A photograph of two riders on a yellow and black ORV (Off-Road Vehicle) splashing through water. The riders are wearing helmets and goggles. The ORV is a Can-Am Outlander 500 Max. The scene is dynamic, with water splashing around the vehicle. The background is a bright, hazy light, possibly from the sun reflecting off the water.

# Today's ORV RIDER

*A COURSE ON  
SAFE AND RESPONSIBLE  
OFF-ROAD VEHICLE OPERATION*

# Children Are at Risk



## Your Role as a Parent

You will be your child's teacher and safety advisor, so you must be familiar with your youngster's OHV. You will need to know the controls, handling characteristics, maintenance requirements, and proper riding techniques.

## OHV Guidelines by Age

For your child's safety, you must match your child with an OHV that is appropriate for his or her age. On newer OHVs, look for the warning label that shows what age children should not ride that machine. OHVs fall into the following categories:

- Y-6+: For ages 6 and older
- Y-10+: For ages 10 and older
- Y-12+: For ages 12 and older
- T (Transition): For ages 14 and older
- Adult: For ages 16 and older

## Note to Parents: Is Your Child Ready To Ride an OHV?

Many states have laws specifying the minimum age at which a person may ride an OHV unsupervised. If your child meets the age requirement, it's your job to assess whether he or she is truly ready to ride. To make an informed decision, you must consider several factors.

- **Physical Development:** Can your youngster sit comfortably on the OHV and reach the controls easily?
- **Motor Skills:** Is your child's coordination adequate for the challenge of riding an OHV?
- **Visual Perception:** Does your child have good depth perception, peripheral vision, and the ability to judge distances?
- **Social/Emotional Maturity:** Will your youngster understand the risks involved in riding an OHV and make good decisions to drive responsibly and avoid accidents?



Nationwide, children under the age of 16 account for 25% of OHV accidents and deaths.<sup>†</sup> Several factors contribute to this.

- **Physical Factors:** A major cause of accidents among juvenile riders is riding a machine that's too large for them to handle physically. Small children can't maintain a proper riding position or control without increased risk of falling off or being thrown from the machine.
  - **Leg Length:** When a child stands on the footrests, the top inseam of the pants should be a minimum of three inches above the seat. This clearance is required to maintain balance on the footrests when turning and riding over hills and rough terrain. While seated, the thigh should be roughly parallel to the ground.
  - **Foot Length:** A child should be able to reach the brake by rotating the foot on the footrest.
  - **Arm Length:** When seated on the machine, a child's arms should be long enough to:
    - Turn the handlebars and maintain a firm grip.
    - Operate the throttle comfortably when the handle is extended fully in a turn.
    - Operate the brake lever. The first joint of the index finger should extend beyond the brake lever when the child grips the handlebar.
  - **Strength and Weight:** In addition to reaching the controls, a child must have the strength to operate them properly. For example, a child should be able to squeeze a brake lever firmly during an emergency. Also, the child should have the strength and weight to keep from being thrown off the OHV on rough terrain.
  - **Coordination:** Make sure your child is coordinated enough for the challenge of riding an OHV.
- **Perceptual, Motor, and Maturity Factors:** Children up to age 16 are at risk when operating OHVs because they:
  - Perceive distances to be greater than what they actually are.
  - Have a shorter attention span than adults.
  - React more slowly than adults.
  - Tend to believe that products purchased by their parents are safe.
  - Take more risks—particularly males—and perceive less danger in those risks than adults.

- Get into trouble trying to imitate friends who show off new skills or stunts.
- Often believe a little experience makes them expert riders who know everything there is to know about OHVs. **Parents** must make the correct judgments when their children ignore obvious dangers, risks, and limitations.

<sup>†</sup> U.S. Consumer Product Safety Commission

# Today's ORV Rider

## A Course on Safe and Responsible Off-Road Vehicle Operation

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## Purpose of This Manual

Off-Highway Vehicles (OHVs) have been increasing in popularity during the past decade. As trails and recreation areas become more crowded, it's especially important for people to operate these vehicles safely, ethically, and responsibly.

- OHVs are motor-driven, off-highway recreational vehicles capable of cross-country travel without benefit of a road or trail.
- Depending on the type, an OHV may travel on land, snow, ice, marsh, swampland, or other natural terrain.

## Terminology Used in This Manual

For easier reading, we may use three-letter acronyms to refer to vehicles.

- **OHV:** Off-Highway Vehicle. A two-, three-, or four-wheeled vehicle that has a motor and is designed for riding on unpaved surfaces. OHVs are also commonly known as ORVs.
- **ATV:** All-Terrain Vehicle. A type of OHV with low-pressure, knobby tires designed for riding on unpaved surfaces. ATVs typically have four wheels. Three-wheeled ATVs are illegal in many states.
- **OHM:** Off-Highway Motorcycle. A type of motorcycle equipped for certain off-road sports. These motorcycles may or may not be "street-legal."
- **UTV:** Utility-Terrain Vehicle. A type of OHV where the driver and a passenger can sit side-by-side in the vehicle. They are most commonly known as UTVs (Utility-Terrain Vehicle or just Utility Vehicle) or Side-by-Side Vehicles. UTVs are not designed for use on paved surfaces.

The general information in this course applies to all types of OHVs. Much of the specific information, however, applies primarily to ATVs and OHMs.

## What's Included in This Manual

This manual presents a wide variety of information, including:

- Basics for ATVs and OHMs
- Information on the safe operation of ATVs and OHMs
- Responsibilities of OHV riders to others and the environment
- General information on preparing for the unexpected

**Note:** The operational sections of this manual are not intended as a substitute for the owner's manual that came with your vehicle.

## How To Use This Manual

1. Read and review each chapter of this manual.
2. Complete the corresponding chapter review questions, beginning on page 35.
3. Check your answers to the questions, beginning on page 37.
4. Review the information you may have answered incorrectly.
5. Continue in this manner until all the chapters have been covered.

## You should be able to...

- Explain why an ATV should not be ridden on pavement.
- Name your best resource for learning about your ATV.
- List the common ATV parts.
- Name five essential items to wear when operating an ATV.
- Describe the proper way to load an ATV on a trailer or in a pickup.



## A Brief History of ATVs

ATVs were developed in Japan so that isolated farmers could transport their crops and supplies across rugged terrain. Their popularity spread to the United States and Canada.

- In 1969, Honda® introduced the All-Terrain Cycle (ATC) in the United States. The ATC had three fat wheels and was promoted as a recreational vehicle.
- After 1988, ATVs fell somewhat out of favor as a recreational vehicle because of a Consumer Products Safety Commission report. ATV riders were involved in a disproportionately high number of injury accidents due to rider immaturity, inexperience, and lack of safety training.
- More recently, a new generation of recreational riders, with a growing awareness of safety, has rediscovered the fun of ATVs.
- While newer ATVs may have better safety features than their predecessors, they also have faster, better-performing engines that make safety an even more critical issue to be addressed by all responsible riders.



## Practice Learning Your Controls

You should sit on your ATV and practice locating each control without looking at it. Operating a control by second nature can be critical in emergency situations.

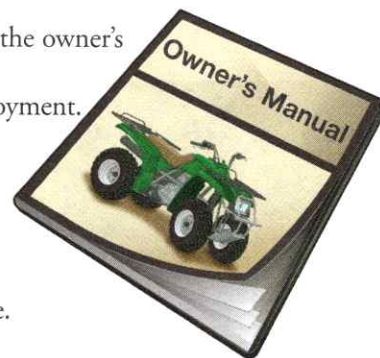
## Learning the Characteristics of an ATV

ATVs are motorized vehicles with an overall width of 50 inches or less **designed for use exclusively on off-road terrain, primarily for a single rider.** They're powered by gasoline engines and equipped with low-pressure tires, handlebars for steering, and a seat that is straddled by the rider. The legal definition of an ATV can vary by state.

### Your Best Resource—The Owner's Manual

The best way to learn about your ATV is to read the owner's manual. The information included tells how to:

- Improve your ATV's performance and your enjoyment.
- Maintain your ATV to help it last much longer.
- Improve your riding skills.
- Perform simple repairs.
- Operate safely to protect yourself, others, and your ATV.
- Get more information about questions you have.



### Workhorse and Recreational Vehicle

Today's ATVs are used for both work and play.

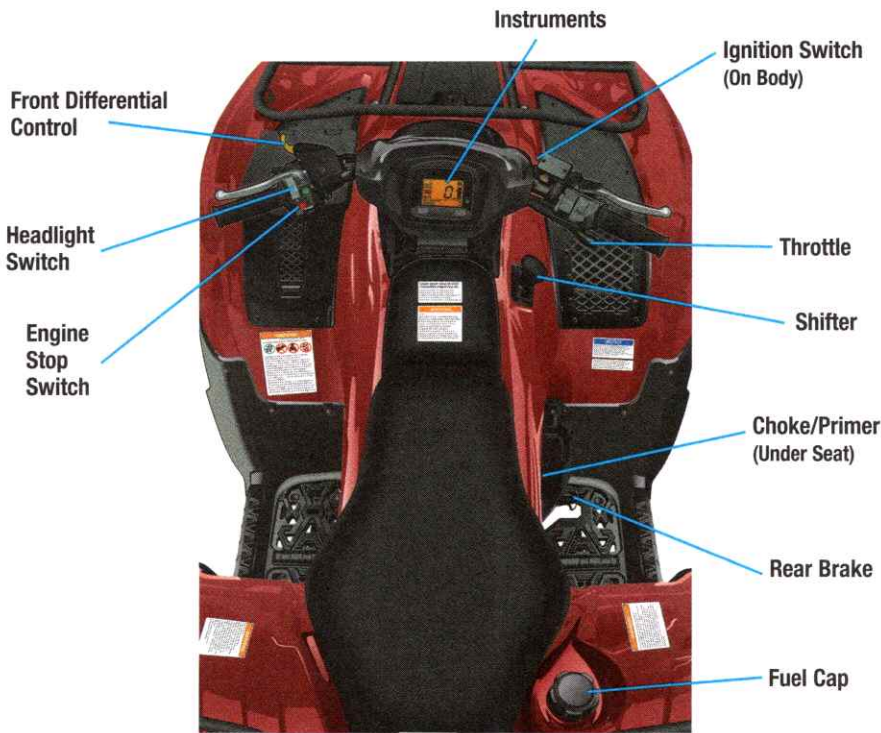
- Work-related uses include farming, ranching, construction, oil production, land management, field maintenance, law enforcement, military applications, and rescue operations.
- Recreational uses include trail riding; transporting items, such as hauling gear to a fishing spot, campsite, or hunting grounds; and hauling firewood from the backwoods to the homestead.

## Getting To Know Your ATV

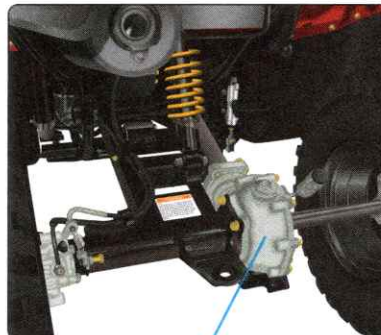
ATVs can provide hours of safe, enjoyable off-road riding. But ATVs also can be dangerous if you don't understand your vehicle or know proper riding procedures.

- Different types of ATVs have their own handling characteristics, so it's important for you to learn how to operate your particular model. For example, most ATVs have front and rear brakes, but some have linked brakes. You need to know the correct braking techniques for your ATV.
- ATVs also use different transmissions, shifting mechanisms, throttle mechanisms, starting mechanisms, cooling systems, and axle designs. Controls and their locations also differ from one ATV model to another.

## Common ATV Parts



Drive Chain



Drive Shaft

## The ATV Community

Thousands of ATV clubs are located across the United States and Canada. These nonprofit clubs are groups of volunteers based in local communities. Their goal is to share the fun of ATV riding and make the sport safer for everyone. ATV clubs often work with state and provincial organizations to carry out numerous recreational and community service programs. They:

- Design, construct, map, and maintain trails—both public and private.
- Sponsor ATV outings and year-round social activities.
- Monitor and initiate government legislation, and participate in public hearings.
- Volunteer their services as certified safety instructors, and conduct safety and maintenance clinics.
- Publish newsletters and newspapers.
- Provide vital services to sheriff's departments, police, and civil defense units. For example, they patrol trails and search for lost hikers, skiers, hunters, and children. They also assist conservation officers in emergency wildlife-feeding activities.

## Remember...

Your ATV may or may not have all the parts and controls shown in these illustrations. Also, their positions may vary from model to model. Consult your owner's manual to learn the specific parts, controls, and locations for your model.

## Finding an ATV Club

An ATV club is a great place to get to know people in your area with similar interests. Because ATV riders should never ride alone, it's also a great place to find riding partners.

- Ask your ATV dealer or instructor about any local clubs.
- Use an Internet search engine such as [www.yahoo.com](http://www.yahoo.com) or [www.google.com](http://www.google.com) to search for ATV clubs or associations in any state or area.

## Safeguarding Yourself With Protective Gear and Clothing

Off-road riding requires protective clothing. Wearing the correct clothing can reduce the chance of injury and make your ride more comfortable. Never operate an ATV without these essential items, and have them professionally adjusted when you purchase them to ensure the safest fit.



### ■ ATV helmet

- Helps prevent serious head injury.
- Should fit snugly and fasten securely.
- May be a full-face helmet or an open-face helmet.
  - Full-face helmets protect both your head and face. They provide the best protection during a collision, protect from tree branches and falls, provide warmth, and protect from loud noises.
  - Open-face helmets are lighter and cooler but should be worn with eye protection.
- Can increase your visibility after dark if you add a strip of reflective tape to your helmet.
- Should have a safety-approved label from the Department of Transportation (DOT), the American National Standards Institute (ANSI), or the Snell Memorial Foundation.

### ■ Goggles or face shield

- Protect you from hazards—branches, road debris, and insects—which can impair your vision and jeopardize your safety.
- Use gray-tinted eye protection on bright days, yellow-tinted on overcast days, and clear for night riding.
- Should be shatter-resistant and well-ventilated to prevent fogging.
- Keep eye protection scratch-free and fastened securely at all times.
- *Note: Sunglasses do not protect adequately. Use goggles or a face shield.*

### ■ Gloves

- Keep your hands warm in cold weather.
- Prevent soreness and fatigue.
- Offer protection from rocks, branches, or other debris and also offer protection during a fall.
- Should be padded over the knuckles for the best protection.

### ■ Boots

- Heels prevent your feet from slipping off footrests.
- Over-the-ankle boots offer protection from ankle and foot injuries.

### ■ Clothing

- Protects you from scratches as well as the extremes of the weather such as heat exhaustion, sunburn, and hypothermia.
- Helps cushion you in falls or collisions.
- For best protection, use off-road riding gear:
  - Pants with kneepads
  - Chest and shoulder protectors
  - Riding belt for lower back support
- Always wear long pants and a long-sleeved shirt or jacket.

### Cold Weather Riding

In cold weather, clothing that works well for snowmobile riders is also ideal for ATV enthusiasts.



## Transporting Your ATV Safely

Always transport your ATV to the riding area. It is almost always illegal to ride an ATV on roads or in the ditch. Ideally, use an ATV trailer to transport your ATV. Consult your owner's manual for the proper transport method.

### Preparing To Tow

- Select a trailer with the proper load capacity to carry the vehicles you want to transport.
- Be sure the trailer has an adequate number of tie-down points.
- Check the owner's manual of your towing vehicle to be sure it's rated to tow the combined weight of the trailer and ATV.
- Inspect the trailering equipment to make sure it is performing properly and meets your state's safety requirements.

### Hitching the Trailer to the Towing Vehicle

- Use a towing hitch appropriate for the loaded trailer.
- Make sure the size stamped on the ball hitch on the towing vehicle is the same size that is stamped on the trailer's coupler. If the ball hitch is too small, a bump in the road could cause the coupler to lift off the hitch.
- Crisscross two strong safety chains to support the trailer's coupler if it becomes disconnected.
- Connect the trailer to the towing vehicle's lighting system. Make sure all the lights work, including the brake lights and both blinkers.

### Loading the ATV

- Wear your protective ATV gear—helmet, goggles, gloves, and boots.
- Use a winch to load the ATV whenever you can. Many accidents and even deaths have been caused by driving an ATV up a too-steep ramp.
- Use a high-quality ramp with a rated load capacity that can withstand the combined weight of the ATV and its rider.
- Attach the ramp securely to the trailer or pickup using straps or chains. If you have separate left and right ramps, space them properly for your ATV.
- Approach the ramp in first gear so that you can climb it easily. Engage four-wheel drive in low gear, if applicable.
- Ride straight up the ramp. It's easy to drop a wheel off the side of a narrow ramp.

### Securing the ATV

- Balance your trailer by centering the ATV slightly behind the axle.
- Set the parking brake on the ATV.
- Use tie-down straps. Ropes may stretch during transport.
- Use four straps whenever possible, front and back on both sides. Never use fewer than three straps.
- Cinch the straps as tightly as possible. Shake the ATV, and make sure it's secure. The tires should look like they're carrying weight.
- Loop any excess strap length below the trailer or pickup.
- When using a pickup, close the tailgate if possible.

### Driving on the Road With a Trailer

- Drive at moderate speeds, and avoid sudden maneuvers.
- Allow for the added length and weight of the trailer.
  - Make wider turns at corners and curves.
  - Allow extra time and distance for stopping and for passing other vehicles.
- On long trips, pull over every hour to check the towing equipment.

## Performing Pre-Season Maintenance

After your ATV has been in storage, inspect it and perform pre-season maintenance as described in your owner's manual. Don't wait until you're ready to ride to discover you need to see a mechanic or buy a replacement part. Some areas to inspect include:

- Battery
- Oil and oil filter
- Spark plugs
- Fuel
- Lights
- Tires
- Possible rodent damage
- Other deterioration in rubber or plastic parts

## Preparing Your ATV for Storage

When you're ready to store your ATV at the end of the riding season, consult your owner's manual again. The steps below also may be useful in extending the machine's mechanical life.

- Clean the ATV, and let it dry. Moisture can collect on dirt and cause rust.
- Change the oil and oil filter. Dirty oil contains contaminants that may age the engine. Run the engine a few minutes to circulate the new oil.
- Drain the fuel tank, and run the engine to burn any fuel in the lines. If you don't drain the fuel tank, at least:
  - Turn off the fuel valve.
  - Add gasoline stabilizer. The stabilizer works when added to fresh gas only. Don't add it to older gas that's already started to deteriorate.
- Clean all moving parts thoroughly, and lubricate them.
- Clean the air filter.
- Place plastic bags over muffler outlets to keep out moisture and rodents.
- Remove the battery, and store it separately. A battery can be damaged if left undercharged for long periods, so charge it fully once a month.
- Jack up the ATV to get the tires off the ground, or at least turn the wheels once a month so that the same spot is not always on the ground.
- Store the ATV in a cool, dry location.
- Place a porous cover over the ATV to protect it from dust.

## Learning To Ride: Basic Skills

### You should be able to...

- Describe the special risks and requirements associated with an ATV's unique design.
- List four leading causes of ATV accidents.
- Describe the significance of START-GO.
- List the key steps for starting an ATV.
- Describe the three types of transmissions.
- Describe good riding posture and explain why it's important for safety.
- List the three basic riding positions.
- Describe how to turn safely.
- Explain the difference between a solid and a differential rear axle.
- Describe how to climb a hill.
- Explain what to do when riding uphill and your ATV begins to lose forward momentum or begins to roll backward.
- Describe five procedures to remember when riding downhill.
- Describe what to do when traversing a slope.
- Describe three characteristics of a good practice area.
- Explain reaction time and braking distance.



## Understanding the Risks of Off-Road Terrain

The unique design of ATVs creates risks for the rider if not handled properly. This chart compares design factors of ATVs and the special risks associated with them.

Design	Risks/Requirements
Capable of traveling over rough terrain	<ul style="list-style-type: none"> <li>Unknown hazards and obstacles, such as rocks, ruts, stumps, fences, holes, and embankments, may cause collisions and rollovers.</li> </ul>
Wide, low-pressure, knobby tires	<ul style="list-style-type: none"> <li>May cause loss of control from wobble or bounce.</li> <li>Create unstable handling on paved roads.</li> </ul>
Fixed rear axle for traction	<ul style="list-style-type: none"> <li>May cause loss of control on paved surfaces. Requires special riding skills for turns.</li> </ul>
Powerful drive train with high and low gear ratios	<ul style="list-style-type: none"> <li>Makes it capable of speeds that are too fast for conditions and/or operator's skill level.</li> <li>Has power to climb until it flips over backward.</li> </ul>
High ground clearance and short, narrow wheelbase	<ul style="list-style-type: none"> <li>Requires operator to meet minimum size and weight requirements to balance the vehicle properly.</li> </ul>
Seat on top of the vehicle	<ul style="list-style-type: none"> <li>Requires operator to maintain balance on the vehicle.</li> <li>Creates a high center of gravity. Can cause operator to fall or be thrown. Provides no protection for the operator in a collision or a rollover. In a rollover, the weight of the vehicle can crush the operator.</li> </ul>

### *Remember...*

ATV operators are sometimes criticized for making excessive noise. All ATVs must have a muffler in good working condition.

## Alerting Yourself to the Causes of ATV Accidents

The following are leading causes of injury and fatal accidents.

- Driving an ATV on a paved surface. **ATVs are designed for off-road use only and handle poorly on pavement.**
- Riding double on an ATV that isn't designed to carry a passenger. Most ATVs are designed for only one rider.
- Letting inexperienced operators ride without an experienced riding partner.
- Riding without adult supervision.
- Performing dangerous stunts and maneuvers.
- Operating in unfamiliar areas or terrain.
- Failing to observe state laws and local ordinances.

### Preventing Accidents

- Take an ATV safety course.
- Supervise young riders.
- Wear an approved ATV helmet with a face shield or goggles.
- Check the weather before riding.
- Don't cross frozen water.
- Never travel alone.
- Tell a friend or family member about any long trips. Leave behind a copy of your travel plan, a map of the area, and a time schedule.
- Never use drugs or alcohol while riding.
- Learn and observe state laws and local ordinances.

### *Remember...*

During the first month of operating an ATV, an inexperienced rider is 13 times more likely to have an accident than an experienced rider. It is the owner's responsibility to ensure that young or inexperienced operators receive proper instruction prior to operation.

**Remember...**

When borrowing an ATV or operating an unfamiliar ATV, **always** perform a pre-ride inspection.

**Routine Maintenance**

Off-roading puts a strain on your ATV, so it's important to perform the scheduled maintenance recommended in your owner's manual. You can avoid a breakdown and possible injury.

**Additional Items**

In addition to checking the items listed in START-GO, your pre-ride inspection should include the following.

- **Spark arrestor/muffler:** Make sure it's attached firmly and working properly.
- **Air filter:** Make sure it's clean, undamaged, and unblocked.
- **Spark plugs:** Replace if necessary.

**Inspecting Your ATV Before You Ride: START-GO**

Always inspect your ATV before each ride to detect problems that could cause an accident.

- **Always** set the parking brake first.
- Consult your owner's manual for items that may need to be lubricated, tightened, adjusted, aligned, or checked for wear. An easy way to remember the items to inspect is the phrase "START-GO."

**S**teering and Drive System

- **Drive chain:** Check your owner's manual for proper adjustment. Inspect and lubricate the chain regularly.
- **Drive shaft:** Check for leaks, and consult your manual for proper lubricant levels.
- **Handlebars and footrests:** Shake to make sure they're secure.

**T**hrottle and Brakes

- **Throttle:** Make sure it moves smoothly and snaps closed.
- **Ignition switch:** Check for wear.
- **Engine stop switch:** Test operation.
- **Brakes:** Test to make sure controls operate smoothly.
- **Foot shifter:** Make sure it's attached firmly and positioned for safe operation.

**A**ctivate Lights

- **Headlights and taillights:** Turn them on.
- **Brake lights:** Press the brake, and have your riding partner make sure the brake lights illuminate.

**R**egistration

- Make sure your registration or trail pass decals are attached.
- Confirm that the dates are still valid.

**T**ires, Wheels, and Suspension

- **Tires**
  - Always use a low-pressure gauge to check tire pressure.
  - Make sure pressure is equal on both sides.
  - Check for damage that could cause air leaks.
- **Axle nuts:** Make sure they're tight and secured by cotter pins.
- **Bearings:** Try to rock the wheel on its axle to check for wear.
- **Major fasteners:** Periodically tighten all major fasteners with hand tools.

**G**asoline

- **Gasoline:** Make sure the tank is full.
- **Leaks:** Check for fuel leaks.

**O**il

- **Oil:** Check while the engine is off.
- **Leaks:** Check for oil leaks.



## Operating Your ATV

### Starting the Engine

First, consult your owner's manual. Typically, you will:

- Point the ATV in a safe direction.
- Put the transmission in neutral or park.
- Set the parking brake.
- Turn on the fuel valve.
- Make sure that the engine stop switch is in the “run” or “on” position.
- Put the choke in the “on” position if the engine is cold.
- Start the engine.

### Starting Off

After the engine is warmed up:

- Apply the hand brake.
- Release the parking brake.
- Shift into gear.
- Release the hand brake and apply the throttle slowly.

### Braking

Consult your owner's manual for correct braking procedures.

### Shifting Gears

- Read your owner's manual for instructions on shifting. There are three general types of transmissions.
  - **Manual:** Similar to the stick shift in a car. You let off the throttle, pull the clutch lever, and shift through the gears using the foot shifter.
  - **Semi-Automatic (or Semi-Manual):** There is no clutch control. You let off the throttle and shift up or down with the foot shifter. The clutch is handled automatically.
  - **Automatic:** Just as in a car, you only adjust the throttle. Both the clutch and shifting are handled automatically.
- If you have a manual or semi-automatic transmission:
  - Always close the throttle while shifting to prevent the front wheels from lifting.
  - Learn where the engagement point is to prevent stalling and to allow smooth shifting.
  - Listen to the engine. By engine sound alone, you usually can tell when to shift gears or adjust the throttle.

### Parking

- Stop the engine.
- Shift into neutral (or park), and set the parking brake. If you don't have a parking brake, shift into low gear to prevent the ATV from rolling.
- If your ATV has a parking mechanism, allow the drive train to lock.
- Avoid parking on an incline.

### Additional Gear

Along with a tool kit and your owner's manual, carry these other emergency items:

- Headlight and taillight bulbs
- Electrical and duct tape
- Flashlight
- Knife
- First-aid kit (see Chapter 5)
- 25 feet of nylon rope
- Extra spark plugs—worn plugs are the number one cause of engine stalling
- Sturdy tow rope or chain
- Cell phone
- Extra key
- Sunblock



### Learn How Much Pressure To Apply to the Brakes

From one ATV to another, even within the same model, brake sensitivity can vary significantly.

Each time you operate a different ATV, start slowly and practice braking. The pressure you normally use on another ATV may not work as well on this one.

- With sluggish brakes, your normal pressure may not stop the ATV in time.
- With sensitive brakes, your normal pressure may cause you to lose control of the ATV or even get thrown off.

### Proper Level Riding Position



### Posting



## Positioning Yourself for Safer Riding

To ride an ATV safely, you need to learn how to position your body properly as you maneuver through various types of terrain. Mastering the basic riding positions is a major key to your success.

### Correct Posture for All Riding Positions

- To make sure that you can shift your weight quickly when necessary and reach the controls easily, always maintain proper posture:
  - Head up and eyes looking far ahead
  - Hands on the handlebars
  - Feet on the footrests, toes pointing straight ahead
- Removing one hand or foot reduces your ability to control the ATV and can cause you to lose your balance and fall off.
- Removing your feet from the footrests or dragging your feet on the ground can result in serious injury if your feet get under the rear wheels.

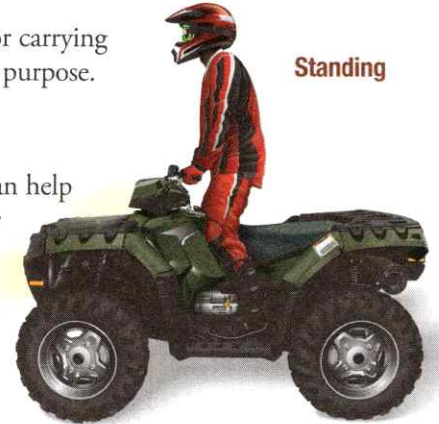
### Sitting: Best Position for Stability

- Sitting provides the lowest center of gravity for maximum stability and safety.
- This is the only position recommended for carrying passengers if the ATV is designed for that purpose.
- Keep your feet firmly on the footrests.

### Standing: Best Position for Viewing

- In areas with obstructions, this position can help you look over an obstacle to see if another is behind it.
- At road crossings, this position provides the longest line of sight.
- Standing allows you to shift your weight quickly in any direction and change riding positions rapidly.

### Standing



### Posting: Best for Climbing and Rugged Terrain

- Rough trails may produce more and harder bumps than you can absorb easily in a sitting position. If so, switch to this crouching position.
- It's also useful for climbing steep hills, crossing creeks and streams, and other challenging situations.

## Beginning To Ride

### Turning

Consult your owner's manual for the proper technique to turn your ATV. At low to moderate speeds, you should:

- Move your body weight forward, and lean in the direction of the turn.
- Turn the handlebars while looking where you are turning.
- If your ATV starts to tip while turning, lean your body farther into the turn while gradually reducing speed.
- Increase your speed slightly as you come out of the turn.

### Leaning into a Turn

Always slide forward before you lean into a turn. If your ATV has a solid rear axle or a locked differential rear axle, use these techniques.

- For slow turns, slide forward and to the outside—then lean into the turn.
- For fast turns, slide forward and to the inside—then lean into the turn.



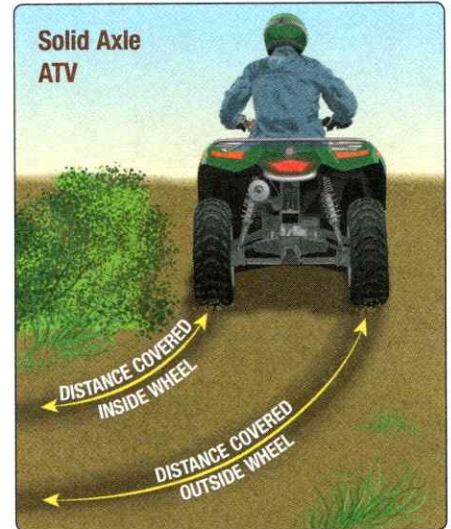
### How the Type of Rear Axle on Your ATV Affects a Turn

The type of rear axle on your ATV, as given in the owner's manual, affects where you should position your body on the seat during a turn. The rear axle may be either of two types.

- **Solid Axle:** The wheels on both the inside and outside of a turn rotate at the same speed, even though the wheels on the outside of the turn cover more distance.
- **Differential Axle:** The outside wheel rotates faster than the inside wheel, resulting in an easier and smoother turn.

### Riding Uphill

- Climbing hills can be dangerous if you don't follow the proper procedures as described in your owner's manual. You could lose control of your ATV, or it could overturn. In general, you should:
  - Use good judgment. If the hill looks too steep, it probably is.
  - Start the climb by shifting into a lower gear. Speed up to maintain momentum.
  - Move up on the seat and lean forward, or stand and position your torso over the front wheels.
  - Keep your weight uphill and your feet on the footrests.
  - If you can't see what's over the crest of a hill, slow down until you can.
- If your engine begins to "lug" or sounds as if it might stall, you need to shift into a lower gear.
  - Keep your weight forward.
  - Shift quickly while briefly releasing the throttle, which will prevent the front wheels from lifting up.
- If you don't have enough power to reach the top of the hill but still have enough momentum and room to turn around safely:
  - Keep your weight uphill.
  - Make a U-turn before you lose speed.
  - Head downhill in a lower gear, keeping your weight to the upside.
- If you lose all forward momentum while climbing a hill:
  - Keep your weight forward. Apply the brakes. **Do not** let the ATV roll backward.
  - Set the parking brake while keeping your weight forward.
  - Dismount on the uphill side of the ATV.
  - Shift the ATV into neutral, and turn off the engine.
  - Hold the front brake, and disengage the parking brake.
  - Turn the handlebars sharply toward the middle of the hill.
  - Slowly release the front brake until the ATV is parallel with the side of the hill.
  - Set the parking brake, and start the engine.
  - Mount the ATV from the uphill side, keeping your weight uphill.
  - Point the front wheels downhill, and disengage the parking brake.
  - Slowly ride downhill, shifting your weight to the rear of the ATV.

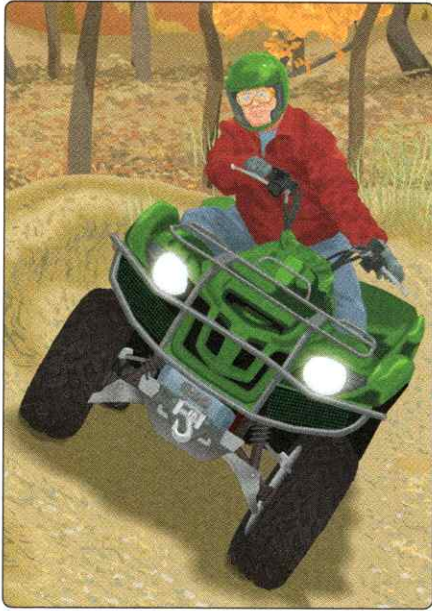


During a turn, the inside wheel slips since it does not travel as far as the outside wheel.



### Remember...

**Use extreme caution:** Each year, ATV operators are seriously injured or killed attempting to climb hills that are too steep.



### Turning an ATV Around if It Stops on a Hill

Check your owner's manual for the correct method recommended for your model.

#### Drag the Rear of the ATV

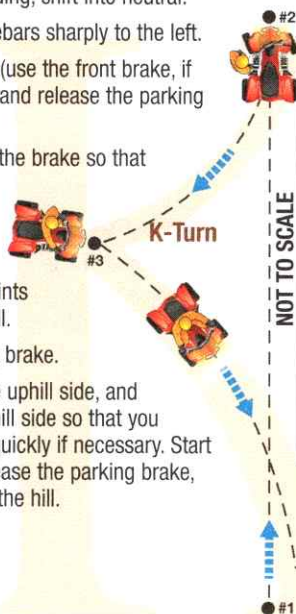
You may be able to drag a very light ATV.

- Staying on the uphill side at all times, lift the rear and drag it uphill until the ATV is pointed downhill.
- When you mount to ride, be sure to do so from the uphill side.

#### Perform a K-Turn

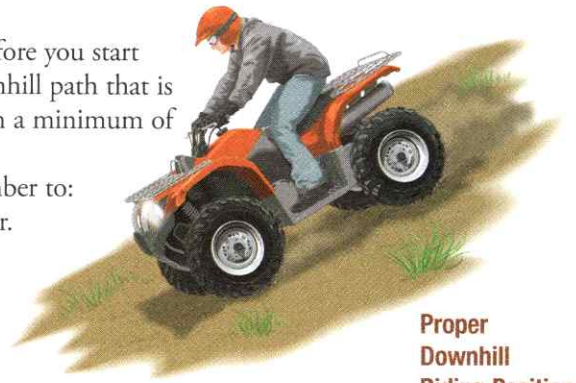
Alternatively, use the ATV's own weight to perform a K-turn.

- Set the parking brake.
- Stand on the uphill side of the ATV.
- While still standing, shift into neutral.
- Turn the handlebars sharply to the left.
- Hold the brake (use the front brake, if you have one), and release the parking brake.
- Slowly release the brake so that the ATV rolls backward and turns to the side. Let it roll until it points slightly downhill.
- Set the parking brake.
- Mount from the uphill side, and stay on the uphill side so that you can dismount quickly if necessary. Start the engine, release the parking brake, and ride down the hill.



### Riding Downhill

- Carefully check the terrain before you start down any hill. Choose a downhill path that is as straight as possible and with a minimum of obstacles.
- When going downhill, remember to:
  - Shift your weight to the rear.
  - Use a lower gear.
  - Maintain a low speed.
  - Brake gradually.
  - Stay focused on the ground ahead.



Proper Downhill Riding Position

### Traversing a Slope

- You may encounter hills that are too steep to ascend or descend in a straight line. In that case, you may be able to drive across, or traverse, the slope at an angle. Never attempt to traverse a slope with surfaces that are slippery, rough, or loose.
- When traversing, be sure to:
  - Keep both feet on the footrests.
  - Lean uphill.
  - If the terrain is soft, turn your wheels slightly uphill to stay on a straight line.
  - If your ATV starts to tip, turn downhill. If you can't turn because of obstructions, jump off on the uphill side.
  - Keep your speed steady. Sudden acceleration could tip your ATV.

### Preparing for Riding Practice

Locate a safe, unchallenging area to practice your riding skills. Walk the area first to make sure there aren't any unseen hazards that could trap tires, such as dips and holes.

- **Select terrain** that is at least 100 feet by 200 feet, containing two areas:
  - An area that's large, open, flat, and free of hazards
  - A hilly area that is not too steep and is easy to climb on foot
- **Set up a practice area** with a tape measure and a half-dozen markers, such as sand-filled plastic jugs or similar containers.
- **Develop safe riding habits** by using the same procedures and safety measures when practicing that you will use when you begin serious off-road riding.
  - Wear proper clothing and safety equipment.
  - Perform a pre-ride inspection.
  - Maintain a safe speed at all times.
  - Don't mix alcohol or drugs and riding.
  - Bring someone along in case something goes wrong.

### Practicing Your Riding Skills

#### Before You Begin

- **Perform a Pre-Ride Inspection:** Using your owner's manual, find and check all of the items listed in "Inspecting Your ATV Before Your Ride: START-GO."
- **Practice Correct Riding Posture:** With the engine off, mount the ATV. Keep your eyes on the trail ahead. Using proper posture, locate and operate the controls.
- **Practice Shift Pattern:** Using your owner's manual, learn the proper shift pattern for your ATV and practice with the engine off.

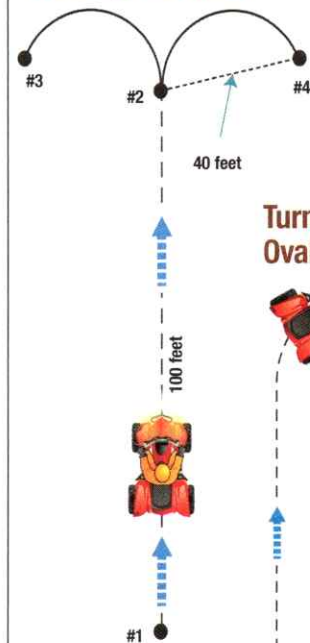


## The Basics

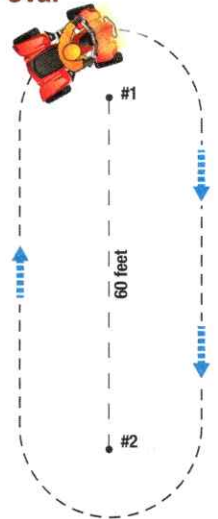
Parents should always visually supervise children as they practice. (See “Parents: Watch Out for the Little Rider!”)

- **Braking in a Straight Path:** Place marker #1 at the starting point. Place marker #2 100 feet away. Ride straight toward marker #2, and come to a smooth stop. Practice this in first and second gear until you come to a smooth stop every time.
- **Braking in a Turn:** Place markers #3 and #4 ahead and several feet to either side of #2. Practice the turns by accelerating through the gears in the straightaway, downshifting at the turns (marker #2), and coming to a smooth stop at #3 or #4.
  - Keep your eyes forward, and look around the turn as you approach #2.
  - Release the throttle before you shift, and keep your foot clear of the shift pedal after you shift.
  - Move your weight forward and lean into the turn.
- **Turning in a Large Oval:** Place two markers 60 feet apart and ride around the outside of the markers in an oval pattern. Stay in first gear and lean into the turn. Ride a few times in one direction and then the other. Remember to:
  - Keep your feet on the footrests.
  - Look straight ahead, concentrating on your path.
  - Slow as you approach the turn, and gradually increase your speed as you exit.
  - Shift your body weight forward, and lean into the turn.
  - Lean farther into the turn if you feel you are tipping.
  - If your turns are too wide, slow down more before the turn and lean farther into the turn.
- **Turning in Small Circles:** Ride around one marker turning to the right, making smaller and smaller circles. Then move to another marker and turn to the left.
- **Making a Figure Eight:** Circle the two markers in a figure eight pattern, gradually moving the markers closer together until the pattern is as tight as you can make it.
- **Turning Sharply:** Making sharp turns without tipping your ATV requires coordinating braking, weight shifting, and throttle control.
  - Place three markers about 50 feet apart to create an equilateral triangle.
  - Practice riding around the triangle in one direction and then in the other direction.
  - Change the shape of the triangle to vary the challenge.
  - Remember to use all of the techniques practiced earlier.
- **Making Quicker Turns:** Quick turns will help you avoid obstacles. To do this, you will adjust your body position, shift your weight, and change your speed.
  - Space five markers 35 feet apart. Travel to the left of the first marker, and then weave back and forth around the other markers.
  - Start slowly, and then gradually accelerate without going past second gear.
  - When you feel comfortable with the original spacing, move the markers closer together, working your way to a minimum distance of 18 feet.
  - If you hit any markers, swing wider around the marker and shift your weight more. Try adding a burst of speed but not so much that you pop up the front wheels.

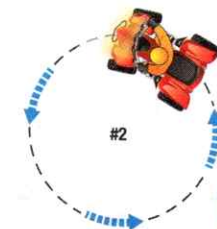
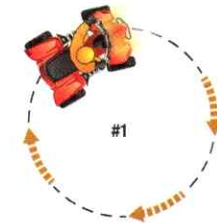
## Braking in a Turn



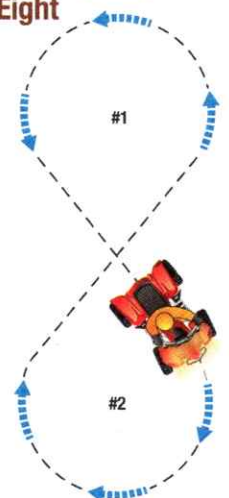
## Turning in an Oval



## Turning in Small Circles



## Making a Figure Eight



### Parents: Watch Out for the Little Rider!

- The most important influence on children's safety and their development of safe riding habits is their parents.
- It is your role as a parent to:
  - Learn this material with your child.
  - Attentively and enthusiastically supervise your child during practice sessions. Enjoy this time with your child!
  - Use riding practice as a time to constructively and positively encourage your child's riding form and habits. Be sure that tips and instructions in this material are followed.
  - Enforce regulations and nurture your child's responsible citizenship.
- For the safety of your child and others, it is equally important that you:
  - Reinforce safe riding practices and help your child appreciate the enjoyment of safe riding.
  - Be alert for signs of inappropriate riding—clowning around or other behavior that begins harmlessly but, left unchecked, leads to risk and serious consequences.
  - Put in place a “zero tolerance” policy toward inappropriate behavior.

#### ■ Making Quick Stops on a Straight Path

- Set two markers 100 feet apart. Ride from one end toward the other in second gear. Maintain your speed until you pass the second marker.
- Apply the brakes, and shift into first gear. Mark where you come to a stop.
- Start over, and try to stop in a shorter distance.
- Once you're satisfied with your performance, repeat the process in higher gears.

#### ■ Making Quick Stops on a Turn: Set up the course you used for braking in a turn.

- Start from the first marker in second gear. Turn toward marker #3 or #4 after you pass marker #2 on the outside.
- After passing #3 or #4, stop as quickly as you can while downshifting into first gear.
- If you feel your ATV swerving to one side, center your body on the machine and look where you want to go.
- If the rear end skids, ease up on the rear brake and shift into a lower gear.
- If the front end slides or skids, apply less front brake pressure.

#### ■ Climbing and Traversing Hills: Review the sections “Riding Uphill” and “Traversing a Slope” to be prepared if you stall or start to tip over.

- Accelerate at the base of the hill.
- Downshift if necessary to maintain momentum.
- Turn your ATV to the left, making an arc over the face of the hill.
- Continue to turn until you're headed back down the hill.
- Shift into a lower gear, and apply your brakes to slow down.
- Repeat in the opposite direction.

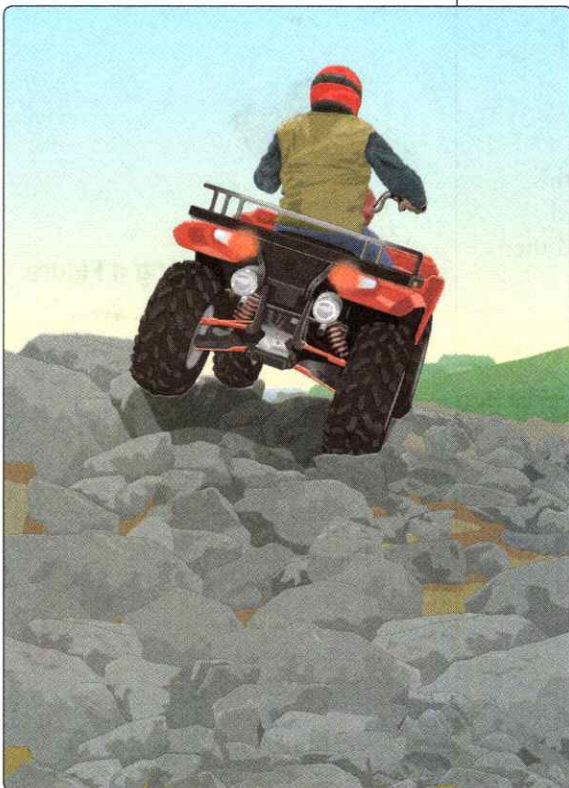
#### ■ Stopping While Descending

- As you descend, shift your weight back toward the rear of the ATV. On steep slopes, straighten your knees and elbows but don't lock them.
- Bend forward so that your rear is over the back of the seat.
- Shift into low gear, and apply the brakes to slow your descent.

#### ■ Additional Riding Skills: After you master the basic riding skills, you will be

ready to move on to more advanced skills. Many of these skills are covered in Chapter 3 and include:

- Riding on trails that are more difficult, such as those with mud; water; sand dunes; snow; ice; and obstacles like rocks, logs, and bumps
- Riding at night or in low-light conditions
- Carrying a passenger on your ATV
- Towing a heavy load with your ATV
- Crossing roads and highways safely



## Speed and Stopping Distances

To stop safely, you must be able to calculate a safe speed based on the distance needed to stop.

- Safe speed is necessary to control your vehicle and stop in time to avoid a collision.
- The greater the speed, the greater the stopping distance.
- To determine a safe speed, you must understand stopping distances and how to factor in sight distance and reaction time.

### Sight Distance

- Sight distance means the distance from which you can see and identify a hazard. You often see an object before you're able to identify it as a hazard.
- If the stopping distance to an object is greater than the sight distance, you're in danger of hitting the object.

### Reaction Time and Distance

- Reaction time is the time it takes you to react to a hazard. It involves these steps:
  - Seeing something
  - Recognizing it's a hazard
  - Deciding whether to brake or steer around the object
  - Reacting
- Reaction distance is the distance the ATV travels during your reaction time.
  - The distance depends on the reaction time (in seconds) and speed (in feet per second).
  - It is calculated as: Reaction Distance = Reaction Time x Speed
- Accidents occur in just a few seconds, so think of your speed in feet per second (multiply mph by 1.46667).
  - 15 mph = 22 ft. per second
  - 30 mph = 44 ft. per second
  - 45 mph = 66 ft. per second
  - 60 mph = 88 ft. per second
- At 30 mph with a reaction time of three seconds, the reaction distance is 132 feet (3 sec. x 44 ft./sec.).

### Braking Distance

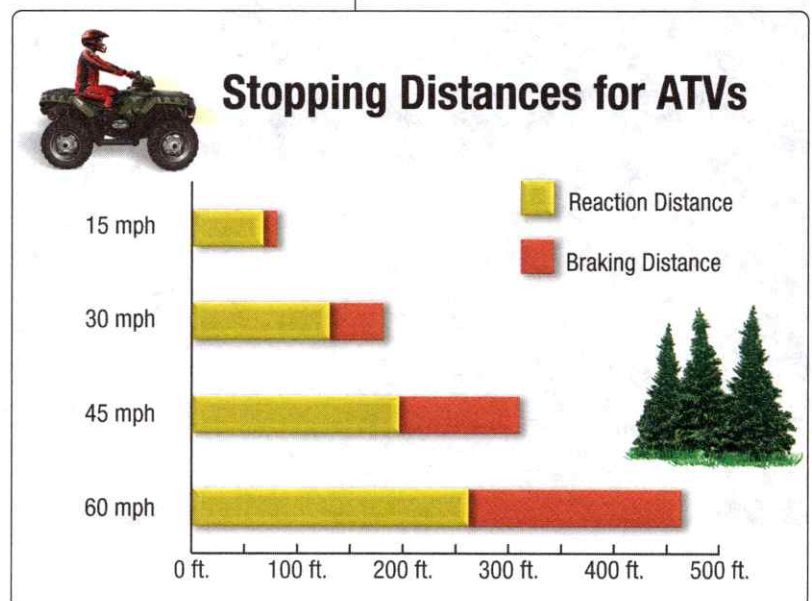
- Braking distance is the distance traveled while you're braking to a stop. It depends on two factors: speed and drag.
- Drag is the amount of friction between the tires and the surface of the terrain. For example, mud has more drag than dirt. A hard, dry surface has more drag than a hard, wet surface; and ice has very little drag.

#### Total Stopping Distance Formula

$$\text{Stopping Distance} = \text{Reaction Distance} + \text{Braking Distance}$$

### Normal Reaction Time

Studies reflect that a person's reaction time is anywhere from one to three seconds. In general, however, three seconds is probably more accurate.



### You should be able to...

- List at least four actions to take in assessing terrain.
- List guidelines to follow when riding on different types of terrain.
- Explain what “overdriving your headlight” means.
- Describe why you should not carry passengers unless your ATV is designed to do so.
- Describe how to tow a trailer properly.
- Describe how to cross roads and highways safely.



## Riding on Different Types of Terrain

### Trails

- Use caution when riding from sunny to shaded areas on a trail. Your eyes may not adjust quickly enough to see rocks or ruts in the shade.
- Ride within your limits. Avoid trails that are beyond the capabilities of your machine or your skill level. One difficult section on an otherwise easy trail makes it beyond your limits.
- For maximum safety, keep your headlight on so that oncoming riders can see you easily.

### Mud and Water

Riding through rivers, streams, lakes, and wetlands is illegal, causes environmental damage, and hurts fish and wildlife. You will, however, encounter puddles or low-water crossings on trails. When you do, follow these guidelines.

- Determine the depth of the water before you cross.
- Keep your feet firmly on the footrests, which may become slippery.
- Drive through the water at a slow, steady speed so that you can spot and avoid submerged obstacles and slippery rocks.
- Stay alert for obstacles above the water.
- **Do not** drive into water that is deeper than the maximum depth specified in your owner's manual.
- Avoid spinning your wheels, which disrupts streambeds and erodes banks.
- Test your brakes once you're on dry land.
- If you have four-wheel drive, make certain that it's engaged in low gear.

### Sand Dunes

- Mount an antenna flag on your ATV so that other riders can see you approaching.
- Avoid riding on vegetation or wet sand.
- Be alert for **slip faces** and **razorbacks**.
- Be careful at midday—lack of shadows makes it hard to spot hazards.

### Snow

- Perform winter maintenance on your ATV as directed in your owner's manual.
- Make certain you have been trained in surviving the extremes of the environment in which you'll be traveling. Never venture into an area without properly preparing for the unexpected.
- Check with local law enforcement to find out if ATVs are allowed on snowmobile trails.
- Check local weather forecasts and monitor weather changes.
- Dress warmly to offset the wind chill created by your motion.
- Before venturing onto a frozen lake, make sure the ice is thick enough to support your loaded ATV safely.
- Ride only on firm snow or groomed trails. Riding on soft snow can damage the terrain.
- Watch for snow drifts. They may cause an accident or cause you to get stuck.

### Ice

Ice is as hard as pavement and requires extreme caution. Spins are common and fast stops are impossible.

- Equipping your tires with chains can improve traction and stopping.
- Use slow speeds. To stop, let up on the throttle and coast to a stop.
- Don't go onto lakes or rivers unless you know the ice conditions. The ice should be thick enough to support your loaded ATV safely.
- Stay away from areas where streams are flowing in or out of the ice, which weakens the area.
- As a rule, it's best to stay off frozen rivers and lakes.

## ASSESS Terrain

A critical skill in riding is the ability to assess the characteristics of the terrain where you're riding. Follow these guidelines to avoid dangerous obstacles and hazards.

**A**void dangerous terrain such as marshes, steep slopes, and mud.

**S**elect existing trails.

**S**can the path far ahead of you to see obstacles early enough to react.

**E**valuate. Be aware of your surroundings and ready to respond to changing conditions.

**S**peed. Always travel at a speed appropriate for the terrain and your skill level.

**S**tay alert. Assess those trails that are new to you, and decide whether you are personally able to ride on them.

### Remember...

Stay on designated trails and other authorized riding areas.



### slip face

The slope of a sand dune. Characterized by an extremely steep incline opposite the prevailing winds below the crest or ridge line of a dune.

### razorback

Peak of a sand dune that sharply drops off on either side.

## Riding Over Rocks, Logs, and Bumps

Ride around obstacles when you can. Sometimes, however, the obstacles are small enough to ride over safely. Practice this skill by riding over a series of logs, one at a time.

- Find three logs about four to six feet long, no more than 10 inches in diameter.
- Place the logs 35 feet apart and at various angles.
- Begin at least 25 feet from the first log, and accelerate to second gear.
- As you approach the log:
  - Stand up, keeping your knees and elbows flexible and bent.
  - Lean forward slightly.
  - Keep the front tires at a 90-degree angle to the log.
- As the front tires touch the log:
  - Apply a small burst of throttle to keep your momentum.
  - Lean forward further as the rear tires go over the log to prevent being hit by the seat or the rear of the ATV.
- Keep your head up, and prepare to go over the next log.



### Beware of Darkness

- Slow down and watch for others at night or in low-light conditions.
- Exercise caution on overcast days.
- Establish a point of reference when riding on large, open fields after dark. Estimating distances and direction of travel may be difficult.

## Riding at Night

ATV accidents occurring at night usually involve ATVs running into trees, rocks, fences, or other stationary objects. Typically, these objects come into view unexpectedly in your headlight beam. It's important to drive slowly so that you have time to recognize the danger and react.

- Never "overdrive your headlight." You always should be able to stop within the length of the headlight beam. If the headlight suddenly reveals an obstacle, you should be able to stop before you hit it. An ATV high beam is effective for about 200 feet. To avoid a collision, travel slower than 30 mph because the stopping distance at this speed is about 180 feet (see Chapter 2).
- At nighttime, you also should:
  - Make sure your lights are clean and work properly.
  - Travel only in familiar terrain.
  - Stay on established trails.
  - Always carry a flare or flashlight for emergency signaling.
  - Never travel alone.
  - Pull off the trail if you stop so that you won't be a hazard to others.
  - Wear reflective apparel to make yourself more visible to other riders.

## Carrying Passengers

**Most ATVs are not designed to carry passengers.** A passenger can interfere with the operator's ability to shift his or her weight properly during maneuvers, which can cause a loss of control. If your ATV is designed for more than one person, be sure your passenger(s):

- Stays seated to keep the vehicle's center of gravity as low as possible.
- Keeps his or her feet on the footrests and does not extend his or her hands beyond the edge of the ATV.
- Dismounts before you cross a road and walks across.

## Towing a Trailer

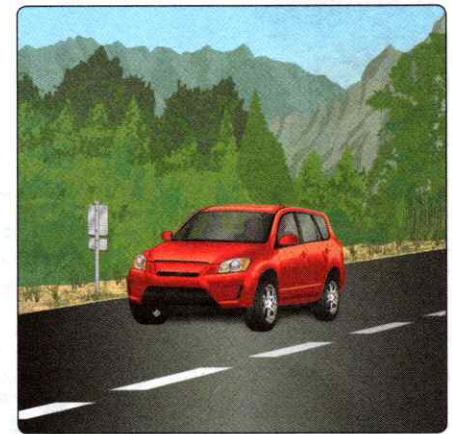
An ATV makes a great utility vehicle because it can tow heavy loads a lot easier than you can carry them. To avoid damaging the load or injuring yourself and others, always use the proper equipment and position the load correctly.

- Use a rigid hitch when towing anything. If you're pulling a cargo trailer or wagon, use a tow bar to keep the trailer from ramming into your ATV.
- Load the cargo to maintain the lowest possible center of gravity. Distribute the load along the bed of a trailer instead of piling it up. Also, secure the load so that it won't shift when you turn or brake.
- When slowing, downshift and use the engine to help slow the vehicle. Do not brake suddenly. On slippery surfaces, downshift and apply brakes equally (if equipped with dual brakes) and lightly.
- When descending a hill, always shift to a lower gear.

## Crossing Roads and Highways

ATVs are designed exclusively for off-road use. They can be difficult to handle on paved surfaces. Riding on or crossing a road illegally or improperly is a leading cause of ATV rider fatalities. If you must cross a road, follow this safe procedure.

- Pick a crossing point where you have good visibility in both directions.
- Bring your vehicle to a complete stop on the shoulder of the road.
- Look both ways, and yield to oncoming traffic.
- Drive forward slowly because your ATV may be difficult to maneuver on pavement.
- Drive straight across the road.
- When crossing in a group, have one rider dismount and act as a crossing guard until everyone else has passed safely.
- Stand up to give yourself maximum visibility.
- Remember that approaching automobile drivers are not expecting, or looking for, ATV riders.



### Legal Operation

ATVs are designed for off-road use. Cars are designed to be driven primarily on paved surfaces. Riding an ATV on pavement is legal only when the road is posted officially as an ATV route.

## Riding Safely and Responsibly

### You should be able to...

- List and describe the six common hand signals.
- Describe the five factors that cause riding fatigue and three steps to prevent it.
- Describe how the effects of alcohol and drugs make riding dangerous.
- List what a rider must do to abide by the code of safety.
- List what a rider must do to practice good trail etiquette.
- Describe the “Tread Lightly!” program and its significance in the future of off-road riding.





## Using the Buddy System

- Use the “buddy system”—make each rider responsible for keeping track of another person.
- Ride in a group of two or more.
- Plan your ride, and leave a copy of your plan at home or with a friend.

## Riding Within Your Personal Limits

- Know your personal limits and your abilities, and work within them.
  - Know what you can do—as well as what you can't do.
  - Don't try to keep up with your friends. If they are more experienced, you easily can get into situations that are beyond your abilities.
  - Even when you're experienced, remember that you still don't know everything. Be prepared for unexpected situations.
- But, if you always stay within your personal limits, how can you develop new skills and abilities?
  - Challenge your limits once in a while. It's normal to want to try new things. However, do so in practice situations, not out on the trail.
  - Have an experienced rider supervise your practice session and help you if needed.
  - Practice one new skill at a time, and start slowly. Trying to learn too many new things at once can be frustrating and dangerous.

## Preparing Yourself Before a Ride

Off-road riding is physically demanding, and riding for hours at a time requires stamina. To enjoy your time on the trail fully, you should:

- Be in good physical condition.
- Get plenty of sleep, and eat nutritious food before and during your ride.
- Drink plenty of water to replace fluids you lose through sweating, even in the cold.
- Avoid riding when you are ill or fatigued, which affects your judgment and reaction time and can lead to serious injury.

## Staying Alert To Avoid Fatigue

Long hours of riding added to the effects of motion, wind, engine noise, and vibration cause fatigue. Fatigue impairs judgment, slows reaction time, and can cause accidents. To reduce fatigue:

- Counteract the effects of wind, cold, and rain by dressing properly for the weather.
- Know your endurance limit, and don't drive beyond it.
- Take a break at least once an hour.

## Riding Single File With a Group

- Leave adequate space between vehicles, and maintain a safe speed. If the rider in front of you suddenly applies the brakes, you should be far enough behind to stop or maneuver in time to avoid a collision.
- Calculate safe distances using a reaction time of at least three seconds. As the vehicle in front of you passes an object, count one-thousand-one, one-thousand-two, and one-thousand-three. If you pass that same object in less than three seconds, you should allow more space.
- Be sure everyone performs a pre-ride inspection. Your brakes and brake lights may work, but your safety also depends on the other riders.
- Be sure everyone in the group knows the proper hand signals for turning, slowing down, and stopping. These simple hand signals can prevent serious accidents.
- If you're not in a group and someone is tailgating you, let him or her pass.

## Hand Signals

Traveling in a group requires communication. Make sure everyone in your group understands basic hand signals.

Stop



Slow Down



Left Turn



Right Turn



Hazard Left



Oncoming Traffic



## Understanding the Dangers of Alcohol and Drugs

- **Don't drink and ride.** Studies have found that riders had consumed alcohol in:
  - Thirty percent of all off-road riding fatalities.
  - Fourteen percent of all reported accidents.
- Alcohol depresses the central nervous system, affects judgment, and slows reaction time.
- Alcohol makes it difficult to pay attention, especially to multiple tasks.
- Most people become slightly intoxicated after only one drink.
- Over-the-counter drugs, as well as prescription drugs like tranquilizers and barbiturates, have effects similar to alcohol.
- Marijuana reduces your ability to see at night and slows your reflexes.
- Amphetamines or cocaine can increase focus temporarily but lead to fatigue when the drug wears off. They also produce mild euphoria, which alters judgment and leads to reckless behavior.

## Combining Speed and Alcohol

Speed is a major factor in accidents, and alcohol delays your reaction time. Mixing these two can have serious, even fatal, results. To appreciate more fully why you should never drink and ride, consider these factors.

- Review the information about reaction times and stopping distances in Chapter 2.
- Use three seconds as a typical reaction time, and suppose that alcohol doubles your reaction time. If you're traveling at 30 mph:
  - Normally, you travel 132 feet (3 sec. x 44 ft./sec.) during the time it takes you to see an obstacle and then begin to slow down or maneuver.
  - Under the influence, you travel 264 feet—approaching the length of a football field.
- When you do react, your speed, diminished judgment, and impaired physical condition further complicate a critical response.
  - The faster your speed, the longer the braking distance.
  - During a hard brake, your impaired condition could cause you to lose control of the vehicle.
- Under normal circumstances, you usually can handle hazardous situations before they become problems. If you were under the influence of alcohol, your vehicle's speed creates grave consequences to such problems.

## Observing the Code of Safety

### ■ Your Vehicle and Your Gear

- Be sure your vehicle is in good mechanical condition.
- Familiarize yourself with your vehicle by reading your owner's manual.
- Wear protective clothing suitable for the environment.
- Use a helmet with goggles or a face shield to prevent injuries from twigs and debris.
- Make sure your vehicle's lighting system is working properly.
- Don't remove the factory-installed air box or muffler.

### ■ Your Environment

- Know the terrain where you plan to ride.
- Remember that trail conditions can change due to elevation, terrain, and weather.
- Be aware of the weather forecast, especially ice and snow conditions.
- Respect any people and animals you encounter.
- Never venture out alone.



### A Deadly Mix

When you drink alcohol faster than your body can burn it, the level of alcohol in your bloodstream increases. This level is referred to as Blood Alcohol Concentration (BAC).

### Be a Wise Energy User

- Drive slowly for the first few minutes to let the engine warm up.
- Operate at lower speeds to help conserve fuel.
- Keep your engine tuned correctly to get maximum mileage.
- Use trails closest to your home to minimize transportation costs.

## Using Courteous Trail Etiquette

- Ride only where permitted.
- Be considerate of others on the trail, and keep to the right.
- Always yield to uphill traffic. Such riders may have trouble starting after stopping.
- Announce your intention before passing.
- Slow down when someone is passing you.
- If you meet bikers, horses, and hikers coming from the opposite direction, slow down, pull over, and yield the right-of-way.
- If you stop to talk to other trail users, be courteous and remove your helmet. A helmet masks your features and can be intimidating.
- Be safe and considerate when you stop along the trail. Never stop side-by-side, in the middle of the trail, at the crest of a hill, or around a corner on the trail. Also never block an intersection. Remember to shut off your engine.
- Leave gates as you find them.
- Report downed trees and trail maintenance needs to land managers.
- Report illegal riding.
- Carry out what you carry in.

## Protecting the Environment: Tread Lightly!

The Tread Lightly! program supports recreationists by encouraging outdoor ethics to preserve the beauty of wild land. The word “tread” helps us remember to:

- T** **Travel responsibly** on roads and trails or in permitted areas.
- **Stay on designated roads.** Don't blaze a new trail or cut across switchbacks.
  - Travel only in areas open to your type of vehicle.
  - Drive over obstacles, instead of going around them, to avoid widening the trail.
  - Cross streams only at designated crossings.
  - If you must cross a soft or muddy area, go slowly to avoid spinning your wheels.
  - Respect closed gates and regulatory signs. Do not exceed the posted speed limit.

**R** **espect the rights of others** including private property owners and all recreational trail users, campers, and others to allow them to enjoy their recreational activities undisturbed.

- Never cross private land without permission.
- Yield the right-of-way when you meet others on the trail.
- If you meet a horse and rider, turn off your engine to avoid spooking the animal.
- Stay clear of wild animals, and avoid disturbing livestock.
- Minimize noise. Keep your vehicle properly tuned, and do not rev your engine unnecessarily.
- Avoid creating dust, especially in residential areas.

**E** **ducate yourself** by obtaining travel maps and regulations from public agencies, planning for your trip, taking recreation skills classes, and knowing how to use and operate your equipment safely.

- Get maps that show the area where you plan to ride.
- Learn about regulations governing off-road riding in the area.

**A** **void sensitive areas** such as meadows, lakeshores, wetlands, and streams. Stay on designated routes.

- Avoid sensitive habitats, including living desert soils, tundra, and seasonal nesting or breeding areas.
- Stay out of designated wilderness areas.

**D** **o your part** by modeling appropriate behavior, leaving the area better than you found it, properly disposing of waste, minimizing the use of fire, avoiding the spread of invasive species, and restoring degraded areas.

- Equip your vehicle with a spark arrestor.
- Before and after a ride, wash your vehicle to reduce the spread of invasive species.



### Encountering Horses on the Trail

- Slow down and pull over. Turn off the engine and remove your helmet to avoid startling the horse.
- Avoid sudden movements.
- Wait until the horses have passed, and then ease back onto the trail.

### Avoid Riding Below the OHWM

- The Ordinary High Water Mark (OHWM) is a stain on rocks and trees along the shoreline of a waterway, defining where the highest water level usually is.
- Areas below the OHWM, such as exposed shorelines and lakebeds, are very important to ecosystems.
- Because vehicles can easily damage these vulnerable areas, you should never operate below the OHWM.



### Reduce the Spread of Harmful Weeds

Weed seeds lodge in tires and caked-on mud. To prevent the spread of weeds, wash your vehicle after every ride.

### Campground Guidelines

- Slow down in camping areas and around crowds.
- Practice minimum impact camping.

## Preparing for the Unexpected

### You should be able to...

- List four risks of venturing into off-road terrain.
- Describe four ways to plan properly for outings.
- Demonstrate how to read a topographic map and use a compass.
- Define declination, and demonstrate how to compensate for it when using a compass.
- List three steps that will help you survive outdoors if you become lost.
- Describe what to look for when seeking a natural shelter and how to build a lean-to or a debris hut.
- Demonstrate how to build, start, and put out a fire.
- Describe four risks from exposure to extreme weather, and explain how you can prevent them.



## Planning for the Risks of Off-Road Terrain

- Anytime you venture into off-road terrain, some risk is involved. You could become:
  - Stranded because of mechanical problems
  - Caught in unexpected, severe weather
  - Injured or lost
- Environment characteristics also increase the chance of accidents:
  - Rough terrain
  - Climate extremes
  - Remoteness

### PLAN Properly

**Prepare for the trip** and any problems you can anticipate.

- Decide how to deal with such problems. Consider terrain, location, weather, and other factors that could affect your trip.

**Locate the area** where you'll be riding.

- Use a map to familiarize yourself with the area. If the area is remote, also purchase a topographic map and familiarize yourself with the terrain.
- If you own a GPS, take it along. If you don't have one, consider buying one.

**Assess** your physical condition, your equipment, and safety rules.

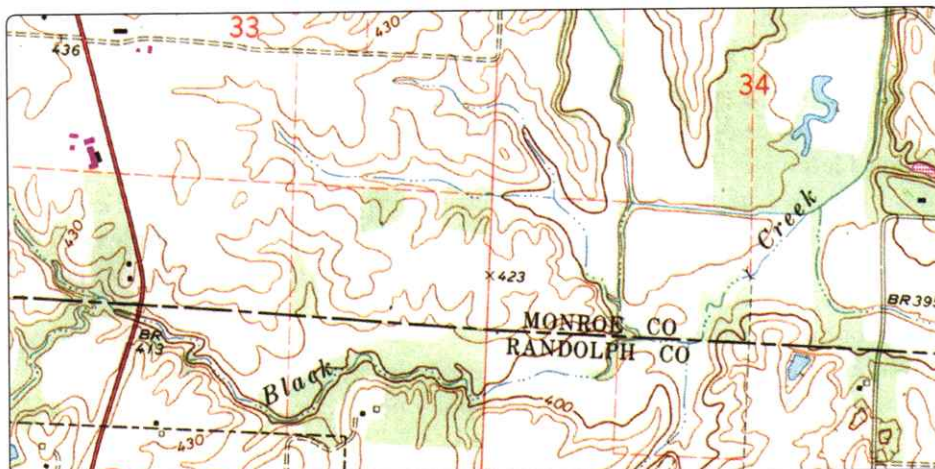
- Analyze all of the logistics related to the trip.
- Based on this information, decide whether the timing of the trip is good.

**Notify** someone about where and with whom you're riding and your expected return time. Leave a specific plan with a family member or friend.

## Using Maps and Compasses

### Reading a Topographic Map

- If you plan to spend a lot of time traveling through unfamiliar terrain, a topographic map is a good investment.
- Topographic maps are created from aerial photographs and reveal the contours of the land, including hills, ridges, and valleys, as well as lakes, rivers, creeks, trails, and roads.
  - Contour lines show the elevation of the ground.
  - Contour intervals reveal how much vertical distance there is between each contour line. Closely spaced contour lines indicate very steep slopes.
  - Contour lines that are sharply tapered indicate an uphill direction.
  - Rounded contour lines typically indicate a downhill direction.



### What To Bring Along

**Map and Compass:** Most states have good trail maps. Topographic maps provide the most useful information for navigating terrain because they show the area in three dimensions. Purchase a good orienteering compass, and learn how to use it with a topographic map.

**First-Aid Kit:** Carry a well-stocked first-aid kit, and take a first-aid course so that you'll know how to respond in an emergency (see "Basic First Aid" and "Coping With Extreme Weather").

**Survival Kit:** In addition to the items listed above, you should carry:

- Emergency blanket in cold weather
- Emergency food and water (enough for one or two extra days)
- Flashlight
- Hand axe or saw
- High-energy snacks such as candy bars
- Iodide tablets for water purification
- Knife
- Nylon rope
- Plastic whistle
- Pocket mirror
- Signal flares
- Snowshoes in the winter
- Tarpaulin
- Waterproof matches

#### Other useful items:

- GPS receiver
- Mobile phone
- Radio for weather reports

## Map Resources

Topographic maps are available at many outdoor stores or may be obtained from the U.S. Geological Survey at [www.usgs.gov](http://www.usgs.gov). Or contact the USGS by calling toll-free 1-888-ASK-USGS (1-888-275-8747).

National Forest Service Motor Vehicle Use Maps (MVUMs) show forest road networks and restrictions. They are available from the U.S. Forest Service at [www.fs.fed.us](http://www.fs.fed.us).

## Remember...

Metal objects such as knives, gun barrels, and belt buckles will affect the magnetic needle of a compass.



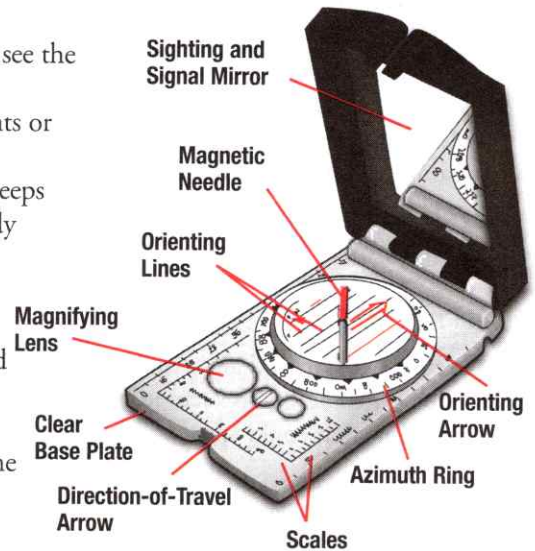
## Another Direction Finder

You can use an analog watch—the kind with hands—to find south. With the watch on a flat surface, rotate it to point the hour hand at the sun. South is the direction halfway between the hour hand and 12. (If the watch is set to daylight savings time, south is the direction halfway between the hour hand and 1.)

## Selecting a Compass

A good orienteering compass is critical. It should have these features:

- Clear base plate that allows you to see the map underneath
- Straight sides for aligning two points or for drawing lines
- Liquid-filled needle housing that keeps the magnetic needle relatively steady when taking readings
- Two arrows:
  - A direction-of-travel arrow, painted on the base plate, is used to point the compass at your destination.
  - An orienting arrow, located in the needle housing, is used to orient your compass to your map.



## Understanding Declination

- Topographic maps are drawn to true north (North Pole). However, a compass points to magnetic north, which is in the Hudson Bay area. The difference between true north and magnetic north is called “declination.”
- When true north and magnetic north are aligned ( $0^\circ$  declination), the compass needle points to true north. If you’re east or west of  $0^\circ$  declination, the compass is not in line with true north.
- A diagram on topographic maps shows whether magnetic north is to the east or west of true north and by how many degrees.
- You can correct for declination when you use a compass and a map to take a bearing, as described below.

## Using a Compass To Take a Bearing Visually

When visibility is subject to change, such as from hills or fog, take a bearing on your destination while you can see it. Then, when it’s out of sight, use the bearing to find your direction. To take a bearing:

- Hold the compass level, and point its direction-of-travel arrow toward your destination.
- Rotate the azimuth ring until the orienting arrow lines up with the magnetic needle. Be sure the north end of the needle (usually red) points to N, not S.
- Find where the degree markings around the azimuth ring line up with the direction-of-travel arrow. That degree mark is your bearing.

## Using a Compass and Map To Take a Bearing

If you know your current location on the map and want to travel to another mapped location:

- Lay out the map on a flat surface and remove any metal objects from the area.
- Place the flat edge of the compass (the side parallel to the direction-of-travel arrow) along the line between the two points. Be sure the direction-of-travel arrow points toward your destination.
- Orient the map to north.
- Without moving the compass, rotate the azimuth ring until the orienting arrow (indicated by N) and the orienting lines point northward on the map, as indicated by the map’s north arrow or vertical lines.

- Turn the map and compass together until the magnetic needle lines up with the orienting arrow.
- Correct for east or west declination.
  - Rotate the azimuth ring left or right using the direction and the number of degrees given on the map.
  - Do not rotate the compass itself. It's okay if the magnetic needle does not line up with the orienting arrow.
- Find where the degree marking around the azimuth ring lines up with the direction-of-travel arrow. That's the bearing to your destination.

### “Red Fred in the Shed”: Using a Compass

- Think of the rhyme “Red Fred in the Shed” to remember how to use a compass. As you perform the steps below, remember the following.
  - Move your body—not the compass.
  - Think of the red magnetic needle as “red Fred.”
  - Think of the orienting arrow as the “shed.”
- To use the compass to follow a specific bearing, put “red Fred in the shed.” For example, if you want to travel at a bearing of 240°, follow these steps.
  - Turn the azimuth ring until the 240° mark is lined up with the direction-of-travel arrow.
  - Keep the compass level as you point the direction-of-travel arrow directly away from your waist.
  - Keeping the compass in the same position with your body, turn your body until the red needle lines up inside the orienting arrow (think of it as putting “red Fred in the shed”). You now are facing a bearing of 240°.
  - Move in the same direction that the direction-of-travel arrow points. Be sure to keep red Fred in the shed as you go.



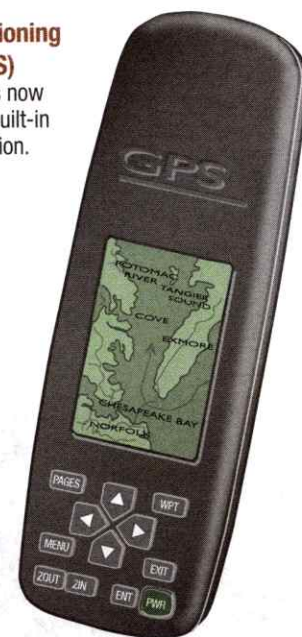
## Navigating With a Global Positioning System

- The Global Positioning System (GPS) is a navigation system based on a network of 24 satellites. Users with a GPS unit can determine their exact location (latitude and longitude) in any weather conditions, all over the world, 24 hours a day.
- GPS satellites circle the earth twice a day and transmit information to the earth. GPS receivers use this information to calculate the user's location by comparing the time a signal was transmitted by a satellite with the time it was received. The time difference tells the GPS receiver the distance the user is from the satellite. By calculating the distances from several satellites, the receiver can determine and display the user's location on the GPS unit.
- Once the user's position is determined, a GPS unit can calculate other information, including bearing, trip distance, distance to destination, and sunrise and sunset times.
- GPS receivers are accurate to within 15 meters (49 feet) on average. Certain atmospheric factors and other sources of error can affect the accuracy. Accuracy can be improved with a Differential GPS (DGPS) or WAAS (Wide Area Augmentation System).

## Training To Develop Survival Skills

- This chapter helps you to plan for the unexpected on an off-road trip and to prepare in order to avoid common misadventures, such as being lost. It should *not* be seen as equivalent to survival training, which is much broader and more intense training in dealing with the rigors of the wild.
- Survival skills can vary widely depending on the geographical area. Your ability to survive in the snow or mountains, for example, might rely on a different set of skills and knowledge than surviving in the desert or heavy woods.

**Global Positioning System (GPS)**  
Some vehicles now come with a built-in GPS as an option.



## Rules of Survival

- Tell someone where you're going and when you plan to return.
- Don't travel alone.
- Take enough food and water to last for at least two days in an emergency.
- Bring a map and compass, and always orient yourself before leaving.
- Wear layered clothing.
- Don't panic if you become lost.

## Benefits of Survival Training

Taking a formal class in survival skills can be invaluable if your riding environment is extreme in terms of terrain, climate, or remoteness. Some benefits include:

- The potential for saving your life or the life of one of your companions
- The ability to enjoy areas of the country that would be off-limits to adventurers equipped with less knowledge
- Greater respect for the environment and wildlife and for their collective risks
- Greater confidence in your own self-sufficiency, which will translate to other areas of your life

## Scope of Survival Training

Survival training skills range from somewhat simple tasks to quite sophisticated medical procedures. A survival training class could include how to:

- Light a fire without a match.
- Set a fracture in the wild.
- Avoid encountering bears.
- And much more.

The wide scope of useful topics makes it impractical to attempt to cover survival training within this manual.

## Preparing for Unexpected Weather

- Over 90% of all presidentially declared disasters are weather-related. The National Weather Service has a number of programs to help communities prepare for weather emergencies.
- Although you have no control over the weather, you can prepare for typical weather conditions that are likely to occur.
  - **Precipitation:** rain, cold, or sleet
  - **Temperature:** extreme heat or cold
  - **Extreme weather:** tornadoes, hurricanes, blizzards, heat waves, and others
- Always prepare for your trip by studying the weather in advance. If extreme weather is forecast, reschedule your trip for another time.
- If you live in an area where extreme weather events such as hurricanes and tornadoes take place, know when the "season" for these events occurs.

- Check with the National Weather Service (NWS) website for information about weather planning and preparedness: <http://www.nws.noaa.gov/>
  - The NWS even may be able to send weather forecast updates to your cell phone in text messages, depending upon where you're located.
  - Weather updates while on the road can help you avoid extreme weather events that develop.

## Coping in Remote Areas

If you plan to visit a remote area, you must prepare for the possibility that your party may be stranded and must await rescue. If you are, you can take three steps to help you survive.

- Prepare a shelter.
- Build a fire, if necessary.
- Signal for help.





## Preparing a Shelter

- Before dark, begin looking for a dry, well-drained site protected from the wind.
- Look for a natural shelter, such as a rock overhang or thicket of evergreens.
- Ideally, the site should be near fresh water and firewood, in case a fire is necessary.
- If no natural site is available, build a lean-to.
  - Lean branches against a horizontal support to form a frame for a roof.
  - Orient the opening of the lean-to away from the wind.
  - Cover the frame with evergreen branches or a tarp to block out the weather.
  - Add side walls, if necessary.



## Building a Fire

- If there is snow on the ground, build the fire on a platform of green logs or rocks. If the terrain is dry, clear a patch of bare dirt to avoid starting a grass or forest fire.
- Collect more fuel than you think you can use.
- Pile fine twigs, grass, or bark shavings loosely as a base. If you can't find dry kindling, shave dry wood from the inside of tree bark.
- Place slightly larger sticks on the starter material until you have a pile about 10 inches high.
- Light the kindling in the middle of the base. If there is a breeze, light one end of the kindling so that the flame will be blown toward the rest of the fuel. As the flames spread to the larger twigs, slowly add more wood to the blaze.
- Make sure everyone in your group practices responsible fire safety.
  - Build campfires away from tents and away from heavy fuels such as logs or brush. Consider wind direction in choosing a location for the fire.
  - Never leave a fire unattended.

## Putting Out a Fire

- Near the end of the fire, stop adding fuel. Add small, singed bits of wood to the fire to use them up.
- Allow the fire to burn fully to white ash. Then extinguish it with water.
- Carry out a "cold-out" test by using your hands to feel through the cold, wet ash to make certain the fire is out.
- Disperse the ash remains over the area. If necessary to avoid polluting sources of water such as a river, take the ash with you in your trash pack to dispose of when you return home.

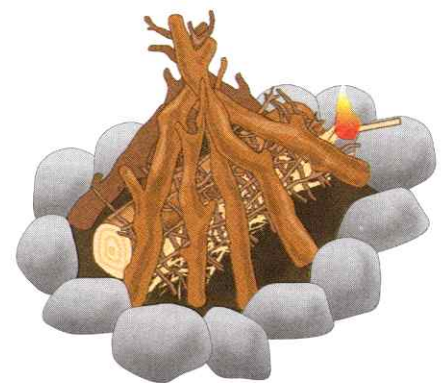
## Drinking Water

- Everyone needs two to four quarts of water daily.
- You can last only a few days without water.
- Clear water does not mean pure water. Mountain streams often are contaminated by parasites.
- The best way to purify water is by boiling it for five minutes.
- If boiling is impossible, use a chemical purifier or filter.
- Try to avoid complicating survival problems. Never drink unsafe water.

## Planning a Fire

Decide whether you really need a fire. Ask yourself the following questions.

- What's the fire danger for this time of year and this area?
- Are there restrictions that make a fire illegal? For instance, is there a fire warning due to wind or drought that could result in wildfires?
- Is there enough wood so that its removal will not damage the immediate area?
- Do you know the appropriate way to build a fire that will leave no impact on the area? (The good rule of thumb is to build fires in existing fire rings.)



A tepee of larger sticks enclosing the kindling is a good way to start a fire.

## Remember...

Always fully extinguish any fire with water before leaving your camp.

## Basic First Aid

All riders should take a first-aid course to prepare for outdoor emergencies. The American Red Cross offers training in first aid and cardiopulmonary resuscitation (CPR).

It's also wise to carry a complete first-aid kit. Suggested contents for a first-aid kit include:

- 2-inch-square sterile gauze pads
- 4-inch-square sterile gauze pads
- 42-inch-square cloth for triangular bandage or sling
- Antacid
- Antibiotic salve
- Aspirin
- Assorted adhesive dressings
- Assorted butterfly dressings
- Cell phone
- Cotton swabs
- Decongestant
- Eye dropper
- Hand sanitizer
- Instant chemical cold packs
- Instant chemical hot packs
- Latex gloves
- Moleskin
- Needles
- One-half percent hydrocortisone cream
- Petroleum jelly
- Roll of 1-inch adhesive tape
- Roll of 2-inch adhesive tape
- Roll of 2-inch gauze bandage
- Safety pins
- Scissors
- Single-edged razor blades
- Sterile eyewash
- Thermometer
- Tweezers



## Signaling for Help

Prepare help signals as soon as possible.

- Use the international emergency sign for distress, three of any signal:
  - Three fires evenly spaced
  - Three blasts on a whistle
  - Three flashes with a mirror
- If you're near an open space, walk a large "X" in the grass, sand, or snow. If possible, outline it with rocks or branches.

## Coping With Extreme Weather

Some of the most common and dangerous risks to off-road riders result from exposure to extreme weather. Learn to recognize the signs of these dangers, which include hypothermia, frostbite, heat exhaustion, and heat stroke. It's even more important, however, to prepare ahead of time to avoid such risks.

Risks from Extreme Weather			
Condition	Contributing Factors	Symptoms	Prevention
Hypothermia— The body loses heat faster than it produces it.	<ul style="list-style-type: none"> <li>• Extreme cold</li> <li>• Use of alcohol or drugs</li> <li>• Slower metabolic rates, as in older people</li> <li>• Other medical conditions</li> </ul>	<ul style="list-style-type: none"> <li>• Uncontrolled shivering</li> <li>• Slow slurred speech</li> <li>• Memory loss</li> <li>• Irrational behavior</li> <li>• Lack of movement</li> <li>• Sleepiness</li> <li>• Unconsciousness</li> </ul>	<ul style="list-style-type: none"> <li>• Wear weather-appropriate clothing that can wick away moisture.</li> <li>• Keep your head covered.</li> </ul>
Frostbite— Tissue is damaged by extreme cold. Frostbite most frequently occurs in toes, fingers, ears, and nose.	<ul style="list-style-type: none"> <li>• Extreme cold</li> <li>• Wet clothes</li> <li>• Wind chill</li> <li>• Poor circulation (can be due to tight clothing, medications, or other medical conditions)</li> </ul>	<ul style="list-style-type: none"> <li>• Skin turns off-white</li> <li>• Prickly or tingling feeling occurs as ice crystals form</li> <li>• Pain may be present initially, then disappears as frostbite progresses</li> <li>• In severe cases, loss of feeling occurs in the affected area</li> </ul>	<ul style="list-style-type: none"> <li>• Wear clothing to protect vulnerable areas.</li> <li>• Avoid fabrics that retain moisture.</li> <li>• Before exposure, avoid alcohol and smoking. Get plenty of food and rest.</li> <li>• In prolonged exposure, find shelter and stay active.</li> </ul>
Heat Exhaustion— The body produces heat faster than it can dissipate, increasing the core body temperature.	<ul style="list-style-type: none"> <li>• Extreme heat and direct sunlight</li> <li>• Humidity</li> <li>• Dehydration</li> <li>• Strenuous exercise or enclosed spaces in warm weather</li> </ul>	<ul style="list-style-type: none"> <li>• Pale and clammy skin</li> <li>• Weakness</li> <li>• Nausea</li> <li>• Headache</li> <li>• Muscle cramps</li> </ul>	<ul style="list-style-type: none"> <li>• Wear light, loose clothing.</li> <li>• Wear wide-brimmed hats, vented if possible.</li> <li>• Drink plenty of liquids.</li> </ul>
Heat Stroke— The result of advanced heat exhaustion. This is a dire condition that can result in death and must be avoided.	(See "Heat Exhaustion.")	<ul style="list-style-type: none"> <li>• Dry, hot, and flushed skin</li> <li>• Dilated pupils</li> <li>• Rapid, weak pulse</li> <li>• Shallow breathing</li> <li>• High temperature</li> </ul>	(See "Heat Exhaustion.")

Note: Taking a first-aid course is highly recommended for all riders.

# Learning To Ride Off-Highway Motorcycles: Basic Skills

## You should be able to...

- Name the main cause of motorcycle accidents.
- List the actions you can take to prevent accidents.
- List the common motorcycle parts.
- List three essential items to wear when operating a motorcycle.
- Describe the correct body position when riding a motorcycle.
- Describe how to brake effectively and turn safely.
- List the three preventive safety measures you can take when riding at night.

## Learning the Characteristics of Off-Highway Motorcycles

Off-highway motorcycles are categorized by a number of off-road sports, the most notable being the following.

- **Motocross:** These motorcycles are designed for racing over jumps and are not legal for the street.
- **Enduro:** These long-distance competition motorcycles meet minimum standards to be “street legal,” as well as Environmental Protection Agency (EPA) standards.
- **Dual-purpose:** Designed for paved-road and off-road use, these motorcycles are fully street legal.
  - Lights and turn signals are approved for highway use.
  - Tires are approved by the Department of Transportation (DOT).
  - Spark arrestors are approved by the U.S. Forest Service (USFS).
  - Noise- and emission-control devices conform to EPA standards.

## Being Safe and Responsible

### Causes of Accidents

- When riding off-road, you usually can avoid the main cause of motorcycle accidents: drivers of larger vehicles who disregard the motorcyclist’s rights. Most often, the driver of the larger vehicle claims he or she “didn’t see” the motorcycle.
- Other factors in accidents include the motorcyclist’s lack of skills or training:
  - Overbraking
  - Turning too wide and losing control
  - Drinking alcohol, which impairs the ability to perform basic maneuvers

### Preventing Accidents

- Make yourself visible to other drivers.
  - Wear bright clothing.
  - Use your lights at all times.
  - Use hand signals when turning or stopping.
  - Flash your brake lights when you slow to a stop.
  - Ride in the area of the road where others are most likely to see you.
  - Stay out of blind spots.
  - Let the driver ahead see you.
  - Help drivers at intersections see you.
  - Use whip flags on sand dunes.
- Practice skills in a safe area before exploring more difficult areas.
- Always observe regulations.
- Never drink and ride.



## Common OHM Parts

Spark Arrestor/Muffler

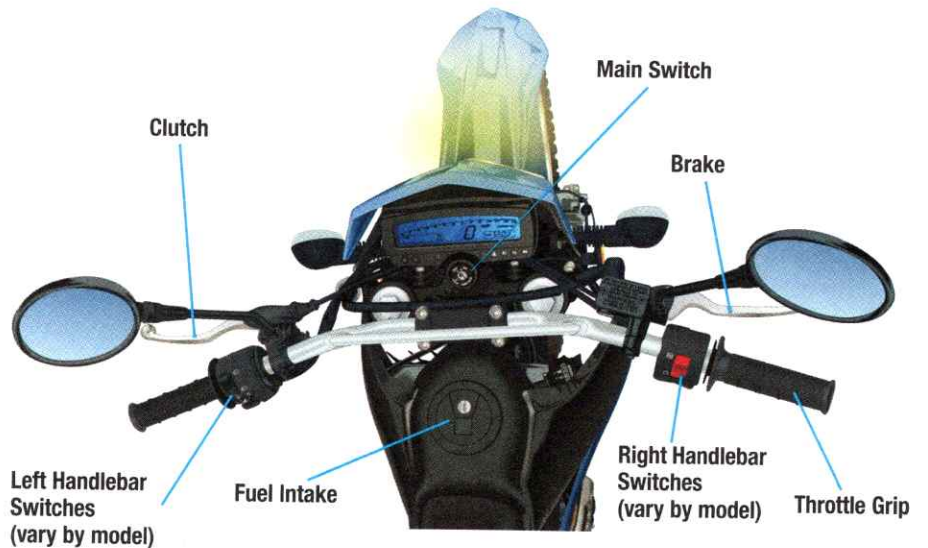
Fuel Tank

Footpeg



### *Remember ...*

Your motorcycle may or may not have all the parts and controls shown in these illustrations. Also, their positions may vary from model to model. **Consult your owner's manual to learn the specific parts, controls, and locations for your model.**



## Preparing To Ride

### Selecting Protective Gear and Clothing

Protective clothing and gear—including a DOT-approved crash helmet—can make a dramatic difference if an accident occurs. Review “Safeguarding Yourself with Protective Gear and Clothing” in Chapter 1 to make sure you’re properly outfitted. Protective clothing and gear play an important role in preventing injury and death in motorcycle accidents and at other times.

- **No access to safety equipment in an accident.** In an accident, you will likely be separated from the motorcycle. In that case, safety gear on the bike can’t protect you.
- **Crash helmet.** Riders wearing a DOT-approved crash helmet are likelier to survive a motorcycle crash.
  - Head injuries are a major cause of death in motorcycle accidents.
  - Studies overwhelmingly demonstrate reduced injury of all types for riders wearing helmets.
  - There are no compelling medical arguments against wearing a helmet.
  - Helmets do not reduce visibility or hearing.
  - Because a helmet’s function is to absorb the impact of a crash, it deconstructs significantly during a crash. Always replace your helmet if you’re in an accident.
- **Eye protection.** Wearing goggles or a full-face helmet safeguards you in two ways:
  - Keeps debris from your eyes, preventing vision difficulty while riding that could result in accidents
  - Protects your eyes from injury
- **Brightly-colored, rugged protective clothing.** The proper clothing provides additional protection.
  - A colorful riding suit makes you more visible to other riders and motorists, thus helping avoid accidents.
  - Rugged clothing helps protect you from environmental extremes.
  - In an accident, clothing made specifically for riding can help protect your skin from contact injuries.

### Get Ready To Ride with START-GO

Always perform a pre-ride inspection using **START-GO**, described in more detail in Chapter 2. Consult your owner’s manual to determine how to conduct the inspection.

## Beginning To Ride: Basic Skills

### Body Position and Its Importance in Safety

On a motorcycle, your body is, effectively, an extension of the machine.

- Each component of body position affects your ability to steer, turn, control the throttle, maintain balance, and spot obstacles quickly.
- To master control of your motorcycle, always use correct body position.
- Whether sitting or standing, maintain this position.
  - Stay forward with your weight directly over the footpegs.
  - Keep your feet on the footpegs with your knees slightly bent.
  - Press your knees lightly into the gas tank.
  - Hold the handlegrips firmly to control the motorcycle in tough terrain. Grip with the right wrist down to avoid accidentally giving too much throttle.
- If your position is correct, your arms should have to bend slightly to hold the handlegrips.

### Starting Your Motorcycle

Check your owner’s manual for details about starting your motorcycle. Most motorcycles use a kick-start system.

## Pre-Ride Inspection Procedure

Equipment on your motorcycle may vary.

### Steering

- Handlebars
- Footpegs

### Throttle and Brakes

- Throttle
- Ignition switch
- Brakes
- Shifter mechanism

### Activate Lights

- Headlight
- Taillight
- Brake light

### Registration

- Registration decal
- Trail pass decal

### Tires, Wheels, and Suspension

- Tire pressure and air leak
- Axle nuts
- Bearings
- Spark arrestor/muffler
- Major fasteners

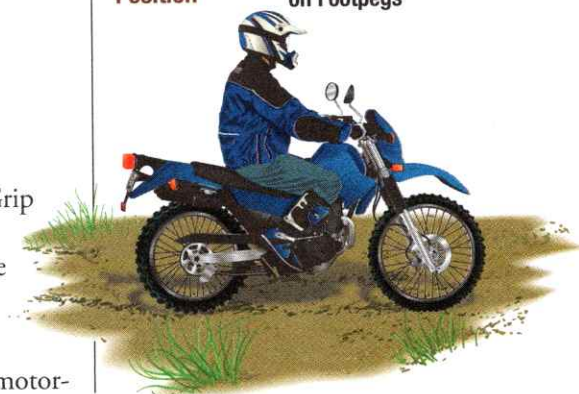
### Gasoline and Oil

- Oil and gas levels and leaks
- Air filter
- Spark plugs

### Operate Responsibly

Proper  
Level Riding  
Position

Body Weight  
on Footpegs



### Riding Uphill



- Check the following conditions before starting.
  - The fuel is on.
  - The ignition is on.
  - The motorcycle is in neutral.
  - The key or switch is in the “Start” or “On” position.
- If the engine is cold, use the choke until it runs smoothly. Then move the choke to the “Off” position.

### Accelerating

- Keep your hips over or slightly in front of the footpegs. Lean your upper body forward.
  - Press your feet down and back into the footpegs, which will help you counter the force pushing you rearward.
  - Practice shifting until you can coordinate the throttle, clutch, and shifter into one smooth, quick motion.
  - Run through acceleration drills to improve your control skills.
    1. Accelerate hard until you reach third gear.
    2. Stop accelerating.
    3. Apply the brakes.
    4. Come to a complete stop.
    5. Repeat steps 1-4. As your skills improve, you will notice the following.
      - Step 3 comes closer to Step 2 until they occur at the same time.
      - Step 4 occurs much closer to Step 3.

### Braking

As with other functions, keep your weight forward for better braking control.

- Ease up on the throttle.
- Keep your weight forward and over the footpegs.
- Press your knees against the gas tank to keep your weight forward and balanced.
- Although the front brake is most effective for stopping on most surfaces, practice using front and rear brakes on all surfaces.
- Use the engine stop/kill switch during normal and emergency stops.
- After stopping, turn off the ignition key or switch to save your battery.

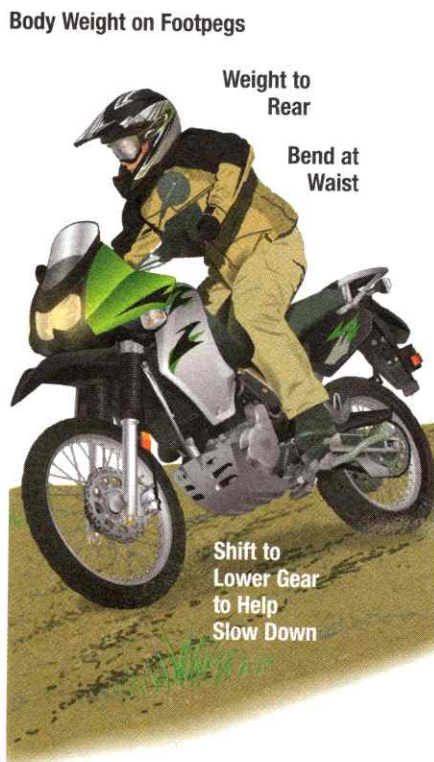
### Turning

- On slow turns:
  - Shift your weight *away* from the turning direction.
  - If necessary, brake, shift, or throttle, depending on the speed and sharpness of the turn.
- For quick turns to avoid unexpected obstacles:
  - Lean quickly in the direction you want to turn.
  - Push on the inside of the handlegrip on the same side (to turn right, push right).

### Riding at Night

- Always use your lights.
- Slow down to give yourself more time to react.
- Increase the distance between yourself and the vehicle in front of you.

### Riding Downhill



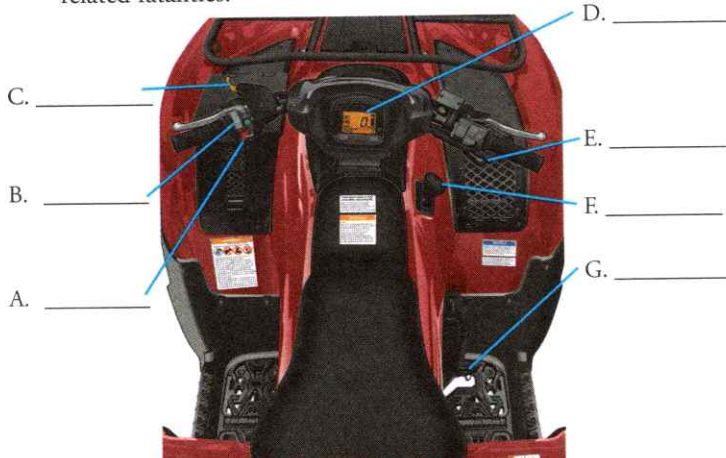
# Chapter Reviews

## Chapter 1

- ATVs are designed for \_\_\_\_\_ use only.
- Fill in the blanks to identify the common ATV parts shown below.
- What is the best source of information about your ATV?  
\_\_\_\_\_
- What are five items you must wear when operating an ATV?
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
- Choose a \_\_\_\_\_ that has a Department of Transportation (DOT) label or the Snell Memorial Foundation label.
- True or False: Sunglasses provide adequate eye protection when riding an ATV.
- \_\_\_\_\_ boots offer the best protection from ankle and foot injuries.
- List four of the six actions you take when loading an ATV onto a trailer or pickup truck.
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_

## Chapter 2

- List three design characteristics of an ATV that create risk for a rider.
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
- List four causes of ATV accidents.
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
- Riding on \_\_\_\_\_ is a leading cause of ATV-related fatalities.



- List the seven items that START-GO reminds you to check or do before riding.
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
- List the four steps for starting off after the engine is warmed up.
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
- List the three types of transmissions.
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
- List the three physical actions involved in correct posture.
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
- It's extremely important to keep your feet on the footrests at all times because if they slide off, they could end up under the \_\_\_\_\_.
- List the four steps for making a safe turn.
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
- With a solid rear axle or locked differential axle, you should position your body to the \_\_\_\_\_ of the seat in a slow turn, and to the \_\_\_\_\_ of the seat in a fast turn.
- If you are climbing a hill and you lose all forward momentum, you should lean forward and \_\_\_\_\_.



12. If your brakes don't hold your ATV after you stall out on a hill and you begin to roll backward, you should immediately dismount on the \_\_\_\_\_ side.
13. List five things to remember when going downhill.
  - i. \_\_\_\_\_
  - ii. \_\_\_\_\_
  - iii. \_\_\_\_\_
  - iv. \_\_\_\_\_
  - v. \_\_\_\_\_
14. List five things to remember when traversing a slope.
  - i. \_\_\_\_\_
  - ii. \_\_\_\_\_
  - iii. \_\_\_\_\_
  - iv. \_\_\_\_\_
  - v. \_\_\_\_\_

### Chapter 3

1. List four of the six actions you should take to assess the safety of your terrain.
  - i. \_\_\_\_\_
  - ii. \_\_\_\_\_
  - iii. \_\_\_\_\_
  - iv. \_\_\_\_\_
2. List five of the eight important guidelines to follow when driving through shallow water or mud.
  - i. \_\_\_\_\_
  - ii. \_\_\_\_\_
  - iii. \_\_\_\_\_
  - iv. \_\_\_\_\_
  - v. \_\_\_\_\_
3. For better handling on ice, maintain \_\_\_\_\_ speed and \_\_\_\_\_ to a stop, rather than braking.
4. What does it mean to overdrive your headlight?  
\_\_\_\_\_
5. List six things you must do to cross a road safely.
  - i. \_\_\_\_\_
  - ii. \_\_\_\_\_
  - iii. \_\_\_\_\_
  - iv. \_\_\_\_\_
  - v. \_\_\_\_\_
  - vi. \_\_\_\_\_

### Chapter 4

1. What three steps can you take to prevent riding fatigue?
  - i. \_\_\_\_\_
  - ii. \_\_\_\_\_
  - iii. \_\_\_\_\_
2. Alcohol and drugs make riding dangerous by \_\_\_\_\_, \_\_\_\_\_, and slowing \_\_\_\_\_ time.
3. Most people become slightly intoxicated after \_\_\_\_\_.
4. According to the code of safety, list three things you should be familiar with or be aware of before you head out.
  - i. \_\_\_\_\_
  - ii. \_\_\_\_\_
  - iii. \_\_\_\_\_

5. List four of the rules of good trail etiquette.
  - i. \_\_\_\_\_
  - ii. \_\_\_\_\_
  - iii. \_\_\_\_\_
  - iv. \_\_\_\_\_
6. To observe the Tread Lightly! program, what five broad rules should a rider observe?
  - i. \_\_\_\_\_
  - ii. \_\_\_\_\_
  - iii. \_\_\_\_\_
  - iv. \_\_\_\_\_
  - v. \_\_\_\_\_

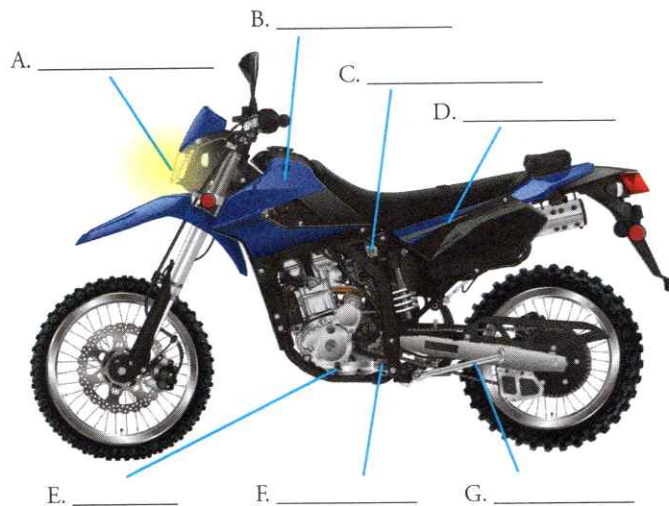
### Chapter 5

1. What are four risks of venturing into off-road terrain?
  - i. \_\_\_\_\_
  - ii. \_\_\_\_\_
  - iii. \_\_\_\_\_
  - iv. \_\_\_\_\_
2. Name four ways to plan an outing properly to help you avoid or minimize problems.
  - i. \_\_\_\_\_
  - ii. \_\_\_\_\_
  - iii. \_\_\_\_\_
  - iv. \_\_\_\_\_
3. What are four essential items to take on an OHV trip?
  - i. \_\_\_\_\_
  - ii. \_\_\_\_\_
  - iii. \_\_\_\_\_
  - iv. \_\_\_\_\_
4. The three steps to take a bearing visually are:
  - i. \_\_\_\_\_
  - ii. \_\_\_\_\_
  - iii. \_\_\_\_\_
5. If you get lost in a remote area, what three steps will help you survive?
  - i. \_\_\_\_\_
  - ii. \_\_\_\_\_
  - iii. \_\_\_\_\_
6. Name three characteristics of a good natural shelter.
  - i. \_\_\_\_\_
  - ii. \_\_\_\_\_
  - iii. \_\_\_\_\_
7. If there is snow on the ground, you can build a fire on a platform of \_\_\_\_\_ or rocks.
8. Even in cool weather, you need \_\_\_\_\_ quarts of water a day.
9. To avoid hypothermia, what two preventive measures should you take?
  - i. \_\_\_\_\_
  - ii. \_\_\_\_\_
10. What three steps can you take to prevent heat exhaustion?
  - i. \_\_\_\_\_
  - ii. \_\_\_\_\_
  - iii. \_\_\_\_\_

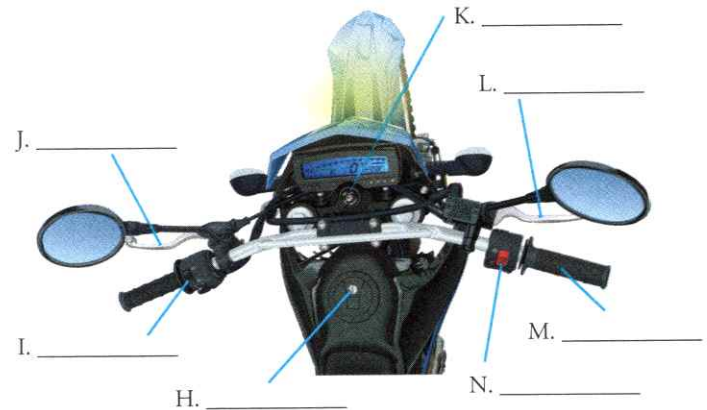


## Chapter 6

- The main cause of all motorcycle accidents is \_\_\_\_\_.
- Name five actions you can take to prevent accidents.
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_



- Fill in the blanks to identify the common motorcycle parts shown below.
- Name three essential items to wear when riding a motorcycle.
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
- Correct body position means:
  - Weight is directly over the \_\_\_\_\_.
  - Feet are \_\_\_\_\_, and knees are slightly bent.
  - Knees are pressed lightly into the \_\_\_\_\_.
  - Handlegrips are held firmly, and right wrist is \_\_\_\_\_.
  - Arms have to \_\_\_\_\_ slightly to hold the handlegrips.
- List the three preventive steps to take when riding at night.
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_



## Review Answers

### Chapter 1

- off-road
- Engine stop switch
  - Headlight switch
  - Front differential control
  - Instruments
  - Throttle
  - Shifter
  - Rear brake
  - Front brake
  - Clutch
  - Rack
  - Spark arrestor/muffler
  - Footrest
- owner's manual
- (Any five of the following)
  - DOT-approved helmet
  - Goggles or face shield
  - Protective gloves
  - Off-road boots
  - Long-sleeved shirt or jacket, ideally off-road garment
  - Long pants, ideally off-road garment

- Protective suit
- helmet
  - False
  - Over-the-ankle
  - (Any four of the following)
    - Wear protective ATV gear.
    - Use a winch to load the ATV, if possible.
    - Use a ramp with the correct rated load capacity.
    - Attach the ramp securely to the trailer or pickup.
    - Approach the ramp in first gear.
    - Ride straight up the ramp.

### Chapter 2

- (Any three of the following)
  - Capable of traveling over rough terrain
  - Wide, low-pressure, knobby tires
  - Fixed rear axle for traction
  - Powerful drive train with high and low gear ratios

- High ground clearance and short, narrow wheelbase
  - Seat on top of the vehicle
- (Any four of the following)
    - Driving on a paved surface
    - Riding double on an ATV that isn't designed to carry a passenger
    - Inexperienced operators
    - Riding without adult supervision
    - Dangerous stunts and maneuvers
    - Operating in unfamiliar areas or terrain
    - Failing to observe state laws and local ordinances
  - paved roads
  - Steering and drive system
    - Throttle and brakes
    - Activate lights
    - Registration
    - Tires, wheels, and suspension
    - Gasoline and oil
    - Operate responsibly
  - Apply the front brake.
    - Shift into gear.
    - Release the parking brake.
    - Apply the throttle slowly.
  - manual
    - automatic
    - semi-automatic or semi-manual
  - head up, eyes on the road far ahead
    - hands on handlebars
    - feet on footrests, toes pointed ahead
  8. rear wheels
  - Move your body weight forward, and lean in the direction of the turn.
    - Turn the handlebars while looking where you are turning.
    - If your ATV starts to tip while turning, lean your body farther into the turn while reducing speed.
    - Increase your speed slightly as you come out of the turn.

10. outside, inside
11. apply the brakes
12. uphill
13. i. Shift your weight to the rear.
  - ii. Use a lower gear.
  - iii. Maintain a low speed.
  - iv. Brake gradually.
  - v. Stay focused on the ground ahead.
14. i. Keep both feet on the footrests.
  - ii. Lean uphill.
  - iii. If the terrain is soft, turn your wheels slightly uphill to stay on a straight line.
- iv. If your ATV starts to tip, turn downhill. If obstruction prevents you from turning, jump off on the uphill side.
- v. Keep your speed steady to avoid tipping the ATV.

### Chapter 3

1. (Any four of the following)
  - Avoid dangerous terrain.
  - Select existing trails.
  - Scan the path far ahead.
  - Evaluate: be aware of your surroundings.
  - Speed: travel at an appropriate speed.
  - Stay alert.
2. (Any five of the following)
  - Determine the depth of the water.
  - Keep your feet firmly on footrests.
  - Drive through the water at a slow, steady speed.
  - Stay alert.
  - Know the maximum water depth for driving specified in your operator manual, and don't exceed that depth.
  - Avoid spinning your wheels.
  - Test your brakes when you return to dry land.
  - With four-wheel drive, engage it in low.
3. slow, coast
2. 4. Drive too fast to stop within the distance that the headlight shines, or more than about 30 miles per hour.

5. i. Pick a crossing point where you have good visibility in both directions.
  - ii. Bring your vehicle to a complete stop on the shoulder of the road.
  - iii. Look both ways, and yield to oncoming traffic.
  - iv. Drive forward slowly because your ATV may be difficult to maneuver on pavement.
  - v. Drive straight across the road.
  - vi. Stand up to give yourself maximum visibility.
- Carry out what you carry in.
6. i. Travel only where allowed.
  - ii. Respect others, private property, laws, and rules.
  - iii. Educate oneself with maps and regulations.
  - iv. Allow for future use of the outdoors by preventing forest fires, minimizing noise, and protecting riparian areas.
  - v. Drive responsibly.

### Chapter 5

1. i. Stranded because of mechanical problems
  - ii. Caught in unexpected, severe weather
  - iii. Injured
  - iv. Lost
2. i. Prepare for the trip and problems you anticipate.
  - ii. Locate the area where you'll be riding.
  - iii. Assess your physical condition, equipment, and safety rules.
  - iv. Notify someone about your plans.
3. i. Map
  - ii. Compass
  - iii. First-aid kit
  - iv. Survival kit
4. i. Hold the compass level, point direction-of-travel arrow toward destination.
  - ii. Rotate the azimuth ring until orienting arrow lines up with magnetic needle. Be sure north end of needle points to N.
  - iii. Find the degree mark around the azimuth ring that lines up with the direction-of-travel arrow.
5. i. Prepare a shelter.
  - ii. Build a fire.
  - iii. Signal for help.
6. (Any three of the following)
  - Dry, well-drained
  - Protected from the wind
  - Near fresh water
  - Near firewood
7. green logs
8. two to four
9. i. Wear weather-appropriate clothing.
  - ii. Keep your head covered.

### Chapter 4

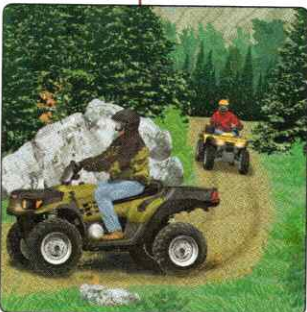
1. i. Dress appropriately for the weather.
  - ii. Know your endurance limit, and don't drive beyond it.
  - iii. Take breaks hourly.
2. Depressing the central nervous system, affecting judgment, and slowing reaction time
3. one drink.
4. (Any three of the following)
  - vehicle in good mechanical condition
  - owner's manual
  - environment to determine suitable clothing
  - your vehicle's lighting system
  - terrain where you plan to ride
  - changing trail conditions in area you will be riding
  - weather forecast, especially ice and snow conditions
5. (Any four of the following)
  - Ride only where permitted.
  - Be considerate of others, and keep to the right.
  - Yield to uphill traffic.
  - Announce intention before passing.
  - Slow down when someone is passing you.
  - Yield the right-of-way to bikers, horses, and hikers.
  - Be safe and considerate when you stop along trail.
  - Leave gates as you find them.
  - Report downed trees and trail maintenance needs to land managers.
  - Report illegal riding.

10. i. Wear loose, light clothing.
  - ii. Wear wide-brimmed hats, vented if possible.
  - iii. Drink plenty of liquids.

### Chapter 6

4. Drivers of larger vehicles disregard the rights of motorcyclists.
5. (Any five of the following)
  - Make yourself visible to others.
  - Wear bright clothing.
  - Use lights at all times.
  - Use hand signals when turning or stopping.
  - Flash your brake lights when you slow to a stop.
  - Ride in the area of the road where others are most likely to see you.
  - Stay out of blind spots.
  - Let the driver ahead see you.
  - Help drivers at intersections see you.
  - Use whip flags on sand dunes.
  - Practice skills in a safe area before taking on more difficult areas.
  - Always observe regulations.
  - Never drink and ride.
3. A. Headlight
  - B. Fuel tank
  - C. Fuel shut-off valve
  - D. Air cleaner
  - E. Shifter
  - F. Footpeg
  - G. Sidestand
  - H. Fuel intake
  - I. Left handlebar switches
  - J. Clutch
  - K. Main switch
  - L. Brake
  - M. Throttle grip
  - N. Right handlebar switches
4. i. DOT-approved crash helmet
  - ii. Eye protection
  - iii. Brightly colored, rugged protective clothing
5. i. footpegs
  - ii. on footpegs
  - iii. gas tank
  - iv. down
  - v. bend
6. i. Always use your lights.
  - ii. Slow down.
  - iii. Increase distance from the vehicle in front of you.







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## W

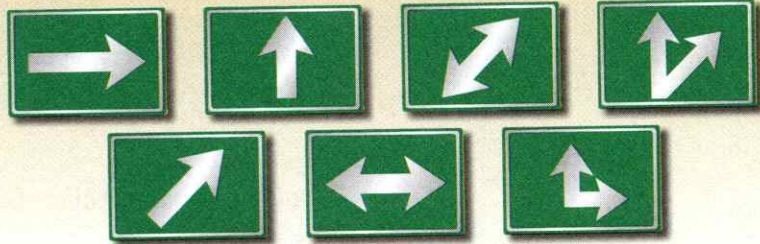
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# Trail Signs

## Route Signs and Arrows



**Purpose:** Indicates that a highway or road is designated for use by off-road riders.  
**Colors:** Green and white.



**Purpose:** Indicate the direction an off-road rider may proceed on a highway or road after leaving the trail.  
**Colors:** Green and white.

## Caution Signs



**Purpose:** Warn of changes on the trail ahead.  
**Colors:** Yellow with black letters or symbols.

## Chevron



**Purpose:** Provides additional guidance to the rider in a sharp turn.  
**Colors:** Yellow with black symbol.

## Hazard Markers



**Purpose:** Shows that a fixed object, such as bridge railings, narrows the normal width of the trail. The stripes slope down towards the trail.  
**Colors:** Yellow and black.

## Trail Markers



### Blazer

**Purpose:** Tells off-road riders that they are on a designated trail.  
**Colors:** Orange.



### Directional arrow

**Purpose:** Indicates the direction to go to stay on the designated trail.  
**Colors:** Orange with black border and arrow.

## Barrier Markers



**Purpose:** Indicate a gated path or a road that is closed.  
**Colors:** Red and white.



## Regulatory Signs



**Purpose:** Instructs riders to bring their vehicle to a complete stop before proceeding with caution.  
**Colors:** Red and white.



**Purpose:** Instructs riders to yield the right-of-way to vehicles traveling on the other trails.  
**Colors:** Red and white.



**Purpose:** Instructs riders not to enter a particular road or trail, such as a one-way trail.  
**Colors:** Red and white.



**Purpose:** Reminds riders of the importance of staying on the designated trail.  
**Colors:** Black and white.



**Purpose:** Identifies areas where off-road riders may not ride their vehicles.  
**Colors:** Black legend with red slash and circle.

# ORV RESOURCES

## **National Off-Highway Vehicle Conservation Council**

427 Central Ave.  
West Great Falls, MT 59404  
800-348-6487  
<http://nohvcc.org>

## **Tread Lightly!®**

298 24th Street, Suite 325  
Ogden, UT 84401  
800-966-9900  
[www.treadlightly.org](http://www.treadlightly.org)

## **ATV Connection**

16135 Vintage St. NW  
Andover, MN 55034  
763-323-3499  
[www.atvconnection.com](http://www.atvconnection.com)

## **ATV Safety Institute**

2 Jenner Street, Suite 150  
Irvine, CA 92618-3806  
949-727-3727  
[www.atvsafety.org](http://www.atvsafety.org)

## **Motorcycle Safety Foundation**

800-446-9227  
[www.msf-usa.org](http://www.msf-usa.org)

## **ATV Source**

5586 Wanda Way  
Hamilton, OH 45011-5094  
[www.atvsource.com](http://www.atvsource.com)

