East Fork Fire and Paramedic Districts
Training and Safety Division

Driving

TOPIC:	WINTER DRIVING
TIME FRAME:	3hrs
METHOD:	• Discussion / Practical
OBJECTIVES:	• Identify the critical steps for Pre-Trip Inspection • Identify the 6 Hazards to Winter Driving • Identify Ways to Improve Safer Winter Driving • Review requirements under NRS 484 • Insure proper fit of traction devices for all station assigned apparatus
MATERIALS NEEDED:	• Handout
REFERENCES:	• Transportation Health and Safety Association of Ontario • Tirechains.com • NRS 484
ASSIGNMENT:	• Perform pre-trip inspection noting any deficiencies on a Maintenance Request Form • Properly distribute Maintenance Request Form
SUNPRO CODE:	• ENG01.06 / ENG02.05

Guide To Safe, Efficient, Winter Driving Equipment, Hazards, Techniques

This guide is intended to provide safety information relative to defensive driving.

By learning about necessary driving adjustments relative to winter conditions, you can safely share the road with other vehicles.

Safety awareness is the first step to health and safety.

Prevention is our ultimate goal.

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 these guidelines.

Only you control your vehicle

It is your responsibility to be alert and cautious in winter driving

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, make sure there are no leaks.
2. **Tires** need to have good tread depth. Balding tires reduce starting traction by 30 - 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 stop, tail, clearance lights and directional signals 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 is necessary, know the proper procedure for jumping the battery.
9. **Windows and mirrors** – windows should be cleaned to ensure good visibility. Mirrors also should be kept adjusted and clean for good visibility to the rear.
10. **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 which 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 4 -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 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. The simple answer: leave a greater following distance between you and the vehicle in front. Gearing down of the vehicle also assists in bringing your unit to a safe stop. The recommended safe following distance under ideal conditions is 1 second for each 10 feet of vehicle length. 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 32^0 to 39°. It is important, when driving in winter weather, to check the feel of the road when you start out.

4. **Slippery Surfaces:** The action of tires spinning and sliding on snow and ice polishes the surface. This greatly decreases traction on already hazardous road surfaces. It 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.

5. **Black Ice:** Ice sometimes becomes disguised. The road ahead may appear to be black and shiny asphalt. Be suspicious, it may be covered by a thin layer of ice known as black ice. Generally, in the winter, asphalt is a grey-white color. If you do see a black surface ahead, slow down, and brake smoothly and gently.

6. **Reduced Ability to See and be Seen:** Insure the entire windshield and all the windows are free of snow and ice. In winter weather, it is even more important to have full visibility of the road and surrounding traffic. Wipe off the headlights, stop and tail lights and turn signals so that others may see you. This may be necessary frequently during a heavy storm. The few extra minutes could save yours or someone else 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. The alcohol evaporates before the water does. That creates two effects: The antifreeze power 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, and don't dilute it – that will weaken its effectiveness. Before using the washer, prepare the windshield by heating it with a full blast of 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.

Be alert, be cautious, take it slowly

Smooth Starts: Practice smooth starting the whole year round. Smooth starts prevent many winter driving problems. First and foremost, avoid spinning the drive wheels because tires spinning on ice generate heat. This 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 hills which remain 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 moves of the steering wheels generate 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,

over-braking, and over-steering. Any sudden steering application is hazardous. Sight distance on a curve is often reduced, hiding hazards 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 maneuver safely and other vehicles enough time to provide a clear path. When making lane changes, do so smoothly, signaling your intention and moving only when it is safe to do so.

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 above all, don't tailgate.

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

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– 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 pumps 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 skidding. The brake pedal will pulsate but this is normal.

Air Brakes: With air brakes, be careful to avoid reducing the air pressure to a low level. When air pressure drops below 30 pounds, the brakes will automatically lock. The air pressure required to lock wheels on ice can be as little as 10 pounds, 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 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 in gearing down. Too much gearing down on ice may cause drive wheels to slide and start a dangerous side skid. 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.

Summary: When pavement is slippery or wet, reduce speed and do not brake violently or change direction suddenly. Increase the distance between your vehicle and the one ahead. Motorists should reduce their speed because the tires do not grip as well on wet pavement as they do on dry pavement.

Wintertime or anytime, the key to safety is you!

NRS 484.643 Traction devices, tire chains or snow tires: Use required where highway marked or posted.

1. **It is unlawful for any person to operate a motor vehicle, whether it is an emergency vehicle or otherwise**, without traction devices, tire chains or snow tires upon any street or highway, under icy or snowy conditions, when the highway is marked or posted with signs for the requirement of traction devices, chains or snow tires.

NRS 484.6432 Traction devices, tire chains or snow tires: Requirements under certain circumstances.

1. If a highway in this State is marked or posted with signs requiring the use of traction devices, tire chains or snow tires, a motor vehicle or combination of vehicles must be equipped with:

(a) Traction devices, tire chains or snow tires if it has a gross weight or combined gross weight of 10,000 pounds or less.

(b) **Tire chains if it has a gross weight or combined gross weight of more than 10,000 pounds.**

2. If a highway in this State is marked or posted with signs requiring the use of traction devices or tire chains on all motor vehicles except vehicles with 4-wheel drive and snow tires on all wheels, all such motor vehicles must be equipped with traction devices or tire chains.

(Added to NRS by 1987, 1342; A 1989, 1051)

NRS 484.6434 Traction devices, tire chains or snow tires: Installation and mounting. If a motor vehicle is required to be equipped with traction devices, tire chains or snow tires, the devices or chains must be installed or the tires must be mounted on at least two:

1. Driving wheels of the motor vehicle; and
2. Braking wheels of any trailing vehicle in a combination of vehicles if that trailing vehicle is equipped or required to be equipped with brakes.

(Added to NRS by 1987, 1343; A 1989, 1052)

NRS 484.6436 Mechanical device to provide traction. If mechanical devices are mounted on both sides of a motor vehicle which, when activated by the driver, provide traction by deploying a chain of metal cross members under a tire while the vehicle is in motion, the:

1. Cross members must extend across at least 85 percent of the width of the tire; and
2. Devices may be used only upon the drive axles of the vehicle.

(Added to NRS by 1987, 1343)

Installing Traction Devices

1. Lay chains out flat, remove all tangles. When chains are placed on tire, cross chain hook eyes must face up. Damage to your tires could result if hooks face against tire.

2. Lay chain over tire, cross chain hooks up and fastener on the outside of tire. Tuck first cross chain under tire.

note: cams face tire tread before tightening

insert cam in slot, turn the cam clockwise until stop

cam will face toward the wheel when turned to lock position

3. Move tire until lever fastener is axle high.

open position

locked position

4. Hook inside fastener first. Remove slack and hook outside fastener. Make chain as tight as possible by hand without the use of tools. Drive approximately 1/4 mile stop and retighten.

5. Install tensioner as shown below:

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Fold over locking latch:

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the following applies to truck chains with cams installed

insert cam in slot, turn the cam clockwise until stop

cam will face toward the wheel when turned to lock position

If you traction devices do not fit notify the proper supervisor so arrangements can be made for adjustment or replacement.

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