

# Your Guide To Safe, Efficient, Winter Driving

Equipment, Hazards, Techniques





This guide is intended to provide safety information relative to defensive driving for all rate groups that IHSA serves. By learning about necessary driving adjustments relative to winter conditions, we can safely share the road with other vehicles. In this way, we can turn our highways into cooperative communities and help eliminate accidents and injuries.

**Safety awareness is the first step to health and safety. Prevention is our ultimate goal.**

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## Your guide to safe, efficient, winter driving

This booklet has been prepared to assist commercial drivers and those drivers who share the road with them. It provides guidelines for safe driving through hazardous winter months.

Driving accidents increase at a chilling pace in winter. Many drivers don't understand winter driving. They fail to take into consideration the hazardous conditions created by winter weather.

Safe winter driving demands knowledge of defensive driving skills and adjustments. The winter scene will be less hazardous if you read and heed the guidelines in this booklet.

**Only you can control your vehicle. It is your responsibility to be alert and cautious when driving in winter.**

# Prepare Early for Winter

The first step to preventing unnecessary incidents is to make sure equipment is ready for that first unexpected freeze or storm.

## Check These Essential Items

1. **Radiators** require proper winter coolant. Also, make sure there are no leaks.
2. **Tires** need to have good tread depth. Balding tires reduce starting traction by 30 to 50%.
3. **Wiper blades** must be in good condition to sweep snow and sleet off the windshield. If new blades are installed, check the arm pressure to ensure effective operation.
4. **Heater and defroster**, when functioning at their full capacity, will keep your windshield clear and you and your passengers warm.
5. **Lights** are particularly important in winter weather to ensure that you are clearly visible to other drivers. Be sure both headlights work on upper and lower beams, and are correctly adjusted. Check that brake, tail, clearance, and turn signal lights work properly and are clean.
6. **Brakes** need to be in top condition to provide uniform braking.
7. **Muffler and exhaust** system should be in good condition and tightly fitted so carbon monoxide does not seep into the interior of the vehicle where it could cause serious illness or death to the driver or occupants.
8. **Battery** – Cold weather lowers battery power. Make sure yours is in good condition. And in case it may be necessary, learn the proper procedure for using a booster battery.
9. **Fifth Wheel Lubrication** – For tractor-trailer combinations, make sure a winter grade of lubricant is used on the fifth wheel. Some heavy summer grades of lubricant at low temperatures become too heavy and interfere with steering on slippery surfaces.
10. **Windows and mirrors** should be cleaned to ensure good visibility. Mirrors should be adjusted properly for good visibility to the rear.

The pre-trip inspection is an important step in your day. During winter driving conditions, it is critical.



## The Six Primary Hazards of Winter Driving

While the two major hazards in winter driving are commonly considered to be poor traction and reduced visibility, research has shown that there are six important problems that confront all drivers.

### 1. Poor Traction

To keep your grip, start off slow and easy. Do not spin your wheels. In deep snow, try turning your wheels from side to side to push the snow. Before you turn off the ignition, move your vehicle back and forth 1 to 2 metres (4 to 5 feet). This packs the heavy snow for easier starting. When you are pulling out, use a light foot on the accelerator, easing forward gently.

Vehicles stuck at an intersection, on a hill, or at an entrance create aggravating delays, major traffic tie-ups, and even accidents.

## 2. Reduced Ability to Stop

It takes 3 to 12 times the distance to stop on ice and snow-covered roads than on dry roads. Test studies show that the heavier the vehicle, the greater the stopping distance.

Leave a larger following distance between you and the vehicle in front. Gearing down will also help bring your unit to a safe stop. The recommended safe following distance under ideal conditions is 1 second for every 3 metres (10 feet) of vehicle length (e.g., the safe following distance for an 18-metre tractor-trailer combination is 6 seconds). Under winter conditions, widen this gap accordingly—the more severe the conditions, the wider the gap.

## 3. Starting and Stopping

Braking on ice is never easy but as the temperature rises, ice becomes even more slippery. For example, your braking distance can double with a temperature variation from zero to  $-18^{\circ}$  celsius. When driving in winter weather, it is important to check the feel of the road when you start out and at regular intervals on your trip.

## 4. Slippery Surfaces

The action of tires spinning and sliding on snow and ice polishes the surface. This greatly decreases traction on road surfaces that are already hazardous. This happens most often at intersections, on curves, and on hills.

The slippery road surface increases braking distances, slows traffic, and presents a severe hazard at intersections. Compensate for it in your driving. Slow down early when you approach a slippery intersection, curve, or hill. Adjust to the existing road, weather, and traffic conditions. Gearing down may be necessary to slow down safely.

## **Black Ice**

Ice can sometimes be invisible. The road ahead may appear to be black and shiny asphalt. But be suspicious—it may be covered by a thin layer of ice known as black ice. In the winter, asphalt is usually a grey-white colour. If you see a black surface ahead, slow down and brake smoothly and gently. Proceed with caution.

## **5. Reduced Ability to See and Be Seen**

Before starting your trip, clean off the entire windshield and all the windows. In winter weather, it is even more important to have full visibility of the road and surrounding traffic. Wipe off the headlights, brake lights, taillights, and turn signals so that others can see you. You may have to do this frequently during a heavy storm. Those few extra minutes could save your life.

Road splatter can leave you blind. Use your windshield washer often. Washer fluid contains 30% and 50% methyl alcohol, preventing it from freezing in the bottle under the hood. On the windshield, however, it has a different effect. Since alcohol evaporates before water does, the antifreeze is weakened and the evaporation chills the remaining fluid rapidly. Air rushing by your vehicle further speeds evaporation. To prevent a windshield freeze-up, be sure you use an antifreeze solution that's right for the average winter temperatures in your area. Don't dilute it—that will weaken its effectiveness even further.

Before using windshield washer, prepare the windshield by heating it with a full blast from the defroster. Run your heater and defroster for a few minutes before you start out. You'll prevent sudden fogging of your windshield. At night, stop occasionally to clean off the headlights. In fog or heavy snowfall, keep lights on low beam, and adjust your speed accordingly.



## 6. Hazards of Jackknifing for Tractor-Trailer Combinations

There are two distinct kinds of jackknifing:

- a tractor jackknife in which the rear of the tractor skids sideways
- a trailer jackknife in which the rear of the trailer comes around.

### **Facts on Jackknifing**

Repeated tests have shown that if a jackknife develops beyond 15 degrees, it is almost impossible to recover. A jackknife can go to 15 degrees in one and a half seconds. You must react fast in order to take preventative action and recover control of your vehicle. The faster this 15-degree angle develops, the greater the severity and potential damage of the jackknife.

### **How to Prevent Jackknifing**

Safe defensive driving and adjusting to conditions offer the best safeguard against jackknifing. Going over a hilltop at 60 km/h to discover a sheet of ice or cars and trucks piled up below invites tragedy. A little caution and alertness will prevent running into trouble. Letting the truck build up speed downhill before a turn or a stop invites danger by having to overbrake, which could result in a skidding or jackknife accident.



## **Driving Techniques**

There has been much debate on the subject of jackknifing and driver techniques have been studied to find the most effective methods of maintaining control of a tractor semi-trailer.

1. The most effective technique for recovery from a jackknife on ice is almost complete reliance on steering with little or no use of accelerator or brakes.
2. A prompt start in correcting a jackknife is important.
3. Experience and practice count. Drivers with the most experience have greater confidence and better control.

## **Directional Control**

Directional control is best with all the wheels rolling. The tractor is most likely to jackknife when the drive wheels of the tractor are locked and the front and trailer wheels are rolling. When the trailer wheels are locked, a trailer jackknife can also develop. Brakes on empty vehicles still have all the power necessary for a full load. When the truck is unloaded, it's easy to overbrake. So, when driving on a light or empty unit, brake with extra care.

## **Overpowering and Spinning**

Power should be applied cautiously. Spinning the drive wheels risks a jackknife. This can easily occur on icy upgrades and usually result in a tractor jackknife that blocks the road and ties up traffic.

## **Brake Before Turning**

Jackknifing often develops while braking for a curve. Start your braking or gearing down well before the turn, get down to a safe and easy turning speed, then take the turn with all the wheels rolling.

# Techniques for Skillful Winter Driving

Driving on slippery roads under winter conditions with reduced visibility requires all your skill and attention. Avoid sudden starts or stops. Any sudden application of power on brakes or steering is likely to cause a skid.

**Be alert, be cautious, take it slowly.**

## Smooth Starts

The professional driver practices smooth starting the whole year round. Smooth starts prevent many winter driving problems. Avoid spinning the drive wheels—tires spinning on ice generate heat, which warms the ice directly under the tires and reduces traction by approximately half. The first sign of a wheel slip means you are using too much acceleration. Ease off a bit to avoid a traction-reducing wheel spin.

## Speed Control

The key to safe and skillful driving is proper, safe speed at all times. Look ahead so that when a traffic situation requires slowing down or turning, you can do so gradually. Get the feel of the road so that you sense how much acceleration or braking power you can apply safely. Even a sudden release of the accelerator can cause trouble because engine braking is applied to drive wheels only. Set your speed to drive safely in the current conditions.

## Hills

If you downshift to go up a hill, do it smoothly or do it before starting up. Beware of the shaded side of a hill—it may be icy while the sunny side may be clear. Reduce speed at the crest of hills to be prepared for unseen hazards on the other side. There could be a stalled vehicle, an icy stretch, or a sharp curve on the downgrade.

## **Curves and Steering**

Steering control must be applied smoothly. Fast and sudden movement of the steering wheel generates forces that will throw your vehicle into a skid as you enter a turn. All vehicles, when on a curved section of highway, are more sensitive to overpowering, overbraking, and oversteering. Any sudden steering application is hazardous. Your ability to see on a curve is often reduced, so hazards may be hiding around the bend. Proceed with caution.

## **Pavement Markings**

Pavement markings may be covered with snow. Keep well to the right side of the road, but be aware of pavement drop-off. Sometimes, after a snowfall, the edge of the road is not visible. This may cause the right wheels to drop off the pavement onto the shoulder. If this should occur, slow down and check traffic conditions to the front and rear before attempting to steer your vehicle back onto the pavement.

## **Lane Changes**

Plan lane changes well in advance, giving you enough time to make the manoeuvre safely and other vehicles enough time to provide a clear path. When making lane changes, do so smoothly. Signal your intention and move only when it is safe to do so.

## **Tractor-Trailer Steering & Fifth Wheel Lubrication**

A cold weather fifth wheel lubricant is essential in winter. It will remain fluid at lower temperatures. If a stiff grease is used on the fifth wheel, it can set up resistance that will defeat the cornering or turning effort of the front wheels when driving on slippery roads. This will result in turned wheels with the tractor continuing to move straight ahead.

## Underpasses

Low subways and underpasses are marked with a clearance measurement. In winter, ice or packed snow can accumulate on the road, increasing the clearance height. Watch for reduced clearances.

## Following Distance

Stopping distances on slippery surfaces are from 3 to 12 times as long as on dry roads. In addition, the heavier the vehicle, the greater the stopping distance required. Sometimes the driver ahead may slow down quickly on a dry piece of pavement and you may have only an icy piece of pavement on which to stop. It is difficult to explain why you couldn't stop when the driver in front of you could. Look well ahead and don't tailgate.

Remember, under ideal conditions, the safe following distance rule is 1 second for each 3 metres (10 feet) of vehicle length, so adjust your distance according to the existing conditions.

### Vehicle length (metres) ÷ 3 = Minimum interval (seconds)

Vehicle Length	Minimum Interval
18 metres	6 seconds
12 metres	4 seconds
9 metres	3 seconds*
6 metres	2 seconds

\* May range from 3 to 6 seconds depending on weight of vehicle

## Stopping Safely without ABS Brakes

A rapid light pumping of the brakes is a recommended way to stop on ice. By pumping the brakes, steering control can be maintained. Apply the brakes for an instant and release them. Repeat this action (i.e., on and off, on and off) until you come to a complete stop. The effect is to give alternate short intervals of braking

effort and effective steering control of all wheels when the brakes are released and the wheels roll. This technique can be used indefinitely with hydraulic brake systems. This method will increase your overall stopping distance.

### **Stopping Safely with ABS Brakes**

Antilock Brake Systems (ABS) automatically pump the brakes for you if your vehicle wheels begin to lock up. This allows the vehicle to maintain effective steering control and reduces the risk of jackknifing or skidding. The brake pedal will pulsate, but this is normal.

### **Commercial Drivers with Air Brakes**

With air brakes, be careful to avoid reducing the air pressure to a low level. When air pressure drops below 420 kPa (60 psi), the trailer brakes will automatically lock. The air pressure required to lock wheels on ice can be as little as 70 kPa (10 psi), so a great deal of pumping can be done with a gentle touch on the brake pedal. For long down-grades or gentle stops, a feathering application is recommended. Because the wheels are not locked, steering control is maintained.

### **The Feathering Technique for Commercial Drivers**

Apply the brakes gradually until you feel the wheels begin to lock and then release them slightly. If you start to lose steering control, release the brakes immediately, gear down, and repeat the gradual application. This technique requires more feel than pumping.

Use discretion when gearing down. Too much gearing down on ice may cause drive wheels to slide and start a dangerous side skid or jackknife. Release the clutch immediately and let the wheels roll to correct this condition.

Remember, when stopping on slippery surfaces, keep all wheels rolling to maintain steering ability, while at the same time using brakes to get the maximum stopping effort without wheel lock-up.



## Emergency Vehicles

### Snow Plows

A vehicle used for the removal of snow from a highway must be equipped with a flashing blue light visible for a distance of 150 meters (500 feet). The use of such a light is prohibited at all other times and on all other vehicles. (*Highway Traffic Act*, s. 62. (31) and (32))

When driving during winter months, be on alert for this flashing blue light, as it warns you of a wide and slow-moving vehicle. Some snowplows have a long wing that extends as much as three meters (10 feet) to the right of the vehicle.

On freeways, snowplows follow each other spaced about 15 meters (50 feet) apart. Do not try to pass between them. There is not enough room to do so safely and the ridge of wet snow can throw your vehicle out of control.

# Road Signs of Winter



When pavement is slippery or wet, reduce speed and do not brake violently or change direction suddenly. Increase the distance between your car and the one ahead.

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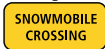
Motorists should reduce their speed because the tires do not grip as well on wet pavement as they do on dry pavement.

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Warns of a steep hill ahead. For very steep hills, it is advisable to slow down and shift to a lower gear.

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Warns motorists that motorized snow vehicles are permitted to cross the highway.

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Motorized snow vehicles are permitted on a street or highway where this sign is posted.

# Wintertime or anytime, the key to safety is you!

## How IHSA can Help

IHSA has several training courses that can help you become a safe driver. No matter what type of vehicle you use, IHSA can teach you the basic concepts, factors, and practices of safe driving.

- Defensive Driving—Commercial
- Defensive Driving—G Class Driver
- Defensive Driving for Emergency Response Personnel
- Highway Traffic Act
- Preventing Work-Related Motor Vehicle Collisions
- School Bus Driver Improvement Course

You can also learn how to teach IHSA's courses yourself by taking one of our instructor workshops.

- Defensive Driving—Commercial Instructor Workshop
- School Bus Driver Improvement Instructor Workshop

Visit **ihsa.ca** to find out when and where our courses are taking place. And if you can't find a course in your area, let us know and we'll do our best to meet your training needs.

Make Safety  
Work for You

## IHSA is Your First Step

IHSA is a leader in health and safety education. Through skills-based training, auditing, and evaluation, we provide safety solutions to those who perform high-risk activities such as working at heights, working with energized high-voltage power systems, driving motor vehicles, transporting dangerous goods, working on suspended access equipment, and utility line clearing.

**Find out what  
we can do for you  
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