

# Slope Maintenance Manual

## Service Strategy

1. Provide our guests with slope conditions they will enjoy skiing.
2. Have a quality team of operators.
3. Cooperate with all other departments.

## General Policies

The reporting place will be the ski area vehicle maintenance building. You are expected to punch in at the beginning of each shift and out at the end of each shift. It is very important that you report to work on time so individual assignments can be made, machines checked out, started and warmed up. On those nights when it is snowing, you should plan to leave home early to compensate for slower road conditions. A four day, 40 hour work week will be scheduled, but you may be asked to work overtime or work on your days off. Every effort will be made to give you prior notice in these cases. The Slope Maintenance Manager will be responsible for the schedule of days off. No one on the slope maintenance crew should expect to have Saturdays or Sundays off as these are busy days.

The shift is scheduled from 11:00 PM to 9:30 AM. The hours that the slope maintenance crew works are difficult, but you are expected to be well rested and be in good physical condition to perform your assigned duties. Starting times may vary due to weather conditions and grooming work required. Afternoon or evening shifts may be scheduled from time to time depending on these conditions.

Personnel will be rotated between slope grooming and snow removal operations. You will be expected to know and follow the procedures covered in this manual. All slope maintenance personnel are encouraged to offer suggestions that may improve the efficiency of the slope maintenance department. You might be expected to perform other duties as assigned that pertain to the operation of Monarch Ski and Snowboard Area.

As an equipment operator, you are the best person to communicate to the vehicle maintenance mechanics about the performance of a machine. You will be expected to operate the slope maintenance equipment in accordance with the manufacturer's operating manual and with good common sense. In doing this you will be able to tell the mechanics when you notice a change in performance or detect a problem of any kind. Good communication between the vehicle maintenance and slope maintenance departments is essential for an efficient operation. Operators will do minor maintenance on equipment (i.e., tighten connections, loose nuts, bolts belts, replace bulbs, adjust chains, track tension, change tires, and other minor adjustments that might take 5 minutes or less ) and do minor servicing such as lubrication, cleaning and tire pressures, etc.

# General Daily Operating Schedule

1. Do pre-operation checks.
2. Start machines.
3. Do weekly inspection on scheduled machine while machines are warming up.
4. Secure a radio and place it on your person in a radio pack.
5. Do the needed work on the mountain and in the parking lot.
6. Fuel, inspect and clean up machines.
7. Fill out fuel and oil logs and a Maintenance and Repair Worksheet if necessary.
8. Return radio to charger.
9. Communicate with mechanics on needed repairs.

## General Rules

1. No unauthorized personnel will ride or operate a machine without authorization from the Slope Maintenance Manager or supervisor.
2. No slope maintenance personnel will operate any machine without being checked out in the machine by the Slope Maintenance Manager or Supervisor.
3. Abuse of equipment will not be tolerated and shall be sufficient cause for termination.
4. Engines will not be over-reved or lugged down. Watch the red line on the tachometer.
5. Seat belts will be worn while operating equipment.
6. Flashing lights, drive lights, and back up alarms must all be on whenever employs and skiers are on the mountain.
7. If a machine must be left on a steep slope, set parking brake and drop blade and implement to the ground., set parking brake, shut off engine.
8. Be aware of all fire hazards. Know the location of fire extinguishers and their proper use.
9. Follow established safety and emergency procedures.
10. Be alert and ready for the unexpected at all times.
11. There is no smoking allowed in the equipment, in the shop or around the fuel pumps. This includes all smokeless tobacco products.
12. Do not litter the mountain with your trash.
13. It is our expectation that job related activities will always proceed with an attitude of concern, awareness and cooperation to maintain high safety standards. An employees disregard for the safety of themselves, their co-workers and/or the public will not be tolerated and shall be considered grounds for termination.
14. The radio will be carried in a case and worn on your person. Radios are expensive, protect them from the environment. Never leave radios lying on dash boards or consoles as continuous vibration from the machine is very damaging.
15. No one should leave the base area without a radio. Check to make sure it is working before you leave. Slope maintenance will operate on channel It is a good practice to contact your grooming partner or supervisor periodically. FCC Regulations prohibit the use of profanity.

## **General Rules and Safety Procedures**

1. Slope maintenance personnel should be conscientious of their safety and the safety of others.
2. Safe operation of all equipment is essential. Risk taking is not allowed.
3. Whenever anyone approaches your machine always drop blade and implement to the ground, apply the parking brake and idle machine down.
4. When operating the loader you should carry the bucket as low as possible for maximum control and to reduce the possibility of tipping over. Avoid severe articulation with a loaded bucket. Do not push or scrape snow with tires off the ground.
5. Be aware of side hills in all machines to prevent rollovers and slipping sideways. losing traction while side hilling can cause the tracks to come off.
6. Do not follow another snowcat too closely, especially on steep terrain.
7. Ask if you are not sure of something. Safety is always the best policy.
8. If something seems wrong with a machine have it checked out immediately.
9. Know who to contact in case of an emergency.
10. When pushing snow banks with the dozer do not drive too far out on the edge. If the machine were to go over the edge or get stuck we may not be able to get it out.
11. Shut off the tiller when you or anyone else is outside the machine and near the tiller, including skiers or anyone else standing close.
12. When experiencing excessive drowsiness or falling asleep park machine, shut down the engine and take a short nap. Advise the supervisor of the situation.
13. Make sure garage doors are closed and locked when leaving the garage area.
14. Tools used from the toolbox will be returned immediately following usage. Do not leave tools in the machines as this could cause damage.
15. Employees will not be covered by Workers Compensation for any injuries occurring while on their free time and not working.

## **Qualified Climber Program**

### **Program Purpose**

Monarch Ski and Snowboard Area has developed this program as an alternative to the Occupational Safety and Health Administration's (OSHA) safety harness and training program rule CFR 19132©. OSHA requires that a qualified climber be an employee who by virtue of physical capabilities, training, work experience and job assignment is authorized by his or her employer to routinely climb fixed ladders, step belts or similar climbing devices attached to structures.

### **Program Description**

Each employee is to be informed of the hazards of using the above mentioned climbing devices. Monarch will insure that the employee is physically capable of using them, has completed a

training session in such climbing and can demonstrate the skills needed to insure that each employee complies with this program. All safety harnesses must be OSHA approved.

## **Pre-Operation Procedures**

1. No machine will be started without checking all engine fluid levels, hydraulic levels, transmission levels, and any others specified by the manufacture.
2. Machines will be started only as the manufacturer recommends. Different machines have different start-up procedures. If you have any doubt as to these procedures, check the operators manual or ask your supervisor.
3. Make sure heater extension cords are unplugged and cords are hung up after starting machines.
4. While machine is warming up the operator will visually inspect the machine and any equipment that will be used . Inspect this equipment for broken, cracked or malfunctioning parts. Also look for fluid spots under the machine and implements that might indicate a leak of some kind.
5. Walk the tracks and visually inspect the grousers, belts, lacings and tires to make sure they are in good operating condition. If not in operating condition, pull machine into the shop and make proper repairs.
6. Machines will be warmed up for at least 5 minutes prior to operation.
7. Check all lights, steering functions and brakes before leaving the base area. No machine should be operated without adequate lights, steering or brakes.
8. When leaving the shop area check for proper function of all hydraulic operations and keep in mind that the hydraulic oil temperature is still cold.
9. Check for any unusual noises or vibrations as you make your way onto the mountain.
10. Machines that use tire chains must have chains inspected for broken links and proper tightness.
11. If you have any doubts as to any of these procedures, check the pre-operation and start-up procedures in the operators manual or ask your supervisor.

## **During Operation Procedures**

1. You as a conscientious operator will be the best evaluator of a machines performance and condition. When reporting problems on equipment be objective and specific, don't just say it doesn't work right explain the problem in detail.
2. Check all instrument and panel gauges frequently. Pay attention to any warning lights or buzzers and act accordingly.
3. A routine visual inspection should be made several times during an operating shift and should include the following:
  - a. Visually check for any fluid leaks.
  - b. Inspect tracks including grousers, belts, lacings, sprockets and tires.
  - c. Check grooming implements and their hook-ups.
4. Be aware of any unusual noises or vibrations. Try to determine the cause of the problem and act accordingly.

5. Remember that your personal safety may depend on all systems on your machine functioning properly. If you have any doubts as to the proper operating function of your machine check it out, refer to the operators manual or ask your supervisor.
6. If a machine or implement has a malfunction or breakdown during operations advise your supervisor immediately. The problem should be evaluated and repairs made to enable getting the equipment off the mountain and to the shop. If the problem cannot be repaired the supervisor should notify the Vehicle Maintenance Department early enough to allow them to come up and try and have the equipment off the mountain before the ski area opens at 9:00 AM.
7. Some minor repairs will have to be done during the shift. Loose belts, loose hydraulic hose connections, broken cross links on tire chains, etc., should be repaired as soon as possible so they don't create more serious problems.
8. If a breakdown requires a piece of equipment to be towed, make sure it is done in accordance with the manufactures recommendations and is done safely.

## **After Operation Procedures**

1. Slope Maintenance personnel will report all malfunctions, breakdowns and needed repairs by writing them down on the Maintenance and Repair Worksheet and by telling the supervisor and the Vehicle Maintenance staff.
2. Machines will be cleaned out after each shift. Remove all bottles, cans, paper, clothes, tools, chains or trash that was in your machine.
3. Diesel engines should be idled down for at least three minutes to cool the turbo and prevent damage to the engine.
4. Machines will be fueled and all fluid levels checked and topped off at the end of each shift in order to keep the condensation of water in the tank to a minimum.
5. Visually inspect machines closely for any indication of broken welds, metal fatigue, loose bolts, leaking lines, etc.
6. At the end of the shift park the machine on level ground and drop the blade and implement to the ground.
7. Check the tracks for broken grousers, torn belts, loose track lacings, bad or flat tires and loose or broken chains.
8. Inspect grooming implements used during the shift for proper operation and report needed repairs.
9. Clean all snow off of the blades, beds, implements and grooming frames on the snowcats.
10. Plug in the engine block heater on the machine.
11. The operator will be responsible for conducting routine and minor maintenance on machines and equipment used each shift.
12. Review the operators manual frequently to insure that you are properly checking out, inspecting and servicing the equipment after each shift.

# Weekly Inspections

Check machines on a weekly schedule so as to rotate thru entire grooming and snow removal fleet. This includes the John Deere loader, grader and dozer and all snowcats except tour cat. Typical weekly inspection includes but is not limited to the following:

1. Check and top off all fluid levels and tire pressures.
2. Clean and vacuum machine cabs.
3. Wash all windows and mirrors.
4. Check for broken, worn or missing parts.
5. Grease all grease zerks on machines including blades and implements.

## These Should Be Checked After Each Operation

- ALL EQUIPMENT
- Engine oil
- Coolant level
- Radiator
- Hydraulic oil level
- Transmission oil level
- Differential
- Visually check for loose wires, belts, hoses, etc.
- Tires and tire pressures
- Exhaust system-loose connections
- Visually check entire machine for signs of metal fatigue or broken welds.
- Indication of fluid leaks.
- Remove excess buildup of snow and ice from blade and blade frames and implement.
- Gauges
- Lights
- Wipers
- Horns
- Heaters
- Fans
- Windows
- Backup alarms
- Beacon lights

## Snowcats in General

Tracks-tension, lacings, grousers, tire guides, drive sprockets and tires. Grooming implements-check for broken, bent, missing or malfunctioning parts. Pintel hook and safety chains.

# Snow Removal Equipment in General

Inspect tire chains for broken or missing parts. Implements including blades, bucket, forks, brush rake and boom.

## General Rules for Equipment Operation

1. Inner cooled diesels ( Bombardiers, Prinoths and all John Deere's ) are not to be left idling more than 15 minutes. Idling for extended periods of time is expensive in fuel costs and will cause excessive wear and damage to the engine primarily due to the extra cooling effect of the inner cooler. Shut machines off during your lunch break.
2. Diesel engines should not be operated above or below ideal torque range for specific machines. Use the guidelines posted in the operators manual for each machine.
3. Engine RPM's:
  - a. Prinoth 1200-1800
  - b. Bombardier's 1700-2200
4. Snowcats should not be turned on axis quickly as it causes excessive wear on all track components. Always slow down, and use the snow in the blade to turn on when using turnarounds or making sharp turns.
5. Wipers:
  - a. Never beat the wipers against the windshield to remove snow or ice . This is a major contributing factor to broken windshields.
  - b. Do not leave wipers running while machine is parked.
  - c. Keep excessive snow buildup off of wipers as this is a weak system and will cause frequent breakage.
  - d. On all machines, if wipers are leaving black rubber streaks you are using the wipers too much.
  - e. Use the intermittent switch or button except during heavy snow fall.
6. Do not operate machines when they are overheated. When machines start to run hotter than normal find out why and correct it before the machine overheats. Bring the cat to half speed and take the load off the blade and the tiller.
7. Do not take any machine beyond the ski area boundary unless otherwise instructed by the Slope Maintenance Manager or Mountain Manager.
8. Never use an parking brake to slow or stop a vehicle except in an emergency situation.
9. At the discretion of the supervisor, one or two machines should be sent to the shop a few minutes ahead of the others to allow for a smooth traffic flow at the fuel pumps. Any machines needing minor repairs should be sent in first.
10. The standard rule of thumb is to allow 30 minutes to refuel, check out the machine and equipment and do the required paper work.

# General Grooming Practices

It would be next to impossible to try and establish a foolproof method for grooming the mountain because of the large number of variables effecting the operation at any one time. The factors effecting slope maintenance operations are the amount of snowfall and its density, skier traffic, manpower available per shift, equipment breakdowns, special events, needs in the parking lot, environmental conditions and special requests from other departments and the resort. This section will deal with general practices, procedures, methods and priorities.

In general our grooming practices mostly affect the beginner and intermediate skier. For that reason it is the highest priority that the beginner trails serving these skiers be maintained to the best of our ability.

## Slope Grooming Plan – Priority One Slopes

With 1” or less of new snowfall groom: or 12” or more

- Around the lodge ,rental center, and children center
- Safari/Congo
- Snowflake/Butterfly
- Little Joe
- Rookie
- Glade
- Sleepy Hollow
- All top ramps
- Roundabout
- Gunbarrel Trail
- Skywalker
- Great Divide
- Snowburn

With 2” or more of new snowfall groom:

- All of the above and add
- K.C. Cutoff
- Ramble On
- Little Mo
- Romp
- Tenderfoot
- Freeway
- Lower Tango
- Sidewinder
- Drifter
- All run outs including Mirage, JR’s, Zipper, Ticaboo and B’s Bash
- Out Back road from the top of Breezeway to Snowburn

- Liberty
- Curecanti ingress and egress roads
- Mirkwood Egress Road
- Pioneer Trail

All maze areas should be groomed when the ropes are down. With new snowfall and when time permits the explosives cache access road should be groomed.

On heavy snow nights there may not be enough time during a shift to pack all the slopes which are normally groomed. Some slopes will have to be left ungroomed. On these heavy snow nights the following slopes may be left ungroomed at the discretion of the Slope Maintenance Manager or Supervisor:

- Little Mo
- Tenderfoot
- Freeway
- Drifter
- Ricochet liberty

## **Slope Grooming Plan – Priority Two Slopes**

After a snowfall and the priority one slopes have been groomed, the following priority two slopes should be groomed as time permits:

- North Forty Left half
- Romp
- Toddler
- Short-n-Sweet Right half
- Doc's Run
- Beeline Right half
- B's bash
- Ticaboo Left half
- Toddler
- Turbo Right half
- Freeway
- Tenderfoot
- Drifter
- Little Mo
- Tele Alley
- Mirage Right half
- Picante Right half
- Liberty
- Upper Tango Right half
- Shagnasty

Any other slopes will be groomed as the need is determined by the Slope Maintenance Manager or Supervisor.

During a shift when it is snowing it may be necessary to groom some priority two slopes before the priority one slopes are done. The practice would be to groom priority two slopes first so that there will be less accumulated snow on the beginner runs when the ski area opens at 9:00 AM. This practice allows the beginner runs to be groomed later in the shift and just before skiers get on the slopes.

At times when it is snowing hard or there is not enough manpower available it may be necessary to concentrate on just a few of the priority one slopes for an entire shift. These decisions are the responsibility of the Slope Maintenance Manager or Supervisor.

The biggest priority on the mountain is the clearing of the parking lot. Enough equipment and manpower must be assigned to the lot to insure it is cleared by 8:00 AM. We can't sell tickets to skiers if we can't park them in the lot.

## **Grooming with Fresh Snow on the Slopes**

At times, due to the consistency and amount of new snow, you may have to groom less than the full width of a slope. On wide slopes such as Little Mo, Lower Tango, Sidewinder, Snowburn or Freeway four or six passes in the center of the slope is adequate. The slope edges can then be cleaned up during the next shift. The exception would be during a storm that lasts a number of days with continual snow. Grooming in the center of the slope day after day will tend to develop a trough down the middle of the slope. This will require extra blade work for future shifts and leave the slope edges too soft to climb. When it is snowing Snowflake/Butterfly should be the last slope groomed prior to the ski area opening and should be groomed side to side. All top ramps should be back bladed, smoothed out and groomed when it snows or on windy days due to the possibility of drifts. Top ramps should be done as close to 8:00 AM as possible to minimize shoveling by lift crews. If you leave any ridges on any of the ramps contact the Lift Operations Department at 8:00 AM so lift crews can take care of the situation.

## **Specific Grooming Practices**

Be careful of the deep gully on skiers left of Lower Tango.

With new snow climb Sidewinder on skiers right, or you may find it easier to climb Drifter and descend Sidewinder.

Climb Romp on skiers right and descend on skiers left with soft snow conditions.

Be careful on skiers right on Snowburn as there is a deep hole that will suck you into the trees. This is why it is called the Snowburn suck hole.

There is a deep gully on skiers right of Liberty, do not attempt to climb.

In soft snow conditions be careful of drop off areas such as catwalks and service roads, you can easily be pulled over the edge. always clean up the edges with a down pass never attempt to drive next to an edge on an up pass.

When grooming in areas that are known to have problems with ruts and speed bumps, use your blade to smooth them out. Following this procedure each time these areas are groomed will help keep the problems to a minimum. Problem areas to be concerned with are:

1. Sleepy Hollow Catwalk
2. Ramble On Catwalk
3. Roundabout above Romp
4. Below the intersection of Little Joe and Glade
5. Sleepy Hollow and Pinball intersection
6. Roundabout switchback
7. Liberty Entrance
8. Where the slow signs are placed during the day

## More General Grooming Practices

1. All machines should be off the mountain by 9:00 A.M. If public are nearby during grooming operations in the morning before this time, call dispatch or Admin to provide a spotter to warn others nearby.
2. Notify the supervisor and Ski Patrol dispatch if you can't be off the mountain by 9:00 Inform them of what run you are on and what time you expect to be off the mountain
3. During early season packing, machines are operated at slow speeds with no sharp turning or Spinning around of vehicles
4. Track packing may be utilized early season to catch snow
5. Any potential ski hazards noted will be reported to the Slope Maintenance Manger or Supervisor and to Ski Patrol Dispatch
6. Do not spin tracks on snowcats, this will cause the machine to sink into the snow
7. Stay 3'-5' away from buildings, tent, lift towers, tree islands, trees on the sides of run's, Telephone polls, ski racks, picnic tables, boundary rope, and Slow signs,
8. If you get stuck. Stop and call for assistance right away.
9. A grooming report will be given every day at lunch on the Monarch web sight
10. Slope maintenance is directly responsible for providing the skiing public with as Good a skiable surface as possible on trails that are groomed, weather and snow conditions permitting. In poor snow conditions and early season, you may have to shovel and put up snow fencing snow to fulfill that responsibility.
11. If there is a question of available time for grooming a slope, it should not be attempted unless You can make at least four passes. Start in the middle and work towards the edges, so if there is any ungroomed snow it will be on the sides.
12. Always climb mellow trails and descend steeper terrain
13. On deep snow nights it may be necessary to make ridges on the down pass and clean up the ridges on the next up pass.
14. On slopes with a side hill start grooming on the high side and work to the lower side

15. On trails that are subject to wind drifting get to know typical drift patterns and avoid them when climbing, pack down through drifts so you won't get stuck.
16. Never do a back up on the Big Air Jump landing. Always do down passes.
17. When grooming down steep slopes go as slow as possible to avoid sliding . If the snowcat starts to slide keep the tracks moving and use the tiller to help steer.
18. When grooming up steep slopes try to go straight up the fall line, use the tiller to help steer, and try to keep the tracks moving the same speed. If the tracks start to spin raise the tiller up .
19. When using turn around areas on the mountain, you should clean up the area when you are finished. Even though the turn around area may appear to be off the main trail, skiers may ski into it.
20. It is a must that the slope by the rental shop to the starbucks entrance does not get too steep
21. There are a number of situations that will determine how and at what speed you operate the machine. Remember, the machines and equipment should be operated in accordance with their operational manuals and common sense.