

# **ABS AVALANCHE AIRBAG SYSTEM**

## **Product Information and Instructions for Use**

### **MOUNTAIN SAFETY SYSTEMS LTD**

**tel: 604-932 5327 fax: 604 905 7637**

**toll free: 1 800 617 7177**

**address: 8271 Mountain View Dr.**

**Whistler, BC, V0N 1B8, Canada**

**email: [abs@tirol.com](mailto:abs@tirol.com)**

With the purchase of an ABS apparatus you have acquired a piece of equipment the function and mechanism of which is based on many years of experience in the study of avalanches, rescue data and statistics. Of central importance is the fact that 90% of all victims (alpine skiers) who are caught and buried in avalanches are alive when the avalanche has stopped moving. Because most of them are buried, they cannot free themselves and they are frequently not visible to potential rescuers. Now the race with death starts, and anyone buried alive whose respiratory system is blocked, is ultimately bound to lose that race within 15 minutes at the most.

The most common cause of death among avalanche victims is suffocation due to a blocked respiratory system, which is even more tragic in the light of the fact that the 15 minutes for possible rescue were wasted. Therefore the most important task of the ABS apparatus is to prevent burial in an avalanche. The ABS provides, in a matter of seconds, the physical requirements necessary to fulfil this task. If the volume of any object or body is sufficiently high then it will be swept to the surface by the rolling mass of snow. If the volumetric weight of these objects/bodies is less than the surrounding snow they will remain on the surface. They cannot sink back into the mass of snow. If the volumetric weight of these objects/bodies is higher they immediately sink back. The volumetric weight of light, dry 'powder snow' is very low even when it is compressed as in an avalanche. In unfavourable circumstances the volumetric weight is just approximately 400 grams per litre. The volume of the airbag system is adjusted to that. The heavier (wetter) the snow of the avalanche, the less additional volume is required.

To remain on the surface of an avalanche, and to be immediately visible, guarantees by far the highest chances of survival. With the ABS-Avalanche Airbag System you can take advantage of this possibility.

## **PRODUCT INFORMATION:**

When using the ABS the following has to be observed:

- the ABS cannot prevent avalanches
- every avalanche means absolute danger to your life, whether you are equipped with ABS or not
- under no circumstances should the ABS increase your readiness to take risks
- the function and effectiveness of the ABS is exclusively limited to avoiding the total burial of the person caught in an avalanche. There may arise situations where this will not be possible or only possible to a limited extent
- the ABS has to be released by the user himself. Practising this is vital in order to react properly in the case of an emergency
- the ABS requires careful handling and a careful examination of its readiness to function before every use
- The ABS together with the respective rucksack is tested according to the PSA-Guidelines 89/686 EWG by TÜV-Produktservice, Ridlerstr. 61, 80339 München - examining authority number 0123.

## **HANDLING AND OPERATIVENES OF THE EQUIPMENT**

When you need to use your ABS rescue kit will be a matter of life or death. Your chances of survival in an avalanche depend on the user knowing how to use the equipment properly and keeping it in perfect order.

## **INSPECTION OF THE OPERATIVENESS OF THE EQUIPMENT**

As a general rule the mechanism should be tested at all start of each season. It is important to check the releasing device, the length of time needed for inflation and the degree of inflation, the imperviousness of the airbag, the fastening on the housing, the air release valve, check pull-back of initial tension, all straps and fastenings on the bag or rucksack, the buckles and the fastening of the central hip strap. It could happen that the equipment is damaged in some way because the user wearing it fell at one time, or it had not been stored correctly. This inspection is particularly important after the equipment has actually been used in an avalanche. When the equipment is not use, then the cartridge should always be removed and stored in a separate place with the protective cap. Then by pulling the red release ring trigger the initial tension. This takes away tension from the spring. Before screwing the cartridge back into place apply initial tension again without fail – see under “HOUSING”.

## **THE HOUSING**

The compact housing constructed out of special, tough, high impact absorbing plastic, encases the complete inflation system with it's booster pump and pressure distributor. The housing is inaccessible so that the operational function of the various components cannot be damaged.

Atmospheric air, representing 45 % of the total volume needed to fill the airbags, is sucked in through the square and round openings found on the side of the housing. Therefore, make sure that these openings are not blocked or covered. The big round opening on the side of the housing permits access to air release valve. The gas cartridge is inserted through the large round hole found on the bottom of the housing. In order to prevent damage to the thread, do not screw any other bottle or material into this opening. A damaged thread can cause improper puncture of the gas cartridge and prevent inflation of the airbag. An incorrectly inserted gas cartridge will, after puncture, release nitrogen into the housing instead of into airbag. The ring found near the opening for the cartridge is used to set the release mechanism. Before screwing in a new cartridge you must pull the ring firmly until it stops, thereby the trigger release mechanism. It is important that in doing so you overcome the blocking point of initial tension. Only when this initial mechanism has clicked in will be release be able to operate properly. So, to be on the safe side it is important to carry out a test release before screwing in the cartridge.

## **BALLON (AIRBAG)**

The airbag, constructed of nylon material, is lined with Polyurethane on the inside and has welded seams. Maximum volume is approx. 150 litres. The maximum volume can vary the change in the air temperature. Bursting strength is twice the regular pressure of 0,14 bar. Tearing strength of the material is 3.000 N wrap and woof underside, 1.50 N wrap and woof topside.

## **RIP CORD, CORRUGATED TUBING**

The rip cord is connected to the trigger release mechanism inside the housing. It must be inserted into the unbreakable tube, otherwise the whole release function, due the friction, twisting and distortion, could be endangered. In order that the red rings is easily accessible, adjust the length of the black/light-coloured tubing to fit your body size. The red ring for the release mechanism must be between chest and collarbone ready for use. If the length of the rip cord is incorrect it is important that this it is adjusted. If the rip cord has be shortened cut the tubing on one side only and twist off the rest, otherwise you damage the rip cord.

**IMPORTANT!** It is of vital Importance that the length of the corrugated tubing and rip cord are properly adjusted to the user's size so that the release mechanism can be relled one the operate correctly. It would be foolhardy not the bother!

## **RIP CORD RING**

It is important that the user can reach the red plastic ring at all times even wearing thick mittens. Attach the "neck" of the ring to the strap with the Velcro provided so that it does not swing about unnecessarily when skiing remove or fix anything that could get in the way of the ring. You must be able to get to the ring even after have fallen. To attach or release the rip cord proceed as follows: the shaft of the red plastic ring has four holes. Pull the rip cord through the upper hole, than through the bottom hole, the second hole from the top, and last of fall through the third hole from the top. Finally pass the rest of the cord trough the opening of the ring itself to release, follow the steps in reverse.

## **GAS CARTRIDGE**

Only original ABS cartridges may be used. ABS original cartridges are black. The threads on the cartridge are equipped with a protection cap. Before use remove the protection cap and carefully store it. Empty cartridges must be returned with the protection cap.

### **A completely filled cartridge is absolutely necessary for the ABS to function.**

Therefore, it is extremely important to carefully inspect the cartridges before use. The bronze seal in the thread of the cartridge must not show any sign of damage, fractures, cracks or other irregularities. Every gas cartridge is supplied with a sticker on which is written the total weight of the cartridge (filled, without protection cap) as well as the date of filling. A reliable control of the readiness for use of the cartridge is possible only by weighting the cartridge again and comparing this weight to the weight written on the sticker. If it shows a difference of more than five graduations on the spring balance than the cartridge must not be used. The danger of a loss in pressure and thus a restricted functioning is given. Possibly check weight again on electric scales.

Under no circumstances should any manipulations of the thread be undertaken. You should be able to screw the cartridge up to the back stop easily. If obvious resistance is met while screwing in the cartridge or if it is difficult to screw the cartridge in against the back stop then this cartridge must not be used. There could be a defect in the threads thereby making a puncture and airbag deployment impossible. Such a cartridge is not ready for use. If the cartridge is not screwed in fully up against the back stop and if the cartridge seal is then punctured, then the danger exists that the cartridge, because of the lower pressure created by a pour seal, could be ripped out of the housing threads and shot through the air like missile. Therefore when testing the ABS apparatus make sure no one is standing in immediate danger. The cartridges have been manufactured for use in temperature extremes from 40°C to -50°C and can be transported, with the protection cap screwed on, in commercial airplane only with special arrangements. Empty cartridges may be refilled. The exchange of cartridges is possible only with the ABS-supplier directly. The cartridges contain only non dangerous nitrogen as found in the immediate atmosphere. But because of the high pressure of 300 bar, the cartridges may only be punctured while in the ABS housing.

**Important!** Under no circumstances should full cartridges be placed on a hot surface (stoves, rear window of car, etc.). Neither should they be thrown around or be covered by heavy objects. The cartridges could explode ! - Do not forget - tampering with the cartridges in any way can endanger life.

### **SUSPENSION OR CARRYING SYSTEM**

The authorized suspension system is certified by the ABS logo. These suspension systems, their materials used, their method of construction and their operational function, are geared to the particular requirements of the ABS equipment and have been safety-tested by the safety standards authority (TÜV). The tight closure of the metal waist belt buckle, the chest straps as well as wearing the safety belt is imperative in order to guarantee that the ABS apparatus and the suspension stays connected to the wearer in an avalanche. Otherwise it cannot be excluded that the ABS is torn away from the body in an avalanche.

### **MAINTENANCE, STORAGE, TRANSPORTATION, CLEANING**

The ABS apparatus and the rucksack are maintenance-free if you observe checking the condition as follows: The airbag should be unfolded at least once a year. You should also regularly check the condition of the rucksack carrier, the buckles, and the Velcro straps. While storing or during transportation avoid exposure to any form of pressure. Make sure that cartridges separated from the apparatus are secured with the protection cap on top. Under no circumstances use any aggressive agents for cleaning the material of the airbag or rucksack, only use soap water if possible

### **LIFETIME - SERVICE INTERVALS**

The lifetime of the airbag depends mainly on how often the airbag is used. Provided that an annual check of the condition is carried out, we recommend to send in to us the complete ABS-rucksack after two seasons for service. However, at the latest after 3 seasons the service is obligatory. The first service will be free of charge. Only costs for freight and packaging have to be paid for.

## **INSTRUCTION FOR USE**

### **BEFORE USE CHECK LIST**

You must complete this check list before each use of your ABS apparatus or ABS rucksack. Your survival in an avalanche could depend on it.

#### **1. Rip cord check**

If the rip cord is tight, have a test run without a cartridge. Pull the rip cord by the ring next the opening the cartridges until it clicks into place. The click must be clearly felt.

#### **2. Gas cartridge check**

Before screwing in the gas cartridges it is vital to compare the weight with that written on the label. Therefore the recommend after each use of the ABS, that you remove the gas cartridge and seal it with the cap. Then before inserting the cartridge, carry out the prescribed visual inspection. Only with correctly filled an properly inspected gas cartridge can you be guaranteed that your ABS will function in an emergency. Compromise nothing and follow the instructions exactly. Pull the release spring. Screw the inspected cartridge in and up to the back stop. Should resistance be uncounted then use another new and properly inspected cartridge. The cartridge must be sit tightly in the housing threads.

#### **3. Position of release handle and fixing it in place**

The release handle must be rest between chest and collarbone. Fix the shaft with Velcro. Remove or fix any items that could hinder operation.

#### **4. Airbag air release valve**

Press the airbag's release valve a few times. This is found in the large round hole on the side of the housing. The white plastic knob should depress easily yet spring back immediately to it's original position.

#### **5. General state of condition**

Unfold the airbags and inspect the material for any damage. Check that the airbag is firmly attached to the housing. Inspect the shoulder straps, waist belt and buckle as well as the leg and chest straps.

### **THE RELEASE**

Pull the red rip cord handle forcibly. The airbag self inflates independent of whether your are skiing, have fallen over, are lying on the airbag or have been caught in the snow masses. It takes approximately 2 seconds for the airbag to become fully inflated. As soon as you are caught or will be caught in an avalanche, release the airbag immediately without any compromise. The inflated airbag do not hamper you while trying to escape which you must try to do in every case.

### **YOUR CONDUCT IN AN AVALANCHE**

When you have pulled the rip cord handle, concentrate on your path down the slope. The inflated airbag, in general, prevent you from falling backwards and from being humbled head over heels. Thus, you can use your arms, make swimming movements and push yourself away from obstructions, to stabilize yourself and to slow yourself down. The airbag does not hinder you in any way whatsoever. The skis are a danger to the person and the airbag. In this case try twisting out of your bindings and, of course, never use ski retention straps. If possible keep your mouth closed.

### **AFTER USE REPACKING**

Completely remove the air from the airbag by pressing on the air release valve while at the same time compressing the airbag. Then fold the two long sides inwards, the upper larger part two times inwards and finally the lower portion one time inwards so that the folded airbag rests on the top of the housing. The airbag must lie freely on the housing in order that it can unfold itself easily. After use check all components of the ABS apparatus as well as of the suspension system, against possible damage. In any case you should undertake an airbag test release. If you have been caught in an avalanche you should send in to us the complete ABS for inspection.

*Translated from the German original text. In case of legal disputes the German original text is valid and legally binding.*