

Calhoun County Road Department

Winter Maintenance Snow Plow Guide Book



Winter Maintenance Snow Plow Guide

The following guidelines are to assist drivers during winter operations. This guide is designed to assist the operator in clearing the roads as soon as possible while avoiding accidents and injuries. Safety is of the utmost importance, so that we all go home at the end of the day as healthy as when we came to work.

1. **Pre-trip inspection:** The pre-trip inspection is vital (as well as mandated by law) to the operator to prevent any unwanted and avoidable breakdowns. In addition to using the Vehicle Condition Report, the following should be inspected closely during winter operation;
 - i. Fuel tank shall be full of fuel and winter time treatment added, if directed, when operating at temperatures below 15 degrees. All fluid levels should be checked and topped off.
 - ii. Underbody blade shall be inspected for worn hydraulic hoses, oil leaks, loose hinge points, and insure that all bolts, including the cutting edge bolts, are properly tightened.
 - iii. Mirrors shall be inspected and replaced if cracked or broken. Mirrors should be adjusted outward to the point where only the outer edge of the truck box is visible in the mirror, giving the driver the widest view on each side of the truck. Spot mirrors extending out from the front corners of the truck hood also give the driver a better view of plow operations, and allows the driver to see vehicles approaching from behind and to the side when backing or turning around at intersections. Be aware that passenger mirrors and door frames together create a blind spot for vehicles approaching from the right. Each truck should have an operational back-up alarm.
 - iv. Tires shall be inspected and air pressure maintained. Check for cuts and defects. Look for signs of cracked wheels and/or loose wheel bolts, such as rust streaks coming from the wheel bolts.
 - v. Plow hitch shall be inspected for cracks and for proper operation of latches. Sitting for long periods without being used can cause hitch mechanism to set up.
 - vi. Inspect salting equipment and conveyor chain for loose, bent, or broken parts. Check that all warning labels are in place and legible.

- vii. Cab shall be clean and free from debris. Never should there be heavy objects that could become airborne and possibly strike and injure the operator in the cab during plowing operations. Small objects such as pop bottles/cans and lunch pails shall be restrained so that they cannot become lodged under operators' peddles should you need to brake suddenly.
 - viii. **Seatbelt shall be in good repair and worn at all times while equipment is in operation.**
 - ix. All lighting shall be inspected to insure proper operation. Insure two-way radio operates properly for communication and in case of emergency.
 - x. Protective equipment that you should carry while conducting wintertime operations are: Gloves, hat, heavy coat, bib overalls, warm boots, tri-angle kit, first aid kit and sunglasses. A tow chain, shovel and cell phone are also valuable tools to keep with you.
2. **Plowing:** is the most hazardous time of the year for our drivers. Along with the snow, poor visibility, wind and ice, we also have the motoring public which we must protect and look out for. The following guidelines are designed to assist the operator during winter operations:
- i. Seatbelt – Again - Seatbelt must be worn at all times.
 - ii. Sunglasses, gloves and boots. Sunglasses are recommended during daytime operations when bright snow and glare is an issue. Warm boots with good tread are recommended.
 - iii. Before getting loaded with material, insure that the sander and spinner/conveyor are working properly. If using a tailgate spreader, insure that tailgate chains are properly adjusted. If chains are “short chained”, not enough material will be allowed into the sander, which may cause plugging at the tailgate, and improper salting quantities. The only way to remedy a “short chained” truck is to dig at the load by hand. Once this happens to you, you will not forget to check again. If you are operating a tailgate sander and your chains are too long, this will cause damage to the sander tailgate causing excessive material spillage. It is recommended that when you find the proper chain adjustment that you mark your chains with a plastic tie so that you can easily see that your chains are correctly set every time you go out. If you have a radius dump box with conveyor in it, it is imperative that you check and make sure that your tailgate is properly latched. Failure to insure the tailgate is latched will result in unloading the majority of the load on the road in a short distance. This is a waste of material. Check your latches before loading.

- iv. **Fuel:** Be sure your fuel tank is topped off at the beginning of each shift, and whenever you are below $\frac{1}{2}$ a tank and are in to re-load. If you were to become stuck or stranded for an extended period of time, at least you could have heat and radio communications.

- v. **Tarp:** Although a tarp is not mandated by law during plowing operations, it does assist in keeping the load dryer during precipitation. Again, if the tarp is not used on a regular basis it can set up, causing difficulty in operation. It is recommended that if you have a tarp system that is fully functional and operates freely to use it. If tarp springs are set up or motor does not work properly, do not use the tarp.

- vi. **Belly Blade:** The underbelly blade is the most used tool for removing snow. The belly blade is approximately twelve feet long and twenty inches tall and has the ability to remove a considerable amount of snow. The underbody blade shall be inspected before each use. Look for worn/leaking hydraulic hoses and fittings, check center pin, and swing blade left and right to insure free movement. Inspect cutting edge bolts to insure tightness. Also, the belly blade may have a tendency to slowly lower itself while the truck has been sitting, so be sure to lift the blade before leaving and/or backing. Seasoned drivers should know how much down pressure to apply to the belly blade to remove snow, but new drivers will need to learn the proper amount to apply. Excessive down pressure is extremely rough on your belly blade and truck, and on the road surface. No matter how much pressure you put on the blade, you will not remove all the snow from the road, as the road is not perfectly flat and your blade does not wear perfectly straight. You will only cause the blade to wear faster, and roads to deteriorate quicker. If you can see "Haley's Comet" in your mirror, you are probably using too much down pressure. Listening to the sound of the blade contacting the roadway will be the best way to determine proper blade pressure. Knowing how far to angle the plow to get the snow to slide in the desired direction and at the same time for the widest coverage for clearing the roadway takes practice. What works for light fluffy snow may not work for heavy wet snow. You should be able to see in your spot mirrors when all the snow is going to one side of the road. Know which roads on your particular route have been sealcoated during the previous summer, and then be careful not to apply too much down pressure, so you don't scrape off the stones. You should know which roads have a graveled shoulder, and then use light down pressure when pushing the snow back away from the edge, being careful to not scrape the gravel off into the ditch. Another area of caution is bridge decks over other roadways. Extreme care should always be taken so as to not plow snow

over the bridge onto traffic below. Slow down so that the snow just goes to the road edge only, until you have crossed over the bridge.

- vii. **Treating the roadway: Common sense plays a vital role here.** Remember, most of the traveling public are not professional drivers - we are. We must look out for them first and foremost. Many commuters will feel safer if they get in behind our trucks while we are salting, especially in slippery hazardous conditions. This causes visibility issues for our drivers when backing at intersections. **Always** assume that someone is behind you, and double check before backing up. For most of our plow trucks it is unnecessary to raise the box while driving (vee boxes and radius dump boxes); however, we utilize several dump trucks with tailgate-type sanders. Having this type of sander leads to many types of hazards not seen in our other trucks. Overhead power lines, cable TV lines, trees, overpasses and bridges all can become hazards if not accounted for during plowing operations. Remember, trees that you had clearance under during the fall may sag under the weight of snow and become a clearance issue. The operator must be aware of his load size when raising his box, especially while driving, moving, and turning. Too much weight, shifted loads, and the load sticking in the corner of the box can make the truck unstable and can cause serious damage and injury. While operating with the box in the air, care must be taken while driving that overhead obstructions are not an issue, and speed must remain under 30 miles per hour while the dump box is up. The speed in any truck while in the salting/sanding mode shall not exceed 35 mph. At speeds above 35 mph, the salt and sand does not stick and bounces off the roadway wasting salt and time. It is recommended that every couple of hours the driver gets out to stretch his legs and walk around his truck, looking for any defect that could cause a breakdown. This is also a good time to clean any snow build-up from the tail lights and strobe lights. If the box is over half full of material and you need to raise it while moving, common sense is needed. It should only be done while moving straight ahead and then lowered to an approximate height of 36" as measured from the frame rail to the front box rail. The box must be lowered to the frame rails anytime a turn or sharp curve is navigated. The type of material to load for your route (salt, sand, or a mix) can be discussed with your group leader prior to the beginning of the shift. State highway routes and primary roads usually get salt only. Local roads and gravel roads may get sand only, or sand/salt mix. Ask your group leader when in question. Although the Road Department is exempt from load restrictions during winter operations, it is ultimately the driver's responsibility to insure that his truck can operate safely with the load he is carrying. These trucks are purchased with heavy duty specifications, but they still have limitations. Always error on the side of caution.

- viii. **Front plow:** The front plow is used when we must remove a significant amount of snow from the roadway. Several new hazards come with the use of the front plow. Visibility is obstructed, not only from the size of the plow but from the snow turbulence that is thrown onto the windshield. Preparation is the key to using the front plow. Prior to the winter season, the operator shall prepare his truck for the front plow. This is done by checking all the attachment points, inspecting the plow lights for functionality and the plow light plugs for damage. Many of the trucks will require the driver to duct tape the heater/defroster vents so that snow does not enter the heater motor housing (if vents are left un-taped water will accumulate on the inside of the windshield, causing visibility problems). It is highly recommended that trucks that have the ability to get their engine air from under the hood (most all ours do) do so, or duct tape off the external air cleaner opening so that the air filter does not become plugged with snow, which causes high fuel usage, loss of power and eventually stalling. Insure that the plow shoes are properly adjusted and the plow height is correct. This is accomplished by sliding your toe under the cutting edge of the front plow while in the down position. If your toe can fit under the cutting edge at all points it is properly adjusted. You do not however, want your plow adjusted too high. This will cause your plow to ride up on the snow causing the truck to get stuck. The shop is always willing to assist you in adjusting your plow. Before the season, the driver should run his route and mark any obstructions or hazards that may be covered with snow in the winter. Headwalls, tree stumps, rocks, and bridge abutments are all examples of hazards that may be easily seen during the summer but may be hidden under a fresh blanket of snow. Road conditions are another factor that the driver will need to take into consideration. Is the ground frozen under the snow? Unfrozen gravel, speed, and an unadjusted plow are a sure recipe for disaster. The cutting edge should never be able to touch the ground, especially when the ground is not frozen. The maximum speed that should be driven while in the plowing operation is 35 mph. Slower speeds will be necessary if conditions warrant. During periods when the ground is not frozen or you are running on soft shoulders you may need to slow to 20 mph. Although many dedicated drivers will want to go faster to open their roads quicker, our drivers' safety outweighs any need to clean the road quickly.
- ix. **Wing blades:** Our newer trucks are equipped with 9' patrol wings. These wings assist in doing the job of two trucks. The wing enables the driver to clear the traveled portion of the roadway as well as the shoulder, cutting down on the number of passes needed. Caution is needed when using the wing blade. Obstructions such as guardrail, mailboxes and delineator posts, stalled or parked vehicles, all can cause damage to the vehicle and the wing plow. The wing blade should be inspected prior to use, checking for loose cutting edge bolts, loose or worn sheer bolts, and all blade connections. A speed of 30 mph.

shall not be exceeded while using the wing blade. Excessive speed causes the blade to bounce and does not give the operator adequate reaction time should something happen. Extreme caution should be used when lowering the wing blade. It is recommended that the blade be lowered before you get to the spot you need to clear. Driving at a high speed and then dropping the wing can cause the truck to spin out of control. All wings are equipped with a taillight/strobe light at the end of the wing. Ensure that these lights are functional and clear of snow. Motorist will attempt to pass on the right on occasion. This light will let them know, during periods of reduced visibility, that you have your wing blade down.

- x. **Sanders, cross conveyors, and chutes:** Our trucks are equipped with different types of spreaders. Most of our trucks have ground speed oriented controllers that were originally calibrated to the truck. There are many variables that can change the output for your particular sander. Normal pump wear, engine rpm, auger wear, and loose conveyor chains are all some examples of the variables. Sanders should be kept clean between uses so the operator can visibly see any defects before heading out on the road. Drivers will often notice that the spinner slows while the dump box, plow or wing is being raised. This is normal. The reason for this is that it is more important during winter operations that the driver be able to lift his wing or raise his plow than to have the spinner turn. The maximum speed that should be traveled while using the sander is 35 mph. There are two reasons for this. At speeds higher than 35 the material simply won't stay where it is needed, and the turbulence from the truck and air foil will send the material everywhere except where needed. There are times during some wintertime conditions when the driver will have to travel significantly slower to keep the salt on the road. Example: during wet slushy conditions you may be able to go 30 mph and have the material stick to the road, but, on ice or "glazed" conditions you may have to slow to 10-20 mph to get the material to stay in place. At the end of each storm the driver **shall clean** his sander, chutes or cross auger. This will improve your odds of having it work properly for the next storm event. The operator **shall never** reach into the sander or cross conveyor while the sander is turning. This is extremely dangerous as clothing may become entangled in the auger, causing serious injury or death. If debris such as plastic bags, rocks, or salt clumps become lodged in the auger it may be necessary to stop and clean out the auger. This is NEVER done with the auger turning, or with power turned on to the auger. Before you attempt to clean the auger pan, turn off the power to the auger. Also, NEVER reach between the frame rails of a raised dump box for any reason, unless the box is securely blocked in the raised position. The operator shall inspect all warning decals and insure decals are legible. Auger bearings and conveyor shaft bearings need to be greased on a daily basis. The operator shall make sure at the end of the season

that the chloride system tanks are empty and are flushed with fresh water or RV antifreeze. This will ensure that the system works the following year.

- xi. **Replacing Underbody Blades:** During your shift it may become necessary to replace the cutting edge. We have a regular area just for changing blades. Changing blades should be done with at least two people whenever possible; mechanics will always assist if necessary. One person should guide the driver onto the hoist so there are no mishaps. Check to be sure that the truck is safely on the hoist saddles before raising it up. Cutting edges should be changed when the most worn side has less than ½" or less remaining, but don't wear down into the moldboard. All blades must be properly charged out prior to leaving the garage.
- xii. **Two way radios:** All trucks are equipped with two way radios. We have multiple channels on our radios so they may be used in many different situations. Channel 1 (or repeater) is our main CCRC channel, and all radio communications will go through the main repeater and everyone on the system can hear you. This channel is for official Road Department business only and idle chatter should not occur.
- xii. **Cell Phones:** While the Road Department advises that all operators have a cell phone in their possession for use in an emergency, use of a cell phone is prohibited while driving unless the user has a hands-free wired/wireless earpiece or speaker phone function. The Federal Motor Carrier Safety Administration has amended the cell phone regulations to restrict the use of hand held mobile telephones by drivers of commercial vehicles. The rules have been amended to include drivers employed by state or a political subdivision of a state. CMV drivers are required to:
 - a. Stay off your hand held mobile phone while driving unless you use a hands-free/wired earpiece or speaker phone function.
 - b. A driver's use of "push to talk" function of a mobile phone violates the prohibition against holding the phone while driving.
 - c. No dialing is allowed, but a driver can initiate, answer or terminate a call by touching a single button on the hand-held phone, earpiece, steering wheel or instrument panel.
 - d. Hand-held mobile cell phone use is also allowed when necessary to contact law enforcement officials or other emergency services.

- e. Drivers cannot use hand-held mobile phones while temporarily stopped due to traffic, a traffic control device or other momentary delays.
 - f. Reaching into a passenger seat or under the driver's seat to activate the phone while driving is not acceptable. The phone must be located where the driver is able to initiate, answer, or terminate a call by touching a single button while the driver is in the seated position and properly restrained by a seat belt.
 - g. The Road Department advises that drivers pull over in a safe location, even in an emergency if at all possible, to initiate a cell phone call.
- xiv. **Post Trip Responsibilities:** At the end of each shift it is the responsibility of the driver, as required by law, to complete the Vehicle Condition Report. The driver shall inspect the vehicle as prescribed on the form. The yellow copy must remain in the vehicle and the white copy must be turned in to the maintenance department. During winter operations, there will be occasions where you may work up to 16 hours and then another driver may operate the same truck. By law the "new" driver is entitled to view the report you filled out at the end of your shift, noting any defects that you may have found while operating this piece of equipment.
- a. Dump box shall be emptied and remaining loads dumped back in salt shed unless another driver will be operating the vehicle immediately. Sander and box shall be washed at the earliest available time.
 - b. Grease bearings on augers and conveyor chain shafts, and pivot points on underbody blade.
 - c. A complete inspection of plow, sander, truck and underbody shall be made. Inspect all warning labels and be sure they are legible. Any safety defects shall be brought to the immediate attention of the maintenance department.
 - d. The plow truck is your "office" for up to 16 hours a day. It is your responsibility to keep it clean and in good working order.