

SAFE RIDING IS GREAT RIDING

Your Guide to Snowmobile Safety



iasa

International Association of Snowmobile Administrators



Acknowledgments

Safe Riding is Great Riding has been produced by the International Association of Snowmobile Administrators (IASA) to further awareness of safe snowmobiling practices. It is adapted from the web-based Safe Riders! Snowmobile Safety Awareness Program which can be viewed at www.snowmobilers.org/saferider/homepage/page_00.html

This snowmobile safety awareness information was developed with financial assistance from the Recreational Trails Program administered by the U.S. Department of Transportation Federal Highway Administration (FHWA).

This document is disseminated under the sponsorship of the Department of Transportation in the interest of information exchange.



**U.S. Department of Transportation
Federal Highway Administration**

The United States Government assumes no liability for the contents or use thereof. The contents of this pocket guide do not constitute a standard, specification, or regulation.

The purpose of this guide is educational only, with no other intent but to expand snowmobilers' knowledge about the safe and responsible operation of snowmobiles. The contributors, FHWA, Trails Work Consulting, IASA and their members accept no liability resulting from the compliance or noncompliance with the procedures or recommendations given herein, or for the accuracy or completeness of the information contained herein. Consult your state or provincial snowmobile trail administrator about specific operating regulations and appropriate riding locations in your area.

Project Manager: Trails Work Consulting
4015 S. Brady Ct., Sioux Falls, SD 57103
Phone: (605) 371-9799 E-mail: TrailsWork@aol.com

Contact IASA at www.snowiasa.org

Owned by the International Association of Snowmobile
Administrators
Copyright © 2008 All rights reserved.

Information may be reproduced without permission by not-for-profit organizations for snowmobile safety and information purposes.

Intentionally Left Blank for Local Information to Be Added



Intentionally Left Blank for Local Information to Be Added



Section 1 - Before You Ride

- Trailer and Towing
- Tilt-Bed Trailers
- Flat-Bed Trailers
- Enclosed Flat-Bed Trailers
- Personal Items
- Safety Equipment
- Emergency Kit
- Notify Reliable Person(s)
- Pre-Ride Checklist

Section 2 - Safety

- Hand Signals
- Planning
- Tools
- Trail Signs
- First Aid

Section 3 - Riding

- Riding Apparel
- Starting Your Machine
- Riding Positions
- Riding in a Group
- Passengers
- Riding Alone
- Night Riding
- Where's the Groomer?
- Tips for Encountering Grooming Equipment
on the Trail
- Trail Quality and Trail Set Up Time
- Sledder's Pledge

Section 4 - Laws

- Registration
- Roads
- Violations
- Restrictions
- Properties
- Snowmobiler's Code of Ethics

Section 5 - Parts

Hood and Engine
Other Fluid Levels
Lights and Mirrors
Dashboard
Key Parts
Steering and Skis
Traction Devices
Belt and Clutch

Section 6 - Maintenance

Fall Preparation
Spring Preparation

Section 7 - Emergencies

Stuck
Stranded
Safety Devices
Keeping Warm
Towing
Injuries

Section 8 - Dangers to Avoid

Alcohol
Avalanche Safety
Ice
Over Riding Headlights
Speed
Vehicles

Before You Ride

This section provides information necessary to help prepare yourself for a ride out on the trails on your snowmobile.

Trailer and Towing

For transporting your snowmobile, use a trailer especially designed for transporting snowmobiles. There are 2-capacity tilt-bed trailers, 2-, 4- or higher capacity flat bed open trailers, and 2-, 4-, or higher capacity enclosed trailers. The tilt-bed trailers may be equipped with a winch system to assist with the loading of your snowmobile. Open flat bed trailers will come equipped with folding or self-storing ramps that allow snowmobiles to be driven on the trailer from the rear for loading and off the trailer in the front for unloading. Enclosed trailers will have doors in the front and rear that fold down to serve as loading and unloading ramps. Be sure you have all the proper equipment to attach your trailer to your vehicle, including safety chains, the proper size hitch ball, and the proper electrical connections with lights that are in working condition. Check the weight limit of your trailer, the amount of required tire pressure, and your vehicle's towing capacity before you start.



BEFORE loading the snowmobile, always double check to ensure that the trailer is properly secured to your vehicle's hitch. This will prevent the trailer from popping up off the hitch when the snowmobile is driven onto the trailer bed, particularly with 2-place trailers.

When securing your snowmobile, avoid using rope or rubber for these can easily fray or break. After securing the snowmobile, check to be certain the trailer's brakes (*if the trailer is equipped with brakes*), turn indicator, and clearance lights all work. After the re-check, always cover your snowmobile, if on an open trailer, to protect it while towing.

Tilt-Bed Trailers

Have an assistant help you when loading a 2-capacity tilt-bed trailer to ensure that the bed stays tilted up for the loading operation. To load the snowmobile onto the trailer, drive the machine at a slow speed about halfway up the tilted bed. Then have the assistant pull forward on the front of the skis while also pushing down on the trailer bed. If the trailer is equipped with a winch, fasten it to the snowmobile and use it to winch the snowmobile forward. If the trailer does not have a winch, you may need to get off your snowmobile and help your assistant pull the snowmobile toward the front of the trailer.

Once the snowmobile is pulled forward, secure the tilt bed down with fastening pins, set the brake on the snowmobile, and then use the trailer's tie-downs to secure the snowmobile to the trailer. The tilt bed trailer will either come equipped with a rod or a bar to secure the snowmobile to the trailer. A rod will go across the skis and is held in place at the outside end by a snap pin. A bar will go across the skis and be screwed into the trailer's deck



at a preset receptacle at the center of the snowmobile trailer bed. Also secure the rear of the snowmobile with a ratchet-type tie-down strap.

If there is a second snowmobile to load onto the tilt-bed trailer, remove the tilt pin, tilt the trailer bed back down, repeat the loading process and then re-secure the tilt pin. If there are two drivers and at least one other person to assist, two snowmobiles can be loaded simultaneously.

Always use extreme caution when loading onto a tilt-bed trailer. Many accidents have resulted from driving too fast onto the trailer bed, which can cause the snowmobile to go up and over the trailer and into the back of a vehicle.

After loading and securing the snowmobile, make sure the trailer bed is tightly latched. Check your load frequency often. About 60 percent of the weight should be forward $\frac{3}{4}$ toward the front of the trailer axle. This places more weight over the “tongue” of the trailer.

When unloading a tilt-bed trailer, remove the tie-downs, release the snowmobile's brake, and ease the machine backwards off the trailer. If the snowmobile has a reverse, start the machine and very slowly back the snowmobile off the trailer. If not, use care to not strain your back while pulling the machine backwards until it is off the trailer bed.

Flat-Bed Trailers

When loading a flat-bed trailer, remove the self-storing ramp and place it securely in the groove or channel on the side for which you will load the snowmobile. If the trailer has fold down ramps, remove the security pin and fold the ramp



down so it is in place for loading. Double check the ramp to be sure it is secure, drive the snowmobile at a moderate speed up the ramp, letting off the throttle as the skis reach the trailer bed at the top of the ramp. Slowly drive the snowmobile forward until it is over the location where it will be secured and set the brake. The flat-bed trailer will either come equipped with a rod or a bar to secure the snowmobile to the trailer. A rod will go across the skis and is held in place at the outside end by a snap pin. A bar will go across the skis and be screwed into the trailer's deck at a preset receptacle at the center of the snowmobile trailer bed. Also secure the rear of the snowmobile with a ratchet-type tie-down strap. Move the self-storing ramp to the other side of the trailer and repeat the loading process if there is more than one snowmobile. When you have finished loading the snowmobiles, replace the self-storing or fold up ramps and secure with the safety pin(s).

When unloading a flat-bed trailer, be certain the tow vehicle is turned at an angle away from the ramp to allow room for the ramp and snowmobile to exit safely. Place the self-storing ramp at the front of the trailer, or fold down the folding ramp. Remove the tie-downs, release the snowmobile's brake, and drive the machine slowly off the trailer and down the ramp, using caution to stay clear of the tow vehicle. Replace the ramp, secure it, and store all tie-downs in a safe place.

Enclosed Flat-Bed Trailers

When loading an enclosed trailer, fold down the rear door, which will serve as the full-width ramp, and follow the same process as for flat-bed trailers. Once the snowmobile is in place, set the brake and then secure it with tie-downs.



Some trailers have a tie-down bar that is placed across the skis and screwed in by the fastening bolt into the receptacle in the trailer's floor. Other models have D-rings in the trailer floor to which ratcheting tie-down straps are fastened to secure the snowmobile down, front and rear. When you have finished loading the enclosed trailer, fold the door up and secure.

When unloading an enclosed trailer, be certain the tow vehicle is turned at an angle away from the front door to allow room for the ramp. Fold down the front door, remove the tie-downs, release the snowmobile's brake, and drive the machine slowly out of the trailer and down the ramp, using caution to stay clear of the tow vehicle. When finished, fold the door up and secure. Store all tie-downs in the enclosed trailer.

Personal Items

Create a kit of personal items, such as driver's license, snowmobile safety certification card (*if required by your jurisdiction*), money, medications, insurance forms for vehicle, cell or satellite phone, litter bag, water, high energy food, and/or any other items you deem important. This kit should be with you at all times.

Safety Equipment

Always carry safety equipment on your snowmobile in case of an emergency. The kit should have a tool kit, a knife, a compass, spark plugs, drive belt, two straps, flares, waterproof matches, a flashlight with spare batteries (*check batteries often*) and an extra ignition key. A GPS (*global positioning system*) unit may be helpful in emergency situations. Add more items to the list for long or overnight snowmobile trips.



Emergency Kit

This kit includes items necessary for an emergency. It should include bandages, 2-inch compresses, 4-inch compresses, a roll of 2-inch gauze, a roll of 1-inch adhesive tape, a thermal/space blanket, knife or scissors, alcohol wipes, and antibiotic ointment. All of which should be



stored in a waterproof container. Do not include liquids that could freeze. It is highly recommended that a First-Aid and CPR (*Cardiopulmonary Resuscitation*) course be taken from a certified instructor.

Notify Reliable Person(s)

Before you begin your trip, make sure someone knows where you plan to go, with whom you are going, when you are leaving and when you will return. If the trip involves an overnight stay, include information on where you will stay and contact numbers. This is most important since time becomes critical if you experience an accident or an emergency. It is strongly recommended that you should never snowmobile alone – always ride with a buddy.



Pre-Ride Checklist

Keep this checklist with you when you ride.

Before you start your machine, check the following:

- ✓ Weather forecast, your clothing (*to ensure appropriate clothing for weather*) and the wind chill factor.
- ✓ Throttle (*it should freely return to the idle or closed position*).
- ✓ Snowmobile (*it should be positioned in a clear space free of people or objects*).
- ✓ Fuel and battery.
- ✓ Ski assemblies and rods.
- ✓ Drive belt.
- ✓ General mechanical conditions.
- ✓ Handlebars (*they should turn both ways*).
- ✓ Emergency kit.
- ✓ Personal items kit.
- ✓ Safety equipment.

Before you begin your ride, check the following:

- ✓ Brakes (*they should operate free and smoothly*).
- ✓ Headlights and taillights.
- ✓ Emergency switch.
- ✓ Idle (*slowly run your machine for 30 seconds*).

Safety

A snowmobile is only as safe as the person operating it. The key to safe operation is knowing your snowmobile, using good judgment, and courtesy.

Hand Signals

Giving clear, easy-to-see hand signals are vital to safe snowmobile riding. Be sure to never make hand signals subtle, always make deliberate signals. Be sure that the drivers behind you can see any signal you make. Hand signals are a very reliable way to communicate while riding.



Stop:

Arm raised from the shoulder and extended straight up over the head with palm of hand flat.



Left Turn:

Left arm extended straight out from the shoulder and pointing in the direction of the turn.



Right Turn:

Bend your left arm at the elbow to shoulder height; with your hand pointing straight up and your palm flat, your arm should make a right angle.



Oncoming Sleds:

Guide your snowmobile to the right while pointing to the trail over your head, so your signal can be seen.



Slowing:

Left arm extended out and down from the side of the body with a downward flapping motion of hand to signal warning or caution.



Sleds Following:

Arm raised, elbow bent with thumb pointing backward, in hitchhiking motion move arm forward to backward over your shoulder.



Last Sled in Line:

Left arm raised at shoulder height, elbow bent and forearm vertical with hand clenched in a fist.



Planning

Planning is a large part of having a successful snowmobile trip. You should plan prior to riding where you will ride, how long you will ride, and with whom you will ride. Planning also includes informing someone of your snowmobile plans.

Where you will ride: Before you start riding, decide the routes and trails you will be riding. Create a plan using detailed maps for the planned riding area.

How long you will ride: When choosing a trail with the maps, always consider how long you want to ride. Determine the time period by the maps and, if possible, an experienced rider's judgment. Take into account passengers or other riders, gasoline/supplies, and added time for stopping and enjoying the sites and scenery along the trail.

Who you will ride with: When riding snowmobiles, always ride in a group or use the buddy system, preferably a buddy who will stay with you throughout your journey and not leave you behind. If you are new, ride with someone who is experienced, patient, and willing to help you learn the proper way to snowmobile. If you are riding in a group, choose a group of riders with equal or better riding experience, or a group of riders who will be considerate of yours and everyone else's abilities.

Notify someone of your plans: Before you begin your trip, make sure someone reliable knows where you plan to go, whom you are going with, when you are leaving and when you will return. If the trip involves an overnight stay, include information on where you will stay and contact numbers. This is most important since time becomes critical if you experience an accident or an emergency.

Tools

Most manufacturers create a small spot for tool storage just inside your hood, or the inside of the seat “trunk.” Basic tools are generally included in a container for your machine.

The tool kit, which should always be with you, should contain:

- Flathead screw driver.
- Philips head screwdriver.
- Pliers.
- Spark plug wrench.
- Adjustable wrench.
- Electrical tape.
- Rag.
- Cord (*specifically made for starting manual start snowmobiles*).
- Spare spark plugs.
- Spare belt.
- Tow strap.

This tool kit should be included with the other minimum safety equipment as discussed in the Before You Ride section.



Trail Signs

As you travel on your snowmobile through trails and on roads, there will be traffic signs along the way that apply to snowmobiles. When on roads, remember that all traffic signs for automobiles also apply to snowmobiles, including highway speed limits if you are operating in a highway road ditch. Knowing what these signs mean can help keep you out of danger, make your trip more enjoyable, and protect the rights of property owners. Respecting these signs and following the rules they communicate will help assure an enjoyable ride for you and protect the future of snowmobiling. Here are some of the signs you might see on your trip.

Remember that each state may have different signs for snowmobiles, so always check with the state you are riding in for information.



Stop:

Stop signs mean just that STOP! You must come to a complete stop, look both ways and be certain the area is safe before proceeding.



Yield:

The yield sign requires a person to slow down at intersections and look for hazards and, if necessary, come to a complete stop. If there is other traffic, you must allow them to proceed before you continue on.



No Snowmobiles:

The snowmobile with a circle and a red slash through it means that snowmobiles are specifically prohibited from entering an area, or are prohibited from going beyond a certain point.



Do Not Enter:

This sign means that all vehicles are prohibited from entering an area or going beyond a certain point.

Snowmobiles are required to obey these signs.



Speed Limit Signs:

These signs are in place to reduce risks to riders. A rider must not ride faster than the posted speed limit. In some cases, depending on the conditions, you must ride slower than the speed limit in order to operate safely.



One Way:

This sign means that travel is allowed only in the direction the arrow is pointing.



Two Way Traffic:

This sign's purpose is to warn of oncoming traffic.



Trail Blazer:

An irregular orange diamond designates the snowmobile trail or corridor.



Stay on Trail:

These signs are used in sensitive areas like wildlife winter range or across private property. It is important that snowmobilers abide by these signs to protect continuing access in the future across these areas.

Anyone sent for help should be capable of providing the following information:

- Time and location of the accident.
- Cause of the accident, and nature of injuries.
- Victim's description and overall condition.
- Number of others at the scene with the victim.
- As in any emergency, stay calm.
- Try to reassure the injured, providing as much comfort and help as possible.
- Know the basics of first aid.
- Keep a first aid kit with you as part of your personal equipment.

Check the victim systematically for vital signs, injuries, or broken bones. In all cases, treat for shock!

- Always check for breathing first.
- Next, check for bleeding.
- Finally, look for other signs of injury.
- Care for shock with any injury.

Accident victims may suffer from...

- Spinal injury
- Cuts
- Frostbite
- Broken bones
- Asphyxiation.
- Hypothermia.
- Heart attack.
- Shock.

Spinal Injury

- Never move a person with a possible neck or spinal injury, unless there is imminent danger such as fire or drowning, until the situation is evaluated by trained emergency medical personnel.
- Victims may have loss of movement or sensation with fingers, toes, feet, and legs.
- Pain in the back or neck may indicate a spinal or neck injury.
- Always leave the helmet on if one was worn during the accident.

First Aid

It is highly recommended that you take a certified first aid and CPR (*Cardiopulmonary Resuscitation*) course to aid you in case of an emergency.

For basic First Aid, always be aware of the dangers of frostbite and take precautions to prevent it. Proper clothing will help reduce the risk of frostbite and can be found in the Riding/Apparel.

A first aid kit should always be with you on your trip and should include the following:

- Ace bandage and band aids.
- Wide adhesive tape.
- Triangular bandage.
- Sterile Vaseline (*tube*).
- Antiseptic and soap.
- Moleskin for blisters.
- Small scissors and safety pins.
- Gauze roll and sterile dressing.
- Aspirin and cotton swabs.
- Tweezers and needle.
- Single edge razor blade.
- First aid handbook/cards.



If you're one of the first on the scene of an accident:

- Approach with caution.
- Be aware of hazards that may have caused the accident.
- Avoid becoming a victim yourself.
- Avalanche or ice-related accidents are of special concern.
- Make sure the accident scene is safe from being struck by oncoming traffic.
- This is especially critical at night, on curves or hills, and during busy daytime use periods.
- Consider posting people on the trail at opposite ends of the scene to provide warning to others.
- Call for help as quickly as possible.
- If 911 is contacted by cell phone:
 - Be aware of your cell phone battery condition.
 - Be available for call-back if necessary.

Cuts

- If a cut is serious, put a compress directly over the wound and bandage it tightly to stop the bleeding.
- The wounded part may be raised or elevated if the bleeding continues, so blood flows away from the wound.
- If bleeding still continues, use the pressure point technique.

Frostbite

- Frostbite is the freezing of skin tissue.
- Frequently check each other's exposed skin as necessary for minor frostbite.
- Warm the affected area as soon as possible, but warm it slowly.
- Do not rub the frostbitten area with your hand, snow, or gasoline!
- Severe frostbite, such as a frozen limb or body part, should be treated immediately by trained emergency medical personnel.

Broken Bones

- Broken bones can be recognized by the odd shape or position of a limb, or by the victim feeling pain.
- Immobilize the limb, and try not to disturb the break.
- Broken bones in most cases must be properly splinted by trained emergency medical personnel before a victim can be moved from the area.

Asphyxiation

- An accident victim still may survive, even though breathing has stopped.
- Breathing can be restored if a rescuer has been trained to perform artificial respiration (rescue breathing).
- This skill needs to be acquired by taking a certified first aid or CPR class.

Hypothermia

- Hypothermia happens when the body loses heat faster than it can be replaced.
- Shivering is the first stage of hypothermia.
- Uncontrolled shivering, stumbling, slow movement, mumbling, and mental impairment occurs as the condition advances.
- Death follows, unless the victim receives help.
- To treat hypothermia:
 - Get the victim warm.
 - Give the victim warm, non-alcoholic liquids.
 - Provide the victim with dry clothing.
 - Use blankets or a sleeping bag.
 - Use direct body heat if necessary.

Heart Attack

- Heart attacks often occur as victims over-exert themselves while getting snowmobiles unstuck, or trudging through deep snow.
- Symptoms of heart attack include:
 - Shortness of breath.
 - Pain in chest or upper arms.
 - Bluish color of lips and around finger nails.
 - Abdominal pain or nausea.
- Heart attacks are true emergencies.
- Rescuers need to be trained in CPR, and the victim needs to be taken to a hospital immediately.

Shock

- Shock is a condition of poor blood circulation often caused by serious injury.
- A victim may be successfully treated for injury, but still die from shock.
- Symptoms of shock are:
 - Pale, clammy skin.
 - Elevated breathing rate.
 - Fast, weak pulse.
 - Overall weakness.
- Treatment for shock:
 - Lay the victim down, on their back, if possible (*depending on injuries*).
 - Make the victim as comfortable as possible.
 - Cover the victim and provide shelter, to prevent chilling and dampness.
 - Raise the victim's feet about 8-10 inches to improve circulation.
 - Get medical help as quickly as possible.

Riding

This section will help you become familiar with the proper riding apparel, how to start your snowmobile, riding techniques, how to interact with other riders, and how to prepare for riding at night. This section also includes the responsibilities of a snowmobile rider.

Riding Apparel

Before heading out onto the trails, you need to equip yourself with the right snowmobile apparel. Make sure you have layers on to protect your body. Select your clothing carefully depending on the weather, paying special attention to the weather when you start, during the ride, and the wind chill factor. Frostbite can be drastically reduced when wearing the proper riding apparel.

Under Layers

The clothing you wear underneath your suit is crucial to feeling comfortable while you are riding. On cold days, layers can provide a barrier from the cold, wind chill, and frostbite. If you have too many layers on, you can always remove them during your journey; but if you don't put enough on before you start, you can't add any later.

The first layer should be long underwear that allows your body to breathe. This layer should be lightweight, and not tight or restrictive. A couple of light layers



add better protection than one heavy layer. Cotton should never be worn as the first layer or as any layer since it does not wick moisture created by perspiration away from the body, does not dry, and stays wet and/or freezes once it is wet. Polyester blends, silk, or other synthetic blends are recommended because they dry quicker and wick moisture away from the skin. Fleece, wool, or polyester tops and bottoms are the best choices. Cotton sweatshirts, t-shirts, and jeans, cotton long underwear, and cotton socks should never be worn while snowmobiling.



Snowmobile Suits

Snowmobile suits are designed for warmth and comfort while riding. The main purpose is to protect you from the cold, wind chill, and frostbite. The outside shell of your apparel should be windproof and waterproof. Acrylic or synthetic materials are the most popular fabrics used in suits. Do not use cotton suits, for they can become saturated with water from the snow. If you plan to travel near or on ice, some suits come equipped with an approved floatation device.



Headgear

Your helmet is your most important piece of equipment. Approved helmets should be worn at all times while snowmobiling. Helmets can protect you from serious injury during a crash. There is always a risk of head injuries, but wearing a helmet can greatly increase your chances of survival. Full-face helmets are the warmest. They completely cover the face and provide a chin guard. These helmets also have full visors to protect your face and eyes from the cold. Open face helmets provide the same protection from head injuries as full-face helmets, but there is no chin guard to protect the face. Remember to always have the helmet's straps fastened as you ride.



Facemasks

Facemasks can be important to have on very cold days to prevent frostbite. If your helmet is not full-faced, a facemask is a must. If not normally worn when riding, a facemask is always important to have stored in a pocket, in case the weather does become very cold. Baklava facemasks made of thin polyester, silk, or other synthetic fabrics are lightweight, less bulky, more comfortable, and often preferred over knit stocking cap facemasks.



Eye Protection

Eye protection is essential and may include a helmet visor, goggles, and sunglasses. They protect the eyes from tree limbs, kicked up snow and ice from other snowmobiles, flying debris, and protect your eyes from watering from the wind and cold.

Goggles, sunglasses, or visors with colored lenses for bright days are indispensable. Amber or yellow colored lenses are very useful during late afternoon or dark times. These lenses, when used in the correct light conditions, can reveal dangerous depressions in the snow.



Gloves

Gloves are an essential item in your riding apparel. Some choose mittens, which can be the warmest, to protect their hands. Always purchase gloves or mittens that allow your hands to operate the controls freely. Gloves, as should your suit, should repel water and wind. This will help keep your hands warm. Fleece or wool glove liners worn as a layer with regular gloves can help adjust for cold to colder or warmer weather, since you can always add or remove the liners.



Socks

When selecting socks, select carefully and **NEVER** wear cotton! Good sock choices include thin nylon, polypropylene, fleece, wool, or synthetic blends. Wool or fleece is best for keeping a good warm insulation on your feet. When you feel your feet getting cold, it is time to change your socks.

Bring an extra pair along with you to change if needed.



Boots

Boots are very important for keeping your trip enjoyable. Boots keep your feet warm, comfortable, and protected from water. The best material for boots is a combination of materials that includes a rubber, waterproof bottom with a good lug sole for traction; a nylon or synthetic upper that is high enough and fastens to repel snow; and a removable, breathable liner made of wool, fleece, or synthetic material that wicks perspiration away from the foot. Make sure your boots do not let in any water, but allow your feet to “breathe” or let out moisture.

Choose boots that fit well and are comfortable for a long day of riding. They should not feel tight or restrictive when worn. Boots that are too tight can cut off circulation and your feet can become cold.



Starting Your Machine

This information will help you become familiar with starting your machine.

First, you should always read the owner's manual on how to start your snowmobile. This is the best guide for your machine. Always follow the recommendations in the owner's manual.

Second, use the Pre-Ride Checklist before you start to ensure your machine mechanically is ready.

Third, to start it:

- Point the snowmobile in a safe direction.
- Be ready to start it by kneeling or sitting on the machine.
- Check the throttle by depressing it at least once to be sure it isn't frozen. When released it should return quickly to the idle position.
- Check all important switches like key and safety switches, which should be in the “on” positions.
- Depending on the machine, choke or prime the engine if it is cold.
- If your machine starts electrically, turn the key to the “start” position and release the choke as soon as the engine starts.
- If your machine is a manual start, pull the recoil starter cord until you feel resistance, then pull vigorously, but don't let the handle snap back.

Try not to flood the engine when starting the snowmobile. If the choke is used and the engine hesitates to start, stop before too much gas is used. Wait a minute or two, and then try to start the engine again.

Riding Positions

Riding positions can vary with the type of terrain you are riding and also your own style. Each position has its own advantages. It is important for you to be familiar with each position so that you can safely and confidently navigate the trails.

Sitting

This is the safest and most common riding position. Position yourself on the snowmobile with your feet flat on the running boards. This will help cushion the effects of bumps on the trail and also keep your feet safe from the tracks or objects. When sitting, keep your body weight low so it will be easier to shift from side to side.



Standing

This position should only be used when you have visibility troubles in the sitting position. Be sure to keep your knees bent to absorb the bumps on the trail and keep your speed slow. Do not use this position for regular riding, for it can be hard to react to situations and doesn't allow quick control in case of an emergency.



Kneeling

This is a good alternative riding position to rest the body while riding at slow speeds. For this position, put your knees up under you on your seat. It can help with better visibility, but it is more difficult to keep your balance.



Semi-Kneeling

A semi-kneeling position, where one knee is up under you on the seat and the other foot is on the snowmobile's running board, can be useful when riding in deep powder snow while riding at slower speeds. This will help with visibility and also help to control the snowmobile.



Posting

This is a semi-sitting position that is best suited for traveling over uneven terrain. Keep your feet flat on the snowmobile running boards and bend your knees. This will help with visibility too.



Riding in A Group

When riding in a group, there are a few guidelines you should know.

- Snowmobiles should ride single file and not side-by-side. Some trails are not wide enough for two snowmobiles. This will also help when there is two-way traffic on a snowmobile trail.
- Follow the snowmobile in front of you at a safe distance that would allow you to stop or slow down in a safe manner. A good rule to follow is the 3 second rule:

When the person in front of you passes an object, note where it is and start counting. By the time you arrive at the same object, you should have counted no less than three seconds. If you counted to less than three, you need to allow more space between the riders in front of you to ensure time to stop safely.

Passengers

When riding with passengers, remember to ride safely and obey all laws including the speed limit (*as you should every time you ride*). You now have the responsibility of transporting, not only yourself, but also another person. You should never take any chances or risks while with a passenger.

Inform your passenger of how to ride with you on the snowmobile. Tell him/her to keep their feet flat on the running boards, firmly hold the handgrips, and to lean into the turns with you.

Riding Alone

It is recommended that you should use the buddy system and never ride alone. If you do choose to ride alone, always use the Pre-Ride Checklist before going out by yourself. Always let someone know you are riding alone, where you are going, and when you will be back. Be sure you have your tool kit, emergency kit, and personal items kit with you before you ride out.

Night Riding

Riding at night can be as enjoyable as day riding, but extra precautions are a must before you ride out.

- Be certain your headlights, taillights, and brake lights are working before you ride. Carry extra bulbs with you, just in case.
- Always drive at speeds that will allow you to stop safely if a dangerous object appears. Adjust your speed to snow conditions, other riders, and basic safety reasons. It is important to ride at safe speeds under all conditions, not just for night riding.
- Since headlights illuminate a path only about 200 feet (*61 meters*) in front of a snowmobile, do not override your headlights. This means that if your stopping distance is greater than 200 feet (*61 meters*) or whatever your headlights illuminate, you are going too fast.
- Some trails can be narrow and can be hard to judge at night. Keep your speeds low so you can react to other oncoming riders and so it is easier to slow down.
- Stay on all marked trails; follow trail signs, and speed limit signs while night riding. Be cautious when crossing roads and always be prepared to stop for anything at a moment's notice.

Visit the Speed section in Dangers to Avoid for more information.



Snow Conditions

The weather can produce unpredictable snow conditions. Be sure to check the weather reports before you leave. The reports can be on the television, radio, and even Web sites. Always be prepared for the unexpected.

Ice

Ice can form on trails and roads and can make the snowmobile difficult to operate. When you suspect ice may be present, be cautious by slowing your speed way down, taking corners very slowly, and stopping with ample space to safely stop. Not taking precautions can lead to serious injury to you and/or your group.

Dirt

When trails are well used, they can develop areas of snow and dirt mixed together. These areas can be hard on the snowmobile. Take caution to not damage your machine when riding over these spots and check your snowmobile often for damage. Try to avoid bare areas of ground since snowmobile use may damage vegetation or cause soil erosion.

Powder

Fresh, powdery snow can be ideal for riding. Powdery snow can linger in the air after snowmobiles pass over it. This snow dust can cut down on visibility for other riders to spot other snowmobilers, trail signs, stop signs, or other motor vehicles. Your speed should always be slower to accommodate for the powder.

Wet Snow

Wet snow can be great to ride on, but can also be difficult. Start out by driving slow, since wet snow can make steering your machine difficult. Wet snow can also accumulate on your clothing. You should be wearing the proper Riding Apparel so the wet snow does not soak into your clothes. If snow and moisture get into your clothing, frostbite can occur.

Responsibilities

As with owning a motor vehicle, a snowmobile driver/owner has responsibilities to uphold. The future of snowmobiling rests in the hands of every snowmobiler. It is extremely important to remember that the trails are for everyone.

- Be safe and courteous at all times. Each time you ride your snowmobile, you should portray that snowmobilers take safety seriously.
- Respect and obey trail, speed and other signs
- Respect land owners' property when a trail runs through their private property.
- Respect others who use the trails, like other snowmobilers, cross country skiers, hikers, snowshoe users, and dogsleds.
- Use slow speeds to prevent injury to yourself and others who may be ahead of you, around turns or corners, and over blind hills.
- Speed limits should be obeyed at all times. This is not only for the safety of yourself, but for the safety of others.
- Respect the groomers, the machines that work the snow and restore the trails you ride.

For additional responsible snowmobiling tips, visit www.treadlightly.org.



Where's the Groomer?

- Snowmobilers often, mistakenly, comment that “the groomers can’t be doing their job because I’ve never seen one.” If snowmobilers do not see grooming equipment on the trails, that is generally a good thing. Groomers should work at night or when snowmobile traffic is the lowest to ensure that grooming efforts are the most effective and that there is proper time for the freshly groomed trail to re-freeze and set up. Trail grooming is very expensive so every effort should be made to ensure that, when grooming occurs, it will be effective and create trails that are as durable as possible.
- Groomers work at night so you can have better trails the following day. Give them a break and please do not follow them when they are working whether day or night.



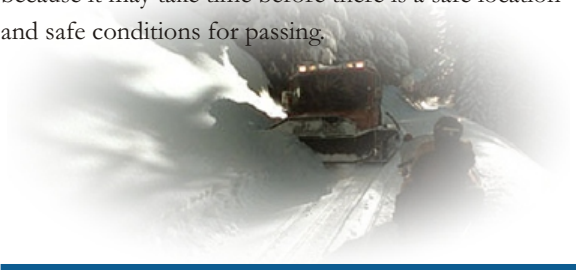
Tips for Encountering Grooming Equipment on the Trail

First, recognize that trail groomers may be working on the trail at any time. They are there in an effort to provide you with smooth, safe trails. Always keep your snowmobile under control and anticipate that a groomer might be around the next corner or over the hill.

Snowmobiles are much smaller and much more maneuverable than groomers, so always yield to a groomer. Always slow down when approaching or overtaking grooming equipment. Groomers move very slowly – typically only 5 to 8 miles per hour – so they are almost stationary when compared to a snowmobile traveling 30 to 60 miles per hour.

When approaching an oncoming groomer on the trail, slow down and move your snowmobile to the far right side of the trail. Realize that the grooming drag or tiller behind the grooming tractor may be very wide, may extend wider than the tracks of the tractor, and may essentially take up most or all of the trail's width. If the trail is narrow or winding, you may need to stop at the far outside edge of the trail to let the groomer pass.

When overtaking a groomer from the rear, slow down and assess the situation ahead. If there is good sight distance and the trail ahead is clear of oncoming traffic, pass the groomer while operating with caution. Beware that the groomer may create snow dust and make visibility poor. If the trail is narrow or winding, you may need to stay behind the groomer until the operator pulls over and signals for you to pass. Be patient because it may take time before there is a safe location and safe conditions for passing.



If you need to stop a groomer to ask for information or assistance, understand this should be done only in an area where there is good sight distance and it is safe to stop. The groomer operator may request that you follow the groomer to a safer location where he can stop and provide the assistance you need.

Trail Quality and Trail Set Up Time

Trail grooming requires that “set up” time be allowed for the freshly groomed trail to re-freeze. Set up time will vary depending upon temperature and moisture content of the snow. Generally two to six or even more than ten hours may be needed for the freshly groomed trail to set up to where it is durable and will hold up to heavy snowmobile traffic.

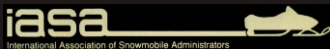
Try to avoid riding a snowmobile on freshly groomed trails for at least two hours after the groomer passes by choosing an alternate route to help improve the quality and durability of snowmobile trails. And never follow directly behind a groomer because it immediately destroys the trail.

If you come upon a groomer and you must use that route, try to minimize impacts to the trail: slow down; try to stay off the fresh grooming if the trail is wide enough to safely do so; operate only at the outside edge of the fresh grooming; ride in single file versus having everyone in the group take a different path on the fresh grooming; and don't purposely fishtail or power through the soft snow.

Understand that aggressive riding styles can impact the quality and smoothness of the trails you ride on. Fast starts and stops, powering through curves, paddle tracks, carbide runners, traction devices, and powerful engines can all combine to destroy the smoothness of a trail. So the next time you hit the brake or throttle, think about how you may have innocently contributed to destroying the trails you would really prefer to be smooth.

Sledder's Pledge

1. I will never drink and drive a snowmobile.
2. I will drive within the limits of my machine and my own abilities.
3. I will obey the rules and laws of the state or province I am visiting.
4. I will be careful when crossing roads, and always cross at a right angle to traffic.
5. I will keep my machine in top shape and follow a pre-op check before each ride.
6. I will wear appropriate clothing, including gloves, boots, and eye protection.
7. I will let family or friends know my planned route, my destination, and my expected arrival time.
8. I will treat the outdoors with respect. I will not litter or damage trees and other vegetation.
9. I will respect other peoples' property and rights, and lend a hand when I see someone in need.
10. I will not snowmobile where prohibited.



Laws

Snowmobilers must follow rules and regulations, the same as any other motorized vehicle. Laws are in place to ensure the safety of you and others, as well as the reputation of snowmobiling.

NOTE: This information does not take the place of the laws set by the state or province you register and/or are going to ride in. Make sure you thoroughly understand the laws of the state or province you plan to ride in before you begin.

Registration

Registration

Registering your snowmobile is important and is required by law in all northern States and all Canadian provinces and territories. You must register in order to operate your snowmobile on the trails and areas open to the public. In most cases, your registration fee goes back into the state's/province's snowmobile program to provide trails and riding areas. Once you have paid the registration fee, you will receive a certificate and adhesive decals. This certificate should be carried on the snowmobile. The decals are to be attached permanently to the snowmobile as directed by the information supplied with your certificate. If these decals are not attached to the snowmobile, you may be stopped by law enforcement.

Trails Pass/User Fee/Out-of-State Registration

Some states and provinces require snowmobiles to also have a trail pass or pay a trail user fee in addition to the registration decal. Additionally, when visiting other states or provinces, you may be required to purchase a trail pass, pay a user fee, or even that area's snowmobile registration. This is typically another decal to be affixed to the machine. Always be sure to check the local regulations when visiting other areas.

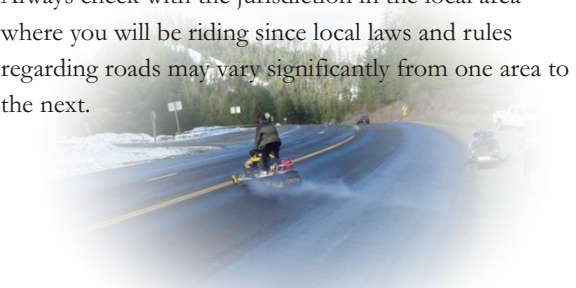


Roads

While on the snowmobile trail, you may encounter a road that may need to be crossed. These are some rules to follow for your safety as well as automobiles and pedestrians.

- Reduce your speed and come to a complete, safe stop at the road. You never know what might be heading toward you on the road. Remember to keep your speed slow so that you can stop at the road and not slide into oncoming traffic.
- Stand tall on the running boards to see and to be seen. When coming upon the road, change your riding position from sitting to standing. This is to help you better see the traffic and also so traffic can see you. Automobiles have the right-of-way on the road, so wait for the traffic to clear first.
- Cross directly or as straight as you possibly can across the road. Remember that concrete and pavement do not allow for the same steering control as snow does.
- Cross slowly and carefully; do not cross the road at high speeds.

When you encounter roads along the trail you are riding, you will need to be aware of what roads you can and cannot ride on. These laws, prohibiting snowmobiles on certain roads, were set in place for your safety and the safety of automobile drivers. Always check with the jurisdiction in the local area where you will be riding since local laws and rules regarding roads may vary significantly from one area to the next.



For example:

- You cannot ride a snowmobile on an Interstate Highway or any other freeway with fully controlled access.
- You cannot ride on most plowed roads except under special circumstances where it has been designated open to joint use with motor vehicle traffic.
- You cannot cross any roadway without coming to a complete stop and yielding to traffic.
- You cannot cross any roadway with more than four lanes, unless the Department of Transportation authorizes it.

You can ride on certain plowed roads only:

- If the road is designated with a route sign and as a snowmobile route.
- If the trail crosses the road.
- If there is an ordinance allowing you to ride from your house to the trail; check the local regulations.
- If there is an ordinance allowing you to ride directly from the motel/hotel to the trail; check with local officials.
- If you encounter a bridge, culvert, or roadway and the road is the only way around it.
- If the road is not normally plowed to remove snow; you cannot operate on unplowed roads after a snowfall, if the street is normally plowed.
- If there is a special event and snowmobiles are allowed to travel on the roads.

Rules of riding next to all roads:

- Generally, ride as far away from the plowed roadway as is safe and/or practical.
- Always comply with all posted signs, including the speed limit for the road.
- At night, dim your headlights if operating in the road ditch against oncoming vehicle traffic on the road.



Violations

These are violations that can occur while riding a snowmobile. The most dangerous of the three would be OWI/DUI, (operating while intoxicated /driving under the influence). Keep yourself, others, and the life of snowmobiling safe by not drinking and driving your snowmobile.

Operating While Intoxicated/Driving Under the Influence (OWI/DUI)

Drinking and driving laws pertain not only to automobiles, but also to snowmobiles. Alcohol greatly impairs your sense of balance, coordination, and judgment. A large number of snowmobile accidents in many areas are caused by alcohol. Never drive your snowmobile while under the influence. Operating while intoxicated can greatly increase your chances of being injured or killed, or killing someone else.

States and provinces have varying limits for alcohol consumption while operating a snowmobile. Most are 0.08 or 0.1. In most jurisdictions, operators can be cited and spend time in jail for an OWI/DUI on a snowmobile.

OWI/DUI is not only limited to alcohol but illegal drugs are also considered an OWI/DUI. Penalties for driving under the influence of alcohol or drugs can be severe.

Eluding Police Officers

While you are riding the trails, a law enforcement officer can stop you if he/she thinks he/she may have a reason to. If signaled to pull over, do so immediately in a safe manner. Failure to stop, or eluding the police, can result in high fines and possible jail time.

Trespassing

Never travel off the snowmobile trail marked with route signs. Always travel on trails approved for snowmobiles. Trespass violations, even those that appear minor, are one of the leading causes of trail closures.

Stay on marked trails and respect the fact that private property owners let you snowmobile on the trails through their property.

Restrictions

Age

The minimum age to operate a snowmobile can vary by state or province. For many it is 15 or 16, as young as 12, or as old as 18. Be sure to check your local laws, or the area you plan to ride. Some states and provinces may also require that you pass a safety certification course to operate a snowmobile. Again, check with the area you will be snowmobiling in to be sure of age restrictions and safety certification requirements.

Exhaust

Exhaust systems that have been modified and are louder than factory exhausts are often illegal. Many states and provinces prohibit the operation of excessively loud machines and restrict the sound level. Since the exhaust system comes tuned and in working order from the factory, it should not be modified. Some jurisdictions carry fines for violating the sound laws.

Speed/Distance

Always obey all posted speed limits. Some areas also have laws related to speed when riding in proximity to other people, homes, or occupied buildings. Some areas may require that if you happen upon pedestrians, you must stay 100 feet from them at a speed of 10 mph. This includes hikers, cross-country skiers, even snowmobilers who have stepped off their machine.

Also, when riding near a residence between the times of noise ordinances, you must not travel faster than 10 mph.

It is important to check for local laws and to adhere to these rules to ensure the safety of others and to also show courtesy to others.



Properties

Restricted Areas

There are certain places that snowmobiles may not be allowed to operate. These areas are generally, but not always, posted with signs indicating that snowmobiling is not allowed. These places are generally restricted: airports, railroad property, cemeteries, sacred Native American lands, school properties, designated Wilderness areas, designated wildlife winter range, and most private property. Visit the Trespassing section for more information.

Ordinances

Be sure to check the local ordinances or laws that are enforced in the places or states that the trail runs through. The ordinances can include speed limits, routes, and trail access.



SNOWMOBILERS'S CODE OF ETHICS

As a snowmobiler I will...

1. Be a good sports enthusiast and recognize that people judge all snowmobilers by my actions. I will use my influence with other riders and owners to promote fair conduct.
2. Not litter trails or trailheads. Nor will I pollute streams or lakes by my actions.
3. Not damage living trees, shrubs, or other natural features. I will go only where there is sufficient snow cover so as to not damage the land.
4. Respect public and private landowners' property and rights.
5. Lend a helping hand when I see someone in distress.
6. Make myself and my vehicle available to assist search and rescue efforts.
7. Not interfere with or harass other trail users, other snowmobilers, or other winter sports enthusiasts. I will respect the rights of other trail users to enjoy winter recreational opportunities.
8. Know and obey all federal, state, provincial, and local rules regulating the use of snowmobiles. I will not ride in designated Wilderness areas.
9. Not harass wildlife and will avoid areas posted for the protection of wintering wildlife.
10. Stay on marked trails when operating in areas where snowmobile use is restricted to trails. I will obey all traffic laws when operating upon plowed roadways designated as open to snowmobiling.



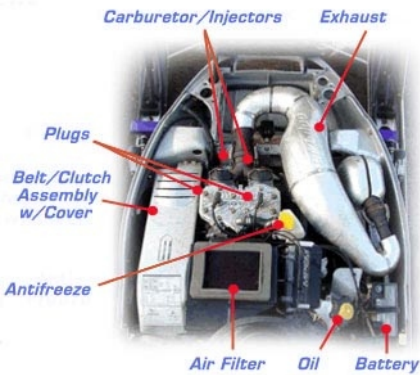
Parts

This section describes general details of the parts on your snowmobile.

NOTE: This is not a substitute for your snowmobile's owner's manual. Read that first for exact details about your snowmobile.



Hood and Engine



Antifreeze and the Reservoir

Antifreeze cools your engine while it is running and keeps the coolant channels free of corrosion. Check the antifreeze reservoir and follow the manufacturer's directions in your owner's manual for the type of antifreeze required and the proper level of fluid to maintain in your reservoir.

Air Filter

The air filter keeps impurities (snow, dirt, twigs, etc.) from entering the air intake system. Never operate your snowmobile with the air filter removed.

Oil

Oil is the lubricant that allows your snowmobile engine to continue to operate with very little friction. If your machine runs out of oil, your engine will seize and will need expensive repairs. Check the oil levels before you start your machine, and again at the end of every ride. Follow the owner's manual recommendations on the type of oil to use and the proper level to maintain in the reservoir. A 2-stroke engine must have injection oil in the reservoir, while a 4-stroke engine must have oil in the crankcase.

Battery

You need a battery if you have a machine with an electric start. Be sure to maintain a charged and healthy battery at all times.

Exhaust System

The exhaust gets rid of burned fuel and byproducts. It includes a muffler, which reduces exhaust noise.

Modifications or leaks in an exhaust system can lead to engine damage and expose you to toxic fumes like carbon monoxide and hydrocarbons.

Carburetor/Injector

Carburetor/injectors are devices that mix the proper amount of air and gas so that a spark from the plugs can ignite it. The resulting combustion runs the engine.

Spark Plugs

These ignite the fuel mixture in the engine cylinders. When plugs become fouled from excessive choking with two-cycle oil, the engine runs rough and eventually stalls. Always carry spare spark plugs in your emergency kit.

Belt/Clutch Assembly

The clutches allow the drive belt to be gripped and/or slip while the engine is running. The clutches are precisely balanced and are under tension by powerful springs that when released improperly, can cause severe injury and damage. Only a qualified mechanic should adjust the clutches.



Other Fluid Levels



Gasoline

Use fresh gasoline at the octane recommended by the manufacturer. Never use old, stale gasoline. Always make sure you have plenty of gas before you start your trail ride.

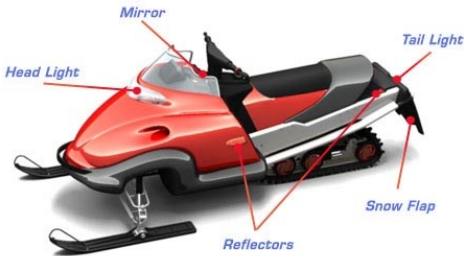
Gear Oil

Gear oil lubricates the gears where the snowmobile's drive train comes together. If these gears are not lubricated, the machine's track will seize. When the track suddenly stops without warning, you are subjected to a dangerous situation and very costly repairs. Follow the manufacturer's recommendations for the level and type of gear oil for your machine.

Heat Exchangers

Heat Exchangers are a series of antifreeze reservoirs located under the snowmobile. Snow kicked up by the track comes into contact with them and cools circulating antifreeze that has been heated by the engine. The cooled fluid circulates back and cools the engine. Some snowmobiles have air-cooled engines. Air-cooled engines have a fan that blows cool outside air across the engine.

Lights and Mirrors



Mirrors

Many snowmobiles are equipped with mirrors to allow operators to see behind them. All mirrors have a “blind spot” that does not allow the operator to see everything behind. Do not rely solely on your mirrors; vibrations from the snowmobile can make it difficult to use the mirrors effectively. Occasionally, give a quick glance over your shoulder to see what is behind you.

Snow Flap

The snow flap is located at the rear of the snowmobile. It covers the rear of the track and prevents rocks, ice, and other objects from shooting back at other machines behind you. As part of your routine snowmobile check, make sure the flap is in good working order and not torn or tucked under the track.

Reflectors

Reflectors and reflective tape are used so the operators of other vehicles, including automobiles, can see you better from the side. To avoid collisions at night, be sure all of your side reflectors are cleared of snow. Do not remove the reflectors! They are required by law.

Taillight

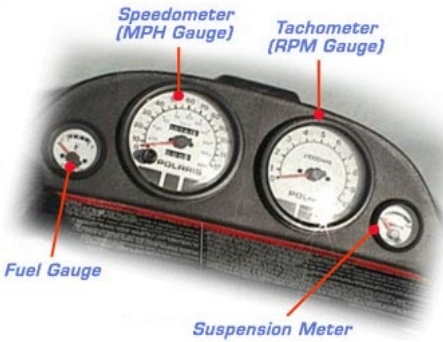
The tail lamp on a snowmobile must display a red light that is plainly visible during darkness from a distance of 500 feet to the rear. Your factory-produced snowmobile is certified to meet this requirement and there is no reason to modify the taillight. Taillights have a tendency to become obstructed by snow and ice from the trail. Be sure to clear the taillight frequently.

Headlights

The headlamps must be a white light of sufficient power to illuminate any person or substantial object at a distance of 200 feet ahead. Your factory-produced snowmobile is certified to meet this requirement.



Dashboard



Speedometer

The speedometer, miles per hour (mph) or kilometers per hour (kph) gauge, tells you how fast you are going in miles or kilometers per hour. The odometer, which measures the total distance traveled in miles or kilometers, is also part of the speedometer. A separate “trip meter” can measure individual trip distances.

Tachometer

The tachometer, or revolutions per minute (RPM), tells you how fast the engine is turning in RPMs. It is important because it tells you when you are loading the engine and how much load is safe before damage is likely to occur.

Fuel Gauge

The fuel gauge can be located in one of two locations. Many modern machines have a fuel gauge mounted on the dash where you can see it without moving your eyes from the trail. Another location for a fuel gauge is on the gas cap.

Suspension Meter

Some of the newer machines are equipped with an electronic suspension system. The meter can be used to check the suspension level. With this option, minor adjustments to the suspension can be made without wrenches.

Key Parts:



Key Switch

The key switch is a safeguard that allows you to “lock” your machine so that others cannot start the machine without the key. For snowmobiles equipped with electric starters, the key and switch starts the machine.

Kill Switch

The emergency stop switch, or kill switch, allows the operator to stop the engine by either pushing or slipping the switch. The engine cannot be started if this switch is left in the “off” or stop position.



Throttle

The throttle starts the snowmobile moving and allows the operator to vary the speed of the snowmobile. The more the throttle is pushed with the operator’s thumb, the faster the snowmobile goes. When the throttle is fully released, the snowmobile will coast to a stop.

Pull Start Handle

For machines without an electric start, the pull handle is connected to a cord that starts the engine, similar to a lawnmower. Many electric start machines have a pull start cord and handle for emergencies.

Reverse Lever

Some snowmobiles are equipped with a reverse lever that allows the machine to be backed up at slow speeds. The location for the reverse lever can be different for the many makes and models, but they work essentially the same, similar to a car.

Brake System

On modern machines, when you squeeze the brake lever, it applies pressure to the hydraulic (brake) fluid, causing the brake pads to squeeze a disk connected to the drive train. This, in turn, slows and stops the snowmobile. Older machines may have a cable attached to the brake lever, using a system that works much like a bicycle brake. All snowmobiles are required to have a working brake.



Lanyard

Some models have a “dead man” switch for additional safety. A lanyard is attached to the operator by a clip or loop worn around the wrist; the other end snaps under a kill switch. If the operator falls from the machine, the lanyard pulls the clip from the switch and stops the engine. The engine cannot be started if the clip is not attached to the switch.

Choke

The choke lever partially blocks air to the engine, causing more gasoline to be dumped into the carburetor. Engaging the choke helps to start a cold engine. However, the choke must be turned off after the engine warms up to avoid fouling the spark plugs.

Steering and Skis



Grips

Grips are located on the right and left sides of the handlebars. Grips are designed to absorb vibrations and provide the traction for your hands to stay on the handlebars. Grips aid the snowmobiler in steering the machine.

Hand Warmers

Modern snowmobiles are equipped with electric heated handgrips as well as a thumb warmer on the throttle control. Most hand and thumb warmers have a couple of temperature settings to adjust to your needs.

Steering Columns

The steering column is connected to the handle bar at the top and to the cross bars that turn the skis at the bottom. The steering column controls the direction of the skis, which allows the steering of the snowmobile. The bolts that hold this assembly together should be checked periodically to ensure they are tight.

Skins

Skins are optional plastic coverings, which can be put under metal skis. Some riders find that when the snow is “sticky”, the skins glide over the snow better and improve gas mileage. Skins are not essential, and you can operate nicely with the stock skis that come with your machine.

Wear Bars (skags)

Wear bars are replaceable steel rods under the skis. They are essential for steering. Without them, you'll slide off the trail when turning corners. Wear bars should be inspected often, and replaced to reduce the chances of a crash and to prevent damage to the skis caused by abrasive surfaces. Be aware that carbide steel wear bars can carve grooves in pavement, so be careful when riding across private driveways and roadways since extensive damage can be caused over the course of a season.

Skis

Skis guide the machine's forward momentum, and allow turning when the operator turns the handlebars. They may be made of metal or plastic. Like a car's front tires, skis must be maintained and kept in proper alignment. Skis that are out of line make it difficult to steer. To check alignment, place the machine on a solid surface and turn the handlebars straight ahead. Measure the distance between the skis at the front and the rear. Refer to the owner's manual for proper ski alignment and have repairs made promptly by a qualified mechanic.

Front Suspension

The front suspension is designed to absorb bumps, give you a smoother ride and assist you in steering safely. Some suspensions allow you to make adjustments to fit the weight of the rider to the depth of the snow.



Steering Joint at Skis

Each ski has a steering joint where the tie rods and steering arms connect to the skis. Read your owner's manual and follow its recommendation on lubrication and adjustments that can be made. These adjustments can affect the snowmobile's steering and performance.

Foot Rest/Running Board Traction

Foot rests and running boards often have raised dimples for traction. There are also products available to improve traction on the bottom and side of the running boards. They can help prevent your feet from slipping, especially when you do a lot of side hilling. Running boards also collect snow and ice, so it is important to remove these accumulations so you can keep a firm foothold.

Rear Suspension

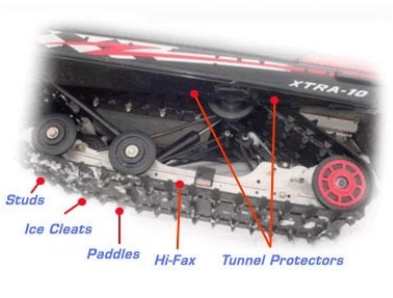
The rear suspension includes the rear axle, springs, bogie wheels, slide rails, and shocks. The suspension keeps the track flat on the snow, gives a comfortable ride, and helps the machine's handling. Some parts can be adjusted for the weight and style of the rider. To make adjustments properly, read your owner's manual or seek qualified help.

Bogie Wheels

Bogie wheels are part of the snowmobile's rear suspension systems. They help keep the machine's track from hitting other parts of the track suspension. They help the track “float” on the snow and give a comfortable ride. Check the bogie wheels condition, lubrication, and axle; check for loose nuts and bolts, and broken wheels and springs before each ride.



Traction Devices



Studs

Studs are metal spikes screwed into the snowmobile's tracks. They are often used for traction on ice, or for extra help in stopping. Studs may increase traction, but are no guarantee of safety.

Ice Cleats

Ice cleats are metal supporting braces spread out across the width of the snowmobile's track. Cleats can be effective in providing traction for the machine. While cleats are much wider, they result in a similar effect as studs.

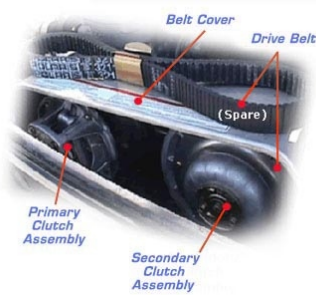
Hi-Fax

A hi-fax, or slide, is a thin strip of hardened plastic between the slide rail and the track. It acts as a buffer to prevent the track from being torn up by the metal. This plastic strip will wear down over time, so inspections are needed. Check with your owner's manual for wear specifications. When the hi-fax becomes too thin, take it to a qualified mechanic for replacement.

Tunnel Protectors

Tunnel protectors are sets of bars that can be installed on the underside of the tunnel to keep added cleats and studs from damaging the tunnel and the heat exchangers. A qualified person should install these protectors because it requires drilling holes in the undercarriage, often near the cooling system's heat exchangers.

Belt and Clutch



Belt Cover

A protective plate covers the drive belt. The plate keeps things out and away from the rapidly moving parts. The cover plate should only be removed to inspect or service the belt when the machine is off.

Drive Belt

The belt is gripped by the clutch assembly after the engine's RPMs reach a certain point. The belt is turned by the engine, which in turn moves the track. Belts do wear out, so always keep a spare stored on the snowmobile. Since each make and model typically requires a different belt, always ensure that the replacement belt matches your machine for safe and proper operation.

Secondary Clutch Assembly

The secondary clutch assembly is driven by a belt that is connected to the primary clutch assembly. The secondary clutch assembly, in turn, drives the track either directly, or through another shaft that is connected to the track by a chain.

Primary Clutch Assembly

The primary clutch assembly spins faster as engine speed increases. At a certain point it will compress enough to engage and grip the belt, which turns the track. When engine speed is decreased and the primary clutch assembly spins slower, at a certain point it will release the belt and the track will no longer be under power.

Maintenance

Fall preparation and spring storage of your machine are as important as regular maintenance is throughout the season. For fall preparation, a thorough inspection of your snowmobile is necessary to deem your machine safe and capable of being ridden for the season. Spring storage will help ensure your machine is ready to use when the first snow hits the next season.

NOTE: Always use your owner's manual for suggested maintenance checks before anything else. This will give you specific instructions for your machine.



FALL PREPARATION

When snowmobile season is approaching, you should perform a full check of your machine to ensure everything is in proper working order. A certified mechanic should repair any items you find that might need repair before the season starts.

A few items to check include:

- ✓ Air Intake: Make sure nothing has clogged your intake.
- ✓ Throttle: Squeeze the throttle and make sure it moves freely.
- ✓ Brake: Squeeze the brake lever to ensure it works properly and does not go all the way to the handlebar grip.

Other items to check:

- ✓ Track.
- ✓ Bogie Wheels.
- ✓ Slide Rail/High-Fax.
- ✓ Wear Bars on Skis.
- ✓ Lights.
- ✓ Injection Oil Mix on 2-strokes or Oil Level on 4-strokes.
- ✓ Gear Oil level.
- ✓ Spark Plugs.
- ✓ Drive Belt.

SPRING STORAGE

Once the snowmobile season has ended, it is time to prepare your machine for spring storage. A certified mechanic should repair any items you find that might need repair.

These are some recommendations for spring storage:

- ✓ Lift the track and keep it elevated by supporting it with a board or a block so it stays off the ground.
- ✓ Place a wooden board under each ski to keep the skags and skis up away from moisture to help minimize rusting.
- ✓ Put the recommended amount of gasoline stabilizer in the gas tank so the gas does not become stale.
- ✓ Turn off the gas with the inline gas valve.
- ✓ Start the snowmobile and run the carburetors dry by allowing the machine to run until it quits.

Other things you should check:

- ✓ Track.
- ✓ Bogie Wheels.
- ✓ Slide/High-Fax.
- ✓ Wear Bars on Skis.
- ✓ Lights.
- ✓ Injection Oil Mix on 2-strokes or Oil Level on 4-strokes.
- ✓ Gear Oil Level.
- ✓ Spark Plugs.
- ✓ Drive Belt.

Emergencies

Emergencies can happen anywhere and anytime during your trip. Creating a plan that you prepare for and practice, in advance, will help when emergencies occur.

Stuck

Getting stuck is not necessarily an emergency, but can be if you're riding alone. It is a common and frustrating problem for even the avid snowmobiler.

Learning How to Read the Snow

Knowing the type of snow you are riding on can help avoid getting stuck. Your machine can easily sink if the snow is loose, light, deep, or powder. When these snow conditions occur, keep your RPMs and power high enough to keep momentum but don't overpower the machine; it can quickly dig the snowmobile's track into the loose snow and result in getting stuck.

If You Get Stuck

Be extremely cautious when trying to move your snowmobile. Over-exerting yourself can lead to back injuries and even a heart attack. Have friends from your riding group help move your machine very carefully. Do not get on your machine and rev up the engine to drive it out of the situation. This may cause your machine to sink even further.

Try these methods when stuck on flat ground:

- With your feet on the running boards, rock the snowmobile slowly from side to side while gently feathering the throttle.
- Shut off the engine, clear the loose snow from the track and try to pack the snow under the track for a firm base.
- Try walking ahead of the machine and trampling a path in the snow to help reduce drag on the machine.
- If you are carrying an avalanche shovel or small folding shovel, use the shovel to dig snow out from around and beneath the snowmobile, as well as to shovel a path in front of the machine.



Getting Stuck Going Uphill

Your machine may get stuck while you are riding uphill in certain snow conditions.

- Shut off the machine and get off on the uphill side.
- You will need to turn the snowmobile around, so assess which direction is the safest and easiest to turn it downhill. If on a steep slope, also assess the potential of triggering an avalanche.
- Trample the snow on the side of the snowmobile you choose to turn it toward and dig out the ski loop on that side if needed to gain a good handhold.
- Grasp the ski loop on the side of the snowmobile you are turning toward and begin pulling the snowmobile around.
- Continue to turn the sled 180 degrees until it's facing downhill. Use caution when on steep slopes so the machine does not roll over on you or take off downhill in an uncontrollable manner.
- Start the snowmobile and drive it back down the hill.



Stranded

In any emergency, you need to determine your best options. Your decisions should include all factors such as where you are, how far away help is, where you are in relation to the trail, if you are alone, and whether you or someone else is injured. Always be sure to pre-plan your trip. The right amount of food, water, clothing, etc., can help tremendously if you have become stranded.

If you become stranded, the most important step is to remain calm. Once you are calm, you can assess the situation and attend to any injuries. If you are not able to walk for help, you must prepare to conserve energy and seek shelter. Use your emergency kit to assist you during the emergency.

Provisions

If you have pre-planned for any emergency, you brought food and warming materials. Make sure to ration the food in case rescue is delayed. You should also carry a space blanket and dry, spare clothing. Warmth is most important for you to be able to think clearly and determine your next move.



Shelter

Seek shelter immediately whether it is under a tree, under a shelf of a wall, a rock outcropping, or a cave. You can even make a snow cave by digging into a snowdrift. Line the cave with whatever material you can. If a fire is needed, use the matches from your emergency kit to help start a fire.

Where are you?

Now that you've assessed the situation and found some shelter, ask yourself where you are. Before your emergency, did you notice trail marks, road signs, rivers or any other markers that might help? Are there any geological features that may point you back onto the trail? You should use your map, GPS unit, and/or compass to help you determine where you are and how to get back to the trail.

How far is help?

Once you have figured out your location, you can guess/estimate how far help is. This guess will also help you decide on whether you start walking or stay where you are. If it is close to nightfall or at night, the best choice is to stay by your snowmobile and build a shelter until daylight. Conserve your energy as much as possible to keep warm during the night.



Safety Devices



Cell Phones

Before you begin your trip, be sure to charge the batteries of your cell phone. The cell phone should be kept warm, like stored in an inside coat pocket, to help preserve the battery life. Cell phones often do not work in the remote areas where you may be snowmobiling, so do not rely on a cell phone as your only safety device.

GPS (Global Positioning System)

A GPS unit can be extremely helpful during your trip. A GPS unit gives your exact location, which can easily be relayed to emergency personnel. A GPS runs on batteries, so be sure to check them before you ride, bring some spares with you and keep them warm. It is helpful to review how the unit works before you ride so you become familiar.

Lights and Flares

You should never head out onto a trail without a flashlight in your emergency kit. A strobe light may also be helpful in an emergency situation. Since flashlights and strobes run on batteries, always check the batteries before you ride, bring extra with you, and keep them warm.

Flares or “pop-ups” can be taken along on your trip for emergency situations. Be sure to follow the instructions to avoid further injury.

Compass and Maps

A compass is a critical item to have on your trip. It can be used as a back up to your GPS unit if the battery runs out. When reading a compass, do not hold it near metal objects. This causes the compass needle to read falsely. Be sure you become familiar and comfortable using the compass before you ride.

A topographic map is helpful because it shows the landscapes in three dimensions to help you along the way.

Shovel

A small shovel can be most helpful if you become stuck or stranded. Many shovels are small enough to store on your sled or to easily carry in a backpack. Always carry a shovel when riding in avalanche-prone areas.

Ice Picks

Ice picks should be considered by snowmobilers if traveling near water. The cord from each pick is threaded through the sleeves of the jacket, out of the way of your hands, until they are needed. If you happen to fall through the ice, the picks are right at your wrists covered by your jacket sleeves. Jam the pointed end of the pick down in the ice. The pick will anchor you and allow you to pull your body back onto the ice.

Keeping Warm

Proper Clothing

Check out the Apparel section for information on the proper riding apparel for snowmobiling. This section will go into detail about which winter clothing is better than others, so you can prepare for the length of your trip and the weather while you ride.

Alcohol

Alcohol should never be a choice when in an emergency situation. Alcohol does not create a warming effect on the body; it does the complete opposite by causing your body to lose precious warmth very rapidly. It is better to bring a hot beverage, like coffee or hot chocolate, with you on your trip. The warm liquid can help warm your insides and be more comfortable, to help ease the chill from the weather.

Fire Making Materials

In your safety kit, there should be a butane lighter or matches in a waterproof container and some flammable material to help aid you in building a fire. A fire not only keeps you warm, but also acts as a signal to show rescuers where you are. Keep the fire burning until someone finds you or you leave the area to walk for help.



Moderate Exercise

Moderate exercise can be very helpful in the fight against frostbite. Do not do so much exercise that you are sweating; only make movements to keep your body warm.

Hand Warmers

There are products readily available that you can easily store on your snowmobile to help keep your hands warm. Some warmers use chemicals that are activated by squeezing the package, which creates a heat reaction. Another type runs on flashlight batteries and another uses a thick wick soaked in flammable fluid that you start with a match. Hand warmers are also built into the handlebars on most snowmobiles.

Wind Chill

Wind chill is the result of the combination of the wind and cold temperatures. The higher the wind speed, the colder the air feels. To avoid wind chill and frostbite, be sure to check the weather before you ride to prepare the correct riding apparel for your trip.

Equivalent Temperature (°F)

	Calm	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	
		COLD																	
W	5	32	27	22	16	11	6	0	-5	-10	-15	-21	-26	-31	-36	-42	-47	-52	
i	10	22	16	10	3	-3	-9	-15	-22	-27	-34	-40	-46	-52	-58	-64	-71	-77	
n	15	16	9	2	-5	-11	-18	-25	-31	-38	-45	-51	-58	-65	-72	-78	-85	-92	
d	20	12	4	-3	-10	-17	-24	-31	-39	-46	-53	-60	-67	-74	-81	-88	-95	-103	
S	25	8	1	-7	-15	-22	-29	-36	-44	-51	-59	-66	-74	-81	-88	-96	-103	-110	
P	30	6	-2	-10	-18	-25	-33	-41	-49	-56	-64	-71	-79	-86	-93	-101	-109	-116	
e	35	4	-4	-12	-20	-27	-35	-43	-52	-58	-67	-74	-82	-89	-97	-105	-113	-120	
e	40	3	-5	-13	-21	-29	-37	-45	-53	-60	-69	-76	-84	-92	-100	-107	-115	-123	
d	45	2	-6	-14	-22	-30	-38	-46	-54	-62	-70	-78	-85	-93	-102	-109	-117	-125	

WIND CHILL CHART

Towing

Towing a disabled snowmobile behind your snowmobile calls for extreme caution to avoid injuries and damage to either snowmobile.

- Always remove the drive belt from the machine that will be towed.
- It is recommended you use a rigid tow bar instead of a rope or chain.
- If you must tow the disabled snowmobile with a tow rope or chain, tie the left ski of the disabled sled tight against the tow snowmobile's hitch or right rear to keep it from wandering into oncoming traffic on the trail.
- It is not recommended that passengers ride on the disabled snowmobile being towed since they can be injured if the snowmobile becomes out of control, or snow or ice chunks are thrown from the track of the tow snowmobile.
- If passengers must ride on the machine being towed, they should keep their feet on the running boards at all times and help steer and brake during towing. Always be certain the rear snow flap on the tow snowmobile is in place and properly functioning to avoid injury to the passenger.
- When crossing a road, passengers should get off the towed machine and walk across. The driver of the snowmobile must be very cautious at all times and should always operate at slow speeds.
- Use reflectors or flags on both machines while towing to warn others that you are towing/being towed.

Skiers

Skiers should never be towed by a snowmobile. It is difficult to watch the skier and the trail at the same time.

Inner Tubes/Sleds/Toboggans

Never tow inner tubes, sleds, or toboggans. The person being towed generally cannot steer or guide the tube. Turning corners swings the tube to the outside and can cause injury.



Cutters

A cutter is a specially designed snowmobile sled with a rigid hitch that is built to carry passengers. This is the only passenger device that can be safely towed behind a snowmobile. Slower speeds, increasing the following distance, and allowing for greater stopping distances should always be considered when towing passengers. Always be certain the rear snow flap on the tow snowmobile is in place and properly functioning to avoid injury to the cutter passenger(s).

Injuries

If any injuries happen during your trip, the first thing that needs to be done is to secure the accident scene to make it safe to ensure someone else does not also become injured. Then assess the situation. Decide whether or not you need emergency services and if you do, call for or send someone for help immediately. The emergency operator may also be able to guide you with helping the injured. If the victim is awake and responsive, ask him to tell you what is wrong. If what he says makes you suspect a spinal injury, do not move the victim unless there is imminent danger such as fire or drowning. By moving him, you may risk injuring him even more. If the victim is not responsive, assume he does have a spinal injury and do not move him.

Follow these Do's and Don'ts next:

Do's:

- Do Remain Calm.
- Do Treat the victim for major bleeding by applying direct pressure to the wound. This pressure can help slow or stop bleeding from the wound.
- Do Evaluate and if necessary treat the victim for shock:
 - Immediately following the crash or incident.
 - Anytime a victim is or was unconscious.
 - Following blunt trauma or severe jarring of the body.
 - If a victim has broken bones.
- Do Keep the victim as dry as possible.
- Do Stabilize.
- Do Take precautions so that you do not become the victim of an accident yourself.
- Do Travel with an adequately equipped first aid kit.
- Do Take a basic first aid/CPR course; it could save a life.

Don'ts:

- Do not offer or allow an injured person to drink any alcohol. Alcohol causes the body to lose heat and can induce hypothermia. Alcohol can cause complications for medical staff who treat the victim.
- Do not take or give drugs or medications, legal or not. Let medical professionals prescribe medications.
- Do not attempt to set broken bones.
- Do not overstep your training.
- Do not move an unconscious victim unless there is no alternative.

Shock

To treat shock, the victim should lie flat on his back and his legs should be elevated. Keep him warm by covering him with extra clothing or a blanket.

Frostbite

Frostbite occurs when your skin actually freezes. Things to watch out for are the skin becoming numb and a burning sensation. If the skin is already frozen, warm the skin. Do not let the skin refreeze once warmed. Seek medical attention immediately. Do not rub the skin with frozen snow. Do prevent frostbite by recognizing the danger signs and wearing the proper clothing.

Hypothermia

Hypothermia is the loss of body heat to a point that the body can no longer generate its own heat, or heat escapes faster than the body can generate it. The first signs of hypothermia are uncontrollable shivering and slurred speech, followed by delirium and unconsciousness. If the person is not treated, he can ultimately die. Warming the victim is the only treatment. If someone shows signs, warm him immediately. Build a fire, hug him, or huddle close together. Do whatever you can to get the victim warm. Do not give the victim alcohol.

Dangers to Avoid

This section discusses dangers to avoid while riding your snowmobile. Snowmobilers should always use extreme caution when riding at any time of the day and in any weather conditions. In particular, dangers that can happen when alcohol, speed, following too close, over riding headlights, ice, avalanches, vehicles, and carelessness are not avoided are emphasized.

Alcohol

You should always choose to **NOT** consume alcohol or use drugs while operating a snowmobile. Many of the snowmobile accidents that occur happen because of alcohol consumption. Alcohol and drugs negatively affect the body by affecting the driver's vision, equilibrium or balance and coordination, and reaction time. For the sake of your life and the lives of others, do not consume alcohol or drugs while operating a snowmobile. Never let anyone drive any vehicle after they have been drinking alcohol. Make responsible choices by giving friends a ride home if they have been drinking. Visit the Violations in the Laws section for more information on operating while intoxicated (OWI/DUI).

Alcohol Affects the Driver's Vision

Those who drive while intoxicated tend to focus only on what is in front of them, similar to “tunnel vision.” The driver fails to pay attention to anything else around them or behind them, and only looks a few feet in front of the snowmobile.

Alcohol Affects your Equilibrium or Balance and Coordination

Alcohol strongly affects the sense of balance and coordination. This decreases your ability to drive your snowmobile in a safe manner. You can become a hazard to yourself and to others on the trail.

Reaction Time

Reaction time is the time a driver needs to react after a danger is recognized. There may only be a few seconds for you to react. Situations when you may need to react quickly while snowmobiling can include slowing down behind another snowmobile, when approaching a road crossing, when making a turn or negotiating a curve in the trail, or swerving to avoid an on-coming snowmobile, a fallen tree or depression in the snow. Alcohol always slows your reaction time. Operating a snowmobile while intoxicated can lead to injuries that can be severe or even deadly.

**SNOWMOBILING
AND
ALCOHOL
DON'T MIX!**



DON'T DRINK AND RIDE.



International Snowmobile
Manufacturers Assn.
1640 Haslett Road • Suite 170
Haslett MI 48840
(517) 339-7788
www.snowmobile.org

Avalanche Safety

Snowmobilers top the list of those who get caught and perish in avalanches in North America. Understanding the basics of avalanche safety is important for those wanting to snowmobile in avalanche country. It is strongly recommended that you take an avalanche-training course with a field session to learn what to look for.

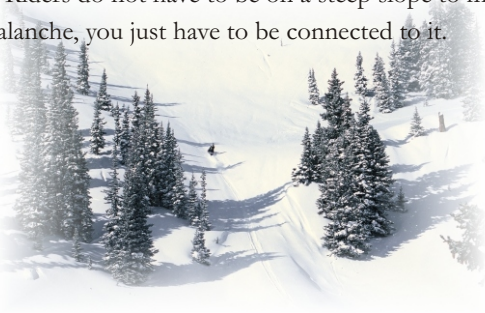
Avalanches that involve people do not randomly occur. Over 90 percent of the time, the victims or someone in their group triggers the snow slide. This means that avalanches could generally be avoided if snowmobilers would learn to follow avalanche safety procedures. The following information is a general introduction to avalanche safety. For additional information, visit www.fsavalanche.org.

Highmarking Safety

Highmarking is the practice of climbing steep slopes with a snowmobile to attain the highest mark/location on the slope, or get over the top. It is one of the most dangerous things you can do on a snowmobile.

Highmarking accounts for more than 63 percent of the avalanche fatalities involving snowmobilers in North America. Tracks on a slope do not mean that a slope is safe. Timing is everything, so ride safely on slopes only when the snowpack is stable.

Any slope steeper than 25 degrees can avalanche. Prime slopes for avalanche conditions are generally 30 to 45 degrees, the same slopes that snowmobilers love to ride. Riders do not have to be on a steep slope to make it avalanche, you just have to be connected to it.



The following travel procedures could cut the number of avalanche fatalities in half. So if you learn nothing else about avalanche safety, remember the following about riding on steep slopes:

1. Ride onto steep slopes one at a time, with the rest of your group watching from a safe spot.
2. Do not park at the bottom of a steep slope.
3. Do not help someone who has his sled stuck on a steep slope.

If you like to highmark, adopting the following habits may help you and members of your group stay alive:

Stay alert for clues of instability, even while driving to the trailhead. Ride your sled onto small cutbanks and small slopes to test snow stability. Periodically, stop your machine, remove your helmet, walk around to get a feel for the snow, and scan the area. If the snow is unstable, you should notice one or more of the following clues:

- Recent avalanches (*don't play on similar, unreleased slopes*).
- New snow (*the added weight can overburden buried, weak layers*).
- Wind loading (*wind can deposit snow ten times faster than snow falling from the sky; as a result, weak layers can quickly become overloaded*).
- Rain (*weakens snow quickly, causing it to stabilize when refrozen*).
- “Whumphing noises” (*indicates the collapse of a buried weak layer*).
- Shooting cracks in the surface of the snow that run across the slope (*indicates that the snow is ripe for fracturing and is beginning to slide downward*).
- Hollow-sounding snow (*indicates a buried weak layer of snow*).
- Signs of rapid or intense warming (*the snow will weaken quickly and create unstable conditions; small “pinwheels” or snowballs that have rolled down the slope are often seen*).

Choose slopes that have been stripped by the wind (*windward*) versus slopes that have been loaded by the wind (*leeward*). Snow that is rock hard can still avalanche if it is poorly bonded to the layers of snow below it. Be wary of steep, smooth, leeward slopes.

Start out on the less steep slope angles and on the side of a slope instead of center-punching it. Do your first runs low and fast rather than maximizing your commitment and exposure by climbing as high as possible right away. If possible, do your first runs from the top down to get a feel for the snow and to improve your chances for escape. Try to turn toward the edge of the slope rather than turning toward the middle.

If unsure of the snow stability, favor slopes that have recently avalanched over those that have not yet slid. You can still ride on unstable days just choose slopes less than 25 degrees that are not connected to anything steeper.

Unless you know the snow is stable, do not approach steep convex rollovers or aim for large rocks or trees isolated in the middle of a steep slope. These are places where the snowpack is under greater stress, and as a result, you are more likely to trigger a slide. Also be suspicious of steep areas where the snow is shallow and weaker.

Avoid deadly “terrain traps” such as gullies, steep-sided creek bottoms, or slopes that end in depressions because they pose a high probability of a deep burial. Do not ride on slopes with cliffs below. Favor slopes that are fan-shaped at the bottom and do not have obstacles like rocks or trees to crash into. Concave bowls are nasty traps because the fracture propagates around the slope and all the debris collects at the bottom. This is why it is not uncommon for snowmobilers to be buried under 10 to 30 feet of debris.

Allow only one rider at a time on the slope. If a person gets stuck, do not send a second sledder to help! Roughly 33 percent of snowmobiler avalanche fatalities occur when a sled is stuck on a slope. About 34 percent involve more than one snowmobile on the slope at the time of the avalanche. It is common for a second rider to turn above the stuck person and trigger an avalanche onto the stuck rider who becomes a sitting duck below. Everyone else in the group should be watching the climber from a safe spot.

Other snowmobilers in the group should always park well away from the bottom of steep slopes. Do not count on being able to outrun a slide. Get in the habit of parking parallel rather than one behind the other. Also have your snowmobile pointed away from the potential avalanche slope and ready to start.

Traveling Smart in Avalanche Terrain

When riding in known avalanche terrain, try to limit your group size to only three or four people. There is decreased safety when the group size is large since it is difficult to communicate, make good decisions, and follow safe travel procedures. But do not split your group. Stop periodically to look for clues to instability in the snowpack and to discuss the avalanche hazard.

NEVER travel above your partner. Remember, one at a time on steep slopes and park in safe spots while watching the person who is exposed to the avalanche



hazard. Each rider in the group should wear a transmitting avalanche beacon and also carry a probe and shovel in a small pack. If the tools you need to save your friend are on your buried sled, your friend may die. Before you drive to the trailhead, confirm that every member of the group has this rescue gear and knows how to use it. Check to make sure all beacons work in “transmit” and “receive” modes.

Always ride with your helmet securely strapped. Full-face helmets have saved a few avalanche victims by providing some built-in air space (*although you can't count on this*). Assumptions can kill you. Avalanches don't care what you want to do or how skilled you are. Don't be reassured just because you have ridden in the area many times before. It doesn't matter that it is a nice day (*most avalanche accidents happen on blue sky days after storms*), that there are tracks on the slope, or that you're wearing a beacon. Remember that you can have fun even on unstable days by staying away from steep slopes.

Cornice Safety:

Cornice Breaks & Catching “Big Air”

Cornices are the overhanging deposits of wind-drifted snow that form along the leeward side of ridge crests and gullies. Cornice breaks are caused by additional new snow, wind loading, warming or the weight of a person or sled. If you like to jump cornices, know that even if you don't break the cornice, the snowmobile's landing shock-loads the slope (*like a detonating bomb*) and can trigger an avalanche. Do not approach cornices from the bottom or ride on slopes that are overhung by cornices. Always be careful of cornices. They usually break farther back than you expect.

When approaching any ridge, slow down, think cornice, and make sure you're riding, parking, or standing on snow that has solid ground beneath it. Many riders have been fooled by bushes because they sometimes extend through the cornice from the slope below.

Avalanche Rescue

The best defense is to avoid getting caught in an avalanche because you don't have time to go for help. There is generally only a 15 minute window of opportunity to rescue a buried victim before he dies from asphyxia. There is not enough time to go for help, so you and the other riders in your group are the help. About 64 percent of riders buried in an avalanche survive because of their partner's ability to perform a rescue. In instances where a partner leaves the scene to go for help, the buried rider typically dies about 78 percent of the time. You simply have to stay at the scene and search for your buried partner.

Unfortunately, most snowmobilers venture into the backcountry untrained and unequipped to rescue a buried friend. Tools for an avalanche rescue include: brain, beacon, probe, and shovel. You must carry the last three and engage the brain in order to have a successful rescue. Otherwise, the exercise becomes only a body recovery.

Always carry rescue gear (*beacon, probe and shovel*) when riding in avalanche country. And better yet, make sure your riding partners have rescue gear. While some people consider buying an avalanche beacon, probe and shovel too pricey, it's not when compared to dying in an



avalanche. If you're completely buried, a beacon may be the only way you can be found and dug out in that 15-minute window of opportunity for survival. Avalanche debris sets up like concrete. Unfortunately there are countless stories of people trying to dig out their partner with their hands, helmet, face shield, windshield or whatever else they can find. This simply does not work because the snow is too hard. Carry a real shovel and better yet, carry it on you in a pack. A probe is a great tool to help pinpoint the buried person to minimize digging time. It is also an essential tool if you're looking for someone

who failed to wear a beacon because it allows you to quickly spot-probe around the debris field.

Most importantly, get training on the use of rescue gear and practice with it regularly to ensure you know what to do, and can act quickly and instinctively, in the event one of your partners becomes buried in an avalanche.

If Caught In An Avalanche

- Try to stay on your machine and ride out toward the side.
- Keep your pack on. It gives some flotation.
- If knocked off your sled, push away from it to reduce your chances of being injured and FIGHT HARD to stay on top of the moving snow by “swimming.”
- Attempt to roll onto your back; you have a better chance of survival if buried face up.
- As the avalanche slows, thrust your hand straight up. Expand your chest and use your arm to create airspace.
- Try not to panic so that you will use oxygen at a slower rate.

If You Are A Rescuer

Watch the victim! Establish the last place you saw the victim and mark it.

If you did not observe the slide, question any witnesses about the number of victims, the location they were last seen, and whether or not the victims were wearing beacons.

Make sure it is safe to search. The slope that has just avalanched is unlikely to slide again unless it has reloaded or has adjoining paths that have not released funneling into the same area.

Conduct a thorough initial search of the debris below the area the victims were last seen. Look carefully for clues (*e.g., sled, boot, glove, blood*). Probe around clues and

in likely catchment areas such as flat benches or dips in the terrain, rocks, tree-wells, and at the toe of the debris.

Leave clues (*including sleds*) in place; they may help establish the victim's line of travel.

Most buried snowmobilers are found no more than 200 feet from their sleds, in roughly the same fall line. More often than not, the victims are upslope and within 40 feet of their machines.

If wearing avalanche beacons, conduct a beacon search (*which you should have practiced many times before!*) simultaneously with the initial search.

If the victim is not located by any of these search methods, systematically probe the most likely search area.

When you locate the victim, dig fast but carefully. Free the victim's mouth and chest of snow first. Then have first aid gear ready for treatment and be alert for airway problems, hypothermia, and injuries.



Avalanche Forecasts

Many regions of the U.S. and Canada have Avalanche Forecast Centers that issue daily avalanche forecasts during the snow season. This is an important resource to help you make good decisions when riding in avalanche country. Find the Avalanche Forecast Center nearest to your riding area and make a practice of checking their daily forecast, which will rate the avalanche danger scale.

AVALANCHE DANGER SCALE:

- LOW**
- Natural avalanches VERY UNLIKELY
 - Human triggered avalanches UNLIKELY
 - Travel is GENERALLY SAFE
 - NORMAL CAUTION is advised

- MODERATE**
- Natural avalanches UNLIKELY
 - Human triggered avalanches POSSIBLE
 - Use CAUTION in steeper terrain on certain aspects

- CONSIDERABLE**
- Natural avalanches POSSIBLE
 - Human triggered avalanches PROBABLE
 - Be INCREASINGLY CAUTIOUS in steeper terrain

- HIGH**
- Natural and human triggered avalanches LIKELY
 - Travel in avalanche terrain NOT RECOMMENDED

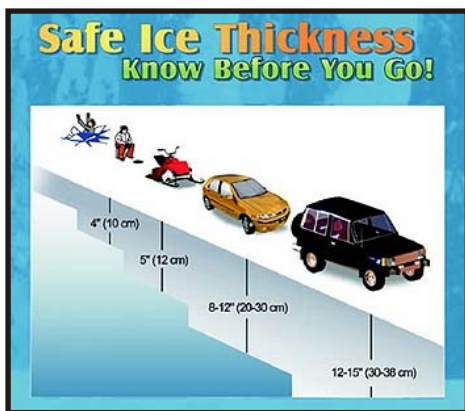
- EXTREME**
- Natural and human triggered avalanches CERTAIN
 - Travel in avalanche terrain should be AVOIDED and confined to low-angle terrain well away from avalanche path run-outs

Ice

The safest snowmobiling rule is to never cross lakes or rivers since it can never be guaranteed that ice of any thickness will support a snowmobile. Ice can be dangerous. Do not venture out onto lakes or rivers unless you are absolutely certain that it is safe.

Besides the danger of plunging through the ice, you have far less traction for starting, turning, and stopping on ice than on snow. Always use extreme caution when riding on ice. Always travel at low speeds. The machine is hard to control on ice, so fast stops are impossible and spins are far too common. To stop, let up on the throttle slowly allowing the machine to coast to a stop. Controlling your machine is best when seated.

Collisions on lakes account for a significant number of accidents because riders too often believe that lakes are flat, wide open areas, free of obstructions. Remember, if you can ride and turn in any direction while operating on a lake, so can other riders. Therefore, the threat of a collision can come from any direction.



If you choose to snowmobile on the ice, be absolutely certain that the ice is safely frozen. Don't trust the judgment of other snowmobilers. You are responsible for your own safe snowmobiling. Drowning is a leading cause of snowmobile fatalities. If you ride on ice often, consider wearing a buoyant flotation snowmobile suit.

Dangers to Avoid

It is also a good idea to have a set of commercial ice picks, with spring-loaded sleeves that cover the points, attached to a cord so they can be threaded through the sleeves of your snowmobile suit.

If you go through the ice, stay calm. Remember that your snowmobile suit (*even a non-buoyant one*) and helmet may keep you afloat for several minutes. Extend your arms out forward in front of you on the unbroken ice surface to catch yourself. Kick your feet to propel you onto the ice, like a seal. If the ice keeps breaking, Continue moving toward shore or the direction from which you came. Use anything sharp, like ice picks, keys, or a knife to dig into the ice to help pull you forward. Don't remove your gloves or mitts. Once you are on the ice, crawl or roll away from the hole. Don't stand up until you are well away from the hole.



Over Riding Headlights

40 mph (65 kph)

Imagine that you are riding your snowmobile on the trail at night. Up ahead, a tree has fallen down across the trail. As you ride, the headlights on your snowmobile illuminate 200 feet (61 meters) in front of you. Therefore, you will not see the fallen tree until it is 200 feet (61 meters) in front of your snowmobile.

A normal reaction time is 1.5 seconds. If you are traveling at 40 mph (65 kph), it will take you 1.5 seconds, or traveling 88 feet (27 meters), before you apply the brake to stop.

At 40 mph (65 kph), you need about another 70 feet (21 meters) to stop your snowmobile. With the normal reaction time of 88 feet (27 meters) and 70 feet (21 meters) to stop while going 40 mph (65 kph), that is 158 feet (48 meters) total you will travel before stopping.

With snowmobile headlights that illuminate 200 feet (61 meters) ahead and 158 feet (48 meters) required for stopping time, you should be able to stop 42 feet (13 meters) from the fallen tree, a very safe distance unless the trail is icy, which will require a longer stopping distance.

At 40 mph (65 kph) or below, you are normally not over riding your headlights.

50 mph (80 kph)

In the experience of law enforcement officers, many riders operate their snowmobiles between 30 and 45 mph (50 and 70 kph) at night. Between 45 and 50 mph (70 and 80 kph), snowmobiles can start over riding their headlights.

At 50 mph (80 kph) you would travel about 110 feet (33.5 meters) before you started to apply the brake.

Dangers to Avoid

You would then be 90 feet (27 meters) from the tree. Since you would need at least 80 feet (24 meters) to stop the machine or make an appropriate move, traveling at 50 mph (80 kph) is dangerous.

65 mph (105 kph)

Speeds of more than 50 mph (80 kph) at night are extremely dangerous. At 65 mph (105 kph), you would have already traveled 143 feet (43.5 meters) by the time you ever start to apply the brake. You would still need about 100 feet (30.5 meters) to stop, but would be only about 57 feet (17 meters) from the tree by then. At this speed, it would be almost impossible to stop in time to avoid the fallen tree.

You should be aware that there are other factors, such as alcohol, fog, snowstorms, fatigue, snow dust, icy trails, and ice on lakes or rivers that will affect (slow) your reaction time and increase your stopping distance. Always reduce your speed when operating in these conditions.



SPEED

Speed is also a major factor in many accidents, many of them being at night. Snowmobilers must always, day or night, be aware of the speed at which they are riding, always keeping the speed of the snowmobile slow enough to ensure they are in control of it and operating safely. Never exceed speed limits that are posted on trails or roadways, including those posted for roadways when you are operating in the borrow ditch of the roadway.

At night, the headlights illuminate your path about 200 feet in front of the snowmobile. Be careful not to over ride the headlights. You must always watch your speed where other motor vehicles operate such as at road crossings, or on open roadways and road right-of-ways. Motor vehicles must always be given plenty of space for the safety of you, your passengers, and the motor vehicles.

Following Too Close

Following too close is another common cause of crashes. Many happen when the lead rider has applied the brake and the person behind could not react fast enough to stop. A good rule to follow is the 3-second rule.

3-Second Rule

When the person in front of you passes an object, note where it is and start counting. By the time you arrive at that same object, you should have counted no less than three seconds. If you counted to less than three, you need to allow more space between the riders in front of you to ensure time to stop safely.

With the weight of the snowmobile, there can be a deadly outcome from the force of impact during a crash. Always allow more distance between riders when riding in whiteouts from snow dust, fog, wind, and snowstorms or when night riding. Visit the Over Riding Headlights and Riding in a Group sections for more details.

Vehicles

Many trails are located alongside roads and sometimes cross over them. It is extremely important to be aware of the vehicles on the road. Always drive defensively and come to a complete stop at all posted stop signs, as well as at any unmarked road crossings. While you are stopped, make sure you are in the standing position, so you can see and be seen by other vehicles. See the [Riding Positions](#) section for the proper standing position details.

Carelessness

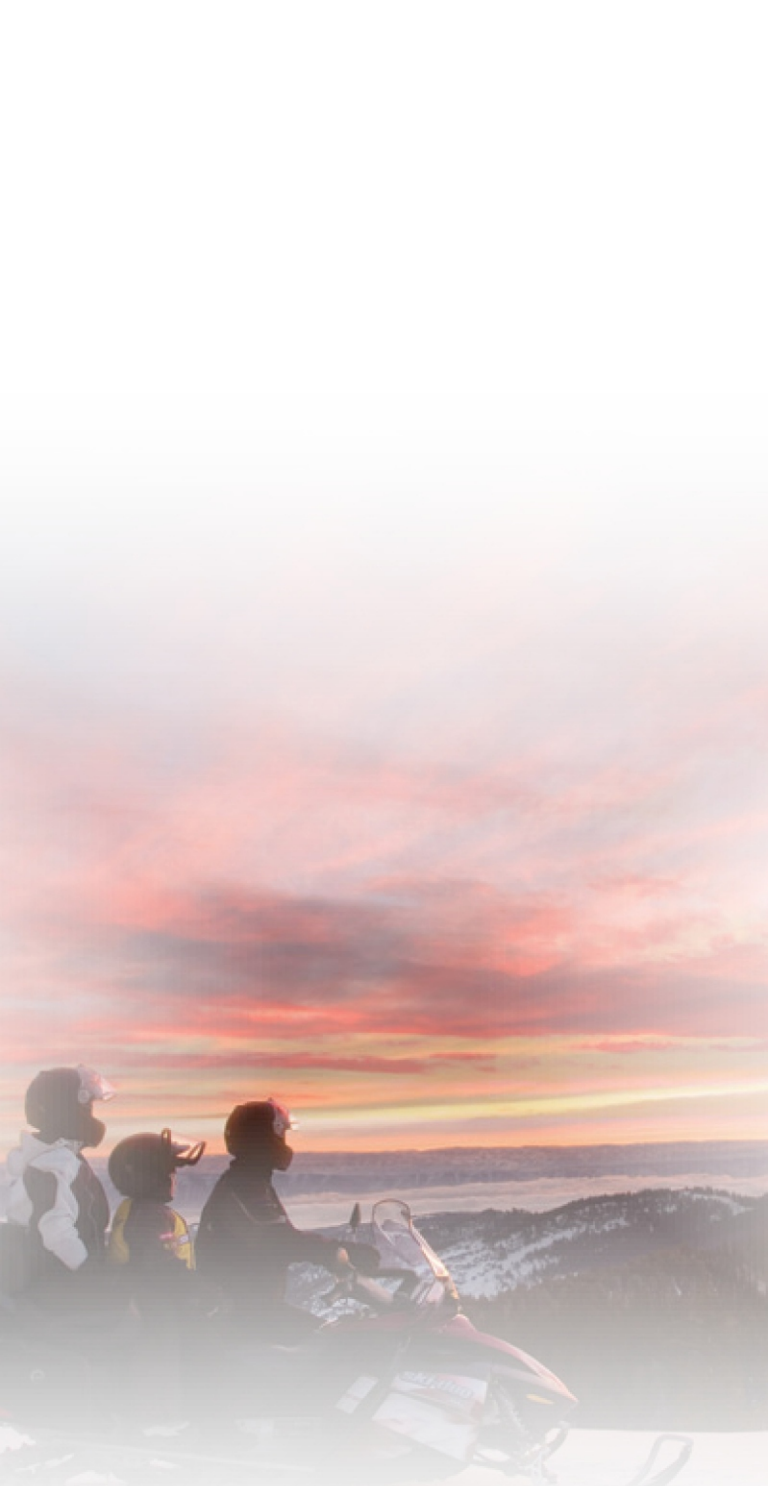
Careless operation is another leading cause of snowmobile deaths. Always drive defensively, at safe speeds, and as if you would encounter a careless driver or another hazard at any time.

Careless snowmobiling operation comes in many forms, including but not limited to:

- Hugging the inside corners on curves.
- Speeding, particularly when near nonmotorized trail users, trailheads, buildings, livestock, or wildlife.
- Over riding headlights.
- Riding too fast in foggy or snowy conditions.
- Riding your snowmobile on prohibited roads.
- Failure to obey signs and regulations.
- Riding on the wrong side of the trail.
- Following other snowmobiles too closely.
- Passing on corners and blind hills.
- Approaching blind hills at excessive speeds.



Intentionally Left Blank for Local Information to Be Added



www.snowiasa.org

