

BE PREPARED FOR WINTER

Colorado's winter driving conditions can change from sunny to blowing snow within an hour or two. Be prepared at all times, and especially in winter. Know road conditions, know your vehicle, use proper driving techniques for the conditions you find, and have the right emergency gear and equipment along. This brochure provides information to help you.

WINTER DRIVING BASICS

Be sure your vehicle is in good working condition. Be sure that it is thoroughly checked and all items on the following checklist have been examined.

AUTOMOTIVE CHECKLIST

- Wiper Washer Fluid
- Antifreeze
- Lights
- Fuel System
- Ignition
- Exhaust System
- Brakes
- Battery
- Heater/Defroster
- Tire Tread
- Wiper Blades

SAFETY CHECKLIST

- Flares/Reflectors
- Chain/Tow Strap
- Blanket
- First Aid Kit
- Shovel
- Nonperishable Food
- Scraper
- Tire Chains
- Sleeping Bag
- Batteries
- Jumper Cables
- Matches/Lighter/Candle
- Snow Bricks
- Flashlight
- Coat/Gloves/Hat
- Sand/Traction Mats

ROAD CONDITION NUMBERS

For current road information, call 303-639-1111 in the Denver Metro area or outside Colorado. Outside Denver but within Colorado, call toll free 877-315-ROAD. You may also visit the Colorado Department of Transportation web site at www.dot.state.co.us.

Tire/Chain Guidelines

In some cases, drivers may face winter travel prohibitions unless vehicles, including passenger cars, sport utility vehicles, and commercial vehicles, are equipped in certain ways. These could include any of the following:

- Snow tires having adequate tread design or depth to provide sufficient traction
- Four-wheel drive vehicles with adequate tires
- Tire chains

Tire chains are defined as metal chains or other traction devices capable of providing traction equal to or exceeding metal chains under similar conditions.

Studded snow tires are legal in Colorado, but may not be adequate for travel under extreme conditions. Some other states prohibit studded snow tires.



COLORADO WINTER DRIVING HANDBOOK

Including:

- Driving Tips
- Snowplow Safety
- Tire & Chain Laws
- Information Sources

Compliments of



COLORADO DEPARTMENT OF TRANSPORTATION
PUBLIC INFORMATION OFFICE
4301 E. ARKANSAS AVE., ROOM 277 • DENVER, CO 80222

Winter Driving Tips

Help keep your car under control and your winter drive a pleasure by following these easy techniques:

Maintain Traction: Start and stop gradually to avoid losing traction in wet or slippery conditions. Drive at steady speeds, avoiding sudden starts or stops. Accelerate slightly when approaching a hill, then maintain steady speed going up. Gearing down ahead of downgrades can help avoid brake wear and reduce the chances of sliding.

Skids: Driving sensibly and steadily will avoid most skids. Anticipating turns or lane changes will help. If your vehicle begins to skid, remove your foot from the accelerator or brake and steer in the direction of the skid. When the vehicle steadies itself, turn the wheels straight and proceed.

Braking: Be gentle with braking pressure during slippery road conditions. Gentle pumping action on disc brakes will avoid locking the wheels and sending the vehicle into a skid or spin. Anti-lock braking systems provide this action for you. Avoid braking on curves by driving through them at a safe, steady speed. Gear down for going both uphill and downhill.

Four-wheelers can't stop better or faster on ice and snow than 2WD vehicles, even if they are locked into four wheel drive. The heavier the vehicle, the longer it takes to stop, no matter how many drive wheels. Many of the popular sport utility vehicles (SUVs) are heavy and require a greater stopping distance.

Safety Around Snow Removal Equipment

Colorado's snowplows use distinctive amber and blue lights to warn you well in advance that snow removal operations are underway. When you see these lights, slow down and use caution.

Your best course of action will be to follow well behind the plow with your headlights on, staying away from flying snow and sand which the truck may be spreading to improve traction.

You may also encounter a CDOT truck applying liquid de-icer. Stay back to avoid getting extensive liquid on your windshield.

Avoid driving in the snowplow's blind spots. If you must pass the plow, remember the limited visibility caused by flying snow. Be sure you have enough visibility to avoid the rooster tail of snow coming from the plow's blade. Please do your part by driving safely around Colorado's snowplows.

Why Does CDOT Use Liquid De-Icers?

Ever wonder what those big tankers are applying to Colorado's highways? CDOT maintenance crews use liquid de-icers like magnesium chloride at the onset of a storm to prevent ice from forming and during and after a storm to break the bond of snow and ice.

Mobility: It reduces the formation of snow/ice on the highways and provides a quicker return to bare pavement and higher driving speeds, there is less reliance on the chain law and fewer highway closures.

Safety: It reduces accidents caused by snow and ice, there is less sand build-up on the roadway after a storm, the reduction of sand means there is also less damage to vehicle windshields.

Air Quality: It does not add air pollutants to the environment like sand does, its use actually helps reduce the pollution caused by sand since CDOT is able to dramatically decrease the amount of sand used on roadways.

Water Quality: Sand use can cause more sediment in streams, liquid de-icers have little or no sediment and are less damaging to vegetation and waterways than sand and salt.

Tip: Wash your vehicle after snow storms to remove any liquid de-icer build-up.

Advice From Experts

Colorado's winter driving experts are the Department of Transportation maintenance professionals who patrol and clear the highways. They offer the following tips and advice based on their years of experience.

1. Slow down in winter driving conditions. Most accidents are caused by driving too fast for conditions.
2. Use your low-beam headlights in bad weather, especially where snow is falling heavily or blowing.
3. Don't use your cruise control in slippery road conditions.
4. Remove ice and snow from windows, mirrors, and vehicle lights, both front and rear, as often as necessary.
5. No matter how far you are driving and no matter what the weather conditions, always wear your seat belts.
6. Leave extra room between your vehicle and the one ahead of you in poor visibility and slippery conditions.
7. Your safest place in bad weather is a safe distance behind a snowplow, where you will find the clearest road and the best traction.
8. If possible, avoid driving at all in bad weather conditions. Stay home until the weather improves and the roads clear.
9. A road that has been treated with liquid de-icer may be wet and slippery. It's important to watch your speed, particularly around curves and in canyons.

Avalanche Information

In avalanche-prone mountain areas, roads may be temporarily closed due to high avalanche danger. Although inconvenient, these closures are intended to protect public safety. Roads will be reopened only when they are determined safe for travel.

From November to April, current information on mountain weather, snow, and avalanche conditions may be obtained by calling the Colorado Avalanche Information Center at 303-371-1080.

Weather Definitions

Road Closure: It is unsafe and unlawful to drive past a road closure at any time for any reason.

Heavy Snow Warning: Snow accumulations of 6 inches or more within 12 hours or 8 inches or more within 24 hours are expected at lower elevations, with 8 inches or more in 12 hours and 12 inches or more in 24 hours expected in mountain areas.

Winter Storm Warning: Heavy snow is expected, aggravated by blowing and drifting conditions.

Blizzard Warning: Sustained or frequent wind gusts of 35 mph or more for at least 3 hours, reducing visibility to less than 1/4 mile, are expected.

Stuck or Stranded?

If you get stuck on a snowy road, or your car slides off the road, the following guidelines will help you decide what course of action to take:

1. If the road ahead is clear and your car can be dug out, use your shovel and traction mat or sand to free the vehicle. Ease the vehicle out gently and steadily to avoid spinning the tires.
2. If the road ahead is not clear or you slid off the road, and there is no shelter in sight, you are stranded. Do not leave your vehicle—it is your only certain source of shelter. Be sure the vehicle exhaust is clear of snow and keep a window slightly open for ventilation. Run the vehicle only a few minutes at a time in order to stay warm. Dress in layers for warmth and cover your entire body with a blanket or sleeping bag. If there are two or more persons, huddle together for warmth.
3. If you are stranded, do not panic. CDOT maintenance crews will be working to open the highways and look for stranded motorists. If you are stranded on a secondary or backcountry road, remain in the shelter of your vehicle until the storm passes so that you can be spotted or can proceed safely on foot.

LIQUID DE-ICER

Fact Sheet

General Description

Liquid anti-icers and de-icers are salt compounds extracted from the Great Salt Lake or Salt Flats with added corrosion inhibitors used to prevent or remove the build up of ice and snow on roads.

How it Works

The products are called freezing point depressants, and work to lower the freezing point of moisture. What's more, they can help prevent the build-up of ice and snow and melt existing ice and snow.

Environmental Impacts

Liquid anti-icers and de-icers are better for the environment than other alternatives including sand and salt. While some sand and salt use is still necessary for CDOT's overall winter maintenance program, increased use of liquids has drastically reduced air pollution associated with sand use. The amount of sand run-off that endangers roadside plant life as well as the amount of silt that goes into streams causing damage to aquatic life, especially at higher elevations, has been greatly reduced.

Safety

In a comparison of the two major interstates through the Denver metro area, CDOT found that increasing the use of liquid de-icers over a 12-year period reduced snow and ice-related traffic crashes by an average of 14% while traffic volumes increased over 23%.

Impact to Vehicles

Salt products naturally lower the freezing temperature of water but do have some corrosive properties. Motorists should always wash their vehicles after any snowstorm to remove liquid de-icer residue that may come into contact with your vehicle just as you always should with salt and sand/salt mixtures. Unlike sand and sand/salt mixtures, however, liquid de-icers will not damage your car's paint job or windshield and are less corrosive than sodium chloride which has traditionally been used for snow removal.

Economics

At approximately 30¢ a gallon, CDOT's most widely used liquid anti-icers and de-icers are the least expensive alternatives to sand and salt on the market. In addition to reducing the need for the less environmentally friendly sand/salt mixture, the application of liquids helps to reduce maintenance costs by lessening the need for plowing and after-storm sweeping.

What products does CDOT use during winter storms?

- Sand or sand salt mixture
- Ice Slicer
 - Solid de-icer made of granular salt and other materials
- Liquid de-icers (27-29% de-icer)
 - Magnesium chloride (used above 16 degrees pavement temperature)
 - Cold temperature magnesium chloride (used below 16 degrees pavement temperature)
 - Includes a corn bi-product to lower the freezing point
 - Used for anti-icing and de-icing on roadways during winter weather conditions

Environment impact studies

CDOT has invested in numerous environmental impact studies which have shown that the use of de-icers like magnesium chloride have little or no environmental impact. Some studies have led to changes in specifications, making the de-icers more environmentally friendly and less corrosive.

- Effect of Magnesium Chloride on Asphalt pavements
(Werner Hutter, CDOT) February 1999
- Studies of Environmental Effects of Magnesium Chloride De-icer in Colorado
(Professor William M. Lewis) November 1999
- Preliminary Environmental Evaluation of Caliber M1000 De-icer for Use in Colorado
(Professor William M. Lewis) December 2000
- Evaluation and Comparison of Three Chemical De-icers for Use in Colorado
(Professor William M. Lewis) August 2001
- Evaluation of Selected De-icers Based on a Review of the Literature
(The SeaCrest Group) October 2001
- Corrosion Effects of Magnesium Chloride and Sodium Chloride on Automobile Components
(Professors Yunping Xi and Zhaihui Xie) May 2002
- Cost of Sanding
(Professor Nien Yin Chang) June 2002
- Roadside Vegetation Health
(University of Northern Colorado) starts fall 2003

Each year, CDOT spends more than \$200,000 on quality assurance testing of its de-icer products. CDOT's de-icer specifications are set by Dr. William Lewis, University of Colorado professor and water quality expert.

For more information on CDOT's winter driving measures:

Visit www.dot.state.co.us

Call 800-886-4887

Send feedback or questions to info@dot.state.co.us



Approved Alternative Traction Devices (ATDs)

Approved ATDs may be used instead of chains. These include:

- **Wheel Sanders**, which must carry enough sand to negotiate the hill
- **Pneumatically Driven Chains** which spin under the drive wheels automatically as traction is lost

Colorado's rules and regulations do not allow the use of tire cables on commercial vehicles.

Following are the only two approved situations in which cables can be used:

- 1) Tire cables constructed with high strength steel spring cross member rollers that are at least 0.415" in diameter or greater. These can be used instead of chains on commercial vehicles with the exception of single drive axle combination units.
- 2) On a tandem power drive axle commercial vehicle, any type of cable can be used only if there are chains on the two outside tires of one of the power drive axles and cables on two or more tires of the other power drive axles.

The Colorado Department of Transportation may rescind the approval of cables as an ATD at any time.

Chain-Up Questions

Do I need to chain up my trailer? Chains are not required on trailers. You may use tire cables on trailer tires.

Where can I chain up? Vehicles placarded for flammable, combustible, or explosives loads may pass the chain-up signs and install their chains where pavement is covered by snow or ice, at a safe location outside the traveled portion of the highway.

When can I continue with my load? CDOT or law enforcement personnel may control the re-entry of vehicles from chain inspection stations to assist traffic flow and ensure safety.

When can I take my chains off? The chain law will cease where designated by an official sign or where bare descending pavement is encountered.

I-70 Chain-Up Stations

Eastbound: Mileposts 178, 183, 184, 187, 203, 211

Westbound: Mileposts 229, 221, 219, 197.

Colorado's weather can change dramatically and quickly. Carry chains and be prepared. For road conditions, call (303) 639-1111 in the Denver area, or call 1-877-315-Road from elsewhere in Colorado. To report a suspected drunk driver call *DUI on your cell phone and for aggressive driving *CSP.

CHAIN UP TIPS

A Guide to Colorado's Chain Law for Commercial Vehicles



Published by the
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Public Relations Office
(303) 757-9228



Chain Law Rules for Commercial Vehicles

Colorado's chain law rules became effective Nov. 1, 1996.

The chain law applies to every state, federal, and interstate highway in Colorado.

When the chain law is in effect, drivers will be notified by signs along the roadways indicating which vehicles should chain up, and where. In some areas, lighted message signs will alert drivers to chain up information.

Metal chains must consist of two circular metal loops, one on each side of the tire, connected by not less than nine evenly spaced chains across the tire tread.

Commercial vehicles having four or more drive wheels must chain four wheels. Dual tire chains are acceptable.

Violation Policies

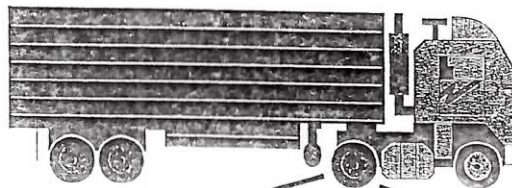
Drivers of commercial vehicles who ignore the chain law can be fined \$100 plus a \$13 surcharge for not chaining up when required. A driver can also be fined \$500 plus a \$61 surcharge if the vehicle is not chained when required and as a result blocks the road.

When Are Chains Required?

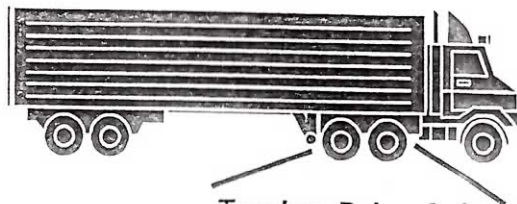
The chain law affects commercial vehicles. A vehicle is defined as "commercial" if it is used in commerce to transport passengers or property and it also:

- 1) Has a gross combination weight rating of 26,001 lbs. or more inclusive of a towed unit which has a gross vehicle weight rating of more than 10,000 lbs., or
- 2) Has a gross vehicle weight rating of 26,001 or more pounds; or
- 3) Is designed to transport 16 or more passengers, including the driver.

The illustrations below show what is meant by the terms single drive axle, and tandem drive axle.



Single Drive Axle



Tandem Drive Axles

Levels of the Chain Law

LEVEL 1 - This level requires that all single drive axle combination commercial vehicles must chain up. All four wheels of the power drive axle must be chained. Cables are not allowed on single-drive axle combination commercial vehicles as ATDs.

When Code 17 is in effect, all other commercial vehicles must have snow tires or chains. Code 17 may be implemented any time there is snow covering any part of the traveled portion of pavement on an ascending grade.

LEVEL 2 - This level requires chains for all commercial vehicles, including all trucks exceeding 26,001 lbs. in weight, and buses or vehicles designed to carry 16 or more passengers.

Auto transports must comply to the extent possible without causing damage to hydraulic lines. Buses need to chain only two drive wheel tires to comply.

Code 18 may be implemented any time there is snow covering the entire traveled portion of the pavement on an ascending grade, or when road, weather, or driving conditions make this restriction necessary to protect the safety of the traveling public and to minimize road closures.

arthritic, orthopedic, muscular, neuromuscular, or vascular disease which interferes with his/her ability to control and operate a commercial motor vehicle safely;

(8) Has no established medical history or clinical diagnosis of epilepsy or any other condition which is likely to cause loss of consciousness or any loss of ability to control a commercial motor vehicle;

(9) Has no mental, nervous, organic, or functional disease or psychiatric disorder likely to interfere with his/her ability to drive a commercial motor vehicle safely;

(10) Has distant visual acuity of at least 20/40 (Snellen) in each eye without corrective lenses or visual acuity separately corrected to 20/40 (Snellen) or better with corrective lenses, distant binocular acuity of at least 20/40 (Snellen) in both eyes with or without corrective lenses, field of vision of at least 70° in the horizontal Meridian in each eye, and the ability to recognize the colors of traffic signals and devices showing standard red, green, and amber;

(11) First perceives a forced whispered voice in the better ear at not less than 5 feet with or without the use of a hearing aid or, if tested by use of an audiometric device, does not have an average hearing loss in the better ear greater than 40 decibels at 500 Hz, 1,000 Hz, and 2,000 Hz with or without a hearing aid when the audiometric device is calibrated to American National Standard (formerly ASA Standard) Z24.5-1951.

(12)(i) Does not use a controlled substance identified in 21 CFR 1308.11 *Schedule I*, an amphetamine, a narcotic, or any other habit-forming drug.

(ii) *Exception.* A driver may use such a substance or drug, if the substance or drug is prescribed by a licensed medical practitioner who:

(A) Is familiar with the driver's medical history and assigned duties; and

(B) Has advised the driver that the prescribed substance or drug will not adversely affect the driver's ability to safely operate a commercial motor vehicle; and

(13) Has no current clinical diagnosis of alcoholism.

[35 FR 6460, Apr. 22, 1970, as amended at 35 FR 17420, Nov. 13, 1970; 36 FR 223, Jan. 7, 1971, 36 FR 12857, July 8, 1971; 43 FR 56900, Dec. 5, 1978; 55 FR 3554, Feb. 1, 1990; 60 FR 38744, July 28, 1995; 62 FR 37152, July 11, 1997; 65 FR 59369, Oct. 5, 2000; 67 FR 61824, Oct. 2, 2002]

§ 391.43 Medical examination; certificate of physical examination.

(a) Except as provided by paragraph (b) of this section, the medical examination shall be performed by a licensed medical examiner as defined in § 390.5 of this subchapter.

(b) A licensed optometrist may perform so much of the medical examination as pertains to visual acuity, field of vision, and the ability to recognize colors as specified in paragraph (10) of § 391.41(b).

(c) Medical examiners shall:

(1) Be knowledgeable of the specific physical and mental demands associated with operating a commercial motor vehicle and the requirements of this subpart, including the medical advisory criteria prepared by the FMCSA as guidelines to aid the medical examiner in making the qualification determination; and

(2) Be proficient in the use of and use the medical protocols necessary to adequately perform the medical examination required by this section.

(d) Any driver authorized to operate a commercial motor vehicle within an exempt intracity zone pursuant to § 391.62 of this part shall furnish the examining medical examiner with a copy of the medical findings that led to the issuance of the first certificate of medical examination which allowed the driver to operate a commercial motor vehicle wholly within an exempt intracity zone.

(e) Any driver operating under a limited exemption authorized by § 391.64 shall furnish the medical examiner with a copy of the annual medical findings of the endocrinologist, ophthalmologist or optometrist, as required under that section. If the medical examiner finds the driver qualified under the limited exemption in § 391.64, such fact shall be noted on the Medical Examiner's Certificate.