No, I'm not talking about a delicious Greek pastry, a balaclava, hood or head sock, is worn over your head and covers your hair and face. A helmet skirt attaches to the outside bottom of your helmet (usually with Velcro); is made of fire resistant material; and is tucked into your suit to prevent fire from burning your hair. ICSCC says you must wear a hood or a helmet skirt and SCCA says you must wear a hood if you have facial hair and that hair protruding from beneath the helmet must be completely covered. This means you may need a hood or helmet skirt or nothing depending on how much hair you have and wear it grows.

Balaclavas are made in single or double layers of fire retardant material. They may also have a single eye opening for both eyes or two eye openings, one for each eye. It is your choice which one you choose. It seems that professional formula car drivers prefer the dual eye port hoods. Single layer, single eye port hoods work fine and if you are on a budget this is a safe, reasonable way to go.

For some reason, helmet skirts are not very popular, even though they can be cooler than wearing a balaclava. A balaclava also absorbs sweat, which is worth considering.

## Head and Neck Restraint

Late in 2004, the SFI Foundation created a specification for head and neck restraints SFI 38.1. The HANS<sup>®</sup> device or Head and Neck Support (see figure 3) designed and manufactured by Hubbard/Downing Inc. in Atlanta Georgia was the first device to meet the 38.1 spec and the can be worn in any type of race car. During an impact, the HANS<sup>®</sup> device restrains your head so that it moves with your body. Both head and body are now held by the shoulder belts. This significantly reduces head travel and neck loading. Dr. John Melvin, Wayne State University and industry crash investigation expert says, "The HANS<sup>®</sup> is the most complete and robust solution for head and neck restraint. It is the most thoroughly tested device by independent groups." Use of the HANS<sup>®</sup> is strongly recommended even for a novice. Today there are about 4 devices that meet the 38.1 spec including the HANS<sup>®</sup>; however, on the HANS<sup>®</sup> is mandated in Formula 1. Further there are over 75,000 HANS devices in use today (far more than any other device on the market), so using anything else just doesn't make sense. In fact all the other devices exist because of the great work by Dr. Bob Hubbard and Jim Downing. I wouldn't even think of wearing anything but a HANS.



Figure 3  
HANS®

### Optional Equipment

More and more racers are wearing neck collars. These round or U-shaped padded collars fit under the helmet and help support it. They are mandatory in go-kart racing and reduce the chance for a neck injury in the event of a crash. Wearing one is worth considering but only if you have excess cash. You can always borrow one or buy one later. If you buy a neck collar, be sure it is made of a fire resistant material. A neck collar also support the helmet and as such SFI changed the name of their spec to helmet support.

A word about arm restraints: the purpose of arm restraints is to keep your arms inside the cockpit in the event of a rollover type crash. They are required in SCCA for all open cockpit cars. SOVREN requires them in open cockpit cards and sedans if the car is not equipped with a window net. Some driving suits are custom made with arm restraints sewn into the sleeve, but you won't find them on your standard suit.

### **Conclusion/ Recommendations**

Let's cut to the chase. Here in the Northwest, racers at one time or another race in both SCCA and ICSCC or SCCA and SOVREN. Thus, to save money and reduce worry, you should select safety equipment that meets the requirements for all the sanctioning bodies. Also, any equipment that is required for road racing will meet or exceed the rules for all circle tracks. Thus, I recommend the following equipment both from a safety as well as financial viewpoint:

- Full Face Helmet made of fiberglass
- Two layer, SFI 3-2A / 5 driving suit
- Single layer single eye port balaclava
- Nomex®Socks
- Single layer driving gloves with at least 8 oz thick Nomex
- Driving shoes
- HANS® (Strongly recommended but not mandatory)

What about actual cost? Depending upon what choices you make you should be able to buy all your personal safety equipment less HANS® for \$1000 to \$1200. If you can't afford that, then perhaps you should rethink if you are ready to go racing. I know people who spend more than that on a set of skis and that doesn't include the price of lift tickets. In fact, the price of lift tickets these days makes race entry fees look like a bargain. Also, remember that once you have purchased this equipment, you will not have to buy it again for years to come. Yes, you may have to replace your gloves or socks next season but overall, the money you spend on safety equipment will not have to be spent again for some time. Also, if you start with the basics, you can always add anatomic grip gloves, a neck collar, or helmet bag later when the budget allows (these items also make great Christmas and birthday gifts to you from your spouse or family).

When you are ready to make your safety equipment purchase or just have a question, call my staff or me at Armadillo Racing Inc. With over 25 years experience helping racers from all forms of motor sports, we can ensure you get a proper fit; help you select the right model helmet for your car, driving style and desires. Check out our entry-level package:

- Bell M4 or Sport III Full-Face Fiberglass Helmet
- OMP Trend 2 SFI 3.2A/5 suit
- OMP Speed gloves
- Single layer single eye port balaclava
- Simpson high top or Piloti driving shoes
- Fire retardant socks
- Equipment Bag (to keep all your gear together)

This package is an excellent value and is offered at \$900 saving you over \$65 from individual prices. Of course if you don't need a helmet or another item on the list, we'll work with you to help you get exactly what you need at a fair price. We stock helmets from Bell, Simpson, and Pyrotec as well as suits from K1 Gear, Simpson and OMP, which means we can outfit you the way you want or work to match your budget. Fitting and selecting safety equipment takes professional help and we're here to serve you. Here is our guarantee:

**Armadillo Andy's Personal Guarantee**

If you are not happy with your purchase of safety equipment from Armadillo Racing Enterprises, I'll refund your money with absolutely no hassles.

Call Armadillo Racing toll free (USA & Canada) at 1-888-211-9129 (3:30 to 8:30 PM) or visit our website at [www.armadilloracing.com](http://www.armadilloracing.com). I promise to do my best helping you to get just the right helmet for all your racing needs.

Here's what a few of our customers have to say about their experience doing business with us:

“Armadillo Racing provides a very valuable service to racing, both at the track and off.” John Farr Club Ford

“Armadillo Racing provides an outstanding, reliable, and thorough support for road racing activities in the Pacific Northwest.” Rog Stark T-1 Viper

“People who truly give a d\*\*n in this sport are rare, that's why I support Andy Collins.” Steve Schaeffer Alfa Romeo GTA

“It's easy to see why everyone in the NW racing community knows and respects Andy.” Mike Blaszczak

“Andy is fair and good to deal with. Good to work with an honest person that will work with you.” Phil Edwards RX-7

“I have enjoyed shopping and chatting with Andy and crew since day 1 and have never been disappointed in the service or their courteous approach to business.” Wes Tipton Club Ford

“Andy (and staff) are the hardest working and most dedicated folks involved in NW racing, road, drag, oval.” Brad Pugh Porsche 911

Good luck and welcome to the wonderful world of auto racing.

#### ABOUT THE AUTHOR

Andy Collins owns and operates Armadillo Racing Inc. in Bremerton, Washington. He's worked as a Turn Marshall for 12 years for ICSCC, SCCA, and SOVREN as well as for CART, Trans-Am, IMSA, NASCAR, and Formula 1. He has served ICSCC as the director of Public Relations; the President of the International Race Drivers Club; President of the Bremerton Sports Car Club; and President of Turn Crews NW as well as Regional Executive of Northwest Region SCCA, and continues to be active in club operations. Andy is absolutely passionate about sports car racing and will do whatever is needed to help you go racing just as he has helped hundreds on new racers over the years. Because of his involvement in NW Racing, he is well known and respected and absolutely must perform for you or lose the credibility and trust of the racing community. You can rely on “Armadillo Andy” for all your racing needs. Andy can be reached at 1-888-211-9129 (toll free USA or Canada) evenings and on non-race weekends. You can email him at [andy@armadilloracing.com](mailto:andy@armadilloracing.com). On race weekends, Armadillo Racing is trackside, serving racers with the equipment, parts, and racing fuel they need. Armadillo Racing is the official safety equipment supplier to the ProFromance Racing School at Pacific Raceways