

# ! WARNING

**\*\*INJURY OR DEATH MAY OCCUR IF THESE INSTRUCTIONS ARE NOT FOLLOWED\*\***



## ! WARNING

STERNUM STRAP MUST SIT AT LEAST 4" BELOW YOUR NECKLINE. ALL LATCHES MUST BE SECURE. HARNESS, SHOULDER AND LAP STRAPS MUST BE TIGHTENED FIRMLY AGAINST BODY AT ALL TIMES. FAILURE TO DO SO MAY RESULT IN SERIOUS INJURY OR DEATH

When mounting and adjusting your harness, it is vital that the sternum straps sit across your chest and is a minimum of 4" **BELOW** your neckline. Please refer to the illustration above for reference. ***Harness shoulder and lap straps must be firmly tightened against the body at all times.***

*[For further information on harness installation, please contact customer service at 1-888-312-7667.]*

Harness Installation Instructions, Rev. 2 (11/10/2011)



# SAFETY HARNESSES

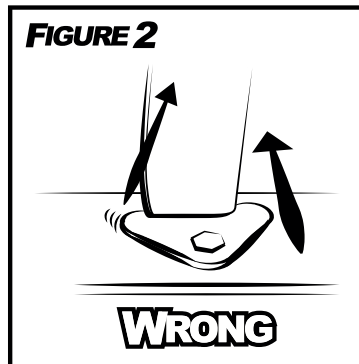
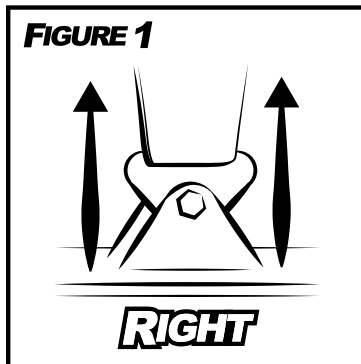
## PRO ARMOR

### INSTALLATION INSTRUCTIONS

Congratulations on the purchase of the very best harness on the market. You will enjoy the exclusive features that only Pro Armor harnesses provide. Features like the built in flashlight pouch which include a super bright 3 LED removable flashlight. Other unique features include a water resistant cell phone pouch to keep your phone or MP3 music device protected, close & accessible to you at all times. You will also immediately notice that the webbing material is made from ultra - high quality materials and the stitching is a work of art. Please be sure to use the harness exactly per the instructions in order to provide you the very best possible safety. Thank you for choosing **PRO ARMOR!**

### **WARNING**

This product is sold without warranty expressed or implied. There is no warranty or representation which is made as to this product's ability to protect any user from any injury or death. The user of the product assumes that risk. The effectiveness, warranty and longevity of this equipment are directly related to the manner in which it is **PROPERLY INSTALLED, USED, and/or MAINTAINED. THE USER ASSUMES THE RISK.** No warranty or representation is made as to its ability to protect the user against serious injury or death, which might result from circumstances beyond the control of Pro Armor.



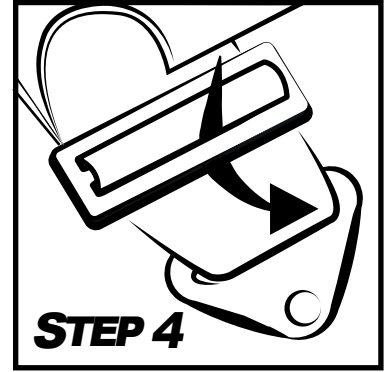
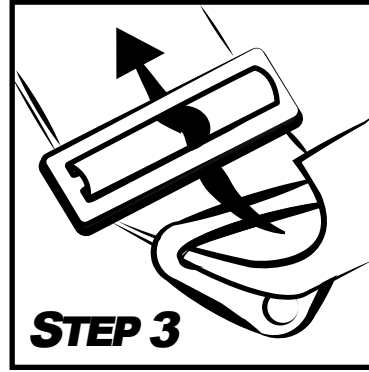
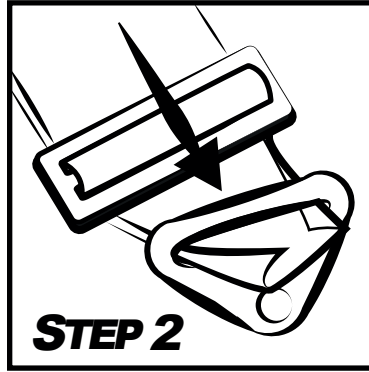
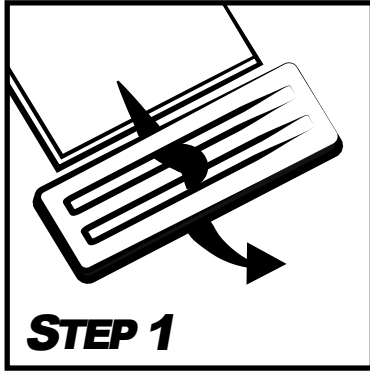
**MOUNTING BRACKET INSTALLATION**

### **WARNING**

Mounting brackets should be installed at an angle that is compatible with the direction of pull on the webbing under full load. Preferred mount is in a double shear with allowance for the bolt in bracket to pivot and align toward the direction of the load as shown in Figure 1. **DO NOT** weld around or near belts or belt hardware. All mounting brackets should be attached directly to the frame or chassis of the car and installed to limit the driver's body travel both upward and forward. Grade 8 minimum specification for bolts and washers to should be used to attach the seat belts, harnesses and anti submarine belt hardware are . Wrap Around style mounts should have a provision to prevent lateral or side-to-side movement.

**[For further information on harness installation, please contact customer service at 1-888-312-7667.]**  
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# WEB INSTALLATION



**⚠ WARNING** Belt webbing must have an unobstructed travel path. Your belts will move in the direction of impact. Make sure the area is clear of obstruction. Allow a minimum 1 inch space around the belts in the seat opening for anticipated travel. Maintain and protect the webbing against abrasion and cuts. Keep belts away or protected from sources of heat (i.e., exhaust headers). Bolts inserted through the belt webbing are not acceptable for mounting.

**⚠ WARNING** “LOCKING” the 3-Bar Slide Adjuster shown in Steps 1 through 4 is **VERY IMPORTANT**. The 3-Bar Bar Slide Adjuster must be located as close as possible to the Bolt-in bracket or Roll Bar (in Wrap Around design). If using the harness bar and wrap around mounting method, omit the mounting tab shown in step 2 above, wrap the harness around the harness bar tube and back through the slide adjuster shown in step 3 and step 4 above.

When attaching shoulder belts make sure the width of the belts does not exceed shoulders width of the rider.

**⚠ WARNING** When mounting and adjusting your harness, it is vital that the sternum straps sits across your chest and is a minimum of 4” **BELOW** your neckline. ***Harness shoulder and lap straps must be firmly tightened against body at all times.***

## **SERVICE:**

The Life of your harness is a maximum of two years. Please make sure to mark the date purchased on the harness tags provided. Replace harnesses after two years of use. Harness webbing can degrade much more rapidly when exposed to sunlight for prolonged periods. In such conditions, inspect your harnesses more frequently, and consider replacing them sooner than two years.

**[For further information on harness installation, please contact customer service at 1-888-312-7667.]**

Harness Installation Instructions, Rev. 2 (11/10/2011)

# SEAT BELTS

## Essential to Driver Safety

by Jennifer M. Faye

The primary goal of any race car driver is to be the best and cross the finish line first. This is achieved by putting long hours of hard work into the engine and tweaking the chassis just right. A lot of thought goes into shaving every fraction of a second off lap time in order to gain even the slightest advantage over competitors.

Hopefully just as much thought goes into driver safety equipment as into the engine. Using quality safety equipment can help a driver get to the finish line in one piece as well as first.

An integral part of safety equipment is the driver restraint assembly, or seat belts, to keep the driver inside the roll cage where the least amount of injury will occur in a crash.

### **The Anatomy of a Seat Belt**

A restraint assembly consists of several components, each with a specific function. The shoulder harness is a belt assembly, one strap for each shoulder, intended to restrain movement of the upper torso and shoulder regions. An optional cross strap across the chest can be used to hold the shoulder harness together. The lap belt restrains movement of the pelvis and the anti-submarine strap prevents the pelvis from slipping forward from under the lap belt in the event of an accident.

The buckle which attaches the belts together should have a quick and easy release mechanism in the case of an emergency situation. There are three types of buckles to choose from:

latch/lever, turn/push, and cam lock. All three can be opened in 1 or 2 motions.

A restraint assembly also utilizes two types of hardware. The adjustment hardware is used to alter the length of the individual straps to fit the driver. Mounting hardware secures each strap to the vehicle.

### **SFI Helps Maintain Quality Assurance in Seat Belt Performance**

The purchase of belts should be based on more important criteria than whether or not the color matches the car.

One way to tell if one manufacturer's restraint assembly is more reliable than another's is to look for belts that are certified to meet performance specifications. Manufacturers whose products pass the standard laboratory tests participate in the SFI Foundation, Inc.'s certification program.

What is SFI Foundation, Inc. and what do they do? SFI is a non-profit organization established to issue and administer standards for all kinds of specialty/performance automotive and racing equipment. Manufacturers of equipment are the primary users of SFI standards. Some standards are adopted as part of the rules of race sanctioning bodies. Ultimately, the consumer benefits from the program because it establishes recognized levels of performance or quality for a product such as driver restraint assemblies.

The specifications are created through a committee process. Technical committees are comprised of individuals

from all facets of the industry who provide a comprehensive cross-section of knowledge. Such diverse expertise and

Participation in the program is purely voluntary, so this does not mean that all manufacturers not in the program produce inferior belts. Their restraint assemblies may be just as good as one that is certified, but they merely choose not to participate in the SFI program. However, to ensure quality belts, it would be a good idea to look for the SFI label.

The standard that applies to safety belts is SFI Specification 16.1. The spec defines a driver restraint assembly and outlines basic design dimensions and requirements. It also explains the testing procedures in detail and how to interpret the test results to determine if the product meets the required criteria and thus passes the test.

Once a product is passed, the manufacturer installs SFI certification tags on the belts which display the date of manufacture. The purpose of the dated certification tags is to enable drivers and race officials to easily determine when the belts reach their 2-year life span. One of the most important requirements of the specification states that the useful life of the webbing in the straps of the restraint assembly shall not exceed two years and they must be replaced at or before that time. Only the original manufacturer can reweb an assembly prior to recertifying.

### **Seat Belts Should be Inspected and Recertified Every Two Years**

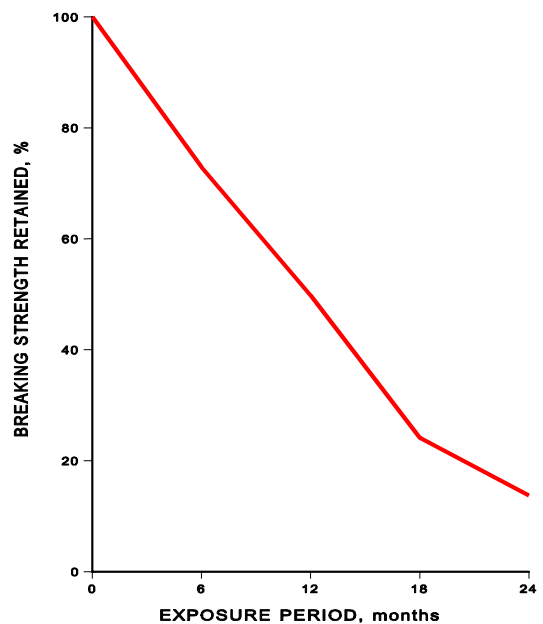
Restraints must be maintained, inspected, and replaced or rewbed every two years because they degenerate from exposure to the elements and over time. Prolonged exposure of seat belt

open participation is the means by which standards are fairly established.

webbing and thread to sunlight can cause degradation of the fibers and loss of restraint integrity.

The rate at which the breaking strength of the webbing decreases with outdoor exposure is illustrated in the graph. The webbing used in motorsports

**NYLON 6.6 WEBBING  
OUTDOOR EXPOSURE**



restraints is typically made with DuPont Nylon 6-6 or a similar product. According to the data, the webbing loses about half of its strength in one year.

With this kind of rapid deterioration, it is obvious why replacing the webbing every two years is essential to driver safety. Old and weakened belts could easily snap under the loads imposed upon them in an accident situation. Failure to properly restrain the driver in a crash would have devastating consequences.

The effectiveness of a restraint assembly is also influenced by attachment techniques. The principal precaution for installing the mounting hardware to the vehicle is to minimize bending stress in the fitting. This is achieved by making sure the belts pull from a straight angle against the hardware. The assembly should be installed so that the straps do not rub against any surface that can cause the webbing to fray. The anchoring mechanisms should also periodically be checked so that they don't become loose or weakened.

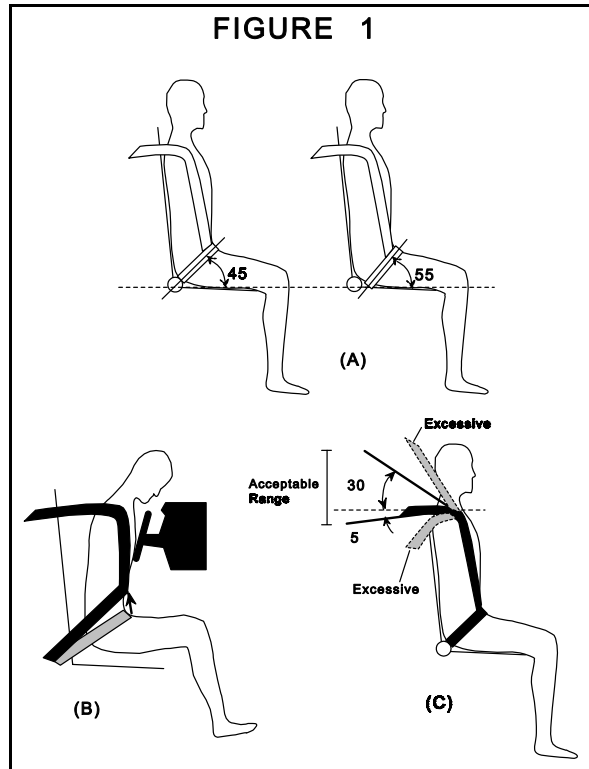
Proper installation of the restraint assembly also means achieving the correct fit to the driver. Belts should be as short as possible to reduce stretching for better control of occupant movement.

The attachment points must provide the optimum geometry to minimize movement of the belts. Lap belts perform best when they act at an angle between 45° and 55° relative to the longitudinal axis of the vehicle as illustrated in Figure 1(A). This angle permits the lap belt to react to the upward pull of the shoulder harness. A system installed with a shallow belt angle, as shown in Figure 1(B), permits the shoulder harness to pull the lap belt up off the pelvic area and into the abdominal region with the likelihood of injury to internal organs.

The end attachments of the shoulder harness must also be installed at appropriate angles. The ideal position is anywhere between 5° below and 30° above the driver's shoulder, as seen in Figure 1(C).

If the upper attachment point falls significantly below the driver's shoulder, then a spinal compression injury is likely to occur. In an accident situation, the

shoulder belts pull down and back on the torso as they resist the forward motion of the driver. The resultant restraint force compresses the spinal column and will add to the stresses in the spine already caused by the force of the crash impact.



On the other hand, if the trailing ends of the harness are too far above the shoulder (greater than 30°), then two problems can occur. First, tension in the shoulder harness is increased and undue stress is applied to the harness and its structural attachments. Second, excessive angle will cause excessive motion. If the harness belts are too far above the shoulder, they will provide little resistance to forward motion of the driver's upper torso. The result is impact with the steering wheel and the possibility of neck injury. The shoulder straps should also be 3-6" apart behind the driver's neck

to prevent slippage off the shoulders.

The reliability of a restraint system is greatly affected by the way it is installed. It is imperative to follow the installation instructions provided by the seat belt manufacturer. Also, the necessity of replacing or rewebbing seat belts every two years cannot be more important.

As cars become more advanced and consequently go faster, everything possible must be done to make the racing experience safe as well as fun. Failure to do so can cause serious injury, or worse. If there is anything that can be learned from the sport of racing, it's that anything is possible, and that the attitude of "it won't happen to me" is false, because it does happen.