

**ATV-SAFETY TRAINING
DNR ENFORCEMENT**

Box 47

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APPENDIX A:
DNR Safety Training Literature
From: "Growth Patterns,
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for ATVs," DNR, January 1986.

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Minnesota ATV Safety Training Manual

Minnesota Department
of Natural Resources
Law Enforcement Division
500 Lafayette Street
St. Paul, MN 55146



Minnesota ATV Safety Training Manual

Disclaimer

The information contained in this publication is offered for the benefit of those who have an interest in and ride all terrain vehicles (ATVs). The information has been compiled from publications, interviews and observations of individuals and organizations familiar with the use of ATVs. Because there are many differences in product design, riding terrain and styles, there may be organizations and individuals who hold differing opinions. Consult your local ATV dealers or experienced ATV riders about appropriate riding locations in your area. Although Outdoor Empire Publishing, Inc. will continue to research and publish responsible viewpoints on this subject, we must disclaim specific or general liability for the views expressed herein.

Outdoor Empire Publishing provides safety texts for outdoor recreationalists which can be customized for state agencies and organizations throughout the U.S. and Canada in the fields of traffic, bicycle, boating, snowmobile and hunting safety.

ATV Safety Training Manual

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To the Parent

In looking through this instruction book you will notice there are self quizzes to be answered at the end of each chapter. When your child has completed a chapter, you should review and check it yourself. When the classroom portion of the course is conducted the student will be required to bring the workbook to class. The instructor will check to see that the chapter reviews have been completed before tests are given.

Enclosed you should find a combination registration/parental release card. This must be filled out by you, the parent or guardian, and include your signature. The registration card must be brought to the classroom portion of the course and turned into the instructor. After your child has completed the take-home portion of the course, please contact your local Conservation Officer, any DNR Regional Office, or the St. Paul Safety Training Staff at (612) 297-4897, to learn when and where the classroom portion will be held in your area.

The classroom time will be devoted to the review of this book, films, and a slide series, as well as general discussion and riding tips before the written exam is given. The practical test will be set up and reviewed with the students before they go out to take that portion of the test.

When the practical portion of the course is set up the instructor will inform you at that time if three-wheelers or four-wheelers will be available or if you will have to supply your own ATV.

We encourage all parents to attend the course with their child.

Sincerely,

Safety Training Staff

Introduction

Welcome to the great ATVenture! Riding an ATV is a fun, healthy recreation for people of nearly all ages. Your ATV can handle many types of OFF-ROAD riding, but it is mastering the proper safety skills that will determine your level of enjoyment.

ATVs can be used in most types of off-road terrain, from snow to sand.

They are not limited to play, they work very hard, too. ATVs can pull loads, climb hills and travel over soft ground. These capabilities come with an obligation to protect the safety of others, the environment, and yourself.

ATV riders are bringing a change to the great outdoors. It is a new sport which needs rules for safety, operation, courtesy and environmental protection, which is what this book is about.

In chapter one you will learn what an ATV is, how the sport interacts to help preserve the environment, and to master the skills needed to ride an ATV safely. Chapters two through six explain how the ATV

works and how to keep it working. Chapters seven and eight will cover intermediate riding skills and how to handle different terrains. Your safe riding skills will be tested at the end of those chapters.

ATV riding involves more than riding a machine. It involves being able to take care of yourself and the environment.

One reason that ATV riding is becoming more and more popular is that it takes you to an environment that is different from the city. An environment that is beautiful. But it can be unforgiving if you are not prepared. With this in mind, we have included an entire chapter on facing the unexpected. Chapter nine deals with topics like first aid, use of maps and compass, and hazardous terrain.

The last chapter of the book reviews all these rules and your responsibilities as an ATV operator. Some of them are written laws and others are accepted guidelines. All are important because they let all trail users enjoy their sport.

Activities and skill exercises throughout this book will help you evaluate your progress on becoming a responsible and skillful ATV operator. A glossary at the back of the text will help you further understand certain ATV terms. Now let's get started and learn about ATV riding!

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Chapter 1

Sport and the Environment

Objectives:

- ◆ To learn that ATV models differ.
- ◆ To understand ATV's and their relation to the environment.

Most ATVs are built for recreation. Learning all you can about your ATV and the places you can ride are good things to do for safe and fun riding. But before riding your ATV for the first time, you need to learn about how it runs and how to operate it safely.

ATVs are different from other vehicles. They are also different from one another in many ways. For instance, there are three-wheeled and four-wheeled types. They vary in control and operation just enough that you should learn about each one before riding.

Some ATVs have rear brakes only, while others have front *and* rear brakes. Be sure to learn the recommended stopping methods for your machine. Read your owner's manual. There are ATVs with electric starters, kick starters and pull starters. There are water-cooled ATVs and air-cooled ATVs. Some ATV transmissions have clutches that are hand-operated, while others have fully automatic clutches. Other ATVs have a reverse gear. There are ATVs with chain drives and ATVs with shaft drives. Some ATV throttles are controlled by twisting the hand grip. Others by pushing a thumb lever next to the hand grip. Other ATVs have solid drive axles, while some have differentials. Controls and their locations differ from one ATV model to another enough so that you should always refer to the owner's manual for exact location and operation of the controls on the ATV you ride.

4-Wheel ATV



3-Wheel ATV



Enjoying Nature on Your ATV

Any new method of transportation brings changes to the environment. As an ATV rider you will get a first hand look at nature's best; from winter's snowy mantle to sandy desert dunes. Be sure that other ATV riders traveling on the terrain after you enjoy the same undisturbed view.



You need to learn to protect and preserve your riding areas. It is not hard, with a few basic guidelines. You should stay on existing trails wherever possible. Be careful of the vegetation, especially in sensitive areas like sand dunes, marshes and alpine areas. As you ride on the trail you may see animals like rabbits, deer, elk, or other species. While you may be curious about them, do not be

tempted to leave the trail to get a closer look, because it may frighten the animals. Stay on your ATV and enjoy watching all animals from a distance.

ATVs and the Environment

The environment is a fragile place. If each of us take full responsibility for our actions while out in nature's areas, we would help current and future generations to enjoy what we enjoy now.

ATV operators should be aware of how seemingly simple acts of irresponsibility can lead to environmental damage. For example, vegetation is nature's method of lessening erosion by increasing the stability of the soil. If an ATV or heavier vehicle destroys the plant cover, the dry soil can be eroded by the wind or rain. Vegetation is very susceptible when covered in frost. Although vegetation damage may appear harmless, you should avoid causing this type of damage because of the serious environmental problems that can result.

ATV operators should exercise caution against causing possible compaction, rutting of the soil, and destruction of vegetation. Each of these can result in erosion, which in most cases, can be harmful to the environment.

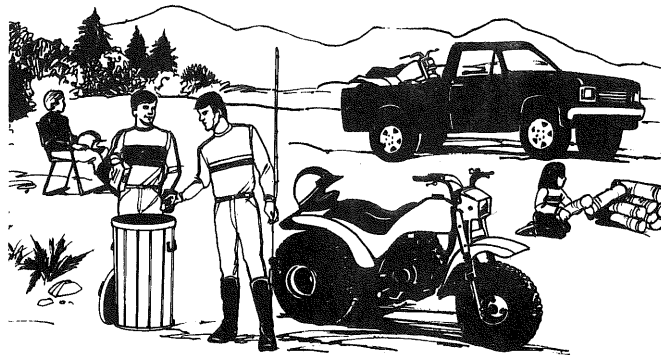
This erosion action is similar to the way water running over a rock will eventually wear the rock away. The ATV operator can avoid soil compaction by not driving a number of ATVs and four-wheel drives (used to transport an ATV) all in the same place a number of times. The amount of compaction can be reduced by not operating a vehicle on moist soil. The type of soil also has a bearing on the degree of compaction. The ATV's wide-based "flotation" tires help reduce this somewhat by spreading the ATV's weight over a wider area, thus reducing the weight on any given point.

Just because the tires may "float" is no reason to drive the ATV, for example, through every stream and creek in sight. The soil and sediment of trout or other fish spawning grounds are very easily stirred up and damaged by mechanical disturbance. You can prevent this disturbance by avoiding the small streams and creeks. A wise ATV operator strives to reduce the negative impact. Caring for the wilderness environment is everyone's responsibility.

ATVs and other vehicles can also affect the habitat for ground nesting animals, especially during the spring and early summer. The tires can contribute to this effect. Be sure to check state and local laws pertaining to seasonal riding limitations. Nature's food chain is a very delicate balance in all wild areas.

Another factor with ATVs and the environment is a basic problem known to all outdoor enthusiasts: *litter*. As well as being unsightly, litter will result in long range environmental impact. For example, dumped oil can make its way to spawning grounds, small streams and creeks, and destroy the fish life.

The rule that all responsible, outdoor enthusiasts follow is: If you pack it in, pack it out.



ATV Learning Activity—Self Quiz

Decide whether each statement is true or false. Circle T or F.

- T — F 1. Controls on all terrain vehicle models are very similar.
- T — F 2. ATVs are totally safe environmentally because they are light in weight, have flotation tires for crossing streams and creeks, and are smaller than heavy 4-wheel trucks.
- T — F 3. All ATVs are controlled by solid drive axles to give them better turning ability.
- T — F 4. An ATV is a versatile vehicle, being able to travel on snow, through mud, water and in desert terrains.
- T — F 5. Outdoor enthusiasts' basic rule which also applies to ATV operators concerning litter is, "if you pack it in, pack it out."
- T — F 6. Vegetation helps prevent soil erosion.
- T — F 7. ATVs are perfect for riding on rural roads where there is little or no traffic.
- T — F 8. All ATV operators have the responsibility for preserving the environment whenever they are out on the trail.
- T — F 9. Tire tracks can reduce the ability of the soil to breathe, causing compaction and soil erosion.
- T — F 10. ATVs are built only for recreational purposes.

Chapter 2

The Names of Parts

Objectives:

- ◆ To learn the names of the main ATV parts.
- ◆ To locate parts without looking at your hands.
- ◆ To identify safety features.

This chapter is not intended to make you a mechanic but rather to show you the basic parts of your ATV. By increasing your knowledge and skills you will decrease your chances of injury and mishap. Those who have ridden motorcycles may need to re-learn control locations for ATVs. Be sure you know the control locations before you ride.

Before attempting to drive your ATV, you should read the owner's manual carefully. Study your manual, as well as actually looking at your ATV, to memorize the location of the controls.

To help you learn, a friend could help you by calling

out the names of parts at random. If you try this method, mount the ATV and physically touch the controls when the part is called out.

Mount the ATV from the left, keeping both feet on the footrests at all times.

By being able to locate the controls and parts without looking, your attention can stay focused on the lay of the land while riding, thus avoiding sudden obstacles or hazards.



One good way to learn is to be blindfolded and try to locate the parts.

Common ATV Parts

The following is a list of the most common ATV parts, which you should be able to identify:

Brake (foot) Pedal (most models)—The brake pedal which is operated by the right foot.

Brake (Hand) Lever(s)—The brake lever(s) located on the left (and/or right) handlebar(s).

Choke—Used for cold engine start-up.

Clutch—A device attached to gear change pedals that allows the gears to be shifted or changed.

Drive System:

Drive Chain—The chain which connects the engine to the rear axle to give an ATV “drive” or forward motion.

Drive Shaft—A shaft which connects the engine to the rear axle to give an ATV “drive” or forward motion.

Engine—The source of power in an ATV where combustion takes place.

Footrest(s)—Bars or platforms located below the engine on which a rider should rest his feet.

Fuel Valve—A valve, usually hand operated, with an on, off, and “reserve” position, which controls gas flow to the carburetor.

Ignition Switch—The switch that starts the engine.

Parking Brake—A mechanism which locks the brake so the ATV cannot roll.

Shift Pedal—Found on some ATVs, operated by the left foot, which is used to change gears for various riding conditions.

Throttle—The device in the carburetor which controls the mixture flow into the engine.

ATV Safety Features

The following safety features are found on many ATVs. See if you can find them on your vehicle. Additional features may be found on some models such as the stepguard located by the footrests. Check your owner's manual for additional items.

Brake Wear Indicator—Indicates if and when the brakes are worn past the service limit and must be replaced.

Engine Stop Lanyard (Tether)—A leash-like rope attached to the rear of some ATV models which enable a person to pull the rope and stop the engine from a short distance. These models are smaller ones built for youngsters. The parent or guardian who trains the young rider should always use this lanyard until the rider develops sufficient skills for safe, independent operation.

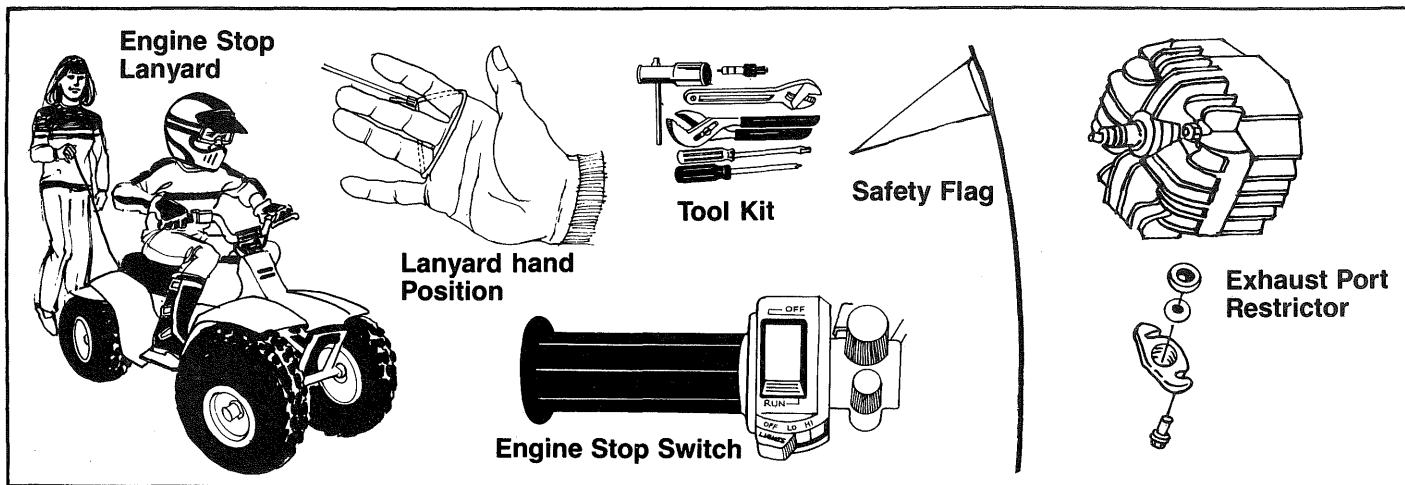
Engine Stop Switch—Switch used to stop the engine quickly, without removing the hands from the handlebars.

Exhaust Port Restrictor—A device that limits the amount of power from the engine.

Safety Flag—An orange fluorescent or brightly colored flag, attached to the back of the machine by a whip antenna, provides a good safety feature. When dune riding, a flag may be required by law in some

states/provinces.

Tool Kit—A basic set of tools usually supplied with your ATV. If your tool kit does not contain the following items, add what is missing before you go on your next ride: (1) pliers, (2) screwdrivers, Phillips and standard, (3) adjustable wrench, (4) spark plug and spark plug wrench. With these basic tools you can take care of most adjustments or basic repairs. Carry them in your machine at all times.



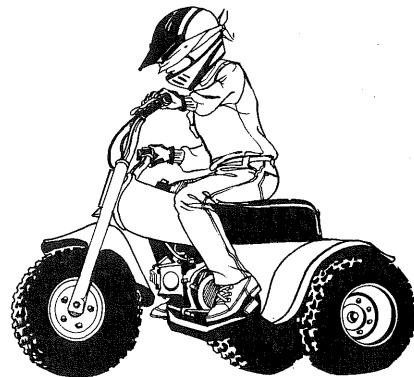
Exercise 1 – Controls

Objective: You must be able to locate and operate the ATV's controls without looking or hesitating. Practicing this exercise will help you maintain control of your ATV under various conditions.

Skills: Control familiarization and operation.

Directions: Mount the ATV, taking care not to step on the shifter. While astride the ATV, identify (physically touch and manipulate) each control. Try it without looking; keep your head and eyes looking straight ahead. Try it again with your eyes blindfolded.

Be sure you learn the shift pattern for your ATV.



Tips:

- Make sure the controls work properly.
- Remember that controls vary from model to model and you should do this exercise any time you ride a different ATV.

Watch for:

- Using the left brake handle as a clutch.
- Downshifting instead of upshifting and vice versa.
- Trouble changing hi/lo lever or finding reverse.
- Controls seem awkward to reach.

Suggestions:

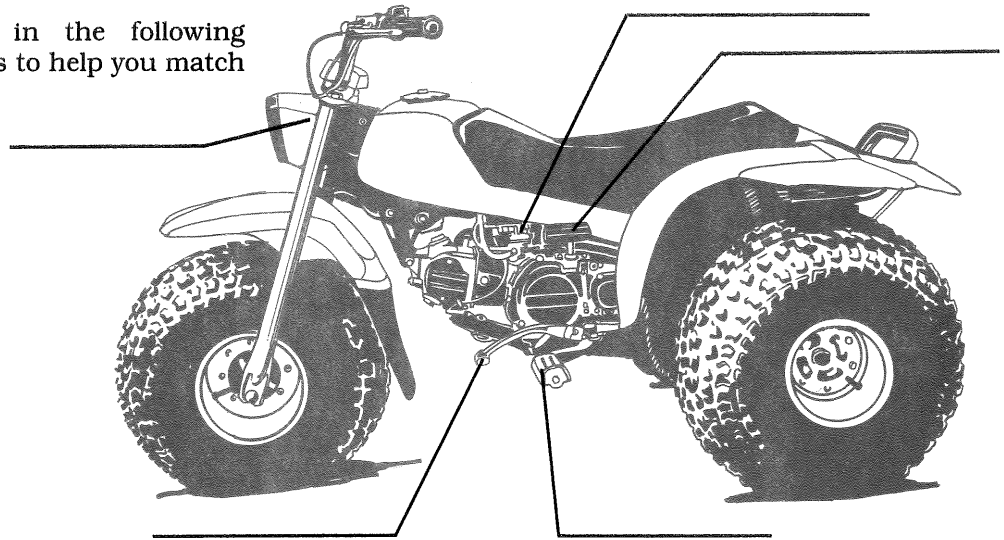
- Motorcyclists must modify old reflexes for controls and turning.
- Shift patterns vary among ATVs. Be sure you know the shift pattern of your ATV.
- Consult owner's manual. Try rocking the ATV slightly while moving the lever.
- Re-position handlebars or controls for ease of operation and check adjustment as stated in the owner's manual.

ATV Learning Activity—Name the Parts

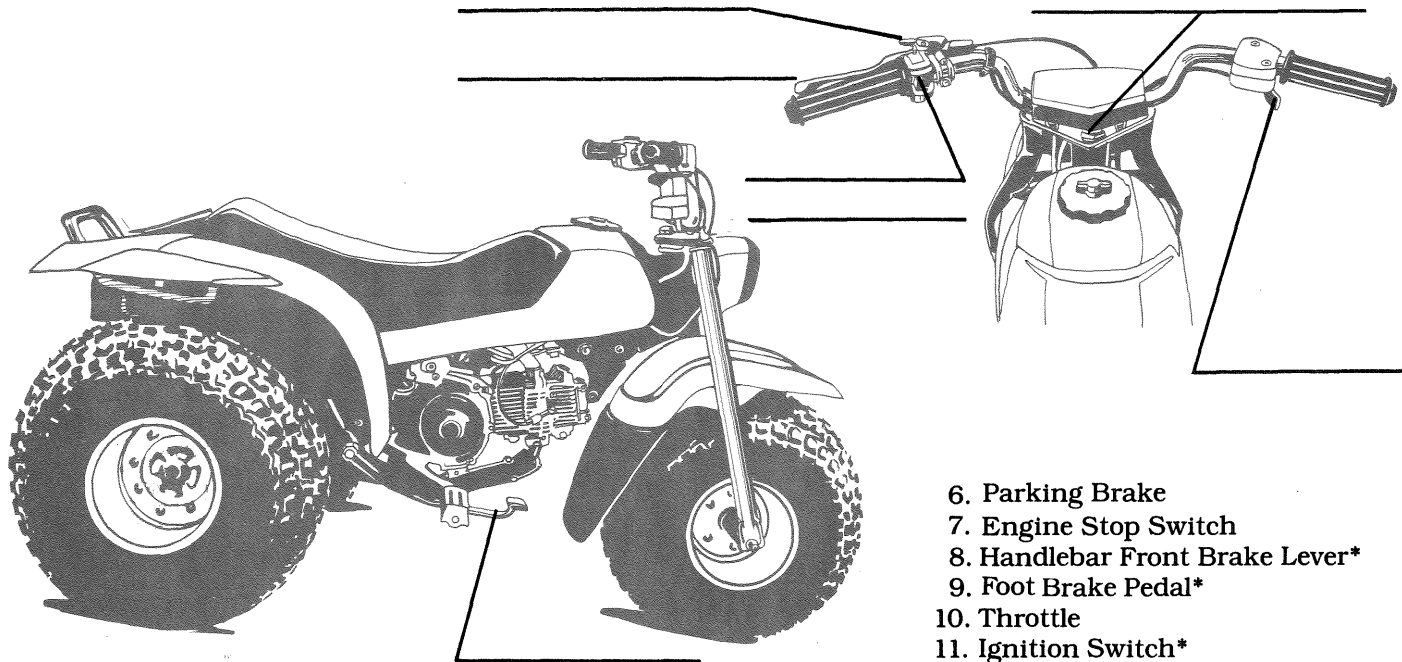
You must be able to locate and operate ATV controls without looking or hesitating. Practicing these exercises will help you maintain control of your ATV under various conditions.

Identify the ATV controls in the following diagrams. Use the list of controls to help you match the part.

1. Footrest
2. Shift Pedal
3. Pull Starter
4. Headlight
5. Choke



ATV Learning Activity—Name the Parts



6. Parking Brake
7. Engine Stop Switch
8. Handlebar Front Brake Lever*
9. Foot Brake Pedal*
10. Throttle
11. Ignition Switch*

* If your ATV is so equipped.

Chapter 3

Protective Clothing

Objectives:

- ◆ Know the protective gear ATV riders must wear.
- ◆ Know what types of ATV gear to wear in warm and cold weather.

Once you get your new ATV, you will no doubt be excited to start riding as soon as possible. But before you do, be sure you and your machine are ready. Here are some basic rules to keep in mind before you ride:

1. Wear the proper clothing.
2. Know your ATV.
3. Practice before riding for the first time. Know your limits.
4. Learn the proper way of starting off and stopping.

Protective Clothing

The nature of ATV riding makes it essential that

you wear protective clothing. Knowing what to wear and how to wear it can make you more comfortable when you ride. More important, it greatly reduces the chance of injury in case of an accident.

Helmets—Wearing a helmet does not make you a race driver. However, it has been proven to prevent serious head injury in the event of a collision. Helmets give good protection from not only collisions, but tree branches and falls. In addition, they provide warmth and some protection from loud noises. Not only should you wear a helmet, but you should advise friends and family to wear them, too.

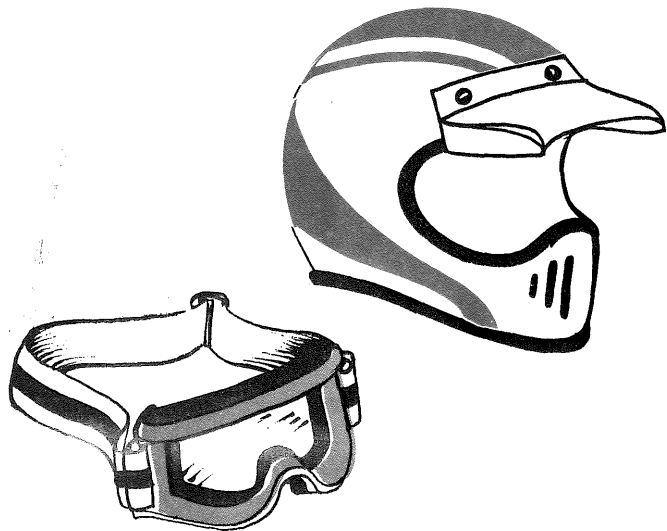
A helmet is the single most important piece of protection an ATV rider can have!

There are a few basic tips to keep in mind when selecting a helmet. When you purchase one, select a good quality helmet, one that meets or exceeds the following safety standards. It should bear either the Department of Transportation (DOT) label, the American National Standards Institute label (ANSIz90.1), or the Snell Memorial Foundation label.

Your helmet should fit snugly, have a good strap and should be securely fastened. Full face helmets

protect your face as well as your head. Open face helmets are lighter and cooler and should be used with eye and mouth protection. Mounting strips of reflective tape on your helmet will add extra visibility if you ride after dark.

There are also times when *not* to wear a helmet. It is important to take your helmet off when talking with landowners and other people you meet on the trail, so they can see who you are.



Eye Protection—You must be able to see clearly in order to ride safely. Any object such as a small stone, a branch or even a bug that hits you in the face can distract you. But if you are hit in the eye, you can be blinded. Regular sunglasses do not offer the proper eye protection. A pair of goggles or bubble visor shield will help protect you. They should be free from scratches. They should be shatter resistant, bearing the standard markings z87.1 or VESC 8 (V-8), or be constructed of a hard coated polycarbonate. They should be well ventilated to prevent fogging, and securely fastened. Goggles or visors with grey/brown or green lenses are preferred for bright days. Amber or yellow lenses are very useful for dark days or late afternoons. These lenses, used in the proper light, can reveal potential hazards in the terrain—especially depressions in the snow. Use clear lenses for night driving which help you see shadows. In extremely cold weather protective lenses can add both protection and comfort. A helmet visor and wind screen on your ATV also help protect your eyes. Be certain to replace eye protection devices if they become scratched.

Gloves—A pair of good gloves will keep your hands warm in the winter and cool in the summer. They will also prevent your hands from getting sore, or tired as well as help improve your grip on the controls. They

will offer good protection in the event of a spill. Off-road style gloves, available at motorcycle shops, provide the best combination of protection and comfort. They are also padded over the knuckles to prevent bruising.



Boots—The footwear which provides the most protection is a pair of strong, over-the-calf boots with heels to prevent your feet from slipping off the footrests. Off-road style ATV or motorcycle boots offer the best protection for feet, ankles and legs.

Jacket and Pants—A sturdy jacket and pants can do a lot for you in the event of a spill on the ground or gravel. Plain lightweight shirts and pants do not

offer as much protection. It is important to protect your skin from scratches. A long sleeved shirt or jersey and long pants are minimal requirements for rider protection. Even better protection can be provided by off-road riding gear such as off-road pants with knee pads, jersey and shoulder pads. You can look stylish and ready for action and still be well protected.



Winter Clothing

Wind Chill Factor—ATV riding in the winter months demands common sense protection against moisture and low temperatures. Keeping your body warm and dry on the winter trail is essential for comfort, safety and health. While the thermometer may indicate a pleasant temperature, don't forget what the weather forecasters often call the "wind chill factor." It indicates the cooling power of cold air

Wind Chill Index												
Estimated Wind Speed in MPH	Actual Thermometer Reading (°F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
Calm	Equivalent Temperature (°F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-21	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-36	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-124
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-49	-67	-82	-96	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
(wind speeds greater than 40 mph. have little additional effect)	LITTLE DANGER*			INCREASING DANGER*				GREAT DANGER*				
	(For properly clothed person)											
	*Danger from freezing of exposed flesh.											

on exposed skin at different wind speeds or ATV speeds. For example, if the temperature on a calm day is 10 degrees above zero and you are riding your ATV at 30 miles per hour, the "wind chill" temperature is equivalent to 30 degrees below zero.

You should select the right combination of clothing to stay warm. Your entire trip can be miserable if you are not wearing the right clothes. If you dress properly, moisture will evaporate from your body. If you become too hot and your clothing traps the moisture, you will get cold. Clothing should be windproof and water repellent. It should be snug, so that it does not catch in the machine. But it should be loose enough to permit freedom of movement and blood circulation.

First Layer—The first layer of clothing should be some type of underwear which ventilates, or "breathes." Wear any light winter under clothing with special attention to covering arms and legs. Avoid underwear that clings to the body. Beware of tight fitting cuffs and elastic bands that cut off circulation. A couple of light layers work better than one heavy layer.

The thermal "waffle-weave" underwear is a good type to wear. If the fabric stretches too much, it loses its ability to retain heat so choose a size that fits you snugly.

Second Layer—The second layer of clothing should provide comfort, utility and durability, such as wool shirts and heavy pants. In colder weather, slip on a wool sweater.

Head Coverings—In addition to your helmet, a cap or some covering over your ears and head should be worn. Avoid the fixed bubble type of face guards as they may frost up. Always keep your helmet strap buckled.

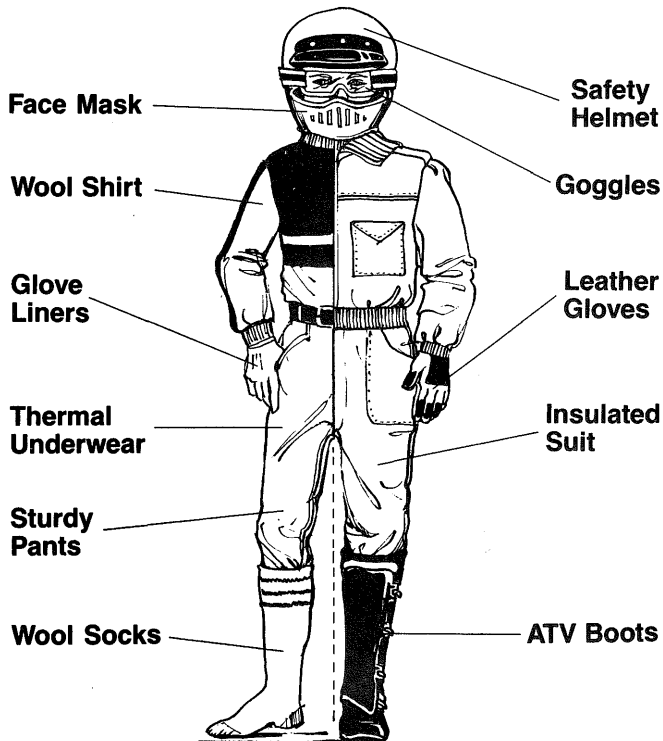
In Minnesota, a face mask is a necessity, where extreme cold conditions occur. Such a mask helps to reduce the possibility of frostbite. Orlon knit pullover face masks are most commonly used.

A word of caution: Never wear a loose scarf when riding an ATV. It can get caught in the moving parts on the machine. It is better to use a turtle neck sweater or “dicky” for neck warmth.

Winter Suit—Snowmobile suits are ideal for winter ATV fun. They are distinguished by their water-resistant outer shell of nylon or similar material and a lining of orlon fleece or other lightweight high-insulating material. One-piece jumpsuits generally provide the most warmth, but the two-piece outfits are warm enough for most occasions. This outer clothing should fit loosely. Reflective strips sewn to the outer garment or other pieces of reflec-

Inner Layers

Outer Layers



tive clothing will give you extra visibility during the long hours of darkness in winter months.

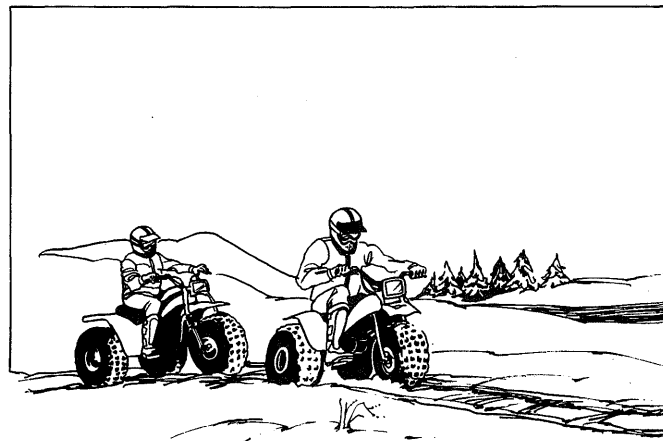
Hand Coverings—For hand protection a good pair of gloves add yet another essential safety precaution. On an ATV, your hands are exposed to the airstream and can become chilled in a hurry. In wooded areas, your hands are also exposed to snapping twigs and branches. The sport of snowmobiling has brought some very warm, new styles of gloves to the market. They are usually padded, have warm orlon fleece lining and gauntlets (straps on the portion extending up your arm) to keep cold air and snow from getting up your sleeves. Gloves or mittens should not fit tightly nor have an outer shell which gets stiff when cold. A light cotton inner glove or liner will prevent your skin from freezing if you must remove outer gloves to handle small items. It is recommended that you carry an extra pair of gloves if possible.

Foot Protection—Socks for winter riding should keep your feet warm and dry. They should not be so bulky that they make your boots too tight, which can cut off circulation and cause cold feet. Socks should allow your feet a little movement inside the boots, plus a layer of air to help the feet breathe.

If the weather is extremely cold, wearing two pair of socks can help keep your feet warmer. A light pair

of socks under a heavy wool pair is ideal.

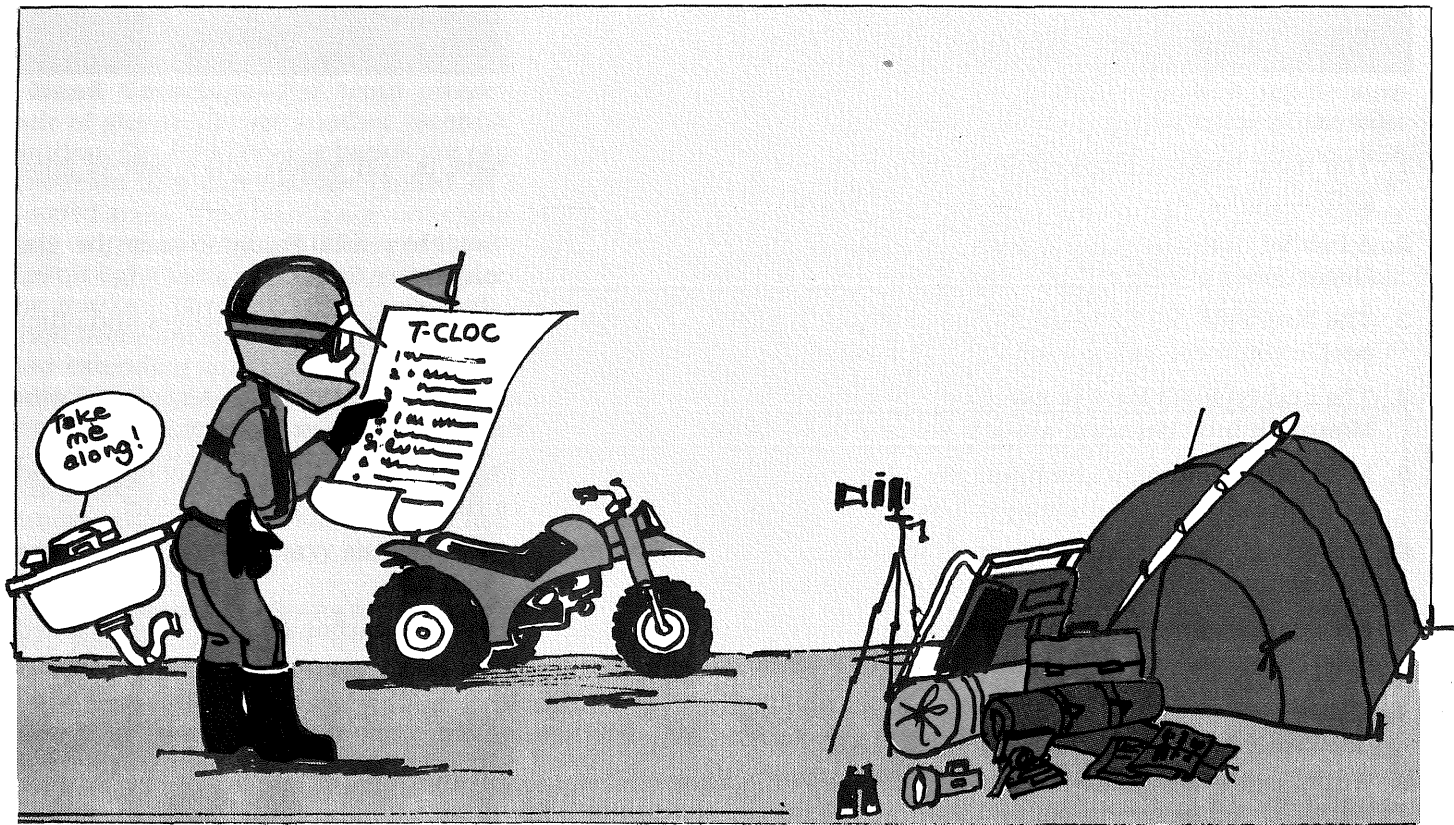
Boots must be capable of keeping your feet warm and dry even though you do little walking. Be sure that they are not too tight. Again, some of the best footwear are those designed for use by snowmobile operators. They are boots that are actually two boots: a felt liner and a separate outer boot with nylon or leather tops and rubber lowers or soles. This combination keeps cold air and moisture out with an air barrier next to your feet to keep body heat in.



ATV Learning Activity—Self Quiz

Circle the letter which best completes the sentence.

1. The most important piece of protective clothing an ATV rider can have is (a) boots. (b) a pair of good gloves. (c) a helmet.
2. A helmet that meets safety standards should bear the label from the Snell Memorial Foundation or the (a) Department of Energy. (b) Department of Transportation. (c) National Safety Council.
3. The best time not to wear a helmet is (a) in desert climates. (b) when talking with landowners and other people you meet on the trails. (c) during ATV skills exercises.
4. The best type of gloves to wear for protection are (a) Quality cashmere/wool, available at sports stores. (b) Mountain bicyclist style, available at pro bicycle shops. (c) off-road style, available at motorcycle shops.
5. Minimal requirements for protecting skin from scratches while ATV riding are (a) a heavy pair of slacks, and a cotton polo shirt. (b) long sleeved jersey and long pants. (c) lycra riding shorts, polyester shirt.
6. The cooling power of cold air on exposed skin at different ATV speeds is called the (a) Wind Chill factor. (b) Celsius factor. (c) Yukon Wind syndrome.
7. Eye goggles should be shatter resistant or constructed of (a) a hard coated bi-carbonate. (b) a hard coated polycarbonate. (c) a hard coated chrome molybdenum.
8. The best protection for your feet, ankles and legs is (a) off-road style motorcycle boots (b) heavy duty hunter's boots. (c) a special industrial style boot.
9. Winter clothing should (a) have tight fitting cuffs, elastic bands for warmth. (b) be one heavy layer suit for warmth. (c) be windproof and water repellent.



Chapter 4

Before You Ride

Objectives:

- ◆ To learn the steps in a pre-ride inspection.
- ◆ To use the “T-CLOC” check procedure.
- ◆ To be able to trouble-shoot minor problems.

Now that you know what proper and safe protective clothing to wear, you are almost ready to go for a ride. Prior to each ride, you should always perform a pre-ride inspection to see that your ATV is in proper working order.

ATV Pre-Ride Inspection

This section will give you some important pointers for personal safety and the safety of your ATV. Inspecting the mechanical condition of your equipment before each ride is very important to help minimize the chance of injury or being stranded, as well

as to ensure long-term performance from your ATV. Remember you can ride farther in an hour than you can walk in a day.

Your owner's manual will list what to check on your particular model; follow the maintenance procedure outlined in your owner's manual. An easy way to remember the basic items is represented in the letters “T-CLOC.” Each letter of this phrase, “T-CLOC” refers to parts of your ATV to be inspected, as outlined in the chart on page 26.

Completing a pre-ride inspection before you ride your ATV should become an automatic routine with each outing.

There are a few other tips that you should pay close attention to before riding.

1. Always tell someone where you are going and when you expect to return.
2. Never go alone. Use the buddy system—ride with a friend or two.
3. Under-inflated or over-inflated tires may cause wheel damage when riding over bumpy terrain, or your ATV may not handle properly.

T-CLOC Pre-Ride Inspection Procedure

T	TIRES AND WHEELS	<ol style="list-style-type: none"> Air pressure – Always have the recommended tire pressure. Be sure front tire(s) and both rear tires are inflated to equal pressures. If the tire pressure on one side is higher than the other side, the vehicle may pull to one side. Condition – Check for cuts or gouges that could cause air leakage. Wheels – To avoid loss of control or injury, make sure axle nuts are tightened and secured by cotter pins. Check these before every run.
C	CONTROLS AND CABLES	<ol style="list-style-type: none"> Controls – Check the location of all the controls by sitting on the ATV. Make sure they work properly. Throttle and other cables – Make sure the throttle moves smoothly and snaps closed with the handlebars in any position. An off-road environment is hard on them. Brakes – Do the controls operate smoothly and are the controls adjusted according to the owner's manual? Are they positioned for easy reach? Your brakes are a crucial part of riding and must always be in tip-top condition. Foot shifter – Is it firmly attached and positioned for safe operation?
L	LIGHTS AND ELECTRICAL	<ol style="list-style-type: none"> Ignition switch (if so equipped). – Check the condition of the switch and make sure it works properly by switching it off and on during your warm-up period. Engine stop switch – Does it turn off the engine? Headlight and taillight (if so equipped) – Are they working? You could be caught out after dark.
O	OIL AND FUEL	<ol style="list-style-type: none"> Don't get stranded because you are out of oil or fuel. Know your ATV's cruising range. Check oil level with dipstick or sight glass while the engine is off. Check your owner's manual for procedure. Always start your ride with a full fuel tank. Check for fuel or oil leaks. Take off the filter cover and check the condition of the air filter element. Be sure it is clean and not torn or blocked.
C	CHAIN AND DRIVE SHAFT CHASSIS	<ol style="list-style-type: none"> Chain – Inspect, adjust and lubricate the chain regularly. Your chain is the vital link from the engine to the wheels. Check for chain slack or free play so that it is within specifications as described in your owner's manual. Drive shaft – If your ATV is equipped with a drive shaft rather than a drive chain, check for oil leaks. Maintain its oil supply as outlined in your owner's manual. Nuts 'n' Bolts – Rough terrain will loosen parts. Look and feel for loose parts while the engine is off. Shake handlebars, footrests, etc., before each ride and periodically check major fasteners with a wrench.

4. Accurately check your tire pressure (usually around 2 to 6 psi). You'll need a low pressure gauge, as automotive gauges do not work.
5. Make sure wheel lug nuts are tight. Grasp the tire at the front and rear and try to rock it on its axle to detect worn out bearings or loose nuts. There should be no free play as you rock the wheel.
6. Check the brake wear indicator. Periodically disassemble and clean the brakes. Check your owner's manual for the correct procedure.

Learning to ride an ATV can at times be a frustrating experience, but everyone must go through the beginner stage. Even seasoned riders don't know it all. This book can help guide you in ATV safety operation, but nothing will help you as much as your own riding experiences. That experience, plus constant attention to good riding practices, will put you on your way to becoming a skillful, safe rider.

Trouble-Shooting

Emergency situations can occur with any type of mechanized vehicle—unknown hazards on the trail, a burned-out light at night, an empty fuel tank in the middle of nowhere. These are not only inconvenient, but are unsafe conditions for ATV riders.

Since ATVs are designed for *OFF-ROAD* use only, ATV riders must be prepared with the right safety precautions. It is not like being in a disabled car which may be within walking distance of help. Fortunately, most problems can be fixed on the spot if you carry a minimum assortment of tools and spare parts.

Tools and Supplies

A basic set of tools is supplied with your ATV, as mentioned in Chapter 2. In addition, you should carry one or two extra spark plugs with your machine. The most frequent cause of engine stalling or poor performance is a bad spark plug.

On long rides or extended trips, other items that should be carried include: flashlight, spare headlamp and tail light bulb, electrical tape, at least 25' of 1/4" nylon rope, waterproof matches, knife, hand axe, first aid kit, compass, map, tarpaulin, signal flares, an emergency food and water supply, with fuel de-icer and snowshoes in the winter.

Regular maintenance will prevent most breakdowns. However, once in awhile your ATV may fail. If you are in an unpopulated area when this occurs, carrying the above items will save a long walk.

Trouble-Shooting Exercise

Problems may be caused by one or a combination of factors. Use the Trouble-Shooting Chart to determine the possible causes of a problem, and then check the recommended solutions to each cause.

By forming teams of individuals or partners, you can use this chart for a contest. One person asks another what might be wrong, if for example, the engine does not start. The other must answer and tell what he/she would do. Score one point for each correct answer naming both the probable cause and its remedy.

Trouble	Probable Cause	Remedy
1. Engine hard to start or does not start at all	<ul style="list-style-type: none"> ● Engine stop switch off. ● Ignition switch off. ● Spark plug fouled ● Empty fuel tank ● Plugged fuel line/filter ● Improper or no ignition ● Engine floods 	<ul style="list-style-type: none"> Turn on. Turn on. Clean or replace. Fill. Check condition of fuel lines, filter, and tank. Clean or change filter. Clean fuel tank if necessary. Check to see if fuel cock is clogged or off. Check spark plug leads. Check for correct spark plug gap and condition. Check to see that wire is on spark plug. Disengage choke, wait 60 seconds or more. Then depress throttle fully and crank engine. Release throttle immediately after engine starts.
		SCORE:

<p>2. Engine stalls.</p>	<ul style="list-style-type: none"> ● Fuel tank empty Fill. ● Fuel cock off Turn on. ● Air filter or fuel tank vent clogged Clean according to directions in owner's manual. ● Spark plug fouled Clean or replace. ● Engine overheated Too much idling/low speed running, turn engine off to cool down. Cooling fins could be packed with mud or dirt; clean. Engine oil low, replace with sufficient amount. Wrong spark plug; correct.
SCORE:	
<p>3. Engine does not develop enough power</p>	<ul style="list-style-type: none"> ● Compression leakage Tighten cylinder head gasket or base gasket. You may have to replace gasket. ● Clutch slipping Re-adjust clutch cable. ● Clogged muffler Consult your dealer. ● Air filter or spark plug dirty . . Clean and replace.
SCORE:	
<p>4. Poor stability and hard steering</p>	<ul style="list-style-type: none"> ● Front, rear tires not properly inflated Check air pressure and properly inflate tires. ● Rear tires have unequal pressure Equalize air pressure of both rear tires.
SCORE:	
TOTAL SCORE:	

ATV Learning Activities—Self Quiz

Decide whether each statement is true or false. Circle T or F.

- T — F 1. PSI refers to air pressure in the tires and stands for “pounds per square inch.”
- T — F 2. T-CLOC is the word used for trouble-shooting.
- T — F 3. If your engine is hard to start or does not start at all, you should replace your oil filter.
- T — F 4. On long trail rides you should carry extra emergency items such as snacks and a water supply.
- T — F 5. Check your oil level with your dipstick or sight glass when the engine is running.
- T — F 6. Your chain only needs to be inspected, adjusted or lubricated once in a while.
- T — F 7. One should go through a pre-ride inspection routine every time you ride an ATV, especially if it is a different model than your own.
- T — F 8. The most frequent cause of engine stalling or poor performance is a bad spark plug.
- T — F 9. If you are an accomplished, skilled driver you do not need to use the buddy system when on a trail ride.
- T — F 10. Automotive tire gauges are perfect for ATV tires.

Chapter 5

Starting Up

Objectives:

- ◆ To know the procedures for starting an ATV engine.
- ◆ To know the proper way to start the ATV moving.
- ◆ To know how to shift the ATV's gears.

Many accidents occur because the driver was not ready to take control of the machine.

Remember that if you start your ATV, you are responsible for controlling it.

The owner's manual gives instructions for all aspects of running your ATV. Many ATVs are alike, but different makes and models start in different ways and parts may be in different locations. For example, those machines that have a manual starter (pull, auto-rewind type) usually have the starter found on the left side of the engine. The key and the

choke are commonly located on the panel in front of the driver. It is always a safe procedure to check with your owner's manual first to note the placement of the controls.

Your owner's manual will list how to start your particular model. However an easy way to remember the starting procedure is represented in the letters "BONE-C." Each letter of this phrase, "BONE-C" refers to things to do to start an ATV.



BONE-C Start-Up Procedure

B	BRAKE	1. Set the PARKING BRAKE.
O	ON	2. Turn gas cap vent to ON position. Also turn the gas valve to ON or RESERVE position, depending on how much fuel in in the machine.
N	NEUTRAL	3. Check that the transmission is in NEUTRAL. To make sure it is in neutral check the NEUTRAL indicator, if equipped. Also roll the machine back and forth.
E	ENGINE	4. Check that the engine stop switch is in the RUN or START position. The engine stop switch is usually found by either the left hand or the right hand.
C	CHOKE	5. If the engine is cold, put the CHOKE in the ON position. Your owner's manual will show where the choke is located on your ATV. 6. Start the engine according to the directions in your owner's manual. 7. Once the machine is warmed up, return the choke to its normal position. This is very important because if you don't, the machine will not run properly, using too much gas. This may also cause damage to the engine if allowed to run with the choke in the START position.

Starting Out

Before attempting to ride your ATV, please make sure that the area you ride in is open to off-road vehicles. Remember you are riding *off road* only, for these vehicles are *not* street legal. Also make sure you have the property owner's permission.

You should be seated with both hands on the handlebars and both feet on the footrests. When mounting, take care not to step on the shifter.

Be sure that the engine is warmed up before you take off.

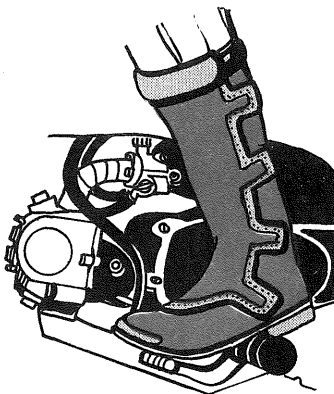
- Hold the rear brake and shift into first gear.
- Release the parking brake.
- Release the rear brake and slowly advance the throttle.
- If your machine has a manual clutch, release it slowly. If the clutch is engaged suddenly, the ATV might move suddenly, causing you to lose control.

Always keep your feet on the footrests while riding to prevent injury. Riding an ATV is similar to riding a bicycle or snowmobile. Balance is kept by shifting your body weight. The throttle and brake also help you to control the machine. Be prepared to shift your weight quickly to counteract the bumps and dips of the land. You must learn to adapt to differing changes in the terrain, and weather.

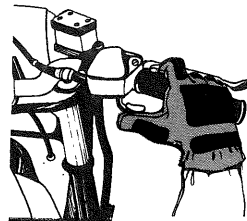
Changing Gears

Always close the throttle when changing gears to prevent front wheel(s) from lifting. Learn the sounds of your engine so you can shift to keep the engine speed in the most efficient range.

If your ATV has a manual clutch, learn where the engagement point is to prevent stalling, and allow smooth shifting.



1. Release throttle
2. Change gears
3. Release shift pedal as you slowly apply throttle again.



To change gears, you must learn to coordinate your throttle lever and clutch pedal (if so equipped).

ATV Learning Activity—Self Quiz

Circle the letter which best completes the sentence.

1. BONE-C is a word used for (a) the pre-ride inspection. (b) the pre-start routine. (c) scanning the terrain.
2. Once the machine is running you should (a) return the choke to its normal position. (b) place the choke in the ON position. (c) keep adjusting the choke.
3. In the pre-start routine, the engine stop switch should be set in the (a) OFF position (b) START or RUN position. (c) NEUTRAL position.
4. Once your ATV is ready to start up, make sure that the area you are to ride is (a) clear of obstacles. (b) has plenty of space to ride around. (c) off-road only, with the property owner's permission.
5. You should keep your feet on the footrests (a) only when starting. (b) always when riding. (c) when making turns, climbing, descending hills and on rough terrain.
6. Shifting body weight while riding an ATV is similar to (a) a motorcycle. (b) a moped. (c) a snowmobile.
7. While shifting you should (a) always close the throttle. (b) gently ease the throttle to one-third of your speed. (c) keep the throttle on.
8. If the choke is allowed to run in the START position, the ATV might (a) move suddenly, causing loss of control. (b) damage its engine. (c) do figure eights.
9. Before you ride, make sure that the area you will ride in is (a) flat, level pavement. (b) street legal. (c) open to off-road vehicles.

Chapter 6

Basic Riding Skills

Objectives:

- ◆ To learn the correct procedure for braking.
- ◆ To learn how to park the ATV.
- ◆ To learn how to turn the ATV at various speeds.

Mastering the basic skills of braking, turning and parking are very important. If you are not completely trained to use these *basic* skills, you will not be ready to go ahead to intermediate and advanced riding. The exercises at the end of this chapter should be performed with ease before you attempt any other skills.

Braking

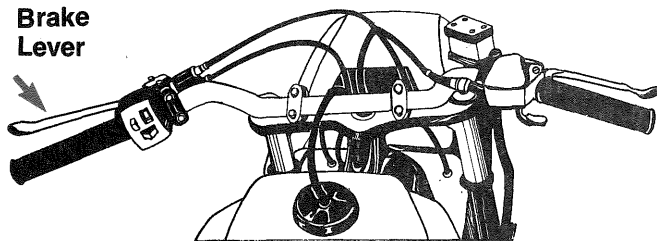
Your owner's manual describes your ATV's braking system. You may have both a front and rear brake or a rear brake only. Of course, your braking technique

will depend upon your ATV's braking system.

Some good tips for braking are:

1. Release the throttle.
2. Shift to lower gear to use the engine to slow the vehicle.
3. Apply both brakes equally (if equipped).
4. Avoid excessive braking while cornering.
5. Apply brakes lightly on slippery surfaces.
6. Shift to low gear when descending a hill and don't ride the rear brake for long periods. **Do not use the front only, use both front and rear brakes together.**

Special Note: If your ATV stalls while traveling up a hill, do not let it roll backwards. See the section on climbing hills for more details on this tricky situation and check your owner's manual.

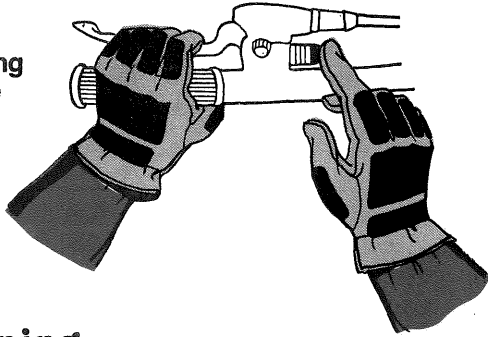


Parking

When parking your ATV you should:

1. Shift into neutral and set parking brake. Or, shift into low gear if you don't have a parking brake, to keep it from rolling.
2. Avoid parking on an incline.

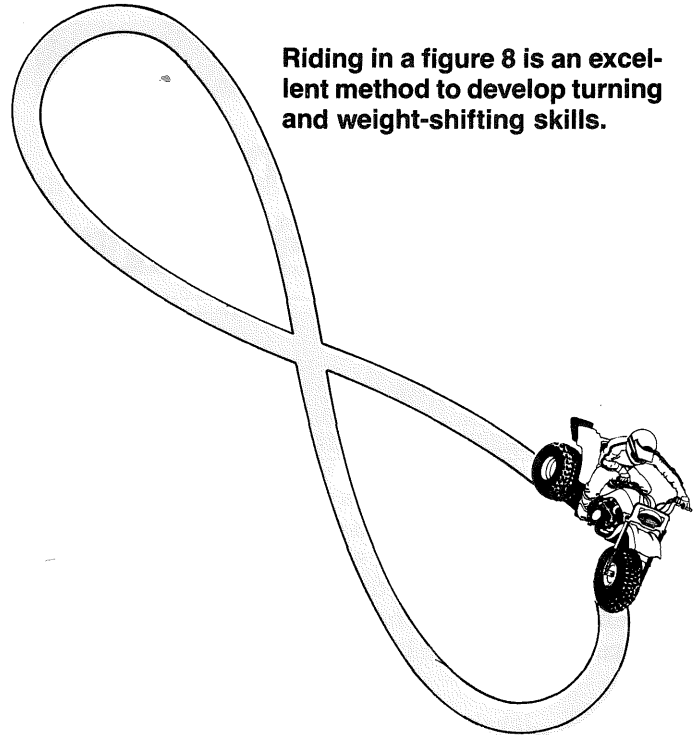
Parking Brake



Turning

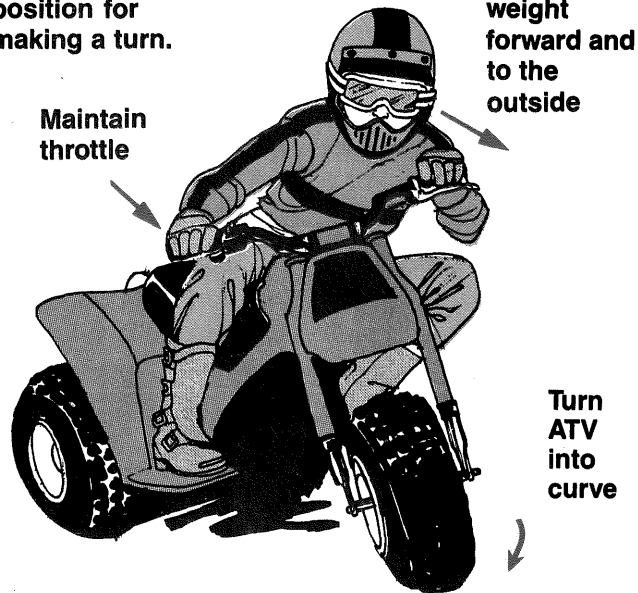
When turning, the outside wheels must cover a greater distance than the inside wheels (but in the same time). ATVs with solid rear axles turn both rear wheels at the same speed. On some ATVs a differential gear case mounted between the wheels, on the rear axle, allows the wheels to spin at different rates upon demand so that the outside wheel in a turn can spin faster as required. This type of ATV is like a car

Riding in a figure 8 is an excellent method to develop turning and weight-shifting skills.



with its unlocked differential. Both types require their own special turning skills. Always check your owner's manual to determine your vehicle type.

Typical body position for making a turn.



Most ATVs, however, have a “live” or solid rear axle: both wheels must spin at the same rate at all times. Putting weight on the outside footrest while leaning in with the upper torso positions the rider’s weight

correctly for normal turning. Here are some tips for turning solid rear axle ATVs:

At low speeds: As you turn the handlebars in the direction of the turn, shift your body weight forward and to the outside of the turn (weight is supported on the outer footrest) while leaning your upper body in slightly. Be sure to maintain throttle through the turn. In turning the objective is to reduce weight off the inside rear wheel by shifting your body weight. If you do not follow this technique, the ATV may tend to plow straight ahead, resisting your efforts to steer with the handle bars. So remember, shift your body weight to reduce weight on the inside rear wheel.

At higher speeds: The method of turning at higher speeds is similar to turning at low speeds. The difference is, as speed increases you must lean your upper body farther toward the inside of the turn, while keeping your weight on the outer footrest. This is to balance the higher cornering force as vehicle speed increases.

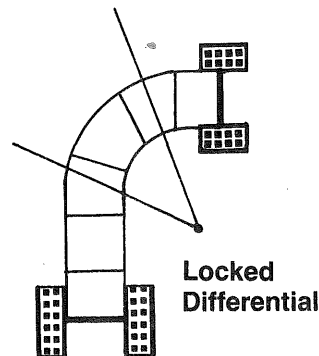
Special Note: If your ATV starts to tip while turning, lean your upper body farther into the turn while gradually reducing throttle and making the turn wider.

Unlocked vs. Locked Differentials

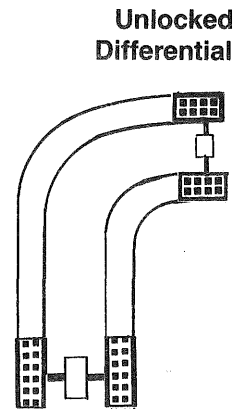
The solid rear axle pays dividends in traction when the going gets tough. Even if one rear wheel loses traction, the other wheel can bite and move the vehicle forward. Two-track vehicles equipped with a differential between the drive wheels cannot move if only one rear wheel loses all traction. The “on demand” feature of the differential allows the slipping wheel to spin, while the one wheel with traction stays dead. This is very similar to a car with one rear wheel spinning on glare ice while the other rear wheel rests motionless on dry asphalt. While the solid rear axle offers a bonus in the traction department, the differential steers much easier and barely tends to plow the front wheel. Some ATVs have a differential which can be locked by throwing a lever, so you can have the best of both worlds.

Use the differential mode for relaxed driving on flat terrain and enjoy easy steering. If the going gets rough, switch to solid mode for best traction. Don't turn real fast when in differential mode. When the inside rear wheel loses a bit of traction, you will lose all power to the other drive wheel, dropping the inside wheel back down and adversely affecting control.

Regardless of rear axle type, the rider must also



Outside wheels have to cover greater distance than the inside wheels.



transfer weight to front and rear as needed. Bend the elbows, slide forward on the seat and lean the torso forward. This adds weight to the front wheel for increased steering traction during slight upgrades or hard acceleration. Severe upgrades or stopping a backwards roll involve rising on the footrests and pulling the handlebars into your thighs while craning the torso forwards so your nose almost touches the front fender.

WARNING: Avoid steep grades until you are an experienced rider.

Sliding way back on the seat increases rear weight bias for improved drive traction and lightens the front end to clear obstacles or skim deep sand. Severe downgrades and extremely poor traction require nearly straightening the knees and elbows, bending over double at the waist and projecting the posterior as far backwards as possible.

Shifting body weight smoothly and quickly is an integral part of the fun of ATV riding.

Exercise Skills Preview

The exercises in this book apply to ATVs with *locked differentials*. If your ATV has an unlocked differential be sure to lock the rear axles before practicing the exercises which follow.

Choosing a Practice Area—Choose an open, off-road area (about 100' x 200') away from other riders and free of obstructions. The terrain should be flat for the first few exercises. When you reach the chapter on hills, you should select a hill that is not very

steep; it should be easy to climb on foot. Practicing on a hard dirt surface will make it easier for you to learn the basic maneuvers.

If you are riding on private property, be sure you have permission from the owner.

Do not do these exercises on pavement. ATVs are designed for off-road use only.

What to bring—Bring five objects that you can use as markers. Milk cartons or plastic bottles with sand in them work well. Don't use glass bottles or other breakable items. You should also bring a tape measure to mark distances; or at least measure your stride so you can pace off the distances (one hundred feet usually equals 35 to 40 paces).

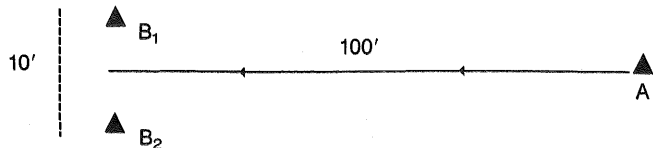
Safety Considerations—Follow instructions exactly for these practice exercises. Also, review these safety rules:

- Wear proper protective clothing.
- Inspect your ATV (T-CLOC) before you begin. Consult your owner's manual.
- Check the practice area for potential hazards.
- Bring an experienced friend along to help if you have problems, and to critique your progress.
- Don't mix alcohol or other drugs with ATV riding.
- DO NOT carry passengers.
- Pay attention to additional safety tips found throughout this workbook.

Exercise 2 – Braking

Objective: You must be able to put the ATV in gear, slowly accelerate, shift smoothly and come to a smooth, safe stop. Practicing these drills will help you master stopping in a straight line and in a curve like when you stop for a rest during a trail ride.

Skills: starting out, shifting, stopping, turning



Directions: Put marker A down to indicate your starting point. Then place markers B1 and B2 100 feet down a straight path. Start your ATV and ride straight toward the second markers. Begin to slow down before you reach markers B1-B2. Come to a smooth, non-skidding stop with your front tire(s) between markers B1 and B2. Practice this a few times in first gear. Then try it in second gear. Ride straight toward B1-B2, accelerate and shift into second. Begin to slow down and shift back to first gear BEFORE you reach markers B1 and B2. Come to a smooth, non-skidding stop with your front tire(s) between markers B1 and B2.

Tips:

- Keep your feet on the footrests at all times.
- Keep your head and eyes up.
- Look straight ahead when stopping in a straight line. Look around the turn as you slow in the curve.
- Shift to a lower gear as you decelerate.

Watch for:

- Overshooting the final marker. ATV turns to one side.
- Rear end slides or skids.
- ATV turns wide in the curve.
- Shifting is not smooth or is inconsistent.

Suggestions:

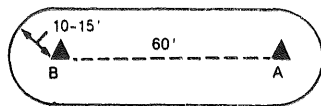
- Begin to slow down earlier.
- Don't shift your weight when stopping in a straight line.
- Begin to slow down earlier. Apply brake pressure more gradually.
- Steer with the handlebars. Lean in slightly. Begin to slow down earlier.
- Move foot clear of the shift pedal after each shift. Release the throttle before each shift.

Exercise 3 – Turning

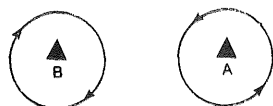
Objective: You must be able to coordinate speed and body position to maintain balance while turning. Practicing this exercise will help as you ride down curvy trails and fire roads.

Skills: Throttle control, shifting weight, turning, braking.

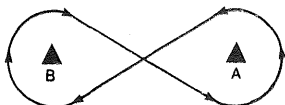
Drill 1



Drill 2



Drill 3



Directions:

Drill 1: Turning – large oval. Place markers A and B 60 feet apart as indicated in the diagram. Ride around the outside of the markers so that you have made a large oval. Ride to the left a few times and then ride around to the right. Do not shift gears during the exercise.

Drill 2: Turning – small circles. Now use those same markers as the center of two large circles. Ride around marker A to the left. Continue riding around to the left and decrease the radius of the circle so that you are making tighter turns. Then ride around marker B to the right and practice decreasing your turning radius.

Drill 3: Turning – figure 8. Combine the circles around marker A and marker B so that you are doing a large figure 8.

Tips:

- Always keep your feet on the footrests.
- Look ahead, concentrating on your intended path of travel.
- Slow before the turn and gently increase throttle as you straighten out.
- Support your weight on the outer footrest and lean your upper body into the turn.

Watch for:

- ATV leans to one side.
- Front wheel(s) plow straight ahead when you turn the handlebars.
- ATV turns wide.

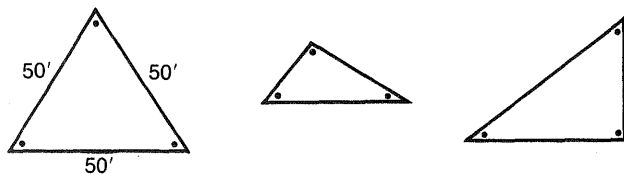
Suggestions:

- Lean your upper body further *into* the turn.
- Put weight on outside footrest as you turn the bars. Put more weight up front and use more effort to turn the handlebars.
- Slow down. Look around the turn.

Exercise 4 – Sharp Turns

Objective: You must be able to maintain balance and control while making sharp turns. Practicing this exercise will help you maneuver your ATV as you would in tight wooded areas.

Skills: Shifting weight, turning, throttle control, braking.



Directions: Place three markers down to create a triangle with sides of equal length. The sides should be at least 45 feet long. Ride around the outside of the triangle going to the left. Stay within three feet of the triangular path. After this is mastered, ride the triangle to the right. Then change the sides and angles of the triangle and practice with each new triangle.

Tips:

- Keep your feet on the footrests at all times.
- Slow before the turn.
- Look through the turn at your intended path of travel.
- Gently increase the throttle as you exit the turn.
- Lean *in* and weight the *outer* footrest as you enter the turn.
- Turn the handlebar in the direction of the turn.

Watch for:

Front wheel(s) plow and ATV goes straight.

Suggestions:

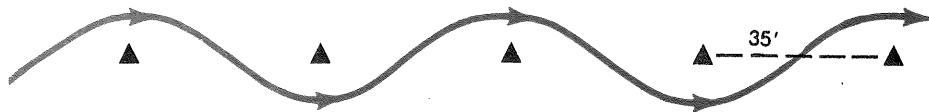
Lean into the turn more while still keeping weight on the outside rest. Apply throttle gradually to avoid taking weight off of the front end. Bend your elbows and lean forward a bit to maintain weight on the front wheels(s).

Exercise 5 – Quicker Turns

Objective: You must be able to coordinate speed, body position, and balance while weaving between cones. Practicing this exercise will help you maneuver your ATV as you would while avoiding obstacles during a ride in an open area such as desert terrain.

Skills: Shifting weight, steering with the throttle, changing direction.

Directions: Put five markers down in a straight path at 35-foot intervals. Travel to the left of the first marker and then to the right of the second and continue until you reach the last marker. Practice at slow speeds first; then gradually increase your speed. *Do not exceed second gear.* After you've mastered this, move the markers closer together. Do not move them closer than 18 feet apart.



Tips:

- Always keep your feet on the footrests at all times.
- Shift your weight quickly to initiate the turn. To shift your weight effectively, rise up slightly on the footrests by flexing your thigh muscles, and "do the twist"; i.e., quickly move your hips and lean your upper body to the inside of the turn and put your weight on the outside footrest.

- To go left, apply a slight left turn to the front wheel(s), quickly shift your weight to the right footrest and apply a short burst of throttle. To go right, do the opposite.

Watch for:

Running over markers as you try to go around.

- Don't look at the next marker you are approaching. Look two markers ahead.

Suggestions:

Swing wider as you go around the marker, and shift your weight more. Use a short burst of throttle but don't take weight off of the front end.

ATV Learning Activity—Self Quiz

Decide whether each statement is True or False. Circle T or F.

- T — F 1. All ATVs are built with locked and/or unlocked differentials.
- T — F 2. ATVs with solid rear axles turn both rear wheels at the same speed.
- T — F 3. At low speeds the objective is to reduce weight on the inside rear wheel.
- T — F 4. You should brake excessively while cornering so you won't plow ahead.
- T — F 5. If you feel the ATV is about to tip when turning you should move your posterior as far back to the rear of the ATV as possible.
- T — F 6. When making turns at low speeds, you should maintain the throttle.
- T — F 7. The solid rear axle is considered the best for ATV traction.
- T — F 8. You should always apply your brakes lightly on slippery surfaces.
- T — F 9. While descending a hill it is best to apply light pressure on the rear brake continuously for long periods to ensure your safety.
- T — F 10. Shifting body weight smoothly and quickly is an integral part of the fun of ATV riding.

Chapter 7

Intermediate Riding Skills

Objectives.

- ◆ To learn how to climb a hill.
- ◆ To understand the method for descending a hill properly.
- ◆ To learn the techniques used when traversing a slope.

You have to know the land you're riding on and what your machine will do in order to get the most out of the ride. Choose the places you ride carefully. Use existing trails. Stay away from terrain where you really don't belong, like dangerous slopes and impassable swamps. Watch carefully for sharp bumps.

Learn to read the trail as you ride. An expert rider looks well ahead on the trail. Know what's coming; be prepared to react long before you get there. Be con-

stantly alert for hazards. Don't ride in situations beyond your capabilities. Know how to adjust your speed to trail conditions and visibility. An expert rider stays out of trouble not simply by handling the machine well, but by being safe and *avoiding* risky situations in the first place.

Climbing a Hill

Remember:

- Some hills are too steep for your abilities. Use your common sense.
- Some hills are too steep for your ATV regardless of your abilities.
- Never ride past your limit of visibility — if you can't see what is on the other side of the crest of a hill, slow down until you can get a clear view.

When approaching a hill you should:

- Keep both feet firmly on the footrests.
- Shift the ATV into a low gear and speed up BEFORE ascending the hill.
- For small hills, shift your body weight forward by sliding forward on the seat. For steep hills stand on the footrests and lean well over the front wheel(s) in order to shift as much weight forward as possible.

- If the hill is steep and you must downshift to prevent stalling, shift quickly and smoothly. Also, don't forget to close the throttle while shifting. This will prevent front wheel lifting.
- If you don't have enough power to continue uphill but you have forward momentum and enough space to turn around safely, turn around before you lose speed and then proceed downhill.
- If you are riding up a hill and you lose forward momentum, apply the parking brake *before* you roll backwards, and dismount to the left. If you are physically able to do so, drag the rear end of the ATV uphill. Stay on the uphill side and never stand downhill of the ATV. Keep dragging it around until the ATV is angled downhill. Remount the ATV while keeping as much of your weight as possible into the hill (uphill). Turn the handlebars downhill, slowly release the parking brake and ride downhill.

If you cannot drag the rear end of the ATV uphill, then once you have dismounted to the left, turn the handlebars fully to the left. As you stand on the uphill side, release the parking brake and pump the handbrake to let the ATV roll backwards. This will turn the ATV sideways to the hill. Reset the parking brake. Turn the handlebars to the right. Staying on the uphill side, release the parking

brake and pump the handbrake to let the ATV roll until it is angled downhill. Set the parking brake and remount the ATV on the uphill side while keeping as much of your weight as possible into



the hill. Slowly release the parking brake and ride downhill. This should work on most hills, but on a steep hill, remounting is extremely difficult. In this situation, concentrate on keeping as much weight uphill as possible.

If your ATV has a front brake, you can try to stop the ATV using the *front brake only*. Move your body weight forward and use the front brake to slow the ATV to a stop. If the front brake does not slow the ATV, dismount to the side immediately.

Special Note: Do not let your ATV roll backwards on a hill. If your ATV begins to roll backwards, dismount to the side immediately. *Do not* attempt to back down a hill using the rear brake. Use of the rear brake could cause you to roll over backwards.

Going Down the Other Side

When descending a hill you should:

- Keep both feet firmly on the footrests.
- Point the ATV directly downhill.
- Transfer your weight to the rear.
- Shift the transmission into low gear and descend with the throttle closed.
- Apply brakes to reduce speed.



Traversing a Slope

Traversing a slope means to go across it. Often when a hill is too steep it is necessary to climb it by traversing. The same is true when descending a steep hill—if it's unsafe to go straight downhill then traversing the hill from side to side is necessary.



Traversing a slope is tricky. Use *caution* and avoid traversing slopes where there is slippery or very bumpy terrain. Here are some basic guidelines to follow:

1. Keep both feet firmly on the footrests.
2. Lean uphill. You may want to put weight on the downhill footrest to increase traction, but most importantly, lean your upper body into the hill and steer slightly uphill.
3. When riding on soft terrain, gently turn your wheel(s) uphill to keep your ATV on a straight line across the hill.
4. If your ATV begins to tip, turn the front wheel(s) downhill if the terrain allows you to. If the terrain doesn't allow you to, dismount on the uphill side immediately.

Exercise 6 – Hill Climbing

Objective: You must be able to ride up, turn your ATV around, and ride down a hill. These exercises will help you practice normal hill climbing techniques – riding up and down hills successfully – as well as give you help if you lose momentum on an uphill climb.

Skills: Maintaining balance, shifting weight, application of brakes, and throttle control.

Drill 1:



Drill 2:



Drill 1: Climbing, turning, and descending. For this exercise, select an easy hill, free of obstructions (easy to climb on foot). Start your approach to the hill by accelerating before the base of the hill. Shift into a lower gear at the base if necessary to maintain momentum while climbing the hill. Turn the ATV to the right in an arc before you reach the top. Keep turning, using your remaining momentum until you are facing downhill. Descend the hill in a lower gear and as you descend, slow by applying the brake(s).

Drill 2: Stopping while descending. As you descend the hill, slow by gradually applying the brake(s) and then stop.

Tips

- Some hills are too steep for your abilities. Use your common sense.
- Shift your body weight forward by sliding forward on the seat as you go up the hill. For steeper hills, stand on the footrests and lean forward.
- As you near the top and turn, shift your body weight to the uphill side as much as possible by leaning into the hill.
- To go downhill, shift your weight back. On steeper hills, straighten your knees and elbows and bend forward sharply at the waist so your posterior is over the back of the seat.
- Use the brake(s) to slow you down as you descend the hill, always in gear.
- The key to successful performance of this exercise is to shift your weight smoothly from forward (as you climb) to the uphill side (as you turn) and to the rear (as you descend). For smooth weight shifts, transfer weight to the footrests and raise up slightly off the seat.

Watch For:

- ATV loses all momentum going up the hill.
- ATV descends too quickly.
- Wheels lock creating a slide.
- ATV rolls backwards while you are on it.

Suggestions:

- Approach at a higher speed. Do not attempt to turn your ATV if you do not have the momentum to make the 180 degree turn. Apply the brake(s) *before* you lose speed. Don't let the ATV roll backwards.
- Maintain smooth braking. Be sure you are in gear and the transmission is engaged. Do not apply the throttle whatsoever.
- Release brakes and then immediately reapply brakes.
- DO NOT LET THE ATV ROLL BACKWARDS.** If it does, move your weight as far forward as possible by rising up on the seat, pulling the handlebars into your thighs and making sure your chin is as far forward as possible **BEFORE** applying the brake(s) gradually.

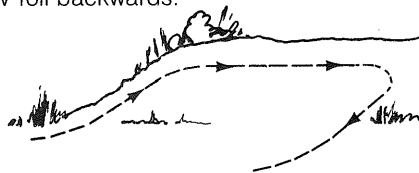
Exercise 7 – Traversing

Objective: You must be able to ride across a hill without stalling or tipping the ATV. Practicing this will help you ride over cambered or hilly terrain.

Skills: Shifting weight, maintaining balance and throttle control.

Directions: For this exercise, select an easy hill, free of obstructions. Start your approach and accelerate before the base of the hill. Shift into a lower gear at the base if necessary to maintain momentum while climbing the hill. Turn the ATV to

the right, ride across the slope and then ride down the hill. Repeat the exercise to the left. **Reminder:** Traversing hills is tricky business so practice this carefully. Remember, do NOT let the ATV roll backwards.



Tips:

- Keep both feet on the footrests.
- Apply the same principles as you did for climbing and descending.
- Exaggerate your weight shifts.
- *If the ATV wants to turn downhill as you traverse the slope, turn the front wheel(s) slightly uphill to keep the ATV going straight across the hill.*
- If the ATV begins to tip, turn the front wheel(s) downhill if the terrain allows you to. If the terrain prohibits your turning downhill, and shifting weight into the hill doesn't help, then dismount on the uphill side immediately.

Watch for:

- ATV loses momentum going up hill.
- Front wheel(s) lift as you climb.
- ATV tips as you traverse the hill or turn.
- Rear end slides downhill.
- Excessive jarring as front wheel(s) encounters bumps going downhill.

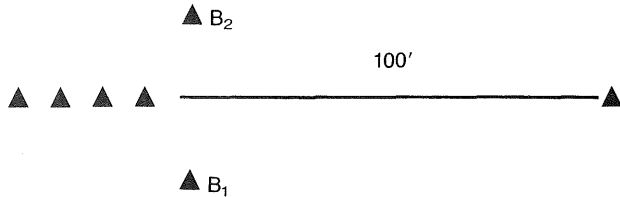
Suggestions:

- Approach at a slightly higher speed.
- Lean forward more; move way up on the seat or stand and position your torso over the front wheel. Don't accelerate up the slope.
- Lean into the hill more. Move off the seat towards the uphill side. Put weight on the uphill footrest.
- Weight the downhill footrest, while keeping your body leaning to the uphill side.
- Shift more weight to the rear. Descend more slowly.

Exercise 8 – Quick Stops

Objective: You must be able to stop in the shortest possible distance. Practicing these drills will help you be able to stop quickly should an obstacle suddenly appear.

Skills: Shifting gears, stopping, braking while turning.



Directions: Start at marker A and ride toward B1-B2 in second gear. Be sure to maintain your speed until you pass B1-B2. When the ATV PASSES markers B1-B2, stop as quick and safe as you can. Notice where you stop. Put some sort of marker down there (a rock, perhaps). Do it again and stop smoothly and quickly, but in a *shorter* distance. Make your first two attempts in second gear and remember to begin braking and shift back to first gear only AFTER you have passed the second markers. Shift to higher gears when you have mastered the exercise in second gear.

Tips:

- Keep your feet on the footrests at all times.
- Keep your head and eyes up.
- If you accidentally lock the wheel(s), release the brakes momentarily and reapply the brakes more gradually.

Watch for:

- ATV swerves to one side.
- Rear end slides or skids.
- Front end slides or skids

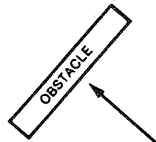
Suggestions:

- Center your body on the machine.
- Apply less rear brake pressure. Downshift smoothly.
- Apply less front brake pressure

Exercise 9 – Riding Over Obstacles

Objective: You must be able to cross an obstacle by choosing the proper approach path and by standing on the footrests. Practicing this exercise will help you maneuver the ATV over obstacles which you cannot avoid such as logs, which cross your path.

Skills: Surmounting obstacles, shifting weight.



Directions: Choose small obstacles for initial practice. A small rut, mound, or small log will work fine. Approach the obstacle at walking speed and as close to a 90 degree angle as possible. Rise up slightly on the footrests, pull up on the handlebars and apply a small amount of throttle as the front wheel(s) reach the obstacle. Lean forward and release the throttle after the front wheel(s) clear the obstacle. Return to normal riding position after rear wheels clear the obstacle.

Tips:

- Be sure to bend your elbows and knees so that you can use them as shock absorbers.
- Mounds and ruts all act as obstacles. Be sure to stand on the footrests for each.
- If only one front or rear wheel goes over the obstacle, be prepared to shift your weight and maintain balance as the ATV tips to one side.

Watch for:

- Excessive jarring from impact.
- ATV fails to continue straight over the obstacle; i.e., ATV turns to one side.
- Front wheel(s) push the obstacle rather than crossing over it.
- Rear wheels hit the obstacle with excessive impact.

Suggestions:

- Bend knees and arms more.
- Keep a firm grip on the handlebars to keep the ATV pointed straight.
- In addition to pulling up on the handlebars, apply a small amount of throttle as the front wheel(s) meet the obstacle. Release the throttle as soon as the front wheel has gone over the obstacle.
- Lean forward slightly once the front wheel(s) have gone over the obstacle in order to take weight off of the rear wheels. Release throttle.

ATV Learning Activities—Self Quiz

Circle the letter which best completes the sentence.

1. Traversing a hill involves a weight shift (a) to the downhill side. (b) to the uphill side. (c) forward, to the uphill side and then to the rear.
2. When climbing hills you should (a) speed up before ascending the hill shifting into high gear. (b) speed up before ascending the hill and shift into low gear. (c) shift body weight backwards and shift into low gear.
3. In going down hills you should (a) transfer your weight by leaning forward. (b) transfer your weight equally to both footrest. (c) transfer your weight to the rear.
4. While ascending a hill to prevent front end lifting you should (a) close the throttle while shifting. (b) Lean on the uphill footrest. (c) transfer your weight forward.
5. If, when going uphill, you cannot go any further, you should (a) apply the rear brake and stop. (b) get off the ATV. (c) use extra throttle speed.
6. If you can't see what is on the other side of the hill you should (a) slow down until you can get a clear view. (b) stop, dismount and check it out first. (c) both a & b, depending upon how steep the hill is.
7. In going up a hill, if you have to dismount, you should always dismount on the (a) downhill side. (b) uphill side. (c) to the rear.
8. If you lose forward motion when ascending a hill, before you roll backwards, you first should (a) kill the engine. (b) apply the parking brake. (c) downshift.
9. One good method for reducing brake wear when going down a hill is to (a) lean far forward. (b) turn the engine off. (c) gear down, using the compression of the engine to slow you down.

Chapter 8

Different Terrains

Objectives:

- ◆ To learn precautions for winter ATV riding.
- ◆ To realize there are differences in handling an ATV on different terrains.
- ◆ To learn how to ride through water safely.

When you feel you have safely mastered skills for climbing and descending hills and traversing slopes, the next task is to learn to be totally aware of the types of terrain in which you can ride. In this chapter we will discuss various types of terrain, from riding in water and mud to dune and snow riding. Your state may not have all of these terrains, but it is wise to know how to ride through them safely.

Reading the Lay of the Land

Always look well ahead of you by scanning the trail before you. Keep your eyes moving, looking where

you want to go. Most people have a tendency to focus on a point just ahead of the front wheel(s). If an obstacle comes up, there is not enough time to avoid it. Instead of focusing on the road ahead there is a good rule of thumb to follow.

At any given speed, you should be looking that many yards ahead. For example, at 30 m.p.h., you should be looking 30 yards ahead.

By looking far enough before you, you'll be able to pick the best "lines" over and around obstacles, knowing when to slow down. If you approach a hazard, you will not need to look directly at it. Instead, by having scanned ahead, you will be aware of its presence as you avoid it. You should always be scanning ahead for the next obstacle.

There is a good word to remember when reading the lay of the land. It is "SIPDE." Each letter of this phrase, "SIPDE," refers to the steps needed to identify any potential hazards in the lay of the land.

Riding Through Water and Mud

Your ATV is designed to ride in water and mud, but there are some precautions that must be taken. When riding through water you should keep your

Reading the Lay of the Land Procedure		
S	Scan the environment	<ul style="list-style-type: none"> ● Look far ahead (sight steering) ● Don't focus on any one obstacle (target fixation)
I	Identify hazards	<ul style="list-style-type: none"> ● Visible and hidden ● Surface composition ● Other trails users, wildlife ● Stationary objects
P	Predict what will happen	<ul style="list-style-type: none"> ● Handling ● Collision or fall
D	Decide what to do	<ul style="list-style-type: none"> ● Look for the right line ● Good traction ● Visibility ● Minimum of obstacles.
E	Execute the decision	<ul style="list-style-type: none"> ● Adjust speed ● Adjust technique

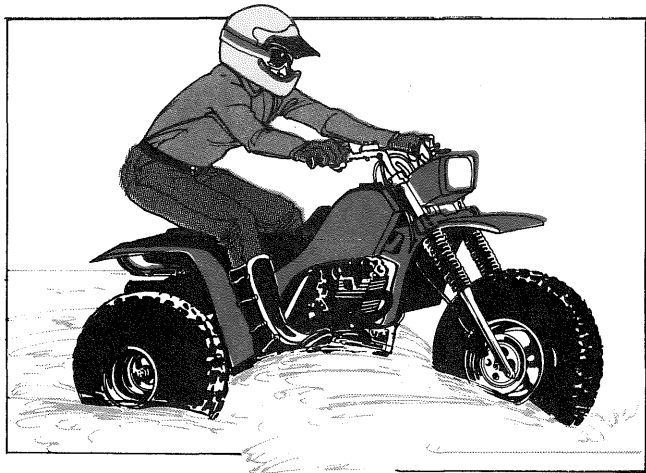
feet firmly on the footrests. Never cross any stream with deep water because your tires may float, making it difficult to maintain control. Smaller ATVs can be submerged up to about eight inches; larger ATVs up to twelve inches. Always check your owner's manual to find out the maximum depth your ATV can travel in.

Choose a course through a stream where both banks have a gradual incline. Try to cross at a known ford, or where you personally know it is safe. Safely determine the depth of the water or mud before riding through it. A clue to look for is the grass height or rocks emerging from the surface. Use a stick to help determine depth. Be careful of swift moving water.

Proceed at a slow steady speed to avoid submerged obstacles and slippery rocks. Dry the brakes after crossing by applying light pressure to them while riding until they return to normal power.

Avoid water crossings where you may cause damage to stream beds, fish spawning grounds, or erosion to the banks of the stream. By this precaution you are not only ensuring your own personal safety, but are preserving the environment for others to enjoy as well.

Don't ride through too fast. Water and mud slow the vehicle very quickly and could cause you to lose control if you approach too fast. Try a moderate speed



with higher than usual RPMs.

After running in the water, be sure to drain the trapped water by removing the drain screw. Please refer to your owner's manual for the exact position of the drain screw. Wash the machine with fresh water if you have driven your ATV in sea water.

Body positioning is very important. At times you may need to take weight off the rear by leaning far forward, while other times you may need to sit right over the rear to gain traction. You may also need to

rock the vehicle side to side to work the ATV out of a hole. By scanning ahead, you will rarely need to look directly in front of your front wheel(s).

When traction is low as in mud or snow, allow the tires to rotate at a speed that allows them to "bite". Don't rev the engine up thinking you'll go faster—you won't.

Riding In Snow

ATVs are fun in the snow. Riding in snow requires that you learn to correctly interpret snow conditions to pick the best riding areas. There is less traction than dirt, so start slow and progress gradually until you know the limits.

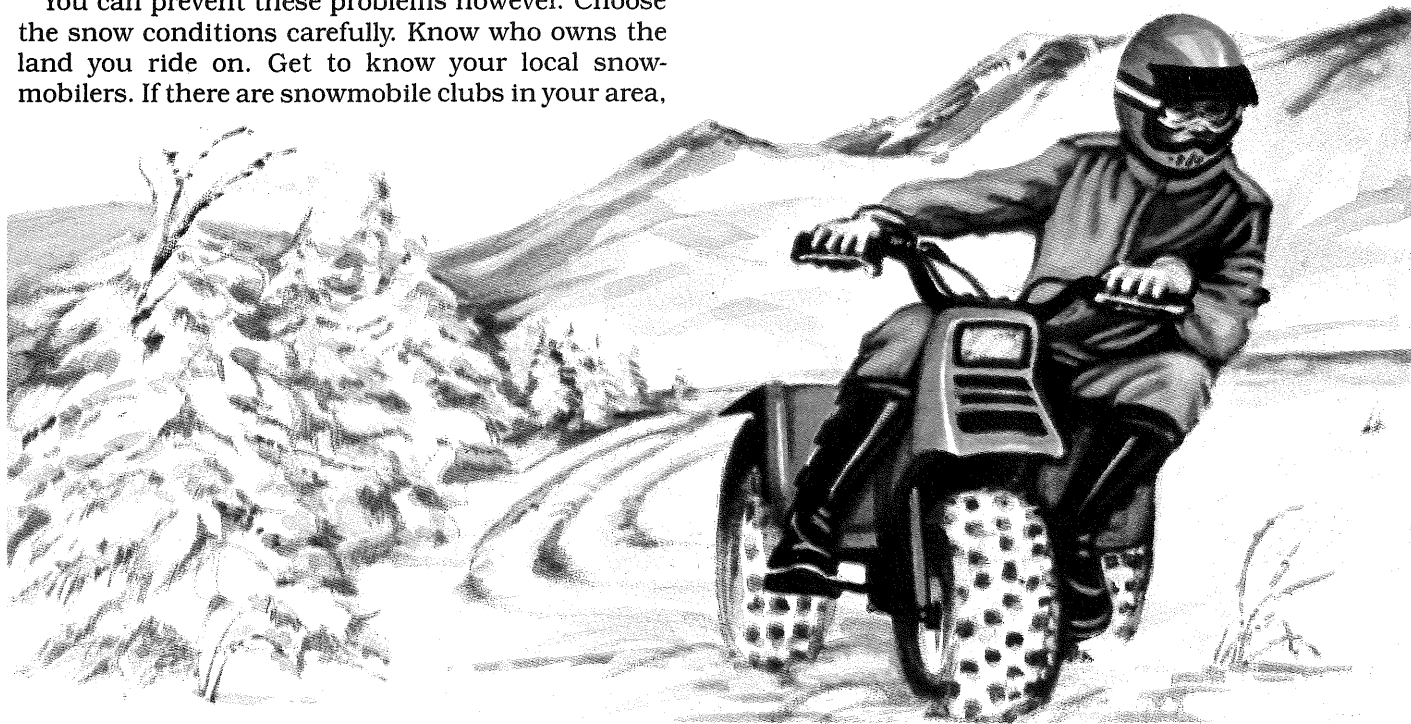
On firm snow you can have a great time and cause no problems. In soft snow, under the wrong conditions, your ride can be a disaster. ATVs do not work well in slushy snow. Be aware that a frozen trail may be nice at the start of a ride in the morning, but that by early afternoon when you may be many miles out, the trail could warm from the sun and become nearly unusable by ATVs.

Know the weather conditions and the weather forecast. Having to cart your ATV through snowdrifts is no fun. Careless winter riding can spoil things for you and everyone else. Snowmobilers can get pretty upset and rightfully so when ATVs run in

slushy snow, and ruin their carefully groomed trails. Landowners get upset when they have given permission for snowmobile trails and find others on them.

You can prevent these problems however. Choose the snow conditions carefully. Know who owns the land you ride on. Get to know your local snowmobilers. If there are snowmobile clubs in your area,

get to know them, too. By working together you can help to preserve riding opportunities for you and fellow outdoors people.



Remember that private land opened for ATVs and snowmobiles in the winter may be cropland that is off limits the rest of the year.

You will also need to change your transmission oil to a lighter weight when you ride in the snow. If your ATV is water cooled, keep anti-freeze in it. Again please refer to your owner's manual for manufacturer's recommendations.

When night riding, be certain your tail lamp is operating. Never stop just before or after a turn on the trail. Give yourself plenty of visibility to other riders. Leave a light on if you stop in the trail.

If you want to ride across lakes that are frozen, be sure to check the ice thickness. There should be a minimum of 8" of ice present to support the weight of you and your ATV.

Dune Riding

Dune riding offers great thrills and fun, but certain safety precautions are necessary to fully enjoy this type of terrain. Make certain that your ATV is equipped with an antenna flag so others can see you better. The antenna and safety flag should be at least ten feet from ground to tip (with the tip lighted at night).

Assume that wet sand is soft and could be quicksand. Do not attempt to cross unless it is a known, safe place.

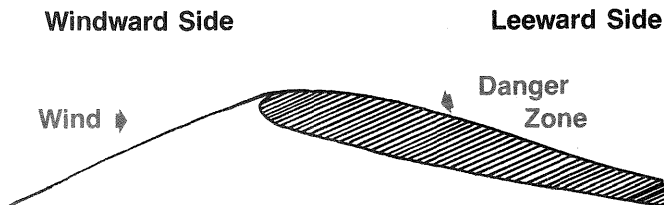
Keep off of vegetation because it helps stabilize the dunes and may hide an obstacle or hazard. Be aware of "razorback" dunes which have a gradual incline on one side (usually the windward side) and nearly a sheer drop on the other side (leeward).

You will need to ride slowly over the tops of all dunes unless you know that the dune has a rounded top and no one is on the other side. Take the time to learn and understand the layout of the dune system in which you are riding. Areas with a prevailing wind will have dunes and razorbacks facing one direction.

Razorbacks are a tricky type of dune. This is a steep sloped dune that occurs on the side of the dune opposite to the prevailing wind. They are difficult to see from the windward side. Other areas may have dunes in all shapes, sizes and directions.



This view shows how the windward side looks normal.



Normal looking dunes can deceive a rider. The windward side looks normal, while the leeward side has a dangerous drop. This problem also exists in snow conditions.

Dunes shift in size and shape. Never assume that everything is the same from one visit to the next. When the wind blows, the tracks you left ten minutes ago could vanish or the road you traveled on a few hours ago can look and drive entirely different. Drop offs can be created in a matter of hours.

Be extra careful when the sun is directly overhead because no shadows are created. The lay of the land is much more difficult to distinguish without something to gauge distance by. Sunny days produce a three to four inch heat haze on top of the sand that may create the illusion that the sand is level where large bumps and holes exist. Travel slowly under these conditions. Use a gradient lens (dark at top and clear at the bottom) or a dark lens in your goggles

to help distinguish dips, drops and holes in the sand. Wear only clear lens at night. Night riding demands extra caution. The best bet is to *slow down*. When stopping for a rest, always park at the crest of a dune. It gives you a better view and visibility.

Always leave a headlight and tail lamp on at night.

Trail Riding

Be careful of going from a sunny to shaded trail. Rocks or ruts may "hide" in the shade and your eyes cannot adjust quickly enough to see them. Gradient lenses will help this condition. Most properly designed trails are "outsloped" to allow rain to run off the surface. This means your ATV may be more "tippy" and you will especially need to keep your weight shifted into the hill.

Plan out your ride. Don't take a trail you know you can't make. Always ride within your limits. Remember that one short difficult section on an otherwise easy trail would put the trail beyond your capabilities. Standing up on the footrests slightly will aid your ability to take on rough terrain. Always be prepared to meet oncoming traffic, as most trails allow two-way travel.

ATV Learning Activity— Self Quiz

Decide whether each statement is True or False. Circle T or F.

- T — F 1. SIPDE refers to the start up routine.
- T — F 2. When riding dunes, your ATV should be equipped with a safety flag and whip antenna.
- T — F 3. ATVs work very well in slushy snow conditions.
- T — F 4. The best place to park your ATV in dune areas is on the leeward side.
- T — F 5. Scanning the lay of the land while riding an ATV is the best method for sighting obstacles.
- T — F 6. Larger ATVs are designed to ford streams and creeks up to twenty inches in depth.
- T — F 7. One good method to work your ATV out of a hole is to rock the vehicle from side to side.
- T — F 8. Gradient lenses are good for such trail conditions as moving from sunny to shaded areas.
- T — F 9. Trails are always very easy to follow when dune riding, since the sand leaves such good clear tracks.
- T — F 10. Riding in snow requires that you learn to correctly interpret snow conditions to pick safe riding areas.

ATV PERFORMANCE TEST

The course used for the Performance Test should be a dry, flat, off-road surface, free of obstacles. To set up the course you will need the following: 100' tape measure, string, stakes, 54 cones, stop watch, and an obstacle at least 6" x 6" x 6". See the following diagram for proper layout of your course. (Also refer to the Exercise Skills Preview on page 39.) If your instructor chooses not to do these tests, you can do them at home with adult help.

Test # Activity

Pass/Fail

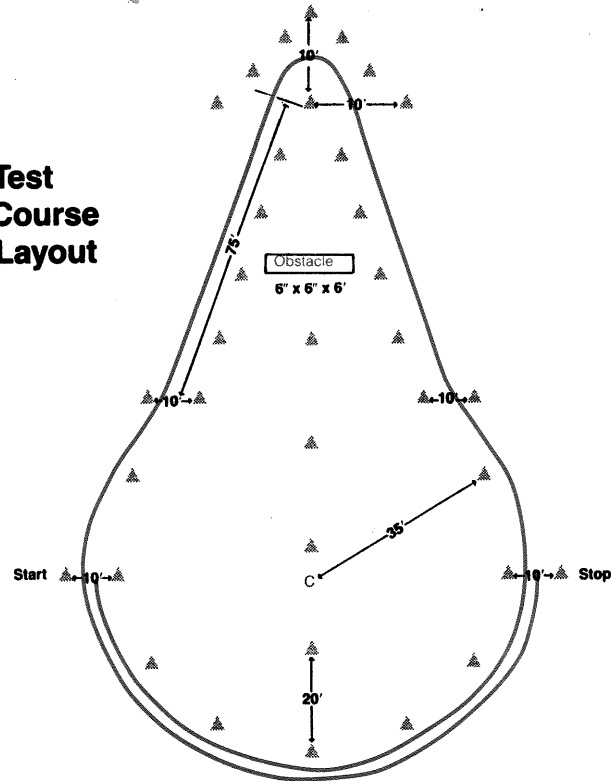
Test #	Activity	Pass/Fail
1.	Check for all safety clothing.....	
2.	Perform T-CLOC inspection.....	
3.	Start ATV using BONE-C procedure.....	
4.	Show proper sitting position.....	
5.	Show proper standing position.....	
6.	Show proper hill climbing position.....	
7.	Show proper hill descending position.....	
8.	Show proper traversing left position.....	
9.	Show proper traversing right position.....	

If you passed all nine tests, proceed to test 10.

Test 10

Turning Left and Stopping – At double cone start point, begin to go around the course. Go all the way around. When you reach the original start point, shift into low gear

Test Course Layout



to help slow your ATV. Stop at double cones on the opposite side of the start point.

1. Stay on correct path.
2. Downshift to slow speed.
3. Stop at cones opposite starting point.

TIME: _____

Test 11

Turning Right and Stopping – Reverse the direction and repeat Test 1.

TIME: _____

Test 12

Turning and Stopping on a Hill – Begin going uphill toward the practice area. Start from 25' away.

1. Stay within the cones when turning.
2. Keep weight uphill.
3. Do not roll backwards.
4. Stop at the bottom of the hill at designated point.

TIME: _____



Test 13

Slalom – Using the cones in the center of the course, you will zig-zag through them without knocking them down.

1. Do not hit cones.
2. Do not skip cones.

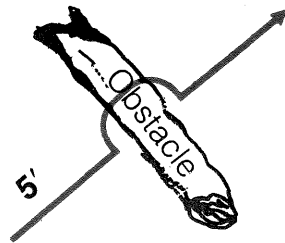
TIME: _____



Test 14

Obstacle – Place the obstacle in a clear area, free of cones, and approach it at an angle. Allow no more than five feet from the starting point to where you encounter the obstacle.

1. Do not plow.
2. Do not hang up on the obstacle.



Chapter 9

Facing the Unexpected

Objectives:

- ◆ Learn how to use a map and compass.
- ◆ Understand how to use a topographical map.
- ◆ Learn basic first aid treatments.

In coping with any unexpected event it is essential to know how to use a map and a compass. Other skills to learn are being aware of how to survive with certain terrains in case of an emergency, such as avalanche, or desert dune slide, and other emergencies, and a basic knowledge of first aid.

Map and Compass

Getting lost may not seem very serious if it only means you return home a little later than expected. But if you become lost so that you are stranded and cold, or if there is an injury which needs immediate

help, getting lost can be a tragedy.

When you are out on an ATV, it is essential to carry a compass and a good map of the area. Keep your eyes open for blaze marks, cabins, rivers, and other landmarks as you travel.

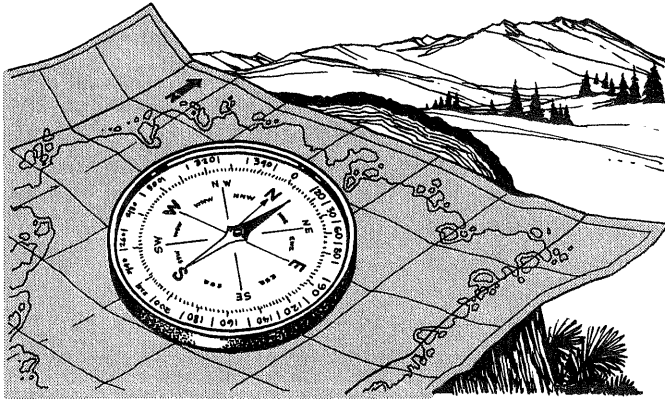
When darkness or fog covers landmarks it is impossible to know which way to go without a map and compass.

Topographic maps are best, because they show the land in three dimensions: north-south, east-west, and elevation. They can warn you of steep areas, valleys and ridges. A topographic map also tells you the number of degrees between magnetic north (where the compass arrow points) and true north (where the North Pole is). This number of degrees, called the declination, varies everywhere in the world, so you must know it for your particular area.

To use a compass and map:

1. Place map and compass on a flat surface away from any metal objects.
2. Place the compass on the map so that the north-south line on the compass dial is parallel with the map north arrow or the vertical lines on the map.

3. Turn the map and compass as a unit, until the arrow moves away from north on the compass at the proper declination noted on the map of your area. Now the map and compass are oriented.
4. If you know your location on the map, you can line up a visible landmark with its map symbol, once the map and compass are oriented.
5. If you do not know your position on a map, but you know you are somewhere along a certain line, such as a ridge, or river, or trail, you can figure



out where you are along that line. Orient the map to north using the compass (Steps 2 and 3). Take a bearing on some landmark which you can positively identify, such as a mountain peak.

The line of this bearing will intersect the trail or ridge where you are located. The point of intersection is your location on the map. As you move along in the right direction of travel, continue to take readings to recheck your position.

To find direction using a watch, lay the watch flat with the hour hand pointing toward the sun. Find the point on the watch face which is half way between the hour hand and the 12. That point will be south.

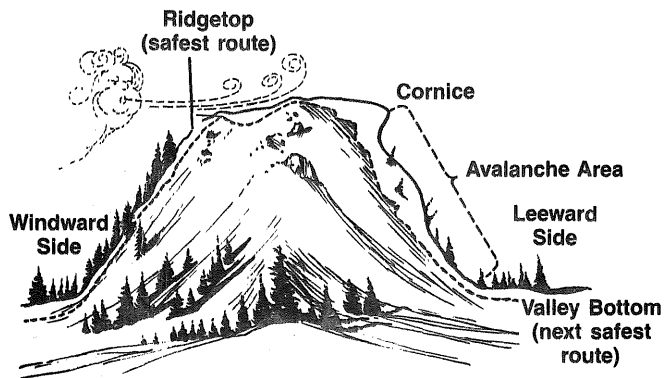
To find direction with a shadow stick, use a stick that is straight and about three feet long. Place it upright in a clear area. With a peg, mark the end of the shadow. Wait 30 minutes. Then place another peg at the end of the new shadow. The line between these two pegs is the east-west line.

If you are in a blizzard or thick fog, and you have no idea where you are, do not wander around, particularly at night. You will waste energy. As calmly as possible, take the steps necessary for survival. Build a shelter, and a fire if you can find the materials. If you must choose between wandering and staying where you are, stay put and keep yourself warm.

Avalanche

In some regions of the country, ATV riders will be operating in mountainous areas. Since one footstep is enough to start an avalanche, or "snowslide," an ATV is certainly capable of starting one. However, it is doubtful a responsible ATV operator will be found on such high elevations where avalanches usually occur.

Many potential avalanche hazards will be posted and that region closed to travel. There is enough danger in unknown areas—don't risk your life in an area you know to be hazardous.



Handling Emergencies

If your ATV breaks down and you are unable to fix it or walk out, it is extremely important to remember that you must conserve energy in order to survive. Seek shelter from the wind and restrict your body movements to reduce sweating. Your machine can be used as a windbreak or as part of a lean-to. Seek shelter in a protected area. An over-hanging rock shelf, or a clearing at the base of a tree make ideal shelters.

In a timbered area, you can make a lean-to by placing one horizontal bar between two trees or crotches in upright poles. Lean small branches against the horizontal bar. Interweave branches to thatch the shelter.

Snow banks and deep drifts offer protection possibilities. Dig a snow cave facing away from the wind, slightly larger than your body size. Line with any extra material you may have such as the seat of the ATV. Place a six-inch diameter ventilating hole in the top of the cave.

Good planning, systematic maintenance of your ATV, and traveling with a companion on another ATV will eliminate most emergencies. To be better prepared, learn and follow these steps in case of an emergency:

1. Prepare a checklist of supplies, tools and other items necessary for your ride and consult it prior to your departure.
2. Let someone know where you will be and when you will be back.
3. If a fire is needed, choose a protected spot that is not under overhanging branches with snow on them. Pick small dead branches to get a fire going. Dead brush works well also. Larger dead wood is added after small branches have a good start. Collect enough fuel before dark if you have

to spend the night.

4. Do not travel on foot in strange areas at night. Conserve your energy, because it will help keep you warm. Moderate exercise can help circulation to cold limbs, but don't overdo it. Good judgment, and common sense are always necessary to make the best of an emergency. If you become unsure of your location during a heavy storm, find shelter and keep warm.
5. In all cases, attend to injuries first, then sit down and calmly think out solutions and possibilities. Panic is your worst enemy.



Understanding Trail Signs

When riding your ATV you may encounter trail signs. They are designed to help trail riders by supplying needed information about the area. Many of the signs you encounter will be designed for snow-

mobilers. Standardized ATV trail signs are currently being developed by the U.S. Forest Service. Until they are posted, it is best to follow the snowmobile signs where applicable. Below are some of the most common trail signs for you to learn.

Regulatory Signs

Stop Sign

Purpose: To be used along a trail prior to a road crossing.
Colors: Red and silver



Dead End Private Trail

Purpose: To indicate a limited use trail or designate a restricted area.
Colors: Silver with red ball



Restrictive/Permissive

Purpose: To indicate snowmobile trails and other areas where snowmobiling is permitted or restricted. If there is a red slash in a circle, snowmobiling is *not* permitted. If there is a green circle, it means it is permitted. Check to see if ATV's are also permitted.



Warning Signs

Trail Intersection

Purpose: To indicate an intersection in the trail.
Color: Yellow or orange



Danger

Purpose: To indicate an area of danger on the snowmobile trail.
Color: Yellow



Information Signs

Trail Blazer (Fig. 1)

Purpose: Shows snowmobiler is still on the trail.
Color: Orange with black



Figure 1

Directional Blazer (Fig. 2)

Purpose: To indicate changes in trail direction.
Color: Orange with black



Figure 2

Survival Kit in a Can

A survival kit is an absolute necessity when planning a long wilderness trip on your ATV. Whether with a friend or a group, a survival kit should be included with your supplies at all times.

The kit easily fits into a can. It can be prepared to fit the local conditions. Just like the tool kit and emergency food supply, this survival kit applies to all terrains, from the woods to the desert. Ask your instructor about items needed for your local area.

How to Make a Survival Kit in a Can

1. One foot of heavy cotton string, dipped in melted paraffin and then wrapped in waxed paper. Cut off 1½" piece, fray end, light with match, and use to start fire. Burns longer and hotter than match alone.
2. Salt, wrapped in foil packet. Improves flavor of food.
3. Two snelled fish hooks. May be used with leader to catch fish.
4. Four feet of black plastic electrician's tape. Used originally to seal and waterproof can. May also be used to fasten splints on broken limb, repair torn clothing, etc.
5. Steel wool, 00 or finer. Makes excellent tinder, even after being wet. Water can be shaken out and it will start from small spark. Burns very hot but very quickly so should be used with other tinder (such as pine needles, twigs, etc.) wrapped inside to start fire.
6. Picture hanging wire. Makes excellent snare wire; may also be used in erecting shelter.
7. Water purification tablets. Use if there is any doubt about purity of drinking water.
8. Metal container, with mirror glued in lid. Mirror may be used to signal searching aircraft. Container used to melt snow for water; also may be used to mix up small quantities of soup.
9. Small tube of antibiotic ointment. Use on small cuts and burns to avoid infection.
10. Wooden matches, dipped in paraffin to make them waterproof; stick broken off to be shorter.
11. Safety pins. Use to fasten torn clothing or replace lost buttons.
12. Packet of condensed soup mix. May be mixed, small amount at a time, with water in a can.
13. Vitamin pills (one per day type). To help maintain health on inadequate diet.
14. Small whistle. Use to signal. Three blasts are recognized distress signal. Saves voice.
15. Adhesive bandages. Use on small cuts, abrasions, burns.
16. 20-lb. test leader. Use with hooks for fishing; use with needle to sew clothing, use for snares; use to lash shelter together.
17. Razor blade (single edge). Use to make fuzz stick to start fire; use to clean and skin small creatures caught for food; use to cut up belt or other material to make thongs, ties.
18. Needle with large eye. Use with leader for sewing; use to remove splinters.
19. A sealable plastic bag to protect things from moisture.
20. A surplus army belt ammo pouch for carrying and storage.

Ground-to-Air Rescue Signals

Cut out these signals. Fold and keep them in your survival kit or wallet. Stamp out a signal if in the snow, or place branches, logs or rocks to mark the signal. It should be at least 18 feet high and three feet wide so it can be easily seen from the air.

Ground-to-Air Rescue Signals



Am Going
This Way



Need
Med. Spls.



Can't
Proceed



Compass
& Map



Don't
Understand



Need
a Gun



Tell Me
Dir. to Go



Need A
Doctor



Help



Yes



No



Need
Food



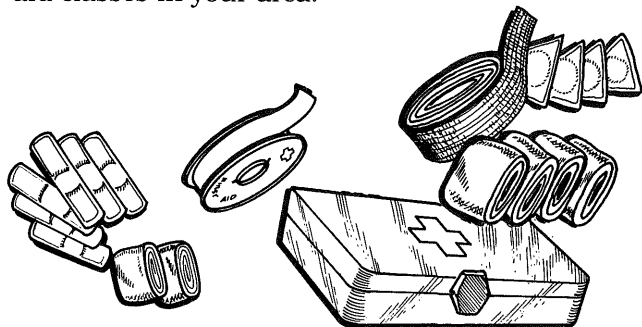
All Well

First Aid

ATV accidents can include some personal, as well as equipment injury. The most dangerous situation occurs when a person is injured and alone, miles from help. But any injury can be dangerous if you handle it carelessly. You may need to care for your own injuries and someone else's when you least expect it.

In any emergency, be calm, firm, and reassuring to the injured person. Do as much as you can for the injured person, and send others for help.

This discussion is not intended as a substitute for actual first aid training. For your own and others' protection, you should learn basic first aid. Your local Red Cross can give you information about first aid classes in your area.



First Aid Emergency Treatments

INJURY	WATCH FOR THESE SIGNS	TREATMENT
Broken Bones	Pain, tenderness, deformity, and possible bleeding.	Immobilize broken ends and adjacent ends. Control bleeding with direct pressure. Keep still and treat for shock.
Burns	Degrees: 1st – Skin is red 2nd – Skin is blistered 3rd – Skin is charred	Immediately immerse burned area in cold water – 70°. Add ice to cool water but do not apply to burned surface. Apply a cold pack to difficult areas. 3rd degree – apply a thick, dry, sterile dressing to keep the air out.
Frostbite	Skin turns white, is cold to the touch, and is rigid.	Warm the affected area as soon as possible, but warm it slowly. Do not rub victim with snow or your hand. Warm pressure against the frostbitten part is best. Place warm clothing or a blanket over the skin, but do not try to warm it too quickly near a fire or heater. Move the victim indoors as soon as possible.
Heart Failure Epilepsy	Victim is obviously ill with no apparent external injury. Clutching chest, possible convulsions.	Send for help immediately. Loosen collar, assist to a sitting or reclining position, whichever makes breathing easier. Help with prescribed medicine. For convulsions, do not restrain victim.
Objects in eyes, ears and nose	Local irritation, tearing and wetting.	Eye: Don't rub. Lift particles out with corner of clean handkerchief. If unsuccessful or particle is embedded, cover both eyes and get medical attention. Ear and nose: Get medical attention, don't try to remove.
Sunburn	Red, painful skin and chills. Fever and shock occasionally accompany severe sunburns.	Apply cold compress to sunburned area. Get medical help for severe sunburns. Prevention: Use sunscreen lotion before and during timed exposures to sun. Stop exposure when burn is first noticed.
Unconsciousness	Victim is not awake, does not respond to external stimuli.	Keep victim lying down. Cover to keep warm. Turn head to side in case of vomiting. Get medical attention. Stand by to give artificial respiration if breathing stops. Never give liquids or foods to an unconscious person.

First Aid Kit

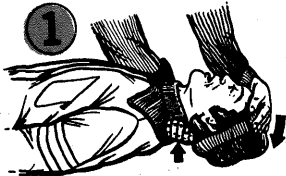
You can easily make up a first aid kit containing the following materials: 1) Six bandaids, 2) Two 2-inch compresses, 3) Four 4-inch compresses, 4) Four triangular bandages, 5) One roll of 2-inch gauze, and 6) One roll of one-inch adhesive tape.

Select a waterproof container to hold the above items; one small enough to store under your seat or in the rear compartment.

Critical Problems

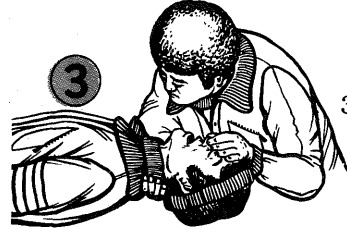
The following medical problems are very serious and can mean death for the victim if left untreated. They are: lack of breath, hypothermia, shock and broken bones. Learn as much as you can about these problems, and what to do in case they occur.

Artificial Respiration—If a person is in an accident and stops breathing, that does not mean the person is dead. You can restore breathing if you have practiced artificial respiration. Here are the steps:



1. Turn head to one side. Remove debris from mouth. Tilt head back.

2. Pinch nose shut. Place mouth over victim's. Inhale deeply and blow air into victim's lungs.



3. Remove mouth, watch victim's chest fall after each breath. Repeat steps two and three.

If you are not getting any air exchange, recheck head and jaw position and clear victim's mouth again. Breathe at a rate of 12 to 14 breaths per minute for adults, 20 shallow breaths per minute for children. Under no circumstances should resuscitation be interrupted for more than five seconds.

Broken Bones—If a person has a broken bone, you need to 1) administer first aid, 2) treat for shock, and 3) prepare for emergency transportation to get

the victim to a doctor. To determine if an accident victim has a broken bone, look for these symptoms: inability to use limb, extreme pain upon movement, deformed shape of bone (such as shortening of the limb, unnatural movement, or an unnatural position), swelling, and discoloration. Also listen to the victim's description of what occurred (if they heard the bone crack).

Always use gentleness and care in handling a person with a suspected fracture. Eliminate all unnecessary contact with the injured part.

For most breaks, bandage the limb in a splint to keep it from moving. Use flat boards or straight tree branches if necessary. For elbow, knee, or ankle breaks, do not move the joint. Splint it with a pillow or wad of clothing in the position it is found.

Always treat the victim for shock, and watch the blood circulation below the injury.

If the broken bone has pushed through the skin, do *not* try to push it back. Cover the wounded area with a large, sterile dressing and bandage; if these are not available, use clean towels, clothing, etc. Do not wash or probe the wound. Seek medical help.

Hypothermia—Hypothermia happens when the body loses heat faster than it can produce it. This

causes the temperature of the main organs (heart, kidneys, lungs and brain) to drop. It is important to know that both dry and wet cold can cause hypothermia.

The first stage of hypothermia is shivering of the body. Shivering is the body's natural reaction to cold, it produces heat. The person should move closer to artificial heat, such as eating hot food, or adding more clothing. Once the person has passed this first stage, the cold will begin to affect the brain. From this point on the person will be able to recover only with the help of others.

The more dangerous level of hypothermia is when the shivering stops. The person may look pale or blue. Movement will be slow.

Shock—Shock is a condition of poor blood circulation often caused by serious injury. Too many times a victim has been successfully treated for an injury but subsequently dies of shock. To treat for shock do the following: (1) maintain the body temperature by protecting the victim from wind and cold as much as possible, (2) keep the person lying down, elevating their feet, so that blood flows to the head and chest where it is needed most. Lying flat is the best position if there is an injury to internal organs, to the head, or for fractures.

ATV Learning Activity—Self Quiz

Match the items with the correct descriptions.

- | | |
|--|--|
| 1. Panic | _____ Topographical maps reveal this feature. |
| 2. Declination | _____ You use this technique to orient your compass to a map. |
| 3. North-South lines,
parallel to compass | _____ Bluish color of the lips, swelling of the ankles, and pains in the chest are symptoms of this medical state. |
| 4. Signal mirror | _____ A small, waterproof container with such items as band-aids, compresses, gauze, and adhesive tape. |
| 5. Artificial respiration | _____ If a person stops breathing, this technique could save his life. |
| 6. Broken bones | _____ A good device to use when you are stranded or lost. |
| 7. First aid kit | _____ An odd position of the limbs usually indicates this condition. |
| 8. Hypothermia | _____ Your worst enemy when injury or emergencies occur. |
| 9. Energy | _____ To survive in the case of the unexpected you must conserve this. |
| 10. Heart attack | _____ When the body loses heat faster than it can produce. |

Chapter 10

Responsibility

Objectives:

- ◆ To show knowledge of safe ATV riding practices.
- ◆ To show familiarity with typical ATV registration form.
- ◆ To be aware of the danger of alcohol or drug use when ATV riding.

Safety, courtesy and protection of the environment are important to all people who use the outdoors. ATV riders share the trail with other ATVs, snowmobilers and non-motorized groups, such as mountain bicyclists and cross-country skiers. All users should respect the other person's right to the trail. The list of goals that follow are good principles to follow when on the trail. Together they form a code for ATV riders. Try to think of why each point is necessary.

ATV safety is dependent on judgement, technical knowledge and acquired skill.

A Code For ATVenturers

- Know Your Operator's Manual
- Check the ATV Before You Ride
- Wear Your Helmet
- Protect Your Eyes and Body
- Get Qualified Training
- Ride With Others—Never Alone
- Ride Within Your Skill Level
- Do Not Carry Passengers
- Respect Riding Area Rules
- Keep Noise Levels Low
- Ride Straight—No Alcohol or Drugs
- Preserve the Environment
- Be Courteous to All You Meet
- Lend Your ATV to Skilled Riders Only
- Always Supervise Youngsters

**MAKE YOUR GREAT ATVenture
A SAFE ONE!**

Effects of Alcohol and Drugs

There is a lot of information available on how alcohol and drugs affect car drivers. Much less has been done on the effect on the riding skills of ATV operators. Most ATV riders would agree, however, that it takes as much or more coordination and alertness to ride an ATV or dirt bike as it does to drive a car.

Skills such as visual sharpness, reaction time and general awareness are hindered by alcohol. These skills are very critical for an ATV operator. Drinking before riding is a big risk. Using other drugs before or during operation of an ATV is equally as hazardous.

Alcohol is considered a drug but is rarely used for medical purposes. And although it is often abused, alcohol is a legal drug. Alcohol is not the only thing that can impair your ability to ride an ATV. Many prescription drugs have adverse effects on your riding skills. Even over-the-counter drugs such as cold tablets and allergy remedies can lessen your riding abilities temporarily.

The adverse effects of some drugs on driving behavior is often magnified when operating an ATV. Remember to carefully read the warning on labels of prescription and over-the-counter drugs. A cold tablet can reduce vision, alertness and perception. Most people ride ATVs because they enjoy close contact

with the machine and riding environment. Use of alcohol and other drugs can only inhibit the close relationship between the ATV operator, the machine and the trail.

Blood Alcohol Content Chart									
Body Weight in Pounds	Number of Drinks in a Two Hour Period								
	12 oz. beer = 5 oz. wine = 1 oz. 80 proof liquor								
100	1	2	3	4	5	6	7	8	9
120	1	2	3	4	5	6	7	8	9
140	1	2	3	4	5	6	7	8	9
160	1	2	3	4	5	6	7	8	9
180	1	2	3	4	5	6	7	8	9
200	1	2	3	4	5	6	7	8	9
220	1	2	3	4	5	6	7	8	9
240	1	2	3	4	5	6	7	8	9
BAC to .05%	Be Careful —Loss of judgment and coordination								
BAC .05% to .09%	Abilities Impaired —Chance of accident increased								
BAC .10% and over	Do Not Operate an ATV —High risk of accident								

Transporting your ATV

Some ATVs can be transported in another vehicle, standing up and others cannot. You need to refer to

your owner's manual for the exact procedure for your ATV. Those ATVs that can be transported standing up should have the parking brake lever locked, and the front wheel lifted up.

It is a good safety precaution to clamp the crankcase breather hose shut to prevent engine oil from leaking into the air cleaner case when the front wheel is elevated. All the fuel must be drained, too. Have a suitable container to catch the fuel.

Be careful around gasoline. It is highly flammable, and can be very harmful if swallowed, vapors inhaled, or if it gets into your eyes. Make sure that the fuel cock is turned to the "OFF" position after the fuel is drained.

If using a trailer (instead of the back of a four-wheel drive or another vehicle) make sure the trailer meets the safety requirements of your state pertaining to lights, hitch, coupling and safety chains. Make sure the ATV is fastened tightly. Rope can be used, but a chain is best, since rope or rubber tie-downs are easily frayed by sharp metal edges and may stretch too far, allowing movement in transit.

Make sure you allow ample time for the engine and muffler to cool off before transporting it. People have burned their hands touching a hot engine or muffler when loading their ATV too soon after a ride.

Crossing Roads

ATVs are designed for and must be operated *OFF-ROAD* only. However, on occasion you may find it necessary to cross a road. This is common in farm areas where the ATV is used for various work purposes. *The leading cause of accidents and fatalities for ATV riders is from riding on or crossing the road illegally.* The hazards of crossing a road cannot be overemphasized. Besides using common sense, caution and courtesy, you must also follow the laws of your state when crossing a road. Also use the following procedures:

1. Bring your ATV to a complete stop on the shoulder of the road.
2. Yield the right of way to all oncoming traffic. Look both ways.
3. Cross at a 90 degree angle at a place where there are no obstructions and your visibility is good.
4. Make sure you know your state's laws and legal procedure before you attempt any road crossings.
5. Remember, crossing the road, or illegally riding on the road is the **NUMBER ONE CAUSE OF SERIOUS ACCIDENT OR FATALITIES OF ATV USERS**, so use extra caution.

Registration

Laws provide an understanding between ATV riders and law enforcement officers concerning the proper way to act while riding off-road. These laws protect people, property and the sport of ATV riding.

In Minnesota the Department of Natural Resources is responsible for the administration of ATV laws. ATV operators are grouped with other off-road vehicles, or ORVs. In other states/provinces you may find the ATV administration with the Department of Parks and Recreation, the Department of Motor Vehicles, the Conservation Commission or some other agency. This agency will be able to give you information on laws, maps, trails, ATV clubs and safety training courses.

Since ATVs are so new, Minnesota laws are still being refined. A separate publication from the DNR will inform you of the correct rules and regulations.

Safe Riding Review

Here is a basic summary and review of safe riding tips to make your ATV riding more safe and enjoyable:

1. Don't mix alcohol or drugs with ATV riding.
2. Use safety antenna flags and wear bright clothing to increase your visibility to others.

3. Use maps and compass if you are riding in an unfamiliar area. Make a mental note of landmarks; you may need them if you are stranded. If you are lost at night, do not move around. You will waste valuable fuel that you can use to ride safely in the daylight.
4. Carry a first aid pack with you.
5. Your ATV repair kit should include the manufacturer's tool kit as well as some wire, tape, elastic cords, and possibly locking pliers and a tow rope.
6. Carry some snacks and a water supply with you.
7. Always ride with a buddy; there will be plenty of times when you'll be grateful for a helping hand.
8. Don't ride beyond your ability. Practice advanced maneuvers only under controlled conditions.
9. Watch out for thin ice which may be camouflaged by snow.
10. ATVs are designed for *off-road use only* and should never be driven on pavement.
11. Tell someone when you are going and when you expect to return.
12. Never follow directly behind another rider because this restricts your visibility.

ATV Learning Activity—Discussion Questions

The following situations are designed to assist the ATV owner/operator in examining areas which are not always defined in terms of legal responsibility. Rather, these situations revolve around questions of personal choice, conscience, peer pressure, consumer awareness, and safety issues which call for quick, best-estimate decision making.

These situations are best used by having the students respond individually, then moving to group discussions during which they can share their viewpoints and ideas about gray areas.

SITUATION 1—You and three other ATV owners are riding together when you all reach a deep and fairly swift stream. A discussion begins about whether or not any of you should try to cross that stream. You tell your friends that you think crossing is too risky, for a number of reasons. They disagree with you. One by one, they each cross the stream on their ATVs, but with great difficulty. Finally they are all on the opposite shore except you. Your friends are now making fun of you and calling you “chicken”. What would you do?

SITUATION 2—Your best friend in the world asks you to let him ride your new ATV. You only have

one helmet and it is much too small for him to wear. You tell your friend that it is very dangerous to ride without a helmet. He coaxes you further saying, “Good buddies don’t let each other down.” What would you do?

SITUATION 3—You drive your ATV to a friend’s private party up the trail. When you reach the party, you notice that beer and wine are being served. Although you have declined to drink, the host of the party encourages you to “loosen up and have a couple.” He tells you that since you’re driving an off road vehicle, you don’t need to be concerned about drunk driving laws. And, he further mentions, since they are miles from “civilization”, the teen-agers can all drink, too. What would you do?

SITUATION 4—A State Trooper has caught you operating your ATV on a public road for the third time. On previous occasion, he let you off with a stiff warning. This time he wants to know where you live so he can talk to your parents about your violation. He says if you don’t give him the true information, which he will verify, he will confiscate and impound your ATV at Trooper headquarters. What would you do?

Glossary of ATV Terms

ANTENNA FLAG—A 10 foot long fiberglass pole topped with an orange triangular flag fixed to an ATV to improve visibility in very hilly terrain, such as sand dunes. Also referred to as "whip antenna."

ATV—An abbreviation whose initials stand for All-Terrain Vehicle, which is any motorized off-highway vehicle 50 inches or less in width. ATVs usually have a dry weight of 600 pounds or less, traveling on three or more low pressure tires and having a seat designed to be straddled by the operator.

AXLE—The drive rod on which the rear wheels turn.

BODY ENGLISH—A deliberate shifting of body weight and position by the ATV rider used to accomplish ordinary ATV maneuvers.

BONE-C—A way to remember the pre-start routine:

B - Brake (set parking brake), O - On (fuel and ignition on),
N - Neutral, E - Engine Stop Switch, C - Choke.

BRAKES—The parts of an ATV which allow the operator to slow down or stop the machine.

BRAKE LEVER—The hand brake located on the left handlebar.

BRAKE PEDAL—The foot brake which is operated by the right foot.

CABLES—Heavy insulated wires. There are two kinds: mechanical and electrical. Brake cables are mechanical. The headlamp cable is electrical.

CARBON MONOXIDE—A poisonous gas which is also colorless and odorless. It comes out of the exhaust pipe of an ATV when the engine is running. Breathing carbon monoxide can be fatal.

CARBURETOR—Device which feeds the engine the proper mixture of fuel and air.

CHOKE—A device which alters the mixture of gasoline and air sup-

plied to the engine to provide the gassy mixture required for cold engine start-up.

CLUTCH—Device attached to the gear change pedal which momentarily disconnects the spinning engine from the gears so that the gears may be shifted or changed.

DRIVE CHAIN—The chain which connects the engine to the rear axle to give an ATV drive or forward motion.

ENGINE STOP SWITCH—Switch used to "kill" the engine quickly, without removing the hands from the handlebars.

ENVIRONMENT—All natural things in our surroundings including air, land, water, wildlife, plant life and people.

EXHAUST—Leftover gases from the combustion process that come out of the tailpipe when the ATV engine is running. Exhaust contains deadly carbon monoxide gases.

EYE PROTECTION—Goggles or a shatter resistant shield worn over the eyes while riding to protect against dust, flying insects, small branches or other debris. Such eye protection is also effective against bright sun or snow-glare conditions.

FLOODING—A condition which occurs in the engine when the cylinder fills with raw gas and fails to start. This condition usually resolves itself if the engine is allowed to sit quietly and drain.

FOOT REST—Horizontal bar below the engine on which an ATV operator should rest his feet while riding; also known as a footpeg

FUEL VALVE—A valve, usually hand operated, with an on, off and "reserve" position, which controls gas flow to the carburetor.

GASOLINE—A highly flammable liquid mixture of hydrocarbons which is the typical fuel for ATVs.

HANDLEBAR—The metal bar attached to the front end of the ATV which you hold with one hand at each end. Many of the controls for the ATV are located on the handlebar.

HELMET—The most important protective clothing to be worn when operating your ATV. It covers the head and protects against skull fracture or brain injury in an accident.

KNOBBIES—Tires with square rubber protrusions or knobs for good off road traction.

OFF-ROAD or OFF-HIGHWAY VEHICLE—Any vehicle, including ATV's, which is restricted by law from operating on public roads reserved for general motor vehicle traffic.

PARKING BRAKE—A mechanism located on the handlebar which holds the brake so the ATV cannot roll.

PLOWING—A condition in which the front wheel(s) turn, but the ATV continues to go straight ahead, causing the front tire(s) to slide.

PSI—Refers to air pressure in the tires and stands for Pounds per Square Inch, the American unit of air pressure.

RAZORBACK (see Slipface)—A dune with a sharp edge. One side has a gradual slope, the other has a steep, sharp incline.

RECOIL STARTER—The pull cord mechanism used to start many ATVs.

READING THE TERRAIN—Looking well ahead during off-road riding, to anticipate hazards, and choose the best line of travel.

RPM—Revolutions per minute, used to describe the engine speed.

SAFETY—The prime thing to aim for when operating an ATV. Safe operation of an ATV includes maintaining your vehicle in good condition, wearing the recommended protective clothing, plus staying alert

to terrain/trail conditions while driving.

SHIFT PEDAL—On those ATV's equipped with a shift pedal, it allows the operator to change gears to suit the needs of the terrain. The shift pedal is operated by the left foot.

SHOW-OFF—A careless, thoughtless rider who operates an ATV without regard for the personal safety or private property of others—usually for the main purpose of getting attention.

SIPDE—A way of remembering the mental process of reading the lay of the land: S - Scan, I - Identify, P - Predict, D - Decide, E - Execute.

SLIPFACE—A hazard peculiar to sand dunes. A very steep slope that occurs on the side of the dune opposite to the prevailing wind. Generally it is hard to see from the windward side of the dune.

SPARK PLUG—A user-servicable part within the engine which provides the spark for ignition of the gassy mixture in the cylinder.

SWITCHBACK—A sharp curve that leads into a sharp curve in the opposite direction.

TAILPIPE—That part of the exhaust system which expels waste gases.

T-CLOC—A way to remember the pre-ride inspection routine: T - Tires and wheels, C - Controls and cables, L - Lights and electrics, O - Oil and fuel, C - Chain and chassis.

THREE-WHEELER—One type of ATV.

THROTTLE LEVER—The lever operated by the right thumb which controls the engine speed.

TRACTION—Tread friction between the ground and the tires.

TRANSMISSION—The series of gears, shafts, belts, chains and sprockets used to transmit motive force from the engine to the wheels.

WEIGHT TRANSFER—The temporary change in weight distribution which occurs during maneuvering.

**Minnesota Department
of Natural Resources**
Law Enforcement Division
500 Lafayette Street
St. Paul, MN 55146



*** MUST BE COMPLETED AND PRESENTED TO INSTRUCTOR AT EVALUATION SESSION**

NA-1272-01



STATE OF
MINNESOTA

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF ENFORCEMENT

ATV SAFETY TRAINING PROGRAM

REGISTRATION AND PARENTAL RELEASE

(PLEASE PRINT)

STUDENT	(First Name)	(Middle Name)	(Last Name)
ADDRESS (Street, RFD, Box Number)	(City/Town)	(State)	(Zip Code)

NOTE: An individual's birth date is required by law before an ATV Safety Permit can be issued. All information furnished on this form will become Public Record when a permit is issued.

Date of Birth (Month, Day, Year)	County
----------------------------------	--------

I hereby give permission for the above named student to attend the evaluation session of the Minnesota ATV Safety Training Program and waive any claim or cause of action of any nature arising as a result of, or in connection with, the instruction or use of the aforementioned facilities by the above named student, or arising from his or her presence on or about the said property of facilities of the said organization, its instructors or representatives.

I verify that the above named student has completed the home study portion of the Minnesota ATV Safety Training Program.

SIGNATURE OF PARENT OR GUARDIAN	Date
---------------------------------	------

INSTRUCTOR'S CHECK LIST

PASS

FAIL

Home Study Book Completed

Written Test

DRIVING TEST

Pre-Ride Inspection

Right Turn

Left Turn

"Figure 8"

Uphill

Downhill (actual or simulated)

Sidehill (actual or simulated)

Stop

Road Crossing

Shifting

*** MUST BE COMPLETED AND PRESENTED TO INSTRUCTOR AT EVALUATION SESSION**

NA-01259-01



ATV SAFETY TRAINING PROGRAM

TEMPORARY PERMIT

STUDENT	(First Name)	(Middle Name)	(Last Name)
ADDRESS (Street, RFD, Box Number)		(City/Town)	(State) (Zip Code)

Date of Birth (Month, Day, Year)	County
----------------------------------	--------

This is to certify that the above named student has successfully completed the Minnesota ATV Safety Training Program. This Temporary Permit is valid for 60 days from the date the program was completed as specified above.

Instructor's Signature	Date
------------------------	------

SIGNATURE OF PARENT OR GUARDIAN	Date
---------------------------------	------

ATV PRE-RIDE CHECK LIST

- Protective Clothing (boots, gloves, etc.)
- Helmet with Eye Protection
- Pre-Ride Inspection
 - 1) Tires and Wheels
 - inspect tire pressure & tire condition
 - check wheels for loose axle nuts
 - 2) Controls
 - check throttle & brake controls
 - foot shifter should be firmly attached
 - 3) Lights & Switches
 - ignition switch
 - engine stop switch
 - headlight & tail lights
 - 4) Oil & Fuel
 - proper levels of each
 - check for leaks
 - 5) Chain/Drive Shaft
and Chassis
 - adjust & lubricate chain
 - oil supply for shaft drive
 - check for loose bolts & nuts
- Always Carry a Tool Kit

PARENTS - A WORD OF CAUTION

An ATV is not a toy, but a vehicle with very unique handling characteristics. The improper use of an ATV can result in severe injury or loss of life.

Your child's safety is our primary concern. Do not allow your child to practice any of the riding exercises outlined in this home study course without qualified adult supervision.

The Minnesota ATV Safety Training Program requires that you, the parent, learn ATV safety first, so that you will be qualified to supervise and instruct your child on ATV safety. Therefore, it is your responsibility to read the enclosed materials thoroughly and follow directions carefully.

THE ATV SAFETY CERTIFICATION TEST

Your child is qualified to take the ATV Certification Test after completing the home study course.

The test will be given in your community by volunteer ATV instructors. It will include a review of safety procedures and riding skills, a written exam and a riding performance evaluation.

The time and location of the Certification Test will be published in the local newspapers, announced in schools or on the local radio stations. (You may also wish to contact your local conservation officer, any DNR Regional Enforcement office, or the St. Paul office at 612/297-4897).

HOME STUDY COURSE MATERIALS - HOW TO PROCEED

1) The Training Manual

Parents, your child is required to carefully study the training manual and complete the "self quiz" at the end of each chapter. Your child must bring the manual to the certification test. Instructors will check to see if the work is completed. Any child that has not completed the "self quizzes" will not be given the certification test.

2) Registration and Parental Release Form

Parents, it is your responsibility to complete this form accurately. Your child is required to present this form to the ATV instructor for admission to the ATV certification test session.

3) ATV Driving Course Diagram

The certification test session includes a basic driving course designed to evaluate your child's skill in operating an ATV. By practicing the "exercises" outlined in the manual, your child will develop the skills necessary to pass the performance evaluation. Practice should be done only with qualified adult supervision.

4) ATV and Trespass Law

Parents, both you and your child have a responsibility to learn ATV laws and regulations.

If you have any questions about ATV training, contact your local conservation officer or the Safety Training office in St. Paul.

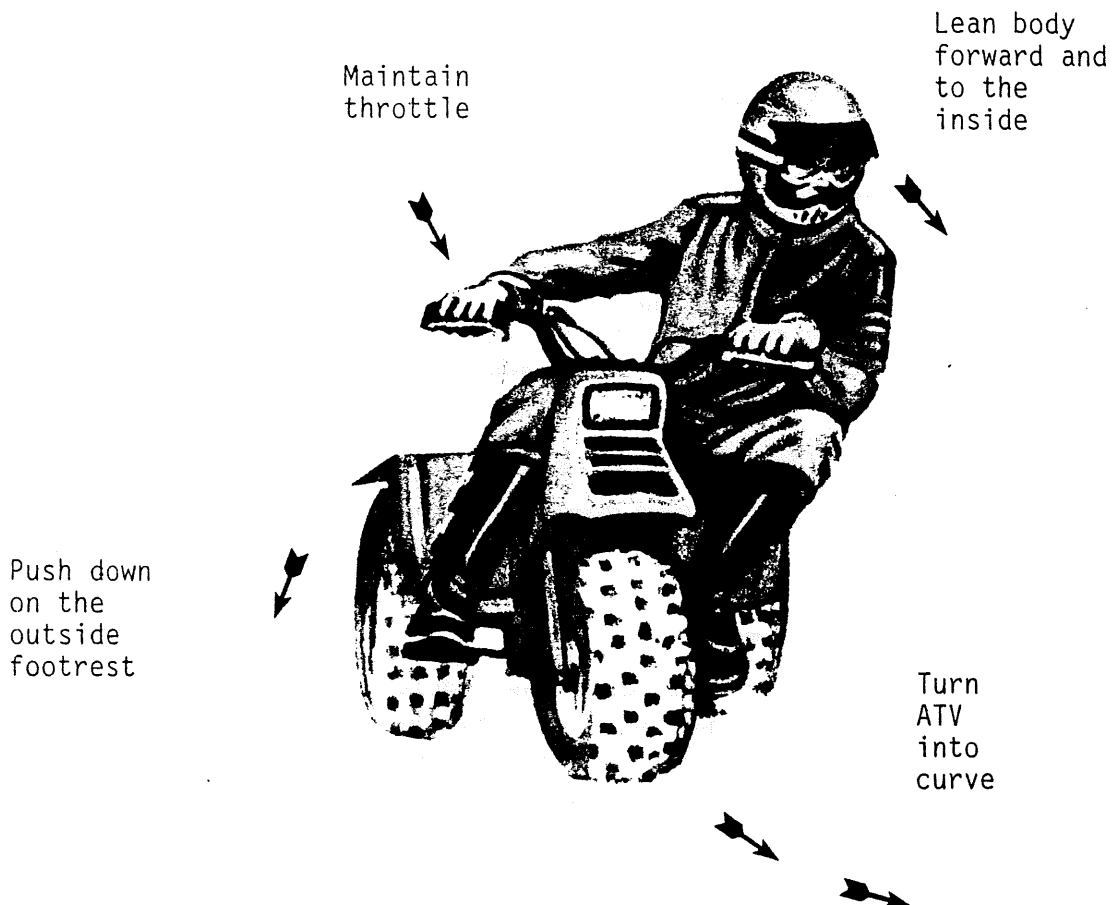
Sincerely,

The Safety Training Staff
Division of Enforcement

CORRECTION:

The illustration on page 37 of the Training Manual incorrectly demonstrates how to turn an ATV.

The diagram below shows the recommended method:



State of Minnesota
THREE-WHEEL OFF-ROAD VEHICLES LAW

84.92 DEFINITIONS. Subdivision 1. The definitions in this section apply to sections 84.92 to 84.929, and Laws 1984, Chapter 647, Section 9.

Subd. 2. "Commissioner" means the commissioner of natural resources.

Subd. 3. "Dealer" means a person engaged in the business of selling three-wheel off-road vehicles at wholesale or retail.

Subd. 4. "Manufacturer" means a person engaged in the business of manufacturing three-wheel off-road vehicles.

Subd. 5. "Owner" means a person, other than a person with a security interest in or title to a three-wheel off-road vehicle and entitled to the use and possession of the vehicle.

Subd. 6. "Person" means an individual or an organization as defined in section 336.1-201, paragraph (30).

Subd. 7. "Register" means the act of assigning a registration number to a three-wheeler off-road vehicle.

Subd. 8. "Three-wheel off-road vehicle" or "vehicle" means a motorized flotation-tired vehicle of not less than three low pressure tires, but not more than six tires, that is limited in engine displacement of less than 800 cubic centimeters and total dry weight less than 600 pounds.

84.922 REGISTRATION. Subdivision 1. General Requirements.

Unless exempted in subdivision 8, after January 1, 1985, a person may not operate a three-wheel off-road vehicle within the state unless the vehicle has been registered. After January 1, 1985, a person may not sell a vehicle without furnishing the buyer a bill of sale on a form prescribed by the commissioner.

Subd. 2. Application, Issuance, Reports. Application for registration or continued registration shall be made to the commissioner of natural resources, the commissioner of public safety or an authorized deputy registrar of motor vehicles on a form prescribed by the commissioner. The form must state the name and address of every owner of the vehicle and be signed by at least one owner. Upon receipt of the application and the appropriate fee the commissioner shall register the vehicle assign a registration number that must be affixed to the vehicle in a manner prescribed by the commissioner. The commissioner shall use the snowmobile registration system to register vehicles under this section. Each deputy registrar of motor vehicles acting under section 168.33 is also a deputy registrar of vehicles. The commissioner of natural resources in agreement with the commissioner of public safety may prescribe the accounting and procedural requirements necessary to assure efficient handling of registrations and registration fees. Deputy registrars shall strictly comply with the accounting and procedural requirements. A fee of 50 cents in addition to other fees prescribed by law shall be charged for each vehicle registered by a deputy registrar, and shall be deposited in the treasury of the jurisdiction where the deputy is appointed, or retained if the deputy is not a public official.

Subd. 3. Registration Card. The commissioner shall provide to the registrant a registration card that includes the registration number, the date of registration, the make and serial number of the vehicle, the owner's name and address, and additional information the commissioner may require. Information concerning each registration shall be retained by the commissioner. Upon a satisfactory showing that the registration card has been lost or destroyed the commissioner shall issue

a replacement registration card upon payment of a fee of \$5. The fees collected from placement registration cards shall be deposited in the three-wheel off-road vehicle account.

Subd. 4. Report of Transfers. A person who sell or transfers ownership of a vehicle registered under this section shall report the sale or transfer to the commissioner within 15 days of the date of transfer. An application of transfer must be executed by the registered owner and the purchaser on a form prescribed by the commissioner with the owner's registration certificates, a bill of sale and a \$5 fee.

Subd. 5. Fees for Registration. The fee for registration of each vehicle under this section shall be \$15 for three calendar years. The commissioner or commissioner of public safety shall charge an additional \$3 per registration granted. The fees collected under this subdivision shall be credited to the three-wheel off-road vehicle account.

Subd. 6. Renewal. Every owner of a three-wheel vehicle must renew registration in a manner prescribed by the commissioner upon payment of the registration fees in subdivision 5.

Subd. 7. Vehicles Owned by State or Political Subdivision. A registration number must be issued without the payment of a fee for three-wheel vehicles owned by the state or a political subdivision upon application.

Subd. 8. Exemptions. A registration is not required for the following;

- (1) vehicles being used for work on agricultural lands;
- (2) vehicles owned and used by the United States, another state, or political subdivision;
- (3) vehicles covered by a valid license of another state or county that have not been within this state for more than 30 consecutive days;
- (4) vehicles used exclusively in organized track racing events; and
- (5) vehicles being used on private land with the permission of the landowner.

84.923 REQUIREMENTS OF MAKERS OF THREE-WHEEL OFF-ROAD VEHICLES. Subdivision 1.

Identification Number. All vehicles made after January 1, 1985, and sold in the state, must have manufacturer's permanent identification number stamped in letters and numbers on the vehicle in the form and at a location prescribed by the commissioner.

Subd. 2. Registration Number. All vehicles made after January 1, 1985, and sold in the state, must be designed and made to provide an area to affix the registration number. This area shall be at a location and of dimensions prescribed by the commissioner.

84.925 EDUCATION AND TRAINING PROGRAM. Subdivision 1. Program Established.

The commissioner shall establish a comprehensive three-wheel off-road vehicle environmental and safety education and training program, including the preparation and dissemination of vehicle information and safety advice to the public, the training of three-wheel off-road vehicle operators, and the issuance of three-wheel vehicle safety certificates to vehicle operators over the age of 12 years who successfully complete the three-wheel off-road vehicle environmental and safety education and training course. For the purpose of administering the program and to defray a portion of the expenses of training and certifying vehicle operators, the commissioner shall collect a fee of not to exceed \$5 from each person who receives the training and shall deposit the fee in the three-wheel off-road vehicle account. The commissioner shall cooperate with private organizations and associations, private and public corporations, and

local governmental units in furtherance of the program established under this section. The commissioner shall consult with the commissioner of public safety in regard to training program subject matter and performance testing that leads to the certification of vehicle operators.

Subd. 2. Youthful Operators. (a) A person under the age of 14 years may not operate a three-wheel off-road vehicle on any public land or water under the jurisdiction of the commissioner unless accompanied by an adult on the vehicle or on an accompanying three-wheel off-road vehicle or on a device towed by the same or an accompanying three-wheel off-road vehicle. However, a person 12 years of age or older may operate a three-wheel off-road vehicle on public lands and waters under the jurisdiction of the commissioner if he has in his immediate possession a valid three-wheel off-road vehicle safety certificate issued by the commissioner.

(b) It is unlawful for the owner of a three-wheel off-road vehicle to allow the vehicle to be operated contrary to the provisions of this section.

84.926 VEHICLE USE ALLOWED ON PUBLIC LANDS BY THE COMMISSIONER.

On a case by case basis, after notice and public hearing, the commissioner may allow vehicles on public trails under his jurisdiction during specified times.

84.927 REGISTRATION FEES; UNREFUNDED GASOLINE TAX; ALLOCATION. Subdivision 1. Registration Revenue. Fees from the registration of three-wheel off-road vehicles and the unrefunded gasoline tax attributable to vehicle use under section 296.16 shall be deposited in the state treasury and credited to the three-wheel off-road vehicle account.

Subd. 2. Purposes. Subject to appropriation by the legislature, money in the three-wheel off-road vehicle account may only be spent for the following purposes:

- (1) the education and training program under section 84.925;
- (2) administration and implementation of sections 84.92 to 84.929 and Laws 1984, Chapter 647, Sections 9 and 10; and
- (3) acquisition and development of vehicle use areas.

84.928 OPERATION ON STREETS AND HIGHWAYS. Except as provided in chapter 168 or in this section, a three-wheel off-road vehicle may not be driven or operated on a highway. A vehicle may make a direct crossing of a street or highway provided:

(1) The crossing is made at an angle of approximately 90 degrees to the direction of the highway and at a place where no obstruction prevents a quick and safe crossing;

(2) The vehicle is brought to a complete stop before crossing the shoulder or main traveled way of the highway;

(3) The driver yields the right of way to all oncoming traffic that constitutes an immediate hazard;

(4) In crossing a divided highway, the crossing is made only at an intersection of the highway with another public street or highway; and

(5) If the crossing is made between the hours of one half hour after sunset to one-half hour before sunrise or in conditions of reduced visibility, only if both front and rear lights are on.

84.929 PENALTIES. Any person who violates any provision of sections 84.922 to 84.925 is guilty of a petty misdemeanor.

STATE OF MINNESOTA

TRESPASS LAW

100.273 TRESPASS. Subdivision 1.

For purposes of this section, "agricultural lands" means lands containing plowed or tilled fields, stand crops or their residues, or lands with a maintained fence for the purpose of enclosing domestic livestock.

Subd. 2. No person shall enter upon the agricultural lands of another with the intent of hunting big or small game nor shall any person intentionally enter upon the agricultural land of another for the purpose of pleasure driving, including snowmobiling or operating any motorized vehicle, unless and until the permission of the owner, occupant, or lessee is obtained.

Subd. 3. No person shall enter upon any land not his own regardless if it is agricultural land with intent to take any wild animals after being notified not to do so, whether orally by the owner, occupant or lessee, or by signs erected pursuant to subdivision 6.

Subd. 4. No person shall enter or leave the lands of another, or pass from one portion of another person's land, through a closed gate without returning the gate to its original position, nor shall any person destroy, cut or tear down any fence, building, grain, crops, any sign erected pursuant to subdivision 6 or live trees, or wound or kill any domestic animals.

Subd. 5. No person shall take any wild animal with a firearm without the written permission of the owner or occupant of the premises on any private agricultural land not his own or any public right-a-way within 500 feet of any building occupied by a human being or by livestock, or within 500 feet of any stockade or corral containing livestock, nor shall any person take any wild animal with a firearm within 200 feet of any building occupied by a human being on any land other than agricultural land without the oral permission of the owner or occupant of the premises, or within 500 feet of any burning area.

Subd. 6. No person shall erect "no hunting", "no trapping", "no fishing", "no trespassing", or other signs prohibiting trespass upon any lands or waters in which he has no right, title, interests, or license. The owner, occupant, or lessee of any private land, or a duly constituted legal authority of public land, may erect signs prohibiting trespassing, hunting, trapping, or fishing if the signs bear letters not less than two inches high, are signed by the owner, occupant, or lessee, and are posted at intervals of not more than 1000 feet upon the boundaries of the area so protected, or in a wooded area where boundary lines are not clear, at intervals of not more than 500 feet.

Subd. 7. In taking raccoon, bobcat, coyote or fox when treed or bay on private land with the aid of dogs, a person while on foot may, without permission of the landowner, enter such private land to retrieve any dogs and then shall immediately leave the premises. During the season for taking big or small game, a hunter may on foot retrieve a wounded big or small game animal from a agricultural land of another which is not posted pursuant of subdivision 6, without permission of the landowner, and shall

then leave as soon as possible.

Subd. 8. All conservation and peace officers shall enforce the provisions of this section.

Subd. 9.

(a) Violation of any provision of this section is a misdemeanor, except as provided in paragraph (b).

(b) A person is guilty of a gross misdemeanor who: (1) knowingly disregards signs prohibiting trespass, (2) trespasses after personally being notified by the landowner or lessee not to trespass, or (3) is convicted of violating this section more than once in a three-year period.

(c) Upon a person's conviction for violating any provision of this section, any license issued to him pursuant to Chapter 98, or any registration pursuant to section 84.82, under which he was exercising or attempting to exercise a privilege while violating this section shall immediately become null and void.

(d) A person convicted of a gross misdemeanor under paragraph (b) may not be issued a license to hunt or trap any wild animal for two years after the conviction.

NOTE: This law does not give any person permission to enter onto posted land or to remain on private land, including roadsides owned in fee title, after the landowner has requested that they leave. Also, even though a body of water may be considered to be public waters or wetlands it does not entitle anyone to cross private land in order to gain access to the water. RESPECT THE PROPERTY OF OTHERS.

