New York State
Snowmobile Safety Education Program
A course of study on the safe operation of snowmobiles
COURSE WORKBOOK

New York State Office of Parks, Recreation and Historic Preservation
Snowmobile Unit
Dear Snowmobiler:

New York’s spectacular landscapes, bountiful snowfall and outstanding attractions bring snowmobilers from across the nation into our communities. Over 10,500 miles of snowmobile trails afford the riders of more than 130,000 registered snowmobiles ample opportunity to see all that New York has to offer. The network of trails on public and private lands connects the trail user to a vast array of experiences within Niagara, Central Leatherstocking, Southern Tier, Finger Lakes, Tug Hill, and the Adirondack & Catskill Mountains.

To improve snowmobiling safety and improve the experience for all riders, New York State Parks, with law enforcement officers and hundreds of volunteer instructors, provides Snowmobile Safety Courses and encourages all riders to participate. We truly believe the increased knowledge of equipment, riding skills, “Rules of the Trail” and the Code of Ethics will enhance the experience of snowmobiling for everyone. To keep the sport of snowmobiling growing and contributing to your communities, we must all work together to encourage landowner participation, community support and public acceptance.

New York has an outstanding world-class snowmobiling system. With everyone’s support and assistance, we can make it even better. By following the safety course guidelines, you will be able to enjoy the pleasures of snowmobiling for many years to come.

Remember to ride safely, ethically, respect the rights of others and most of all, protect and care for the natural environment through which you ride.

Have a fantastic snowmobiling season!

Sincerely,

Stephen C. Lewis
Director of Snowmobiling
INTRODUCTION

Welcome to winter fun! We are glad that you are interested in joining us on the snowmobile trails of New York State. Snowmobiling is an increasingly popular form of winter recreation, with over 130,000 snowmobiles now registered in New York.

As you enjoy operating your snowmobile in the great outdoors, please remember to ride safely, to respect the rights of others, and to protect and care for the natural environment around you. If you do, you and everyone else will be able to enjoy the pleasures of snowmobiling for many years to come.

Happy Trails!

Stay up to date! Contact us for the latest information.

NYS Office of Parks, Recreation and Historic Preservation
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How Snowmobiling Began and Grew

Inventors began to develop machines that could travel over the snow in the early part of the twentieth century. In 1913 a New Hampshire man named Virgil D. White built a caterpillar track unit with a ski front suspension that could be adapted to a Model T Ford. He called it a “snowmobile.”

Some of the other early snow vehicles were adapted from motorcycles, and some were even driven by aircraft-style propellers. Very few of these curiosities worked very well, if they worked at all.

The most successful design of this era was Carl Eliason’s motorized toboggan of 1925. It was the first workable single-track, one passenger snowmobile. He was granted a patent on the design.

In the late 1940’s, several companies begin building the steel-construction over-the-snow vehicles that were called “iron dogs.” These large, slow, clumsy machines were the first snowmobiles built in production quantities for civilian use. Design features included a steering wheel, a cleated track, and a rear-mounted four-cycle engine of modest power. Primarily utility vehicles, they were best suited to hunters, trappers, power companies, and other commercial users.

The major breakthrough for recreational snowmobiles came in 1958. J. Armand Bombardier, who already has a successful business building truck-like enclosed “snow coaches”, developed a small, open snow vehicle that he initially called a “Ski-Dog”. It became the prototype for the modern recreational snowmobile.

This machine featured handlebars for steering, a rubber track, and the engine in front of the driver. It was much smaller, lighter, and easier to handle than an iron dog. Bombardier quickly changed the name to Ski-Doo and set about refining the machine. Initial production units hit the snow in 1959, and it soon became a major success. Many other companies soon began to produce their versions of the basic Ski-Doo design. This allowed the sport of snowmobiling to develop.

Early recreational snowmobiles were crude, loud, slow, uncomfortable, and potentially unsafe by today’s standards. But development was spurred on by dozens of competing companies with literally over one hundred brands of snowmobiles on sale between the early 1960’s and the mid 1970’s.

Racing became an important development and promotional tool. It drove constant product improvement including changes from four-cycle to two-cycle engines and from welded steel to riveted aluminum body structures. Many racing organizations and local snowmobile clubs were started, and the first snowmobile trail systems were developed in places like Quebec, the Wisconsin northwoods and the Adirondacks.

In the early 1970’s, the snowmobile industry adopted voluntary safety and environmental standards that helped refine the machines into much safer and more enjoyable products. But gasoline shortages, poor winters, and a soft economy drove most companies out of the snowmobile business in the later 1970’s and early 1980’s.

Today four major manufacturers build most of the snowmobiles for sale in North America. They are Arctic Cat Inc. (Arctic Cat) and Polaris Industries LLP (Polaris), both based in Minnesota; Bombardier Inc. (Ski-Doo) based in Quebec; and Yamaha Motor Corporation (Yamaha) based in Japan. These four companies are the members of the International Snowmobile Manufacturers Association (ISMA).

All four produce a wide variety of very high quality snowmobiles for different styles of riding that are safe and reliable when used as intended and as directed.

More than ten million North American snowmobilers of all ages can now enjoy the beauty of winter and the benefits of outdoor recreation thanks to these amazing snow machines. Over 100,000 miles of marked and groomed trails are available in the US and Canada. Perhaps one Quebec snowmobile club summed it up best with the motto on their clubhouse. It says “Snowmobile - the sunshine of our winter”.

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Environmental Impact of Snowmobiling

The use of snowmobiles have a minimal environmental impact. It is important to note that any outdoor activity by humans does have some environmental impact, and that the impact may have both negative and positive aspects.

Since snowmobiles should only be operated when there is at least three inches of snow cover, their impact on grasses and other ground cover is generally minimal. This is both because the snow cover protects the plants, and because the ground pressure of a snowmobile is much more widely distributed than a person on foot or on another type of vehicle.

Pressure is not the same as weight. Weight is the force exerted on a mass by gravity and is usually expressed in pounds (lb.). Pressure is weight distributed over a surface area. It is usually expressed in pounds per square inch (psi).

Although a snowmobile and its rider weigh much more than the rider alone, the pressure on the ground of the person on a snowmobile is much less than that of the person while walking. This is because a person's weight is concentrated on two feet when walking. But on a snowmobile, the weight is spread out over the entire track and ski area. It takes ten snowmobiles and riders to exert the same ground pressure as one person on foot.

Evidence from several scientific studies indicates that compaction of snow by snowmobile traffic has no negative effects on yield of crops like winter wheat or alfalfa. In fact, the compaction often eliminates snow mold and increases yields. Compaction can also retard soil erosion, specifically the washing away of valuable topsoil.

Snowmobilers must be aware that larger plants, particularly young trees, are very vulnerable to severe damage by their machines. This is a very good reason to stay on established trails and stay out of tree farms, nurseries, and orchards.

Snowmobile impact on animals is more complex. Scientific studies have repeatedly shown that snowmobile noise emissions have little or no effect on animals, which are not directly adjacent to the trail. Some observers feel that snowmobile trails allow increased winter mobility for larger animals, like deer, allowing them to travel more freely to reach food. Others say that predators, like wolves and coyotes, use snowmobile trails to reach their prey more easily. Both are certainly true in at least some situations. In any case, snowmobilers should refrain from disturbing wild life in any way.

You will often see animals on or near the trail while you ride. When this happens, stay seated, and slow way down or stop until the animals leave the trail. Do not attempt to get closer to them. They will feel that you are chasing them. In the winter, animals need all the energy they have just to survive. Don’t make them use energy by making them run.

There is no evidence that snow compaction caused by snowmobiles or any other activity like skiing or snow shoeing has any significant impact on small burrowing animals like mice or moles.

Snowmobile noise emissions have little or no real effect on humans as long as trails are located away from houses and other occupied buildings.

Sound levels are measured in decibels (dB). One decibel is the smallest change in noise level that your ears can detect. But because the decibel scale is logarithmic, a six decibel increase represents doubling the sound level.

Early snowmobiles were extremely noisy, sometimes producing noise levels exceeding 100 decibels. Prolonged exposure to noise at this level will produce permanent hearing damage.

Over the years, the snowmobile industry has voluntarily produced quieter and quieter machines. Modern (1973 and later) snowmobiles must meet strict sound emission requirements that have been progressively tightened through the years. A 1980 or newer snowmobile passing by at normal trail speeds fifty feet away is limited to 73 decibels. This is about as much noise as a conversation from three feet away. For comparison, consider that one 1960s snowmobile can make as much noise as literally hundreds of modern snowmobiles.

The United States Environmental Protection Agency (EPA) has announced mandatory federal exhaust emission standards for snowmobiles manufactured for the 2006 model year. These new standards include additional reduction in emissions (carbon monoxide and hydrocarbons) scheduled for the 2010 model year. Nearly, 100% of the current population of snowmobiles are equipped with two stroke engines. These engines generally emit higher levels of carbon monoxide and hydrocarbons than comparable four stroke engines. These

<table>
<thead>
<tr>
<th>Recreation</th>
<th>Ground Pressure in Lbs.</th>
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<tbody>
<tr>
<td>210 lb. person in a 4 wheel drive truck</td>
<td>30</td>
</tr>
<tr>
<td>210 lb. person on a horse</td>
<td>8</td>
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<tr>
<td>210 lb. person walking</td>
<td>5</td>
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<tr>
<td>210 lb. person on an all terrain vehicle</td>
<td>1.5</td>
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<tr>
<td>210 lb. person on a snowmobile</td>
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engines can be a significant source of air toxics and fine particulate matter. Based on these new standards EPA predicts an overall reduction in hydrocarbon and carbon monoxide emissions of more than 60% in 2010 when compared to a no action alternative. Four-stroke technology is estimated to reduce hydrocarbon emissions by 70-90% when compared to existing production two-stroke snowmobiles. Therefore, there will be a period of time to phase out the older snowmobiles that have greater emission impacts.

The greatest potential for impacts to the environment occurs during the construction and maintenance of snowmobile trails. The guidelines for snowmobile development should be followed and every effort to protect the environment should be utilized such as avoiding the wetland areas, steep slopes and the cutting of trees.

Snowmobile Clubs and Their Importance

One of the most important differences between snowmobiling and other outdoor recreational activities is the existence of many family-oriented clubs dedicated to safe and responsible snowmobiling.

There are thousands of snowmobile clubs across North America, with over two hundred here in New York State. Clubs have anywhere from a few individuals/families to several hundred individuals/families as members. Many local clubs are organized into county club federations, and many also belong to a statewide organization called the New York State Snowmobile Association (NYSSA). At the national level are the American and Canadian Snowmobile Councils, which join to form the International Snowmobile Council.

Snowmobile clubs are the life blood of the sport because they create and maintain most of the trails, without which there would be little or no snowmobiling anywhere. Snowmobile clubs also organize most public snowmobile events like charity rides, festivals, and races.

Clubs keep their members current on changing laws and regulations affecting snowmobiling, provide maps and other information, and hold events for their members. Clubs also provide opportunities for snowmobilers to participate in public service and charitable activities that help improve the overall quality of life in our communities.

Most snowmobile clubs have low annual dues and generally welcome new members. Local snowmobile dealers, the statewide snowmobile association, or snowmobile publications can put you in touch with clubs in your area.

 Trails and Other Legal Use Areas

Most snowmobile trails are seasonal, snowmobile-only trails on private land. But some are multi-use year-round trails on public lands, or even public roads. The trails are generally maintained for snowmobile use by volunteer labor organized by local snowmobile clubs.

These trails exist only with the permission of the landowner. The trail and the lands around it must be respected or the trail will be closed. Always remember that trail passage is a privilege, not a right.

There are three basic types of snowmobile trails found in New York State. They are corridor, secondary, and club or local trails.

Corridor trails

Corridor trails are the primary snowmobile routes through counties that provide access to significant use areas and concentrations of snowmobilers. They are marked with a Corridor trail sign. Corridor trails are groomed to keep them smooth. There are several thousand miles of Corridor trails already developed in New York State.

Secondary trails

Secondary trails are routes that usually connect local attractions or neighborhoods to Corridor trails. They can also be used to connect two Corridor trails to one another. They are marked with a Secondary trail sign. There are also several thousand miles of Secondary trails developed in New York State.

Club or local trails

Club or local trails comprise some of the thousands of miles of snowmobile trails in our state. They are usually narrow, low volume trails that connect individual homes in local areas, provide access to local businesses and scenic points, and provide the many short cuts and alternate routes that add variety to snowmobiling. They are generally undeveloped and often unmaintained, and may be less permanent than Corridor or Secondary trails.

Play areas

Play area is the name usually given to open expanses of land where snowmobiles may leave the trail to ride deep powder, do donuts, bust drifts, or otherwise operate off of the designated route. These are common in western North America, but not here in the east. Be sure you have permission to leave the trail before you do so. If you don’t know, don’t go.
Snowmobile Safety

By comparative measurements, snowmobiling is a safe recreational activity. But a snowmobile accident can change, or even end a life. The main purpose of this education course is to help prevent accidents and insure a bright future for snowmobiling and the millions who enjoy it.

Snowmobiling is fun, and we’d like you to help us keep it that way. Your personal alertness, riding skill, and attention to safe and responsible operating procedures will help guarantee that you will be part of the millions who enjoy snowmobiling now and in the future.

Remember the snowmobile industry’s official safety message: “Safe Riders! You make snowmobiling safe™”. Please take this message to heart and help concerned snowmobilers everywhere keep the sport as safe as possible.

Respect Private Lands

There are approximately 10,500 State funded snowmobile trails throughout New York State. Over 60% of the trails are on private lands. Every year, the snowmobile clubs seek permission from private landowners to allow the trails on their lands. Since a trail is a linear system, it only takes the refusal of one landowner to jeopardize the continuity of a trail. Therefore it is important to respect the rights of landowners. Snowmobiling on private lands is a privilege, not a right.

Recent events have increased public awareness of homeland security issues. Private landowners are becoming more aware of the potential for bioterrorism to crops, livestock and water supplies and may reconsider the public use of their property. Obtaining permission to use farmers’ fields for snowmobile trails may become more difficult in the future.

All snowmobilers should:

■ Stay on the trail.
■ Encourage those who may not stay on the trail to do so.
■ Become the eyes and ears for the landowner and take note of persons that may be engaged in other activities.
■ Stay away from farm structures and livestock.
■ Obey hours of operation.
■ Become stewards of the land.
■ Be courteous to the landowner.

When you show respect and maintain good communication with private landowners, the statewide snowmobile trail system can continue to provide safe and quality snowmobiling opportunities.
Circle the letter of the most correct answer

1. Over the years, snowmobiles became much safer and more enjoyable products due to
   a.) “lemon” laws about poor quality products
   b.) voluntary safety and environmental standards adopted by the snowmobile industry
   c.) international agreements on engineering standards

2. Snowmobiles should only be ridden when there is how much snow on the ground?
   a.) a trace
   b.) one full inch
   c.) three inches or more

3. Who exerts the LEAST ground pressure per square inch?
   a.) a person on a horse
   b.) a hiker
   c.) a snowmobiler

4. When you see animals on or near the trail, you should
   a.) slow down or stop, and stay seated
   b.) turn around and go the other way
   c.) stand up and point to them so your friends will see them

5. Compared to snowmobiles of the 1960’s, noise emissions of today’s snowmobiles are
   a.) much less than they used to be
   b.) about the same as they used to be
   c.) much more than the used to be

6. Snowmobile clubs are the life blood of the sport because
   a.) they provide social opportunities for snowmobilers
   b.) they create and maintain most of the trails
   c.) they do charity and public service activities

7. Snowmobile trails exist only with the permission of
   a.) the state government
   b.) the landowner
   c.) the International Snowmobile Manufacturer’s Association

8. A Corridor Trail is
   a.) a primary snowmobile route through counties
   b.) a snowmobile route to local restaurants and gas stations
   c.) a trail over to your friend’s house

9. What is the snowmobile industry’s official safety message?
   a.) Safety today, tonight, and tomorrow
   b.) Safety begins at home
   c.) Safe Riders! You make snowmobiling safe.

10. What will guarantee that snowmobiling remains a safe sport now and in the future?
    a.) more laws and regulations
    b.) better snowmobiles
    c.) every snowmobiler’s personal alertness, riding skill, and attention to safe and responsible operating procedures

Your score ________
Definition

A snowmobile is defined by New York State law as a self-propelled vehicle designed for travel on snow or ice, steered by skis or runners and supported in whole or in part by one or more skis, belts or cleats.

Wheeled all terrain vehicles (ATVs), all terrain cycles (ATCs), and trail (or “dirt”) bikes are not snowmobiles. They are generally not allowed to use snowmobile trails as they typically do extensive damage to the snowmobile trail surface. Sometimes operators of these powered wheeled vehicles use them on snowmobile trails that have been closed for the season, which can cause environmental and/or economic damage, and ultimately result in loss of the snowmobile trail.

Respecting Snowmobile Performance Capabilities

Modern snowmobiles are usually powered by four or two-cycle engines with higher power output per unit of displacement than any other non-racing, non-flying vehicles. This power, added to very efficient power transmission, relatively light overall weight, and outstanding traction on hard surfaces, makes snowmobiles very high performance machines compared to cars, trucks, and even most other recreational vehicles.

The performance capabilities of all snowmobiles must be respected by all operators at all times or very severe consequences can result. It is very easy for even experienced riders to get in over their heads before they realize what is happening.

Excessive speed is a major factor in most snowmobile accidents. Accidents cause severe injuries and contribute to trail closures as landowners become concerned about liability. It is unlawful to operate a snowmobile at a speed greater than reasonable or prudent under the surrounding conditions, or at a speed greater than 55 mph. Never exceed posted speed limits on roads, in parks, or anywhere else. Few trails in our state will safely allow sustained speeds over 40 miles an hour, and even that is too fast on narrow and unmaintained trails. Adjust your speed to the condition of the trail.

Owners Manual and Safety Handbook

Snowmobile manufacturers provide their customers with two very important documents with every new snowmobile. These are the owner’s manual and a snowmobile safety handbook.

The very first thing a new owner of any new or used snowmobile should do is to read the owner’s manual and safety handbook from front to back. They will inform the owner how to get the most from the machine, how to care for it properly, and how to operate it safely and responsibly. You should refer back to these manuals from time to time to refresh your memory and for instructions on specific operation and maintenance items.

If you have a used machine that has no owner’s manual and safety handbook, ask your dealer to see if he can provide them for you.

Parts of the Snowmobile

Snowmobiles have similarities. They all work in much the same way to let us have our winter fun. The major subsystems of all snowmobiles are detailed next. See the Glossary at the end of the book for definitions of any terms you do not understand.

Chassis

This is the main frame on which all the other major parts of the snowmobile are mounted. It includes the front-end subframe where the engine is attached, and the tunnel that houses the rear suspension.

Engine

The power unit that allows the machine to move. Most snowmobiles use two-cycle (or two-stroke) engines because they have an excellent power-to-weight ratio. However, some snowmobiles use four-cycle (or four-stroke) engines. Either way, the engine will have one to four cylinders that produce power by burning fuel that is comprised of gasoline and air mixed together.

Air is fed to the engine by an air box at the back of the engine. The air box is engineered as an integral part of the engine. Operating the snowmobile without the air box will increase noise emissions, decrease overall performance, and hasten engine failure, so the air box should not be removed.

On most two-cycle snowmobiles, a nearby oil reservoir provides lubricating oil for the engine. This lubrication system is called oil injection.

An engineered exhaust system with a muffler and a silencer greatly reduces the noise emitted by the snowmobile. In New York State it is illegal to modify a snowmobile exhaust system in any way that emits more noise.

Some of the most important maintenance parts of an engine are the spark plugs. One is located at the top of each cylinder. Spark plugs should be changed once a year, and may have to be changed more often under certain circumstances. Another important part is the carburetor that mixes the gas with air so the engine can burn it. The carburetor must be
serviced when the snowmobile is put away for summer storage. Fuel injected snowmobiles do not have carburetors.

**Drive line**

This is the complex system that delivers the power from the engine to the track to actually make the snowmobile move across the snow.

The drive line works like this — the drive clutches are mounted on the left end of the engine. Their job is to govern engagement of the drive line. When the engine is revved up enough to a predetermined level, the primary drive clutch closes down on the drive belt. The drive belt then transfers the power to the drive clutch, which automatically selects the correct "gear" ratio for the system. The drive clutch is connected to the top gear in the chaincase (also called the drop case because it "drops" the power from under the hood (cowling) to inside the tunnel). Inside the chain case, the top gear is connected to the bottom gear by the drive chain. The chain delivers the power from the top gear to the bottom gear. The bottom gear is on the end of the drive axle inside the track. Drive cogs or sprockets on the drive axle grip the track and transfer the power to it, thus making the snowmobile move over the snow.

The drive belt wears out eventually, and must be replaced when it becomes too worn or begins to break apart. Parts such as springs and bushings in the clutches also must be replaced occasionally when they get worn. Sometimes even the chain or the gears break or wear out and need to be replaced.

**Suspension systems**

This is a group of springs, rods, linkages, limiters, and shock absorbers that move up and down to soften the effect of bumps in the trail. The front suspension supports the skis, while the rear suspension supports and guides the track.

There are numerous very different designs for the front suspension, each with their own advantages and disadvantages.

There are many variations of a single design, called a slide rail, for the rear suspension.

A slide rail suspension has plastic material called track sliders (or hyfax) on the bottom to allow the track to slide along it more easily. The sliders eventually wear out and must be changed or damage to the suspension will result. Snowmobiles built in the 1960's and early 70's usually have an earlier type of rear suspension design called bogie wheels.
**Steering system**

This includes the handlebars, steering column, tie rods, spindles, skis, and ski runners (also called wear bars, wear rods, or skegs) on the bottom of the skis. The runners are designed to wear out first to protect the skis, and they must be changed when worn down. The skis must be aligned to the track, to the handlebars, and to each other for this system to work properly.

**Hood (Cowling)**

This is the covering for the engine, clutches, and other internal mechanical parts. It serves to reduce noise as well as protect the operating parts of the machine and people around it. Openings in the hood (cowling) let air in and out to help cool the mechanical parts while they operate. The hood (cowling) also serves as a mounting point for the windshield, head light, and instrument panel on most machines.

**Seat and gas tank**

Mounted on top of the tunnel, this is the space for people and fuel. The seat will be designed for either one or two people. It contributes to the ride quality by absorbing more bumps and shocks. Many snowmobile seats have a rear storage compartment.

**Controls and instruments**

Mounted mostly on the hood (cowling) and handlebars, these allow you to operate the machine and give you information about what is happening with it. Your snowmobile owner’s manual will give you specific descriptions and locations of all controls and instruments on your snowmobile. Become familiar with them before riding the machine.

*The basic controls are:*

**Ignition switch** - Located somewhere near the steering column or below the right hand grip, the ignition switch allows the driver to insert the key that completes the ignition circuit, which allows the engine to be started. On electric start machines, the ignition switch is usually used to start the snowmobile by turning the ignition key all the way to the right.

**Choke or primer** - Usually located near the ignition switch, the choke or primer is used to add extra fuel to allow the snowmobile engine to start when the engine is cold.

**Throttle** - Mounted on the right handlebar, the throttle is operated with the driver’s right thumb. It feeds fuel to the engine to make it go.

**Emergency stop switch** - A red emergency stop switch is mounted on the right handlebar. It is operated with the driver’s right hand. This switch must be in the proper position or the engine will not run. It is usually called a “kill” switch for short, because activating it will immediately “kill” (stop) the engine.

**Brake lever** - Mounted on the left handlebar, the brake lever is operated with the driver’s left fingers. It slows the snowmobile when the machine is in motion. A parking brake with a separate control is often part of the brake system.

**Headlight switch** - Mounted on the left handlebar inside of the brake handle, it switches the headlight between low and high beam.

Other controls are used to operate the hand and thumb warmers, if the snowmobile is equipped with them, and sometimes other features. These may be mounted anywhere within reach of the driver or passenger.

*The most important instruments are:*

**Speedometer** - Located in front of the driver, this shows how fast the snowmobile is going. A small set of numbers in it, called an odometer, shows how far the snowmobile has gone since it was new. Some machines also have a trip meter that can be reset to measure the distance of each ride. These instruments usually measure distance in miles, but sometimes in kilometers or both.

**Tachometer** - Located in front of the driver, this gauge is found on some snowmobiles. It measures how fast the engine is running in revolutions per minute (RPM).

Most snowmobiles have other gauges and warning lights to alert you to various conditions that occur in the course of operating the snowmobile. These usually include fuel level and headlight high beam indicators, and can also include a brake indicator light, a low oil warning light, and an engine coolant temperature light or gauge on liquid cooled snowmobiles.

**Safety Features**

Every snowmobile manufactured for sale in North America incorporates a number of safety features. Some of them, like brakes, lights, and windshields are obvious. Other safety features include a completely enclosed hood (cowling) to shield most moving parts, an additional internal guard over the clutches, a completely enclosed chain case for the final drive chain, a handlebar pad, bumpers, side reflectors or lights, full
running boards for feet, and a rear snow flap to stop objects from being thrown at following snowmobiles.

But perhaps the most important safety feature is the emergency stop (kill) switch that works independently of the ignition switch. Located on the right handlebar just above and inside of the throttle, it allows the rider to shut off the engine instantly with a minimum of motion.

Some snowmobiles also include other safety features such as throttle monitor switches to shut off the engine automatically if the throttle cable breaks or binds, passenger straps and hand grips on two-up machines, and rear view mirrors.

SSCC Certification

Minimum safety standards for snowmobiles have been adopted by the Snowmobile Safety Certification Committee, Inc. Many snowmobiles carry the SSCC certification label on the side of the tunnel. This is your guarantee that an independent testing laboratory has verified compliance with the voluntary safety standards set by the international snowmobile industry and the SSCC.

Personalizing the Machine for the Operator

Snowmobiles are very personal vehicles. The operator is a major part of the total weight of the unit on the trail. The operator’s position on the machine has a great influence on how the snowmobile rides and handles. We will discuss this later.

The manufacturer of the snowmobile has provided several adjustable elements to tailor the machine to the individual rider for the best possible ride, handling, and overall performance.

The handlebars must be adjusted to the correct height for ease of steering and comfortable operation of the controls. The ski suspension and both the front and rear ends of the track suspension must be adjusted to the rider’s weight and riding style. The headlight beams must be adjusted to provide proper illumination of the trail at night. If the machine is equipped with mirrors, they must also be properly adjusted so the operator can see other snowmobiles behind his or her own snowmobile.

Consult your owner’s manual or your dealer for instructions on how to perform these very important adjustments. Most of them can usually be done with the tools provided in your snowmobile tool kit.
Maintenance and Repair

Proper maintenance of your snowmobile is absolutely essential for reliability, safety, and maximum enjoyment of the sport. Owners who fail to properly maintain their machines are assured of expensive mechanical failure sooner or later. At best, mechanical failure on the trail is a considerable nuisance. In extreme cases, mechanical failure could result in a life-threatening situation.

Every snowmobiler should know how to change a drive belt and spark plugs. These skills could make the difference between spending a night outside in the cold and getting home on time.

Your owner’s manual covers all the basic steps needed to maintain your machine during the season as well as for summer storage and fall preparation for the riding season.

Here are some suggestions for ongoing maintenance of your snowmobile during the winter.

Chassis lubrication - Frequently grease the suspensions using low-temperature grease in a grease gun. This drives out water that will rust suspension parts. If they become rusted, these parts will not operate properly, and the snowmobile may ride and steer badly. Repairs will be difficult, time consuming, and potentially costly. Also remember to grease the speedometer fitting underneath the driven clutch. This is very important to keep the speedometer working. There may be other grease fittings in the steering column or drive system, too.

Drive belt - Inspect the drive belt on a regular basis. Replace it if it becomes frayed, if any pieces come off the top or bottom sides, if it has a flat spot on the side, and whenever it measures one-eighth of an inch narrower than when it was new. Here’s a tip - always run the belt in the same direction and it will last longer. When you install a new one, always do it so that the label reads to the outside. Then, any time you remove it, put it back on in the same way.

Ski runners - Plain wear bars (wear rods or skegs) can wear out very quickly - sometimes in only one ride. You should check them every day, and change them when they are more than half worn through. Longer wearing but much more expensive carbide runners will greatly increase the mileage between runner changes. Here’s another tip - don’t use carbide runners unless your snowmobile has track studs to balance the traction.

Sliders - Check the sliders (hyfax) on the track suspension from time to time to make sure they are not worn through, particularly at the bottom of the curve in the slide rail. You can roll the snowmobile on its side to do this. Or you can measure the thickness of the sliders at the back end and check against the thickness at the bottom of the rail curve. Replace the sliders before they wear all the way through to avoid damaging the slide rail.

Track tension - Check the track tension from time to time. Your owner’s manual will give you the correct adjustment specifications. If the track becomes too loose, the drive cogs or sprockets will not mesh properly with the track, and damage can result.

Brake adjustment - Most newer snowmobiles, including all those with hydraulic brakes, automatically adjust their brakes. But some machines with mechanical brakes need periodic brake adjustment. Consult your owner’s manual.

Starter rope - Inspect the starter rope occasionally to make sure that it is not fraying from sliding past metal edges in the snowmobile. If it becomes frayed, it should be replaced before it breaks. Here’s another tip — don’t let go of the starter cord when you pull it out. The cord will snap back, which contributes to fraying and the handle can damage the snowmobile.

Summer Storage

Proper summer storage will insure a trouble-free season of riding the following winter. Here is a check list for summer storage. Consult your owner’s manual for exact requirements for your snowmobile.

<table>
<thead>
<tr>
<th>Summer Storage Check List</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wash and clean-up the snowmobile</td>
</tr>
<tr>
<td>Inspect thoroughly and make a written list of any problems for repair in the fall</td>
</tr>
<tr>
<td>Grease all fittings thoroughly</td>
</tr>
<tr>
<td>Touch up painted surfaces (remove rust before painting)</td>
</tr>
<tr>
<td>Apply vinyl protectant to seat cover and soft plastics</td>
</tr>
<tr>
<td>Fog lower end of engine with aerosol oil squirted into the carburetors</td>
</tr>
<tr>
<td>Pour 2 oz. of oil into each cylinder, then pull engine over slowly to coat cylinder walls</td>
</tr>
<tr>
<td>Drain gas from tank or treat with a fuel stabilizer</td>
</tr>
<tr>
<td>Drain gas from the carburetors</td>
</tr>
<tr>
<td>Remove the drive belt</td>
</tr>
<tr>
<td>Check water level, charge up, and remove battery if you have one</td>
</tr>
<tr>
<td>Remove luggage, tools, and spare parts to store separately</td>
</tr>
<tr>
<td>Block off exhaust pipe and other entrance passages with rags to keep rodents out</td>
</tr>
<tr>
<td>Raise the back of the snowmobile up on a stand or block to get track off the floor</td>
</tr>
<tr>
<td>Cover the machine with a breathable covering</td>
</tr>
</tbody>
</table>
Pre-Season Tune-up

A thorough pre-season tune-up will also insure a trouble-free season of riding during the winter. Here is a check list for pre-season preparation. Consult your owner’s manual for exact requirements for your snowmobile.

Pre-Season Preparation Check List

- Check your spring repairs list for necessary actions and take care of any problems noted
- Chassis check - Inspect track, track tension & alignment, track studs, track suspension & mounting bolts, sliders, idler wheels & wheel bearings, shocks & springs, steering system, skis & ski alignment, ski runners, tighten ski bolts, check all other fasteners, and repair as needed
- Engine check - Inspect throttle cables, choke cables, fuel filter, fuel line fittings, exhaust system springs, fan belt or coolant level, spark plug wires & caps, starter rope & recoil action, remove exhaust block rags, and service or repair as needed
- Check water level, charge, and install battery if you have one
- Check drive chain tension and chain case oil level - add recommended oil if needed
- Grease all fittings - don’t forget the speedometer drive fitting under the drive clutch
- Clean faces of both clutches and install/replace drive belt - follow manufacturer’s recommendations on clutch lubrication & replace belt if 1/8-inch narrower than specification
- Add some fresh gas and run sled on a jack stand to burn off storage oil in engine
- Check all lights and kill switch operation
- Check brakes for proper operation; adjust if necessary
- Install new properly gapped spark plugs (see owner’s manual for gap specification)
- Top off oil in tank
- Add owner’s manual, tool kit, spare parts, and tow rope
- Apply new registration validation stickers
- Wash and wax snowmobile thoroughly
- Apply vinyl protectant to seat cover and soft plastics
Trouble Shooting Chart

There will be times when something won’t go right when you want to ride. This chart details some of the most common problems, some possible causes, and what to do about it.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Causes</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starter rope will not engage or will not retract properly.</td>
<td>Broken recoil starter. Too much friction in recoil.</td>
<td>Use emergency start rope and have starter repaired. Tap recoil starter housing gently with a tool while keeping light tension on rope.</td>
</tr>
<tr>
<td>Engine will not start.</td>
<td>Emergency stop switch off. Ignition switch off. Battery dead (Electric start). Out of gas. Engine starving for gas. Too much gas (flooded). Fouled or worn spark plugs. No ignition spark. Little or no compression.</td>
<td>Turn on. Turn on. Start manually. See dealer. Refuel. Use full choke or primer. Check fuel lines, filter, and carburetor for freeze up and thaw with hair dryer; use isopropyl alcohol in gas. Hold throttle full open, crank repeatedly while holding brake on tight. (2 people required!) Install new gapped plugs. Check plug wire connections. If wires are OK, see dealer. See dealer.</td>
</tr>
<tr>
<td>Engine runs rough or will not idle properly when warm.</td>
<td>Carburetor dirty or out of adjustment. Fouled or worn spark plugs. Too much oil in engine. Muffler/exhaust blocked.</td>
<td>Clean, adjust, or see dealer. Install new gapped plugs. Check adjustment. See dealer. Stop engine, clean out.</td>
</tr>
<tr>
<td>Low engine RPM.</td>
<td>Air intake plugged</td>
<td>Clean out ice/other material.</td>
</tr>
<tr>
<td>Snowmobile fails to move when throttle is depressed.</td>
<td>Drive belt broken or missing. Track/skis blocked or frozen to the ground. Clutch jammed or broken. Drive chain broken.</td>
<td>Replace with new belt. Unblock/pull loose/thaw out with hair dryer. Check drive belt for flat spotting. See dealer. See dealer.</td>
</tr>
<tr>
<td>Unusually low speed.</td>
<td>Drive belt excessively worn. Not all cylinders working Clutches out of alignment. Chain/track tension wrong.</td>
<td>Replace. See engine fails to start. See dealer. Adjust or see dealer.</td>
</tr>
<tr>
<td>Snowmobile darts from side to side on trail.</td>
<td>Skis toed in. Too much ski pressure.</td>
<td>Align skis to parallel or slight toe-out. Reduce ski pressure.</td>
</tr>
</tbody>
</table>
Circle the letter of the most correct answer

1. Why do we need to respect the performance capabilities of modern snowmobiles?
   a.) because they cost a lot of money
   b.) because they are expensive to insure
   c.) because excessive speed is a major factor in most snowmobile accidents

2. What does the drive belt do?
   a.) transfers power to the drive clutch
   b.) transfers power from the drive axle to the ground
   c.) holds up the pants of the driver

3. What are sliders and what do they do?
   a.) a series of television shows that entertain us when there is no snow on the ground
   b.) the plastic on the bottom of the rear suspension that the track slides along
   c.) the metal tube inside the front springs that lets the springs move back and forth

4. What do ski runners do?
   a.) protect the skis from wearing out
   b.) help you steer the snowmobile
   c.) both of the above

5. When do you use the choke or primer to help start the snowmobile?
   a.) when the engine is cold
   b.) when the engine is warm
   c.) when you have a fresh tank of gas

6. What does the emergency stop (“kill”) switch do?
   a.) stop the track from turning
   b.) shut off the lights
   c.) shut off the engine instantly

7. Which parts must be properly adjusted for the driver?
   a.) bumpers, windshield, and skis
   b.) handlebars, ski and track suspensions, headlight, and mirrors
   c.) seat, track, and snow flap

8. Why is proper summer storage service and pre-season preparation in the fall so important?
   a.) they make the snowmobile season last longer
   b.) they reduce the cost of snowmobile insurance
   c.) they help insure trouble-free snowmobiling during the winter

9. Which of the following are wear parts that need to be replaced from time to time?
   a.) ski runners, track sliders (hyfax), drive belt, and spark plugs
   b.) skis, windshield, handlebar grips, and brake lever
   c.) seat, snow flap, bumpers, and hood (cowling)

10. Why is it important to grease the suspensions?
    a.) it makes the parts look nice and shiny
    b.) it drives out water that will rust the parts
    c.) it makes the snowmobile go faster

Your score __________
# Exercise - Label the Parts

1. hood (cowling)  
2. bumper  
3. brake lever  
4. throttle  
5. kill switch  
6. snow flap  
7. track  
8. ski  
9. wear bar  
10. spark plug  
11. primary drive clutch  
12. drive belt  
13. drive clutch  
14. drive chain  
15. drive axle  
16. windshield  
17. seat  
18. track sliders
Age Qualification for Operation

Anyone who is at least 18 years old may operate a snowmobile in New York State without any other qualification except as defined by state and local laws regulating that operation. However, it is recommended that all operators complete a recognized snowmobile safety course. The Commissioner of Parks, Recreation and Historic Preservation will issue a snowmobile safety certificate to individuals who successfully complete this course.

A person ages 14 through 17 years old may operate a snowmobile without adult or other supervision if they have completed a snowmobile safety training course recognized by the State of New York. A person ages 10 through 13 may operate a snowmobile, on lands upon which snowmobiling is allowed, if they have completed a snowmobile safety training course recognized by the State of New York and are accompanied by (within 500 feet of) a person who is at least 18 years of age. A person ages 14 through 17 who does not hold this certificate is subject to the same restrictions as children under the age of 14 years.

Children under 10 years old or under age 14 without a safety certificate may operate a snowmobile only on lands owned or leased by their parent or guardian.

A non-resident operator who is a resident of another state or country and is the holder of a valid snowmobile safety certificate issued by that state or country shall be considered the same as the holder of a New York State Safety Certificate.

Registration

Snowmobiles operated in New York State must be registered with the New York State Department of Motor Vehicles. Exceptions are made for machines operated exclusively on the owner’s property.

Registration is normally done at time of sale by the selling dealer. However, machines obtained in a private sale or from out-of-state sources may be registered at any Motor Vehicle office. All New York State snowmobile registrations expire at the end of August regardless of the date of issuance.

Decal must be placed within the shaded area.

With the exception of the first $10.00 collected, which goes to the General Fund, registration fees are exclusively used to support snowmobiling in New York State. The fees are deposited into the Snowmobile Trail Development and Maintenance Fund which supports the more than 10,500 miles of public trail. The fund is used for grooming, trail signs, local law enforcement, the snowmobile safety education program and other related snowmobile programs.

The DMV-assigned registration numbers must be displayed on both sides of the hood/cowling of the snowmobile at all times. The hood/cowling is defined as the forward portion of the snowmobile surrounding the engine and clutch assembly. Any other display position on the snowmobile, such as the tunnel, seat, or windshield is NOT legal.

Three-inch by five-inch reflective registration number stickers are supplied with each New York State snowmobile registration. These stickers should stay on the machine throughout its life. Annual registration validation stickers must be displayed in the assigned corner of the NYS registration number sticker.

Insurance

Snowmobiles operated on trails or anywhere else away from the owner’s property must be insured. New York State law requires snowmobilers to carry liability coverage in the minimum amount of $10,000 for an accident involving one person, $20,000 for an accident involving two or more persons, and $5,000 for property damage from one accident.

Proof of insurance must be carried by the snowmobiler and must be displayed upon request of any magistrate, law enforcement officer, or anyone who has suffered personal injury or property damage as a result of the snowmobiler’s actions.

Trail Permits

New York state does not require a paid trail permit (or trail pass) for use of the state funded snowmobile trail system.

However, some local areas in New York State may require a paid trail permit for the use of certain trails. These trails do not qualify for financial support from the NYS Snowmobile Trail Development and Maintenance Fund.

Certain State Parks do require a no-charge trail permit for snowmobiling in the Park after dark or for special events. Check with each individual park.

Documents Required

Snowmobilers are required to carry their registration and proof of insurance documents on their person while snowmobiling.

Holders, under the age of 18, of snowmobile safety certificates must carry their certificate when they are snowmobiling.
These documents must be produced at the request of any law officer or magistrate. Insurance documentation must be produced at the request of anyone that is injured or suffers property damage as a result of operation of a snowmobile.

**Equipment Required**

Anyone who operates or rides on a snowmobile as a passenger in New York State must wear an approved safety helmet except when the operation is on private property owned by the driver or passenger.

All snowmobiles operated in New York State must meet minimum equipment requirements. They are:

1. A working muffler. It must meet state noise emission standards.
2. A head light. It must be sufficient to reveal persons and vehicles at a distance of at least one hundred feet in normal atmospheric conditions.
3. A tail light. It must create a red light that is plainly visible for a distance of at least five hundred feet to the rear during darkness under normal atmospheric conditions.
4. Reflector material. A minimum of sixteen square inches of reflective material must be mounted on each side of the hood/cowling.

New snowmobiles offered for sale in this state normally provide all of this equipment. However, sometimes the reflective material is not included. The New York State registration number decal provides the required reflectorized material.

**Operational Restrictions**

Snowmobiles may not be operated in any unsafe or reckless manner, or in any way that harasses other people or wildlife.

It is **UNLAWFUL** to operate a snowmobile:

1. at a speed greater than reasonable or prudent under the surrounding conditions, or at a speed greater than 55 mph
2. in any careless, reckless, or negligent manner
3. while the operator is intoxicated
4. without the required lights
5. on the tracks of an operating railroad
6. in any tree nursery or planting in a manner that damages growing stock
7. on private property without the consent of the owner
8. towing a sleigh or toboggan except with a rigid tow bar
9. in any way that the operator fails to yield to an emergency vehicle approaching from any direction
10. in any way that fails to comply with a lawful order from a police officer
11. on a frozen body of water within one hundred feet of a skater, ice fisherman, ice fishing house, or other person not on a snowmobile except at the minimum speed required to maintain forward motion
12. within one hundred feet of a dwelling between 12 midnight and 6 AM at a speed greater than the minimum speed required to maintain forward motion

**Operation on Highways**

Operation of snowmobiles on highways depends on the classification of the highway and the prevailing conditions.

1. **Snowmobiles MAY NOT** be operated on the New York State Thruway, other interstate highways, or other limited access highways. The only exception to this law is during a snow emergency as declared by the agency having authority over the highway and when specifically approved by the Department of Transportation.

2. **Snowmobiles MAY be** operated on the shoulders and inside banks of highways, other than limited access highways, **PROVIDED** that the highways have been designated AND posted for snowmobile use by the governing authority.

   Snowmobiles may also be operated on designated highways for a distance not to exceed 500 yards to gain access to operational areas or trails adjacent to the highway.

   Again, an exception to this law may occur during a snow emergency as declared by the agency having authority over the highway in question.

3. **Snowmobiles MAY be operated** on the OUTSIDE banks of highways other than limited access highways.

4. **Snowmobiles MAY be operated** on highways, other than limited access highways, when necessary to cross a bridge or culvert.

5. **Snowmobiles MAY be operated** on county, town, city, or village highways which are unplowed and unused by wheeled vehicles during the winter months. These roads must be designated as such by the governing authority.

6. **Snowmobile operation on any highway MUST be in single file on the right hand side of the road, except to overtake and pass another snowmobile.**

7. **Snowmobiles MAY NOT pull a person on skis or in a sleigh, sled, or toboggan on or across any roadway.**

8. **Snowmobiles MAY make a direct crossing of any highway other than limited access highways at any time of day provided that:**

   a.) the crossing is made at approximately a ninety degree angle, and at a place where no obstruction prevents a quick and safe crossing
   b.) the snowmobile is brought to a complete stop before crossing the highway
   c.) the snowmobile operator yields the right of way to all oncoming highway traffic

**Definition of a Highway**

- **UNPLowed RIGHT-OF-WAY**
- **Plowed Shoulder**
- **ROADWAY**
- **Plowed Shoulder**
- **UNPLowed RIGHT-OF-WAY**
Accidents and Accident Reporting

Despite the best precautions, accidents sometimes happen. In case of an accident involving a snowmobile, the operator must stop immediately.

The operator is legally obligated to provide assistance, to the best of his or her ability, to other persons affected by the accident. The operator must show his or her certificate of registration, and safety certificate (when required by age), and identify himself or herself by name, address, and snowmobile identification number IN WRITING to any person who is injured and to any person suffering property damage. If the person suffering the injury or property damage cannot be located at the accident site, the snowmobile operator must file an accident report with the nearest police agency within 24 hours.

Any snowmobile accident resulting in a personal injury, or in property damage of $1000 or more, must be reported to the nearest law enforcement agency or magistrate, with a copy sent to the NYS Office of Parks Recreation and Historic Preservation (OPRHP). The operator of any snowmobile involved in a reportable accident must file a complete written report within seven days of the accident.

Snowmobile accident report forms are provided by the NYS OPRHP and are available at any police station.

Anatomy of a Highway

“Highway” shall mean the entire width between the boundary lines of any way or place when any part thereof is open to the use of the public, as a matter of right, for the purpose of vehicular traffic

“Roadway” shall mean that portion of a highway improved, designed, or ordinarily used for vehicular travel, exclusive of the shoulder

“Shoulder” shall mean that portion of a highway which lies outside the paved or unpaved roadway immediately adjacent to the portion of the roadway which may be used by motor vehicles

“Bank” shall mean a mound, pile or ridge of snow on the edge of a highway accumulated from natural snowfall or by snowplowing operations

“Inside bank” shall mean the portion of a snowbank immediately adjacent to the shoulder of the roadway

“Outside bank” shall mean the portion of a snowbank outside the crest thereof and farthest removed from the roadway
Circle the letter of the most correct answer.

1. Snowmobiles must be registered in New York if
   a.) they are used on public trails
   b.) they are used in approved areas of parks and other public lands
   c.) both of the above

2. Snowmobile registration numbers must be placed on
   a.) the hood/cowling
   b.) the tunnel
   c.) the windshield

3. Most of the snowmobile registration fee is used for
   a.) administrative expenses
   b.) the cost of the registration number stickers
   c.) the Trail Fund that supports trails and safety education programs

4. What documents do you need to carry while snowmobiling?
   a.) snowmobile registration, proof of insurance, and medical information card.
   b.) snowmobile registration, proof of insurance, and driver’s license
   c.) snowmobile registration, proof of insurance, and safety certificate (when required by age)

5. What equipment is required for a snowmobile?
   a.) working muffler, head and tail lights, working horn
   b.) working muffler, head and tail lights, side reflective material
   c.) working muffler, head and tail lights, working turn signals

6. Where are you NOT allowed to operate a snowmobile?
   a.) on the tracks of a working railroad
   b.) on the outside banks of highways other than limited access highways
   c.) on another club’s trails

7. What kind of roads can you operate a snowmobile on?
   a.) the New York State Thruway and other limited access state highways
   b.) town and village roads posted for snowmobiling
   c.) streets of big cities

8. When you operate a snowmobile on a highway posted for snowmobiling, you must
   a.) attach a safety flag to your snowmobile so it can be seen more easily
   b.) stop when a car or truck comes by in either direction
   c.) stay to the right side in single file except to overtake and pass another snowmobile

9. What is the proper way to cross a highway with a snowmobile?
   a.) at approximately a right angle
   b.) walk the sled across the road
   c.) with a stop in the middle to see if anyone is coming the other way

10. Snowmobile accidents must be reported if
    a.) more than one snowmobile is involved
    b.) any one is injured or there is $1000 or more in property damage
    c.) you happen to feel like it

Your score ________
Personal Preparation

Snowmobiling requires physical and mental preparation. The better general physical condition that you are in, the easier it will be to deal with the muscular demands that are peculiar to snowmobiling.

Extended riding, such as all-day trips, requires physical stamina beyond that required for short rides. Getting plenty of sleep, and eating hearty and nourishing meals before and during a ride is good preparation to insure the necessary stamina. Don’t forget to drink a lot of water. You lose body fluids by sweating in even the coldest weather, and you need to replenish your supply.

You should only ride when physically fit, well rested, and sober. Make it a point not to ride when you are ill, over-tired or over-excited. Mental fatigue or inattention can lead to poor judgments and unpleasant consequences.

Never ride under the influence of drugs or alcohol. Operation under the influence of drugs or alcohol is against the law.

Drugs, including prescription and over-the-counter medications, can make you nervous or drowsy. This detracts from your ability to operate your snowmobile at peak efficiency.

Alcohol distorts your perception, lowers your body temperature, slows your reaction time, and impairs your natural sense of caution. It is also a leading contributor to serious or fatal snowmobile accidents. Even a couple of beers will begin to impair your ability to operate your snowmobile at peak levels.

The New York State Snowmobile Association has adopted a zero tolerance policy. Avoid the consumption of drugs and alcohol completely until the ride is over and the snowmobile is put away.

Ride Planning

A little planning goes a long way to making a ride safer and more enjoyable.

Daytime is a safer time to ride. It offers the advantages of better visibility and warmer temperatures than night riding. Twilight, with its fading visibility, is a particularly dangerous time to ride, so avoid it if possible. If you are going to ride at night, stick to familiar trails and slow down. Extreme caution is required anytime that visibility is limited.

Check the weather conditions and latest forecast to avoid storms. Riding in heavily falling snow or rain is not fun. You can get wet, tired, and lost more quickly in a storm. Wait until the snow has stopped falling and settled a bit before you go out to ride. Riding in fog is even worse. You can’t see anything, so you have to crawl along at a very slow speed.

Start by finding at least one riding companion because there is always safety in numbers. Club membership usually makes it easier to find a riding companion.

The next step is to plan a general ride route and destination. Tell someone where you are going and when you expect to return. This is very important. If someone knows where you are going, and when you expect to return, he or she can notify authorities or send out searchers if you do not return when intended.

Gather and check all your personal equipment in advance. Make sure you have everything you will need with you when you leave. A map or first aid kit won’t do you any good if it is sitting at home when it is needed.

Snowmobile Clothing

Snowmobile clothing and protective equipment that is specifically designed for this sport will generally provide better performance than apparel and equipment that is not designed for snowmobiling.

Better quality snowmobile suits often include waterproof/windproof breathable materials that increase comfort in cold and wet conditions. Some snowmobile suits also have added safety features such as reflective striping, extra padding in important areas, or flotation foam.

Layering is always the best way to dress in cold weather. Since each individual is different, and since temperature, humidity, wind chill, and amount of protection from your snowmobile’s windshield can vary greatly, there is no one correct combination of clothing for all snowmobiling.

Generally speaking, you should start with a foundation layer of underwear and socks that will wick perspiration moisture away from your skin. Garments made of materials like polypropylene or branded materials like DuPont’s Thermax® and ThermaStat® will keep you drier and more com-
You normally wear while riding. Be careful not to overdress in warmer weather, as you will get very sweaty and uncomfortable, which could lead to more serious problems. Trial and error is the only way to find out what you need to keep warm in any given set of conditions, but most people don’t need to drag out the “long johns” until the temperature dips into single digits.

Boots and gloves designed for snowmobiling are generally warmer and longer lasting than general purpose winter wear. Add sock and glove liners to your snowmobile outfit for very cold weather. Wear a turtleneck sweater to keep your neck warm.

Never wear a scarf because a loose end could get caught in moving parts and strangle the wearer. A helmet liner, or balaclava, will provide some face and neck warmth as well as permit your helmet to slide on more easily. There are various full and half face masks for additional facial protection in very cold weather.

**Helmets**

Helmets provide warmth, impact protection, and support for eye protection. They are required by law for anyone driving or riding on a snowmobile in New York State, except when on private property owned by the driver or passenger.

Impact protection is an obvious need if you fall off your snowmobile, but it may be most important when you are still on the machine. You may need the protection when you ride under a low-hanging branch or get head-whipped by a branch sticking out from the side of the trail.

**Snowmobile helmets come in two basic styles**—full coverage, often called open face, and full face. Full face helmets are more popular because they are warmer.

All safety helmets must meet minimum protection standards set by the United States Department of Transportation. The Snell listing is a far more stringent measure of protection performance. The Snell Foundation is an independent testing organization that rates helmets in five year cycles with increasing performance standards. A Snell 95 rating is better than a Snell 90 rating, and so on. Performance required to meet these standards far exceeds the minimum requirements of the US DOT.

No helmet will provide complete protection if it is not fitted properly and buckled on. Helmets should be snug but not uncomfortably tight. Always try them on over the head gear you normally wear while riding.

Snowmobile helmets differ from motorcycle helmets in ventilation capabilities and face shield engineering. Snowmobile helmets are more prone to fogging the shield than motorcycle helmets, so airflow through the helmet must be carefully managed. If the shield foggs up, the wearer will not be able to see very well. In extreme cases, the fog will freeze and the wearer may not be able to see at all. Many snowmobile helmets now have vents that can be opened and closed as needed. Most also have double lens face shields because they resist fogging better than the single lens types found on motorcycle helmets.

Helmets are made of fiberglass or plastic. These materials become brittle with age. For maximum protection, replace your snowmobile helmet with a new one every five years or so. Don’t paint your helmet, as solvents in the paint can weaken the shell material.

Most importantly, don’t forget to buckle up. If your helmet comes off your head, it won’t protect you when you need it most.

**Eye Protection**

Your eyes must be protected from snow and ice crystals in the air, from snow or objects kicked up by the snowmobile in front of you, from overhanging branches that can whip your face, and from the glare of winter sunlight, even on overcast days.

The three basic types of eye protection are flip shields, goggles, and sunglasses. Helmet-mounted flip shields, so named because they can be “flipped” open, are the most popular type. They are easy and comfortable to wear, offer the widest field of vision, and keep your face warmer.

Some riders combine sunglasses with flip shields for maximum protection. Good sunglasses reduce light overload (glare) and some can enhance contrast for better vision. Most importantly, they protect the eyes from harmful ultraviolet (UV) rays that can rob sight over time. The white snow surface reflects sunlight up to your face, compounding the glare and UV exposure by delivering more of the sun’s rays to your eyes than in the summertime.

When selecting sunglasses, remember that wrap-around styles will fog more easily than flat frame styles. Styles with metal frames will transfer cold into your helmet, so plastic or plastic-coated frames are a much better choice for snowmobiling.

Tinted (colored) sunglasses and lenses are popular for snowmobiling. On bright sunlit days, the reflection of the sun rays off white snow can cause serious visual discomfort. Dark gray or gray/green lenses are the best choice for these bright days because they provide soothing glare reduction with
minimal color distortion. On partially overcast days, brown, amber, or rose tinted lenses are a better choice. Although they produce some color distortion, they will also reduce glare and increase contrast, allowing you to see things better. On heavy overcast days, a light yellow or peach tint is the best choice. It will increase contrast even in heavily clouded conditions. Avoid blue lenses at all times. Blue light does not allow your eyes to focus properly. This retards good vision and leads to fatigue and headaches.

Tinted lenses, goggles, or shields should never be worn after dark. Any tint will make vision much more difficult.

**Snowmobile Spares and Equipment**

Every snowmobile should be equipped with emergency equipment. These items fall into two categories, tools and spares for mechanical problems, and general emergency equipment.

Every time you ride your snowmobile you should carry a basic tool kit, a spare drive belt, at least one spare set of new pre-gapped spark plugs, an emergency starter rope, a tow rope, and a working flashlight. At minimum, you should know how to change the drive belt, change the spark plugs, and use the emergency starter rope that is usually provided in the tool kit.

Some riders carry extra oil. Never store oil in the rear seat compartment because the container will break sooner or later, and the oil will leak out making a real mess.

If you need to use any of these items on the trail, don’t discard the used parts or packaging on the trail. Carry them back in the snowmobile for proper disposal.

Every snowmobile should also have a small first aid kit to deal with simple cuts and burns, headaches, heartburn, and other minor medical problems. A pocket package of facial tissues can be handy, too, for anything from runny noses to fogged up glasses to wet spark plugs. And sometimes a chemical heating pack can be welcome to warm up bare hands numbed by working in the snow and cold.

A snack like a candy bar, granola bar, or a couple of beef sticks stashed away somewhere is always a good idea, too. Sometimes having a little something in your stomach can help you settle down and think more clearly when it really counts.

Communications items can be very helpful. A cellular phone could be a lifesaver in an area covered by cellular service. Also carry a small pad and a pencil, not a pen, because a pencil will not be affected as much by cold and wetness as a pen will be.

In addition, you may want to carry some more serious survival gear if you are riding on longer trips in remote areas. Consult books on winter camping for ideas on what else you may need.

Again, don’t discard any packaging on the trail. Carry it back for proper disposal later on.
Servicing the Snowmobile

Fill the gas tank with fresh gasoline using proper fueling precautions to minimize fire danger. Do it outdoors if possible, and always with the hood shut. Fill up with the engine cold, or at least shut off. NEVER fuel up with the engine running. And NEVER try to check fuel level with a lighted match - use a flashlight if you do not have a gas gauge. Make sure there are no open flames or people smoking anywhere in the area. Take special care not to splash gas, overfill the tank, or take longer than necessary to fill up.

Also, it is a good idea to add a few ounces of isopropyl alcohol or use an in-tank water absorber for moisture management in your fuel system. Regular use could prevent an annoying and possibly engine-damaging fuel system freeze up. This is especially important if you store your machine in a heated garage.

Make sure that your injection oil reservoir is full. It is best to choose one brand of oil and stick to it. If you have a liquid cooled machine, check to make sure that the coolant level is up to the line in the reservoir. Remember, NEVER open the coolant reservoir when the engine is warm. If the reservoir must be opened to check the level, wait until the engine is cold or pressure will force hot coolant to spray out.

Your machine’s suspensions should be greased frequently. Use a good low temperature grease. And don’t forget to grease the speedometer drive cable. The fitting for this is usually found behind the drive clutch. Some machines also have grease fittings in the steering gear and on parts of the drive train. Consult your owner’s manual for more information.

Pre-Ride Machine Check Over

When you are ready to start your machine, check to make sure that the track and skis are not frozen to the ground. You can ruin the drive belt if you try to start with anything frozen down. Then check to make sure that the throttle is operating freely, that the brake works properly, and that the steering is free. It is also a good idea to check the ski runners (skegs) and track sliders (hyfax) to make sure that they are in good condition.

Take a few moments to look around for loose nuts and bolts, elongated mounting holes, popped-off exhaust springs, and so forth. Make sure that spares and emergency equipment are loaded, and see that everything else is in good working order. Clean off your lights, instruments, mirrors, and windshield if they are covered with ice, snow or dirt.

When you have completed the next quiz, you will finally be ready to go for a ride.
Circle the letter of the most correct answer.

1. What is good personal preparation for snowmobiling?
   a.) getting lots of sleep, eating nourishing meals, and drinking plenty of water
   b.) staying up late at night, eating junk food, and restricting intake of fluids
   c.) using drugs and medicines

2. What are the most important parts of ride planning?
   a.) check the weather and find a riding partner
   b.) plan your route, and tell someone where you are going and when you will be back
   c.) all of the above

3. What is the best way to dress for colder weather?
   a.) wear wool everything
   b.) layer your clothing
   c.) wear a scuba diver’s wet suit for underwear

4. Why are you required by law to wear a helmet while snowmobiling?
   a.) warmth and protection
   b.) it looks good
   c.) because motorcyclists have to wear a helmet, too

5. Wearing a helmet isn’t enough. What must you do to insure that it will protect you properly?
   a.) wear a balaclava underneath it
   b.) buckle your helmet snugly on your head
   c.) pull up your jacket collar

6. What do good sunglasses do that other eye protection doesn’t do?
   a.) keep snow flakes and ice crystals out of your eyes
   b.) help keep your face warm
   c.) protect your eyes from harmful UV rays that can rob your sight over time

7. What should every snowmobile have in it?
   a.) a tool kit, spare drive belt and spark plugs, a tow rope, and a first aid kit
   b.) a phone book in case you have to call somebody for help
   c.) magazines to read while your friend fixes his snowmobile

8. If you change a drive belt or spark plugs on the trail, what should you do with the old parts?
   a.) throw them into the bushes
   b.) carry them out with you for proper disposal
   c.) hide them in some one else’s snowmobile so they’ll be surprised when they find them

9. When you gas up your machine, you should do it
   a.) outdoors, with the hood shut, taking care not to splash gas
   b.) indoors, with the hood open, using a big funnel
   c.) outdoors, with the hood open and the engine running

10. Your pre-ride check should include
    a.) skis and track, runners and hyfax, throttle and brake
    b.) spares and emergency equipment loaded, steering and lights working
    c.) all of the above

Your score ________
Starting the Snowmobile

The very first thing to do is to make sure that your snowmobile is pointed in a safe direction before you start it up. If it is equipped with reverse gear, make sure you know what gear it is in. Next, make sure that the throttle and brake are working freely before doing anything else. Lock the parking brake until you are ready to ride. Make sure the emergency stop (“kill”) switch is in the correct position.

Use the correct position when starting your snowmobile. If the engine is cold, use the choke in full on position or pump gas in with the primer to enrich the fuel mixture in the carburetor according to manufacturer’s instructions. If the engine is warm, DO NOT choke it or prime it as this will “flood” the engine with fuel making it very difficult or impossible to start.

On an electric start machine, turn the ignition key to engage the electric starter and release as soon as the engine begins to run. On a manual start machine, turn the ignition key to “on” and pull the engine starter cord with a sharp, fast motion. Don’t allow the cord to snap back, as this can damage the snowmobile. If the engine is cold, two or three pulls on the starter cord will be required. If the machine has been sitting overnight in very cold conditions, several pulls may be required. But if the engine is warm, one sharp pull should be enough.

Allow the engine to warm up for a few minutes before doing anything else. On machines with chokes, move the choke lever to the middle position and let the machine idle. Once the engine has idled down, take the choke off. On machines with primers, you will probably have to use a few more primer pumps to keep the machine running.

Next, clear the track and warm it up by slowly rotating it several times. Do not rev the engine high while doing this. Warm up can be done by elevating the rear of the machine off the ground using a safety stand (jack stand) with a shield. Or you can simply drive the snowmobile very slowly around the immediate area until the engine, drive belt, and track are fully warmed up. This slow warm-up procedure will prevent engine damage from what is known as “cold seizure” and will also prevent flat spots on the drive belt and idler wheels. And it will let you check that everything is working properly.

Riding Positions

There are four basic riding positions used by snowmobilers out on the trail. Each is particularly suited for certain situations. And remember to keep your feet on the machine at all times.

Sitting

Sitting is the most common and most comfortable riding position, partly because it requires the least expenditure of energy. It has many advantages, particularly providing the lowest center of gravity for maximum stability. It also keeps the rider warmer down behind the windshield.

Sitting is the only position recommended for carrying passengers. Riders using proper sitting position should have their feet up in front of their body for the best control and most comfort.

Kneeling

Kneeling is used for shifting weight, primarily for leaning into slopes while side-hilling or diagonally crossing snow banks. Keep the uphill foot on the running board and move the knee of the downhill leg into the middle of the seat. This allows weight transfer to the uphill side for better traction on the slope. If the machine rolls over, jump off to the uphill side.

Kneeling gets the rider’s head up higher for better sight, so it is also useful for road crossings, moving machines around in restricted areas, and similar situations. It does take some getting used to, so it’s a good idea for novice riders to practice this position in a safe, flat area before using it out on the trail.

Posting

Posting is a semi-standing position with the knees bent and the feet back on the running boards underneath or slightly behind the body. This position transfers more weight to the rear of the snowmobile, which is helpful for additional traction in certain situations.

Posting allows the legs to work as shock absorbers for very rough conditions. Like kneeling, posting also gets the head up for better sight. But it is the most tiring position, requiring considerable stamina for extended use, so it is generally only used for very rough trail surfaces, climbing steep hills, or difficult situations such as crossing unbridged creeks.

Standing

Standing has the primary advantage of getting the rider’s head as high as possible for the best possible vision. This makes it particu-
larly useful for road crossings where the longest possible line of sight is needed.

Standing also has the advantage of allowing the rider to shift his or her weight as much as possible and as quickly as possible in any direction. It also allows a quick shift to other riding positions.

Effects of Body Position

Since the rider is a significant portion of the total weight of the snowmobile / operator combined unit, the exact position of the rider on the machine has a big influence on how it handles. Experienced riders use their weight and position on the snowmobile effectively to help maneuver their machines.

Leaning into Turns

Riders can get better, more controllable turning by leaning into the turns. Placing more of the body weight forward and into the turn puts more loading on the inside ski, keeping it down on the snow and giving it a better bite. This is particularly useful for snowmobiles that have worn ski runners or do not have sufficient ski pressure from the suspension.

Up and Down Hills

When climbing hills, make sure that your weight is centered from side-to-side, and you are sitting well back on the machine for traction. Bend your torso forward to keep your center of gravity low. If the hill has a side slope, slide your weight a bit to the uphill side. Give the machine enough speed to reach the top, but be prepared to stop at the top if necessary. Always stay well to the right of the trail on any hill.

When climbing very steep hills use the posting position with your feet at the back of the running boards for traction. Lean forward as necessary to keep your skis on the snow and your head level.

If you need to travel across a slope, lean your weight to the uphill side. Kneeling with your uphill foot on the running board is the best position for this. This is called side-hilling.

When coming down a hill, always use the sitting position and be prepared to stop. Keep the clutches engaged by giving the machine just enough gas to make it go forward. Slow or stop the snowmobile by pumping the brake. This is done by alternating squeeze and releasing the handle.

Bounce for Traction

Sometimes a snowmobile simply needs a little extra traction, particularly on ice. A rider can often create this extra traction by simply bouncing up and down on the snowmobile, preferably as far back on the machine as possible. This can best be done from the sitting or posting positions. This trick also sometimes works when a snowmobile is slightly stuck in deep snow.

Snow Conditions

Reading snow conditions and making the correct decisions to deal with them is a skill that comes with practice. It is a skill that can be practiced only out on the trail in the winter.

Loose Blowing Snow

Loose blowing snow kicked up from the trail causes very dangerous conditions for snowmobilers. The action of the track kicks up a mini-blizzard that cuts down forward vision and coats the snowmobile tail light with snow. Under these conditions, it is important to ride more slowly, increase following distances, and frequently clean your tail light lens so that riders following you can see your tail light, and, more importantly, your brake light.

Deep Soft Snow

Deep soft snow can be found almost anywhere. It can be off the edges of the groomed trail. It can be in the ditch at the road side, in the tree line drifts, on the back sides of small ledges, in creek beds and other natural depressions, or even in the low spots of the trail. It can hide serious obstacles like concrete culverts, large rocks, or tree stumps. Stay on the compacted trail whenever possible.

If you do get into soft, deep snow, keep going slowly and steadily. Be careful about giving it too much gas. That could cause the back end of the machine to dig down in and get stuck. If you do feel the back end starting to dig down, lean up over the handlebars to get more weight on the front end. Be careful not to hit the kill switch or the throttle while doing this. Do not attempt sharp turns. By moving from side to side, you can use your body to assist while steering.

Don’t stop in deep snow unless you are sure you can get going again. If you want to stop, circle around a couple of times to pack down the snow a bit. It is also a good idea to do it facing an open area or downhill.

Sooner or later everyone gets his or her snowmobile stuck in deep snow. When you do get stuck, the first thing is to recognize that you are stuck and stop immediately. Gunning the throttle will only dig you in farther and make things much worse. Shut off the engine.

Dismount, remove your helmet, and open up your jacket. You are going to be working and you don’t want to get all sweaty. Stomp down the loose snow in front of the machine to provide a more compacted surface for the machine to move on. Make sure to dig the snow completely away from the front suspension parts.

Go to the rear of the snowmobile. Stomp down the snow on one side of the machine to provide a more compacted surface for the track. Lift the back end of the snowmobile up out of the hole and over onto the area you have compacted. Then zip up your jacket, replace your helmet, start your sled, and drive out by rolling the gas on slowly so as not to dig in again. A slight side-to-side rocking motion is sometimes helpful to gain traction.

In an extreme situation, tie your tow rope onto the front of the snowmobile and have other riders use it to pull you out to more solid snow. Be very careful not to run over any of them while doing this.

When you get back onto the trail, make sure you clean off your snowmobile head and tail lights so others can see them,
clean off your instruments so you can see them, and remove any snow from near the engine air intake so it is not ingested. This can cause significant problems on some snowmobiles.

Ice

Ice presents special problems. Never venture onto any frozen body of water unless you are certain that it will support you and your snowmobile. If there is any doubt, stay off it. Ice is not uniform in thickness. If you should go through the ice, try to remain calm. Extend your hands and arms forward onto the unbroken surface. Then kick to a nearly level position and work forward onto the ice. Roll away from the break area before attempting to stand up. This distributes your weight over more surface area.

When you are riding on ice, especially an icy road or trail, your snowmobile is much more difficult to control because your track and skis have much less traction. Stay seated, drive slowly, don’t attempt fast or sharp turns, and remember that your braking distance will be much, much longer than on hard packed snow.

Some snowmobilers add pieces of metal called track studs to their snowmobile to help them maneuver better and stop in a shorter distance in icy conditions. This is probably the most important safety modification a rider can make to a snowmobile. Be sure to have a dealer do it, or get expert advice before you do it yourself.

Ice Crusted Snow

Ice crust can occur when temperatures are fluctuating, or after a freezing rain. The surface may be almost like glare ice. In these conditions, traction balance is very important. Snowmobiles with carbide runners but no track studs can become very unstable on side hills and diagonals as the front end bites while the rear end breaks away and slides downhill. Slow down and ride very carefully in these conditions. Avoid diagonal slopes as much as possible.

Heavy Wet Snow

Heavy wet snow, often found in the early and late winter, makes the snowmobile work harder than normal. Pay special attention to your fuel consumption and drive belt in these conditions.

Slush

One of the worst trail conditions is slush. Commonly found in swampy areas and on the surface of frozen bodies of water, getting through slush requires extra power. Try to avoid it if possible.

If you do encounter slush and cannot avoid it, do not stop in it except to avoid going into open water. Do not ride in the exact same path as the machine ahead of you unless it is definitely the safest place to be. Stay on the throttle to get through the slushy area, and be prepared to pour on the power if needed to deal with deep slush, but be prepared to let off and use the brake if necessary when you clear the slushy area.

Be aware that slush can sometimes be hidden by a thin top layer of fresh powder snow.

Marginal Snow Conditions

The generally accepted minimum amount of snow for snowmobile operation is three inches of cover. Riding in less than three inches of snow can be damaging to the environment, and to the snowmobile, so it should be avoided completely whenever possible. But sometimes snow conditions will change drastically in just a few miles on the trail, requiring that you cross an area of marginal snow cover.

Riding in marginal snow cover requires extra attention to the trail, as minor surface irregularities like rocks or ruts that are covered in better snow conditions may present problems. Take it easy and slowly work your way through any obstacles that you may encounter. Be sure to get back into better snow conditions as soon as possible while remaining on the trail.

Reading the Trail

Reading the trail and reacting properly to it is paramount to safe snowmobiling. The condition of the trail will change, so ride based on the current conditions. Every second of every ride feeds you a huge amount of information to assimilate and act upon. Safe actions result in a safe ride. Unsafe actions can result in tragic accidents.

Trail Markers and Signs

Trail markers and signs are designed to communicate information about the trail to the rider. In order to establish a degree of uniformity throughout North America, the International Association of Snowmobile Administrators (IASA) has established some basic sign standards for all snow belt states and provinces. Here are the common signs you will see on New York snowmobile trails.

Snowmobile Permissive - Indicates trails and use areas where snowmobiles are permitted to operate. Colors are green and black on white.

Snowmobile Restricted - Indicates trails and areas where snowmobiles are NOT permitted to operate. Colors are red and black on white.

Stay On Trail - Indicates that there are sensitive land use issues in this area, so snowmobilers must stay on the trail or permission for it will be revoked. Color is usually black on orange.

Stop - Indicates a significant hazard trail or road intersection. Snowmobiles MUST come to a complete stop and yield to cross-traffic before proceeding. Color is red and white.

Stop Ahead - Indicates that there is a stop sign 200 feet or more ahead. Probably the most important sign on a trail because it warns of a potentially hazardous situation ahead. Color is usually red and yellow.
Object Marker (Hazard Marker) - Identifies a fixed object at the side of the trail. Used any time the fixed object narrows the normal width of the trail such as bridge railings. The stripes slope down towards the trail.

Caution - Indicates a hazard of some sort in the trail 50 to 100 yards ahead. A sign on each side of the trail indicates an extreme hazard. Color is usually black and yellow.

Bridge Ahead - Indicates a bridge in the trail 50 to 100 yards ahead. Color is usually black and yellow.

Directional Arrow - Indicates a sudden or significant change of direction in the trail ahead. Used to mark dangerous turns. Color is usually black and yellow, but may also be orange and white.

Trail Blaze or Blazer - Indicates the path of the trail. Reassures riders unfamiliar with the trail, and guides groomers after storms when they are re-opening the trail. Color is usually solid orange, or orange and white.

Speed Limit - Indicates the maximum lawful speed in miles per hour for the trail section. Color is black and white.

Corridor Trail Number - Indicates that the rider is on a NYS Corridor Trail. The word Corridor will appear on the sign. Corridor trails are primary routes that provide access to significant use areas and concentrations of snowmobilers, and are supported with Trail Fund money. Color is brown and yellow.

Secondary Trail Number - Indicates that the rider is on a NYS Secondary Trail. The word Secondary will appear on the sign. Secondary trails are routes that connect local attractions and concentrations of snowmobilers to Corridor Trails, and are supported with Trail Fund money. Color is brown and yellow.

Facilities - Indicates the availability of gas, food, lodging, telephone, and repair services. Color is usually white on dark brown.

You may see other trail signs with messages like “No Entry - Trail Closed”, “Skiers On Trail”, “Winter Wheat”, “New Seeding”, or “Snowmobile Trail - No Wheeled Vehicles” that are designed to provide additional information for safe and responsible riding. Please obey the messages on these signs.

Recognizing and Avoiding Trail Hazards

Recognizing and avoiding trail hazards is one of the most important skills for safe snowmobiling. This process begins with awareness. Any time you operate an off-road vehicle, you have to be even more aware of your surroundings and ready to deal with all situations as they happen.

• Watch closely for hazards like half-buried rocks or machinery, driveways, ditches, culverts, runoffs, or unmarked dips and depressions. Even good trails sometimes have to cross or go near hazards like these.

• Fences are a particularly bad hazard. Trails are often routed through openings in fence lines, so getting off the trail means a good chance of getting tangled up in barbed wire.

• Guy wires on telephone and power poles are capable of causing fatal injury to unwary riders. The guy wires are very difficult to see until you are practically on top of them, so be especially careful around phone and power poles.

• Bridges present another hazard. Expect to find moguls (bumps) on and near bridges on snowmobile trails. Take it slow, be extra cautious, and make sure that a bridge is safe before you drive onto it.

• Roads used as trails pose extra hazards. Expect to find parked vehicles on the sides. Never exceed posted or statutory speed limits. Be extra careful where plowed roads turn into trails. Typically there will be only a narrow, rough, and bumpy opening to the trail. Where plowing stops, watch for gates, chains, or other barricades, and for parked vehicles.

• Trail speed should always be kept to a reasonable pace. You never know what is around the next bend. There could be fallen trees, wildlife, a groomer, an oncoming sled on your side of the trail, or any number of other hazardous situations. Slow down, enjoy the outdoors, and you’ll have a better time snowmobiling.

When riding in unfamiliar territory, the problem of the unknown is compounded. There could be a hairpin turn, an ice hill, a difficult bridge entrance, or an unbridged creek. If you stay aware and keep your speed down to a reasonable pace, you will have time to react to and avoid trail hazards.

Avalanches

If you travel to western states to snowmobile, you will probably be riding in mountainous areas where danger of being caught in an avalanche is virtually constant. This is a condition that can also happen in New York State. An avalanche is one of the greatest dangers any snowmobiler can face, so extreme caution is required.

Check with local clubs and authorities to learn how to minimize avalanche danger and how to equip yourself to deal with an avalanche if necessary. www.avalanche.org
Night Riding

Night riding is particularly dangerous because visibility is restricted to what you can see in your headlight. Slow down, don’t travel unfamiliar trails or areas, make sure you have a working flashlight, and never, never overdrive your headlight. In other words, make sure that your braking distance is less than the length of your headlight beam.

Pulling a Skier or Sleigh

In New York State it is illegal for a snowmobiler to operate a snowmobile towing a sleigh, sled or toboggan, unless attached by a rigid support, connection or towbar.

It is also illegal to pull a sleigh containing people on or across any roadway.

Carrying a Passenger

Most snowmobiles are designed for only one person. They should not be used to carry a passenger. Two people on a single seater is uncomfortable and unsafe. It can result in an accident, and it can also damage the machine.

If you have a two seater snowmobile, stiffen your track suspension to compensate for the added weight when you do carry a passenger. Refer to your owner’s manual for instructions on how to do this. Also adjust the passenger back rest to make your passenger as comfortable as possible. And remember that the law requires your passenger to wear an approved safety helmet, too.

When you ride two-up, instruct your passenger on what to do. Show the passenger where to hold on. Tell the passenger to keep his or her feet on the snowmobile at all times. And tell the passenger when to lean and to what side.

The rougher the trail, the slower you should travel when riding double. This is necessary to keep your passenger from being bounced around excessively, or even bounced right off the snowmobile. Never attempt difficult maneuvers because the passenger will have extreme difficulty holding on and could be injured falling off.

Navigation

Navigation on the trail while snowmobiling is a necessary skill that is easily learned. Several learning aids and tools are available. Like any other skill, it is enhanced by regular practice.

Learn by Following

One of the easiest ways to learn a particular trail or riding area is by following someone who knows the territory. Look for landmarks like streams, buildings, special trees, large rocks, permanent signs, and other physical elements that are not likely to change. Make a mental note of where they are and how they relate to the trail so that you will remember them later.

Map and Compass Skills

Snowmobile trail maps are available from clubs, businesses, and public agencies. But always remember that changes can be made after a map was published, so always obey signs along the trail.

The basic navigational tool to use with a map is a compass. Even a simple compass can get you oriented. A small compass is usually included in survival kits and equipment, and may even be found on zipper tags and key fobs. You can purchase a good quality compass for a just few dollars in a sporting goods store.

A compass does not tell you which way to travel. To find your way, you need both the map and the compass. Place the map on a flat surface, like the seat of your snowmobile. Place the compass on the map and rotate the map until the north-south line on the map matches the north-south line on the compass. Then determine your current heading and decide which way you want to travel.

For more detailed instructions on use of a compass, consult a book on orienteering.

Celestial Navigation (Using the sun, shadows, and your watch)

Celestial navigation has the advantage of being completely free and easy to use.

Sun Positioning - During the day, remember that the winter sun is in the southern part of the sky, and that it progresses from east to west as the day goes on. Simply referring to sun position and movement over time will let you keep track of your general direction of travel.

Using Your Watch As A Compass - A watch can be used as a compass. Lay the watch on a flat surface with the hour hand (the shorter one) pointing towards the sun. Locate the place on the watch face that is half way between the hour hand and 12 o’clock. This half way place will point south, so north is directly opposite across the face of the watch.

Shadow Sticks - If you are lost, you can use sticks as a directional tool. Place a stick upright in the snow. Place a second stick upright in the snow at the end of the shadow of the first stick. Wait thirty minutes. Then place a third stick at the end of the shadow now cast by the first stick. The line formed by the second and third sticks indicates east-west direction.
Group Riding

Group riding, sometimes called safari riding, is by far the safest way to snowmobile. There is safety in numbers, as well as the companionship of others who enjoy the outdoors in winter. An organized group can cover ground easily, quickly, and safely without constant disruptions IF they make sure that everyone’s snowmobile is in good operating condition and serviced properly, and IF they follow a few basic procedures.

Leader and Tail Rider

The first step is to choose a leader and a tail rider. The leader should be an experienced rider who best knows the area and the trail. The tail rider should be the next most knowledgeable and experienced. The leader and tail rider count and agree on the number of people in the group. This number should be checked periodically to make sure everyone is accounted for.

The group leader handles navigation, designates the road crossing methods (see below) and sets the pace for the group. He or she signals all turns and oncoming traffic to riders behind.

The tail rider always rides last, insures that everyone is accounted for, assists anyone who has a problem, keeps count of any riders who leave the group, and never lets anyone fall behind.

Group Riders

The group should stay together at all times, in single file. Riders should change positions in the line only with great care. No one should ever pass the leader or fall behind the tail rider. If anyone leaves the group, they should tell the tail rider, who can advise the leader at the next stop.

Riders should leave adequate following distance. Three or four sled lengths is a good following distance for normal trail speeds. Increase your following distance as trail speeds increase.

All riders must relay hand signals to the rider behind them. This is critical at turns. Make sure the rider following makes the correct turn. If the following rider is out of sight, stop and wait for the rest of the group to catch up.

Road crossings with a group

The safest way to cross a road with a group is to post a road guard. This person will get off his or her snowmobile and take a position that permits sight down the road in both directions. The road guard’s job is to signal the other riders when it is safe to cross and stop them when it is not.

Usually the rider immediately behind the leader becomes the road guard. When everyone has crossed, the road guard drops back into the group just ahead of the tail rider. The new second in line becomes the road guard at the next crossing. This method is called rotating road guards.

Another method of road crossings is called designated road guards. One or two of the most experienced riders are pre-designated as road guards for all the road crossings. When a crossing is completed, the leader must stop the column and allow the road guard(s) to pass the other riders and return to a position just behind the leader prior to the next road crossing. This method is best suited to riding with a group of kids, beginners, or slow riders.

Trail Hand Signals

Standard trail hand signals should be used to communicate within the group and to oncoming riders. Never make sloppy signals, and make sure to hold your signals long enough so that the rider behind you is certain to see them. Every snowmobiler should be familiar with the following trail signals.

Sharing the Trail

No matter when and where you ride, you will be sharing the trail with other users. They may be other snowmobilers, trail groomers, other vehicle operators, other recreational users, and, definitely, wildlife. Most will have just as much right to the trail as you do. How you approach the presence of these other users makes a great deal of difference in how safe the trail is for you and everyone else.

Sharing with other vehicles

The general rule for sharing a trail is “Ride Right”. This means to stay to the right of the trail at all times. Always assume someone is coming the other way. Staying to the right is particularly important in limited sight areas like on a hill or on a curve. However, staying to the right doesn’t mean that you have the right of way at all times. Snowmobiles or other vehicles may be parked on the right side of the trail or road. And beware of oncoming traffic on your side of the trail. Not everyone stays on their own side of the trail like they should, particularly in tight corners.
“Ride Right” also means be courteous to other snowmobilers and other trail users because it is the right thing to do. When you do meet an oncoming group of snowmobilers, slow down and give them as much room as possible. If the trail is narrow, one group (usually the smaller one) should stop until the other group clears. A group going down a steep hill should yield to one going up.

You should also be aware of faster riders overtaking you from behind. Again, stay to the right to allow them to pass. If the trail is narrow, pull off and stop until they go by.

Encountering a trail groomer is a more difficult situation. By state law, grooming vehicles always have the right-of-way. It may be necessary for you to pull off the trail and stop completely. Groomers warn you of their presence with flashing yellow beacons.

When encountering automobiles and trucks on shared-use roads, stay to the right, obey posted speed limits, use the kneeling or standing position to be more easily seen, and always yield to the wheeled vehicles.

Stopping Along the Trail

One of the most important parts to sharing the trail with other snowmobilers is where you leave your snowmobile when you stop. Look for a straight section of trail, and pull off to the right side. Make sure that other riders can see you as they approach, and that you do not stop in a part of the trail that they are likely to want to use.

- Never block an intersection.
- Never stop side-by-side on a trail, always stop in single file.
- Never stop in the middle of a trail or road.
- Never stop on the inside or outside of a corner in a trail.
- Never stop just over the crest of a hill or just around a corner in a trail.

When you do stop along the trail, shut off your snowmobile. Leaving it running just wastes gas. But worse, the snowmobile could “creep” away from you if the clutches engage. Leaving a snowmobile running also invites operation by unauthorized individuals, who could cause an accident, or steal your snowmobile.

Take some care about where you stop. It’s another way you can “Ride Right”.

Encountering Non-Snowmobilers

Encountering other snow trail users is an opportunity to make friends for snowmobiling. Other users may judge all snowmobilers by the way you act, so it is very important to “Ride Right” for these encounters. A smile, a wave, and a friendly, positive attitude will go a long way in making them feel more comfortable about snowmobiles and snowmobilers. Remember, you are an ambassador for snowmobiling.

When you encounter skiers or hikers, slow down to the minimum to maintain forward motion. When you have gone well past them, slowly accelerate back up to cruising speed so as not to shower them with snow or scare the animals with noise.

When you encounter dog sledders or horseback riders, yield the way. Stop and shut off your engine if there is the slightest doubt about the behavior of the animals. They are much more difficult to control than machines. Let the people with the animals make the decisions on what to do. Don’t do anything quickly or make any gesture that the animals could interpret as threatening. The animal owner may well wave you on by. If so, pass at a minimum speed. When you have gone well past them, slowly accelerate back up to cruising speed so as not to shower them with snow or scare the animals with noise.

When you encounter all terrain vehicles or trail motorcycles, remember that they do not have the control and maneuverability of a snowmobile, and must be given lots of room.

If you are lucky enough to encounter wildlife on the trail, slow down or stop entirely so as not to alarm the animals. You’ll get a better look that way. Never chase or harass wildlife on or off a trail.

No matter who you meet on the trail, “Ride Right”. It helps protect your right to ride.

Riding to Protect the Trail

Good snowmobilers always ride to protect the trail. They know that the trail is the result of great effort by other snowmobilers to obtain landowner permission, to construct and mark the trail, and to groom it to maintain a smooth surface.

Protect the trail by “Riding Right.”

- Wait until there is at least three inches of snow on the ground before riding
- Stay on the trail
- Don’t litter
- Don’t take souvenirs
- Don’t make excessive noise—do not run modified exhaust systems in violation of New York State law

Riding to protect the trail also means riding to protect the trail surface from damage. Moguls can be formed by blowing and drifting snow, but they are most often formed by uneven compression of snow from passing snowmobiles. Formation of moguls is accelerated by poor snowmobile operating habits that dig up snow and leave it in little piles. These little piles result in an uneven trail surface, which becomes more uneven and rough as more snowmobile traffic compacts the surface more and more. The moguls get bigger as the soft spots be-
tween the more compacted snow piles are dug into holes. And the holes get deeper. Then the moguls get so big that inexperienced riders apply throttle at the bottom of the hole to get up over the next mound. This digs out even more snow from the hole, making the bad moguls even worse. Protect the trail by operating your snowmobile properly.

- Avoid quick starts
- Slow down for corners
- Avoid hard braking

If everyone rides to protect the trail, we will keep our trails open and in better condition to ride.

Theft Prevention

Snowmobile theft is a growing problem. Once your snowmobile has been taken without your permission, the chances of recovering it are not good. The more difficult you make it for a thief, the more likely he will pass on your snowmobile and try an easier target. Have your machine insured for theft just in case the worst does happen.

Here are a few steps you can take to safeguard your snowmobile:

- Park your snowmobile where it will be hard to steal. Never leave it on top of a snow bank or any place else where it can be easily loaded into a waiting truck. If possible, park your machine where you can see it.

- Never leave your snowmobile running, even for a few moments, and never leave an ignition key in an unattended snowmobile, even in your own yard.

- If your snowmobile is going to be left unattended for any length of time, lock it up. The best locking systems are cables or heavy chains to secure machines to each other or to objects like large trees or steel posts.
Circle the letter of the most correct answer

1. What should you do immediately after you start your snowmobile?
   a.) jump on and get going
   b.) allow the engine to warm up for a few minutes
   c.) check your ski runners

2. How can you make the snowmobile turn better?
   a.) sit way back on the seat
   b.) use the posting position
   c.) lean into the turns

3. What should you do when riding in loose, blowing snow?
   a.) slow down, increase following distance, and clean off your tail light frequently
   b.) slow down, get closer to the snowmobile in front of you, and ride the brake
   c.) slow down and use the kneeling position

4. What must you remember about riding on ice?
   a.) you must be absolutely certain that the ice is safe before going on it
   b.) your snowmobile will be harder to control because the skis and track have less traction
   c.) all of the above

5. What is the general rule for sharing the trail?
   a.) “See and Be Seen”
   b.) “Ride Right”
   c.) everyone for themselves

6. Which of these are trail hazards to watch out for?
   a.) fences, guy wires on poles, and bridges
   b.) half-buried rocks, ditches, and depressions
   c.) all of the above

7. What is the most important rule of night riding?
   a.) make sure you have enough gas to get back
   b.) don’t overdrive your headlight
   c.) get home before midnight or you’ll turn into a pumpkin

8. The correct hand signal for stopping is
   a.) one hand pointing down at the ground
   b.) one hand extended straight out
   c.) one hand held straight up in the air

9. Where is the only safe place to stop along the trail?
   a.) at the right side along a straight section
   b.) in the middle of an intersection
   c.) on a corner

10. What is the best way to ride to protect the trail surface?
    a.) as fast as possible
    b.) smoothly, without quick starts or stops or hard cornering
    c.) only ride at night when it is colder

Your score ________
Preparation for Emergencies

The best way to deal with a snowmobile emergency is to avoid it entirely. To do this, you should maintain your machine properly, plan your rides, notify someone where you are going and when you will return, dress appropriately, and ride responsibly.

If a problem does appear, be ready to deal with it. Emergency equipment on your machine should fall into two basic categories - repair/recovery items for the machine and personal equipment.

Repair/recovery items include spare drive belt and pre-gapped spark plugs, a basic tool kit, and a tow rope. Personal equipment should include a small first aid kit, a plastic whistle for signaling, and a flashlight with good batteries.

Medical Emergencies

The most common snowmobiling medical problems are frostbite, hypothermia, and snow blindness. The best way to deal with these problems is to dress properly to avoid them. Be sure that you can recognize their early symptoms and know how to treat them to prevent serious injury or death.

Frostbite

Frostbite is freezing of the skin and underlying fluids. It commonly happens to the nose, cheeks, and chin, but it can also happen to ears, fingers, toes, or any other part of the body. The victim is usually not aware of the problem until told by someone else. In the earliest stage, the skin may be slightly flushed. Then the skin changes to a white or grayish-yellow tone. The affected part feels intensely cold and numb. Mental confusion will eventually set in, with judgment impairment.

In advanced stages, the victim will stagger, eyesight can fail, and the victim will fall and lapse into unconsciousness. Shock will be evident. Ultimately, breathing will cease.

Minor frostbite may be treated by slowly warming the affected area. Place warm clothing over the area, but do not rub it or warm it too quickly near a fire or heater. Severe frostbite must be treated by a physician.

The best way to avoid frostbite is to dress adequately for the wind chill that will be experienced, with special attention to the face, hands, and feet. Using a flip shield on a snowmobile helmet usually provides better facial protection than goggles in very cold temperatures or very windy conditions.

Towing a Disabled Snowmobile

Sometimes it may be necessary to tow a disabled snowmobile back to the starting point or out to the nearest road crossing. Here is how to do it correctly.

- First remove the drive belt from the machine to be towed. Make sure that the track is free to rotate and that the brake still works. If the track does not rotate, the machine will not tow easily, so consider leaving it where it is.

- Next, tie the tow rope to one ski spindle of the disabled machine, loop it through the back bumper of the tow machine, and tie the other end to the other ski spindle of the disabled sled. If ski spindles are not accessible, use the front bumper. Never tow by the ski tips because the skis will toe in, resulting in extreme instability and darting by the machine being towed. The disabled machine should have a rider to work the brake when needed, and if the skis are toed in, there is a strong chance that the rider will be thrown off by the darting of the machine.

- Start up very gently to take up the slack in the rope, tow at a slow rate of speed, and come to a stop very gradually. If the brake of the disabled snowmobile does not work, you must tow extra slowly and be very deliberate about slowing down or stopping so that the disabled machine does not smash into the rear-end of the towing snowmobile.
Hypothermia
Hypothermia is a state where the body is losing heat faster than it can generate it. It can occur in relatively warm weather, even well above freezing. Symptoms start with uncontrolled shivering, fumbling hands, staggering, sleepiness, and slurred speech. Eventually the victim will collapse. Death is a very real possibility.

Treat hypothermia victims by covering them with warm, dry clothing and blankets. A physician should treat the victim as soon as possible.

The best way to avoid hypothermia is to stay dry. Wear underwear that wicks moisture away, don’t work up a big sweat, and be careful not to overdress on warm winter days.

Snow Blindness
Snow blindness is excessive light sensitivity from glare that can occur on medium-bright to intensely bright sunlit days. The symptoms are severe headache, dizziness, sensitivity to light, and seeing stars.

Treat victims by removing them to a totally dark area if possible. At minimum, get them into an indoor low light situation.

The best way to avoid snow blindness is to wear good sunglasses or properly tinted goggles. Lenses should produce no visible distortion and block at least some of the visible light. Don’t choose a lens that is too dark, as this will impair your ability to operate safely, as well as damage your eyes.

For the best protection, choose lenses that absorb close to 100% of the ultraviolet (UV) light in the B portion (290 to 315 nanometers) of the light spectrum. This is abbreviated UV-B. The harmful light in these wavelengths contribute strongly to snow blindness and other problems. It has the potential to rob your eyesight over time without you even realizing it.

Other more serious medical emergencies may occur as the result of a heart attack or an accident. This information is not a substitute for a first aid course, only a description of what to look for.

Someone you are riding with could have a heart attack. Symptoms of a heart attack may include shortness of breath, pain in the chest and/or upper arms, bluish color of lips and finger nails, swelling of the ankles, and sometimes pain in the upper abdomen and/or nauseous feelings. If you suspect someone is having a heart attack, keep them quiet and as comfortable as possible. Ask if they have any medication, but be tactful in dealing with the situation. Get professional help to the scene as quickly as possible, or get the person to a hospital as quickly as possible.

If an accident happens, approach the scene with caution. Observe carefully and remain calm. Send for professional help immediately. Try to reassure the injured. Treat all patients for shock by keeping them lying down and as warm as possible.

Check for breathing problems, and for bleeding. If there is bleeding, put a compress over the wound and bandage it tightly. If necessary, elevate the wounded part so that blood flows away from it. Broken bones can often be recognized by the odd position of the part of the body, or by the victim’s pain.

If there are any symptoms of a spinal injury, do not move the victim unless absolutely necessary. These symptoms can include a loss of mobility or feeling in the legs or arms, or a pain in the back or the neck.

You will be much better prepared to deal with a medical emergency if you have had Red Cross training in first aid and cardiopulmonary resuscitation (CPR). Contact your local Red Cross chapter for more information.

If You Get Lost
If you get lost, stop. Usually you can backtrack to an area that you know. If this is not possible, or does not work, stay on the trail, and stay with your snowmobile. You will be much easier to find, and you will have easy access to the resources in the machine.

If you are caught out in a blizzard, prepare shelter from whatever is available (trees, shrubs, items in the snowmobile, or even the machine itself) and start a fire, with safety in mind, if you can. Avoid over exertion and stay as dry as possible.

Detailed winter survival information is available from scout organizations, the public library, and from camping stores. If you ride in remote areas like the Adirondacks or the Catskills, having winter survival skills could be a big plus.

Final Thoughts About Emergencies
Above all else, in any emergency, clear thinking is absolutely necessary. Stay calm. Stay together. Plan a course of action. Conserve your resources and use them wisely. Get help as quickly as possible.
Circle the letter of the most correct answer

1. What is the best way to deal with an emergency situation on the trail?
   a.) call the Sheriff or emergency rescue squad
   b.) wait until somebody else comes along to help
   c.) avoid it entirely by good preparation and safe riding practices

2. What is the correct way to tow a disabled snowmobile?
   a.) by the spindles or the front bumper
   b.) by the ski tips
   c.) by the handlebars

3. When you tow a disabled snowmobile, you should
   a.) put a red flag on the back end of the disabled machine
   b.) put a “snowmobile in tow” sign on the front of the towing machine
   c.) start slowly, tow slowly, and stop gradually

4. Frostbite is
   a.) chilling your mouth with very cold ice cream
   b.) freezing of the skin and underlying fluids
   c.) marks from Jack Frost’s teeth

5. What can you do to prevent frostbite?
   a.) keep your mouth shut
   b.) dress adequately for the wind chill, with special attention to the face, hands, and feet
   c.) don’t stop on the trail so Jack Frost can’t sneak up on you

6. Hypothermia is
   a.) a state where the body is losing heat faster than it can generate it
   b.) a state where the body is making more heat than it can remove
   c.) a state where the body temperature has stabilized at a permanently lower level

7. What can you do to prevent hypothermia?
   a.) stay dry
   b.) keep cool
   c.) stop to rest a lot

8. Snow blindness is
   a.) being unable to see the snow
   b.) loss of sight from getting snow in the eyes
   c.) excessive light sensitivity from glare

9. What can you do to prevent snow blindness?
   a.) stay indoors in the winter
   b.) be careful not to get snow in your eyes
   c.) wear good sunglasses that block most or all UV-B light

10. What should you do if you get lost?
    a.) keep going - you will come out somewhere
    b.) back track to an area you know
    c.) leave the trail and go cross-country to find out where you are

Your score ________
Preparation for the Road

Snowmobile trailers must be licensed, must display the license plate with an annual validation tag, and must be inspected annually by a state-certified trailer inspection agent.

Custom built trailers must meet all equipment requirements of Section 375 of the Vehicle and Traffic Law as well as all other requirements, and must be assigned a vehicle identification number by the Department of Motor Vehicles.

Trailers weighing less than 1,000 pounds unloaded are exempt from title requirements. The registration receipt is proof of ownership and may be used to sell the trailer. Trailers weighing over 1,000 pounds unloaded must be titled. The title is the proof of ownership. Consult the Department of Motor Vehicles for more information on snowmobile trailers.

Insurance is not required because the trailer is covered by the insurance on the vehicle that is towing it, as long as the trailer is attached.

Make sure that your tow vehicle is equipped with a heavy duty flasher, has the correct ball size for the trailer coupler, and is rated to tow the combined weight of the trailer and snowmobiles.

Carefully attach the trailer to the tow vehicle using these steps:

- Drop the coupler on the ball and check the connection by pulling up on the trailer tongue.
- Cross the safety chains under the hitch to keep the tongue off the ground if the hitch breaks.
- Plug in the wiring harness and check all the lights for proper operation.
- Make sure you have your spare tire with a jack and tools that will work on the trailer.

Safe Loading and Unloading Practices

The safest way to load snowmobiles onto a trailer is to walk them up onto the trailer deck. Ride the snowmobile to the edge of the deck or ramp. Then get off, and walking slowly along side of the snowmobile, squeeze the throttle just enough to move the machine onto the trailer. Keep your other hand ready to use the brake while doing this. Be very careful not to overshoot. When the snowmobile has reached the correct point, set the parking brake and secure the snowmobile to the trailer before loading the next one.

Never attempt to transport a snowmobile backwards on a trailer, as it upsets the trailer balance, leading to potentially lethal fish-tailing. Wind pressure can rip the windshield off the backwards snowmobile on an open trailer.

You should have approximately 60 percent of the load weight of the snowmobiles positioned ahead of the trailer axle. Otherwise, the trailer will tend to wander badly behind the tow vehicle, making it very difficult and unsafe to tow. In an extreme situation, the trailer will fish-tail violently with the potential to break loose from the tow vehicle or cause the driver to lose control of the rig.

When unloading, remove the hold-downs and release parking brake. Depending on the trailer design, you may be able to start the machine and walk it off the trailer deck, or you may have to pull it off backwards onto the ground. This is always easier with a well-maintained snowmobile that rolls easily. Addition of plastic trailer slides also makes unloading backwards a great deal easier.

Please note that there are several different types of trailers. You should consult your owner's manual for the safest way to load your snowmobile.
Securing Snowmobiles for Transport

Any time you trailer a snowmobile, it should be secured to the trailer at both ends. Almost all trailers sold for snowmobile use have some sort of ski tie-downs. You should also use a web strap to secure the back end of the snowmobile. This will prevent the machine from bouncing around on the trailer, and could save your sled if the ski tie-downs fail, which does happen occasionally.

Finally, cover your machine for transport if it is on an open trailer. Secure a fabric cover completely so it won’t flap in the breeze and destroy itself. Special care should be taken to protect the front suspension from road grit and debris which will literally sand-blast the ski suspension to the point of severe damage and even failure. There are many types of protection strategies, ranging from totally enclosed trailers to various kinds of trailer front shields (often called salt shields) to special fabric gaiters that wrap around the suspensions or enclose the entire front of the snowmobile.

Trailer Maintenance

Trailers need maintenance just like any other vehicle. All lights must work. Wheel bearings should be checked and greased annually. Everything about the trailer including the frame, tongue and tilt-pin, springs, safety chains, license plate holder, tie-downs, and brakes if so equipped should be inspected by the owner at least once a season for structural and operational integrity. Some items, like a license plate mounted under the deck, should be checked much more often.

Trailer Theft Prevention

Your trailer and the snowmobiles on it are an inviting target for thieves to simply tow away. It is always a good idea to lock your trailer. The best locks prevent insertion of a ball in the coupler. Another strategy is to use a trailer tire boot that prevents the trailer from rolling. Just make sure that your spare tire is not accessible if you choose this type of security device.

It’s also not a bad idea to lock your trailer onto your tow vehicle if you leave it sitting unattended. If you have a receiver-style hitch, remember to lock the receiver, too. But remove the lock when you begin to tow. In the event of an accident, quick removal of the trailer could be a critical factor.
Circle the letter of the most correct answer

1. What laws and regulations must be observed for snowmobile trailers?
   a.) registration only
   b.) registration and insurance
   c.) registration and annual inspection

2. What should you do when you hook up your trailer?
   a.) check the coupler connection and check the lights
   b.) cross the safety chains and check the spare tire and tools
   c.) all of the above

3. What is the easiest and safest way to load a snowmobile onto a trailer?
   a.) start the sled and carefully walk it onto the trailer
   b.) get several friends and lift the sled onto the trailer
   c.) hire a fork lift and operator to load it for you

4. What should you do after loading a snowmobile onto a trailer?
   a.) set the parking brake
   b.) check the lights
   c.) clean and polish the snowmobile

5. How should you secure snowmobiles for transport on a trailer?
   a.) by using just the ski tie-downs
   b.) by using the ski tie-downs and web straps at the back end
   c.) don’t bother – they are heavy enough to stay where they are

6. Why should you never transport a snowmobile backwards on a trailer?
   a.) it is against the law
   b.) it changes the balance of the trailer causing fish-tailing on the road
   c.) it looks silly

7. What items need frequent inspection on snowmobile trailers?
   a.) lights
   b.) tires
   c.) both of the above

8. What parts should be greased annually on a snowmobile trailer?
   a.) ski slides
   b.) trailer springs
   c.) wheel bearings

9. Why do trailer tires need special maintenance attention?
   a.) they wear out very quickly
   b.) they dry rot and they lose air over time all by themselves
   c.) they are frequent targets of vandalism

10. What should you do to prevent trailer theft?
    a.) paint your name on your trailer
    b.) lock the receiver hitch and lock the coupler except when on the road
    c.) don’t worry about it, nobody would steal your trailer

Your score __________
You may encounter words that you are not familiar with or not sure about while taking this course. This page gives definitions for terms common to snowmobiling.

Alignment — The proper positioning of parts. When the skis are parallel, they are in alignment.

Ambient — Surrounding, as in ambient air temperature.

Balaclava — Head gear with an opening for the face that is pulled over the head and neck. It is worn as a liner for a helmet.

Bearing — Parts of the snowmobile on which other parts rotate. They are found in the engine, drive system, and suspension.

Belly Pan — The front part of the snowmobile that wraps around the engine underneath the hood (cowling) and bumper.

Braking distance — The distance required for a vehicle to come to a complete stop. Generally the faster the vehicle is going, the longer the braking distance will be, especially on ice.

Bushing — A simple kind of bearing with no moving parts.

Carburetor — The part of the engine where air and gasoline are mixed to be burned inside the engine.

Caution Sign — A sign that tells the driver to slow down and be extra alert for some sort of potential problem.

Choke — A valve in the carburetor that reduces the amount of air in the air/gas mixture to allow the engine to start more easily. It is used when the engine is cold. Engines equipped with chokes usually do not have primers. See Primer for comparison.

Compaction — Packing firmly together.

Compass — An instrument for determining direction.

Conserve — To keep from losing something, such as heat or other form of energy.

Cowling (Hood) — Legally defined in New York State as the forward portion of the snowmobile surrounding the engine and clutch assembly. This is the area where the New York State snowmobile registration stickers are attached to the machine.

Decibel — A unit for measuring noise. Abbreviated dB.

Directional Arrow — A black and yellow sign showing which way the trail goes. Also a brown and white sign showing the direction in which services can be found.

Drive Belt — The part of the transmission that connects the clutches. This is the weakest part of the drive system, and can break at any time. Often simplified to belt. Do not confuse this with the track. See Track for comparison.

Drive Chain — The part of the drive system that links the primary and drive clutches to the track. It is hidden out of sight in the chain case (or drop case) on the side of the snowmobile under the hood (cowling) and in front of the operator’s left foot.

Drive Clutch — The rear clutch that only spins when the snowmobile is providing power to the track.

Drive Cogs — Plastic wheels inside the front of the track that drive the track around. Contrast to sprockets that are plastic wheels with teeth that stick through the track to drive it around.

Emission — Something that is put out by something else, such as exhaust or noise.

Energy — The ability to do work.

Engagement — Coming together, in this case, to do work.

Environment — The surrounding things, conditions, and influences.

Exhaust Manifold — The pipe that moves exhaust fumes away from the engine to the muffler.
Four-Cycle Engine — A type of engine that uses four separate up or down movements of the piston to produce one power stroke. It does not require that oil be mixed with the gasoline for lubrication. This type is used in automobiles and lawn mowers and has recently been re-introduced to snowmobiles. Contrast to two-cycle engine below.

Frostbite — Freezing of the skin and underlying fluids.

Fuel — A mixture of gasoline vapor and air that is burned by the engine to produce energy.

Grease — A thick, paste-like oil-based lubricant used in suspension parts and bearings to make them work smoothly. Usually applied with a special pressure tool called a grease gun. Contrast to oil.

Habitat — A natural area where animals live.

Humidity — A measure of the moisture content of the air.

Hydraulic Brakes — A type of brake system that uses a special brake fluid to operate it. Contrast to a mechanical brake that uses a cable to operate it.

Hyfax — See Slides

Hypothermia — A state where the body is losing heat faster than it is generating it.

Idle — State of the engine when it is running but the snowmobile is not moving.

Idler Wheels — Parts of the track suspension that guide and support the track as it goes around.

Ignition — The part of the engine that supplies the electrical spark to the spark plug to burn the fuel mixture in a cylinder.

Information Signs — Signs that alert you to the presence of sources of food, gas, telephone, lodging, and other services.

Kill switch — The emergency safety switch located on the right handlebar that shuts off the engine immediately when pushed down. This is an important safety feature found on all modern snowmobiles.

Lubrication — The process of applying oil or grease to moving parts to keep them working smoothly.

Magistrate — A judge.

Mogul — A bump in the trail.

Muffler — A device for reducing engine noise. All snowmobiles must have one in working order.

Odometer — A part of the speedometer that tells how many total miles the snowmobile has been run during its lifetime. It usually indicates measurements in tenths of a mile or kilometers.

Oil — A free-flowing lubricant used inside engines to keep them working smoothly. Snowmobiles require oil that is specifically engineered for extreme winter weather conditions. Oil is also engineered for either two-cycle (also called two-stroke) or four-cycle (also called four-stroke) engines, and these types should not be interchanged except in extreme emergencies. Contrast to grease.

Oil Injection — A type of lubrication on two-cycle snowmobile engines that supplies oil from a separate tank according to the engine’s needs. Contrast to pre-mix below.

Piston — The part of the engine that is pushed down when the fuel mixture is burned by the spark from the spark plug.

Plug Wrench — A special wrench designed specifically for changing spark plugs in an engine.

Primary Drive Clutch — The front clutch that spins whenever the engine is running.

Pre-Mix — A previously mixed solution of oil and gas required for a two-cycle engine. Most snowmobiles used pre-mix before the invention of oil injection.

Primer — A device for squirting extra fuel into the carburetor to help it start when the engine is cold. Engines equipped with primers usually do not have chokes. See Choke for comparison.

Pressure — A force per unit of area.

Recoil — The mechanism that automatically retracts the starter rope when you let go of it.
Regulatory Signs — Signs that give you specific instructions about what to do or not do.

Running Board — The part of the snowmobile where you put your feet.

Shock — A medical condition of poor circulation brought on by an injury. Also short for shock absorber, a device to control the bouncing of suspension springs.

Skegs — See Wear Bars below.

Ski Runners — See Wear Bars below.

Sled — Common nickname for snowmobile.

Slides or Sliders — The plastic material on the bottom of the track suspension that the track slides along on. Also called hyfax, marfax, slider shoes, or wear strips. They are wear parts that must be changed when they get too thin.

Snow Blindness — A loss of sight caused by too much exposure to sunlight reflected off snow.

Spark Plug — The part in the top of the engine that takes the electrical charge from the ignition and creates a spark to burn the fuel mixture in the cylinder.

Speedometer — A gauge that tells you how fast your snowmobile is moving over the land in miles per hour (MPH) or kilometers per hour (KPH).

Spindle — The upright part of the front suspension where the ski pivots from side to side.

Sprockets — Plastic wheels with teeth on the edges that stick through the track to drive it around. Contrast to drive cogs that are plastic wheels with teeth on the sides which are located totally inside the front of the track and drive it around.

Studs — See Track Studs.

Tachometer — A gauge that tells you how fast your engine is running in revolutions per minute (RPM). Many snowmobiles have tachometers as standard equipment.

Tension — The amount of tightness.

Throttle — The control that increases or decreases speed. It is found on the right handlebar.

Track — The continuous rubber or fiber belt at the bottom of the snowmobile under the seat that supports and propels the machine. Do not confuse with belt as in drive belt. See Drive Belt for comparison.

Track Studs — Steel points that are bolted to the track to provide traction on ice.

Trail Blazes or Trail Markers — Small indicators to reassure riders that they are on the trail.

Two-Cycle Engine — A type of engine that uses two separate up or down movements of the piston to produce one power stroke. For lubrication it requires that oil be mixed with the gasoline, either before adding to the gas tank (see pre-mix) or added later by the engine itself (see oil injection). Contrast to four-cycle engine above.

Tunnel — The part of the snowmobile body that the seat and gas tank are mounted on and the track is housed in. It is part of the chassis.

Wear Bars — Replaceable metal rods that are bolted underneath the skis to keep the skis from wearing out. They are often called ski runners or skegs. If they have carbide inserts for better steering and/or extended wear, they are called carbide runners, or carbides for short.

Wind Chill Factor — How cold it feels due to a combination of the actual temperature, the additional cooling effect of wind speed, and the additional cooling effect of the speed of the snowmobile.

Suggested Additional Reading:

• New York State Snowmobiler’s Guide *
• State and national snowmobile publications
• Snowmobile club and association newsletters **
• NYS OPRHP Snowmobile Web Site www.nyparks.com
• New York State Snowmobile Association Web Site www.nyssnowassoc.org

* available from the NYS Office of Parks, Recreation and Historic Preservation, Snowmobile Unit.

** contact the New York State Snowmobile Association, P.O. Box 612, Long Lake, NY 12847 for more information
ANSWERS TO CHAPTER REVIEW QUIZZES

Chapter One, Overview of the Sport Quiz
1. b
2. c
3. c
4. a
5. a
6. b (clubs do the other things, but b is the most important)
7. b
8. a
9. c
10. c

Chapter Two, Getting Acquainted With Your Snowmobile Quiz
1. c
2. a
3. b
4. c
5. a
6. c
7. b
8. c
9. a
10. b

Chapter Three, New York Laws and Regulations Quiz
1. c
2. a
3. c
4. c
5. b
6. a
7. b
8. c
9. a
10. b

Chapter Four, Pre-Ride Preparation Quiz
1. a
2. c
3. b
4. a
5. b
6. c
7. a
8. b
9. a
10. c

Chapter Five, Riding Skills Quiz
1. b
2. c
3. a
4. c
5. b (a is important, but b is the most correct answer)
6. c
7. b
8. c
9. a
10. b

Chapter Six, Trail Emergencies Quiz
1. c
2. a
3. c
4. b
5. b
6. a
7. a
8. c
9. c
10. b

Chapter Seven, Trailering Your Snowmobile Quiz
1. c
2. c
3. a
4. a
5. b
6. b
7. c
8. c
9. b
10. b
1. Familiarize yourself with the snowmobile you are riding by reading in detail the manual accompanying the snowmobile.

2. Be sure your snowmobile is in top notch mechanical condition at the beginning of the winter season and throughout the months of use.

3. Never remove or alter the factory-installed air box or install a muffler or exhaust pipes that make more noise.

4. Know the state and local laws and regulations regarding snowmobile operation.

5. Wear sensible, protective clothing designed for snowmobiling.

6. Use a helmet with goggles or face shield to prevent eye and facial injuries from twigs, stones, ice chips, and flying debris.

7. Avoid wearing long scarves. They may get caught in moving parts of the snowmobile.

8. Know the area where you are going to ride. If unfamiliar to you, talk with someone who has traveled it before.

9. Know the weather forecast and especially the ice and snow conditions in your area.

10. Never ride alone. Always use the buddy system.

11. Do not pursue domestic or wild animals. No true sportsman would stoop to such conduct. If you see a violation of this rule, report it to the nearest law enforcement officer.

12. Drowning is one cause of snowmobile fatalities. When not familiar with the thickness of the ice or the water currents, avoid traveling on the ice.

13. Never ride after consuming alcohol or drugs.
The Operating Skills Evaluation is designed to determine the rider’s ability to safely operate a snowmobile. To properly operate a snowmobile, a rider must be able to safely perform the following operations and maneuvers.

1. Pre-start safety check
2. Appropriate starting procedure for the machine
3. Four riding positions: Sitting, Kneeling, Standing, Posting
4. Demonstrate hand signals Left turn, Right turn
5. Slowing down for turn
6. Safe stopping with hand signal
7. Road crossing
8. Park snowmobile in safe place and remove key

**Evaluation Course**
THE SNOWMOBILERS’ CODE OF ETHICS

1. I will be a good sportsman and conservationist. I recognize that people will judge all snowmobilers by my actions. I will use my influence with other snowmobile owners and operators to promote sportsman-like conduct.

2. I will not litter trails or areas, nor will I pollute streams or lakes. I will carry out what I carry in.

3. I will not damage living trees, shrubs, or other natural features. I will go out only when there is sufficient snow so that I will not damage the land.

4. I will respect other people’s properties and rights.

5. I will lend a helping hand when I see someone in need.

6. I will make myself and my vehicle available to assist search and rescue operations.

7. I will not interfere with the activities of other winter sportsmen. I will respect their rights to enjoy their recreational activity.

8. I will know and obey all federal, state, and local rules regulating the operation of snowmobiles in areas where I use my vehicle.

9. I will not harass wildlife.

10. I will not snowmobile where prohibited.

Adapted from The Snowmobiler’s Safety Handbook, published by the Snowmobile Safety and Certification Committee, Inc. ©1995.
New York State Snowmobile Safety Education Program
A course of study meeting the requirements for NYS Youthful Operator Certification

Register, insure, and properly maintain your machine

- Dress for the weather, and wear a helmet and eye protection
- Stay on the trails and ride to protect them
- Stay aware of your surroundings at all times
- Take it easy and enjoy the great outdoors
- Be prepared for emergencies
- Lock up when not in use

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Empire State Plaza
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(518) 474-0446
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www.nysparks.com

Student Name ____________________________ Certificate Number _____________________
Instructor Name ____________________________ Course Completion Date _______________