TOKO
THE WAX & CARE COMPANY

TOKO®

Board Tech Manual
2003/2004

Racing-Service

INTRODUCTION

When Jakob Tobler founded Toko in 1916, he had no way of imagining what a rapid development lay ahead in ski sport. The tricks and secrets of waxing – together with expert knowledge – over a period of many years of research and development permitted the creation of a wide range of Toko products. For decades, the users of the Toko line could depend on the latest experiences from professional racing continuously being applied in the development of Toko products. What happens in the fringe range between snow and ski today is a research subject for entire scientific institutions. The conversation of this knowledge to speed, gliding comfort, and the care for ski bases is Toko's very special expertise.

Toko has been setting the Ski Wax and Tool world on fire for the past 5-10 years. Toko has quietly pioneered virtually all of the wax technology breakthroughs that have occurred in recent history. Some examples of this include the following: Toko was the first to develop a hand structure tool that allows the waxer to apply an offset structure which channels the water off the side of the ski - Toko Structurite. Toko was the first company to develop and offer a fluorocarbon in block form (Streamline). This product line is carried on by JetStream New and Old Snow Bloc. Toko is still the only company to offer a Copper Brush. The Toko Copper Brush is far softer than any other metal brush on the market yielding fewer (or no) hairs raised as a result of brushing, but is still aggressive enough to get the job requiring a metal brush done properly. Toko GelClean was the first product of its kind. Other companies have been scrambling to copy it, but it still sets the standard. The Toko Groove Pin is an innovative and successful product designed specifically to aid the waxer in removing wax from the groove and edges of the ski. Again, other companies are attempting to knock it off, but the Toko product is still leading the industry. Toko Dibloc was the first fluorinated glide wax to be used on the World Cup. This tradition continues with the Dibloc HF and LF product lines. Toko was the first company to develop an iron specifically for the purpose of waxing skis. This concept has been greatly built on and the Toko WaxCat Iron is the newest Toko offering. The Toko Scraper Sharpener was the first hand tool developed to sharpen scrapers. It has since then been anatomically shaped and been made more affordable. Toko HF and LF Molybdenum is an industry changing product. This product is used as a base layer by the whole elite ski world virtually every time a pair if skis is glide waxed for a race. Toko Molybdenum is simply a great base layer that increases the durability of what ever gets put on top of it. It also improves the properties of the ski base. Our competitors for years have been saying that Molybdenum and Graphite are the same, or even that Graphite is better. Now, 4 years after Toko's introduction of Molybdenum glide waxes, our biggest competitors are coming out with some exciting new breakthroughs: Molybdenum glide waxes! Toko HF Paste makes skiing far more fun for the working (time challenged) skier who likes to ski on fast skis, but doesn't want to take the time to wax them before every ski. HF Paste is also a great product for junior and youth program coaches who wax dozens of skis before a race. It is affordable easy and quick to put on, and performs extremely well. This is a unique product to the industry that is bound to be copied soon as it is being well received. Red Creek Roto Brushes (distributed under the Toko name) were THE Roto Brush pioneers and are still being used by some 95% of the World Cup and Olympic field. Red Creek uses the best materials and tests thousands of new possible

products enthusiastically every season. Red Creek invented Roto Brushes and continues to set the standard. Toko Tex Wax, a truly great way of applying iron-on waxes, is also a Toko only product. From our experience, Toko Plexiscrapers are made from a denser plexiglass than our competitors and hold a sharp edge for a relatively long time. The Toko Thermo Bag is a widely used product on the World Cup. At the 2002 Olympics, many teams had their own bags and many skis were brought to Toko by National Team technicians for Thermo Bag treatment the night before events.

Toko's continuous commitment to research and development guarantees consumers the latest wax technology. This past year, the Toko team tested approximately 300 new Toko formulations of Alpine glide waxes, 200 Nordic glide waxes, 200 grip waxes and 150 klisters. These formulations get narrowed down to just one which gets introduced into the market. Race Service is Toko's last step in evaluating new products. If they are readily accepted by National Team technicians and used in big events, then they finally get the green light to become mass produced and be sold in the retail stores. Toko does not have "race stock wax". The products used on the World Cup are identical to those sold in the shops, except for the occasional test product that, if really good will hit the shops the following year. This has always been Toko's procedure.

Despite being on the forefront of wax technology, the Toko system remains simple, easy to understand, and requires a minimal investment. Three color choices in the System3 line, four in the LF and HF lines (with the addition of Molybdenum) and two fluorocarbon products, means a Toko waxer has fewer waxes to buy and will be far more familiar with each product. With a better understanding of the product, the waxer will be more confident in determining the proper wax.

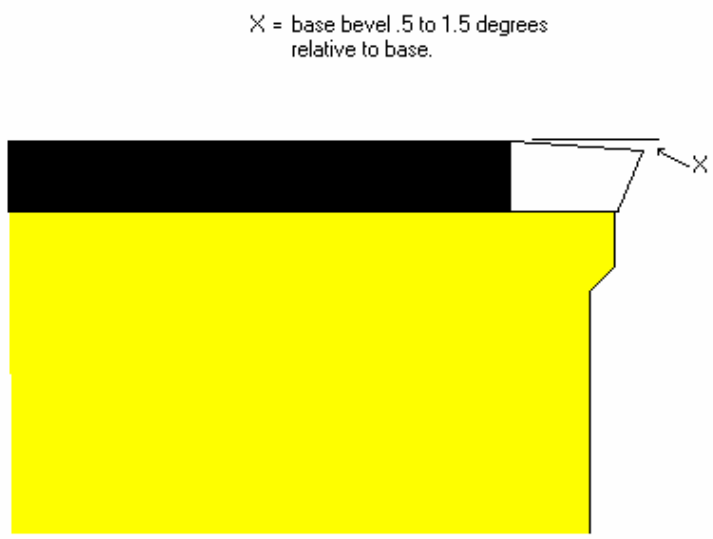
SNOWBOARD TUNING

Snowboarding has come along way in the last twenty five years. Equipment no longer borrows technology from ski companies. The latest in boards, boots and bindings are developed "in house" by boarders, developing new board shapes and constructions, comfortable yet powerful boots and easy to use binding systems. Modern boards can float the deepest powder and still leave ruts in the hard pack. But like their two planking cousins, boarders can benefit from tuning their boards. All types of boarders from freestyle riders to racers can increase performance by waxing and tuning.

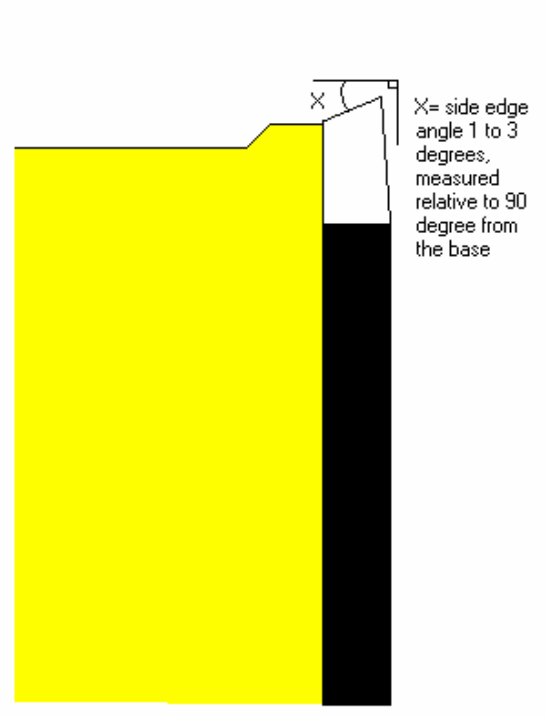
Keeping the edges of your board sharp make the board turn better and hold in all conditions. A snowboard will build speed when carving a turn; this can help a rider go higher in the pipe or a racer go faster down the course. To hold an edge under turning forces the must be sharp and have the right bevels. Bevels on a snowboard are similar to that of a ski, so the tools used are mostly the same. The major difference between a ski and board is the width. This doesn't create any problems with tuning the edges or waxing, but having a snowboard stone ground may not be as easy. Wide stone grinding machines are not as common as machines for skis, so not every shop can handle boards. Snowboards are also harder to build flat; this is something to keep in mind when buying a new board. Have someone show you with a true bar the condition of any of the boards you are considering purchasing. A flatter base will ride better and be easier to get tuned.

EDGE TUNING

The base edge on a snowboard should have a bevel of a half to one degree. A little base bevel makes the board easy to ride, transitioning from toe edge to heel edge without being “grabby”. Base bevel of more than one degree makes the board feel “slippery” and turns have to be skidded because the edge is not close enough to the snow to hook up.



Side edge bevel on a board will depend on the conditions and the rider’s ability. One degree of side bevel is enough for softer conditions and forgiving to beginning to intermediate riders. Two degree side edge grips better on harder snow, this lets a stronger rider lay over in a harder turn. For racing or carving on hard icy slopes a side edge bevel of three degrees will hold, but be take some muscle to control.



The first thing to do when tuning a board is to check out the condition of the board. A true bar will show if the base is flat or not, and how much base bevel is on the edge. If the board is new it should have a little less than one degree of base bevel and be fairly flat. A board that has been ridden a while will sometimes have too much bevel, especially on the heelside edge. Riding on hard snow will wear the edges. The heelside edge is harder to unweight, and most riders favor the heelside when they are stopping so it often gets worn quicker. Most boards that aren't perfectly flat will ride alright if the base bevel is good, but any board with too much base bevel will ride bad. A board that isn't flat, or is over beveled has to be stone ground. Expect to pay good money ($30-$50) for a stone grind on a board, but its well worth it to make your board ride as good as or better than new.

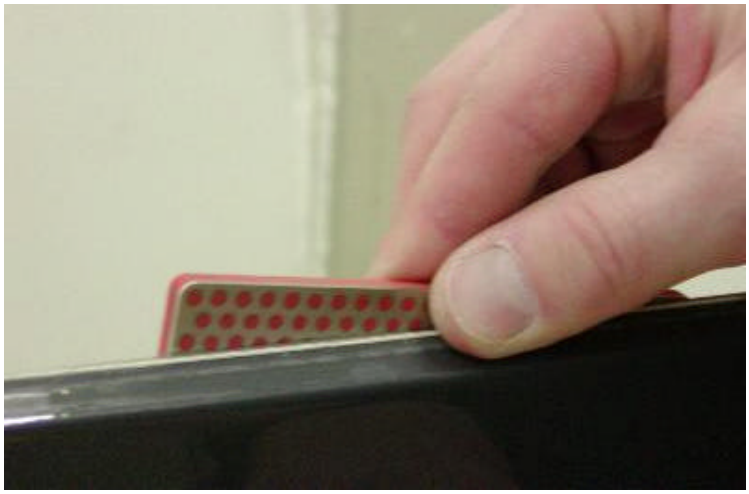
A secure way to hold the board is needed when working on the base or edges. The Toko Board Grip will mount on a table, work bench, or even on the tailgate of your truck, and hold a board both horizontally and vertically. Remove the bindings if they get in the way, just remember to write down your stance or mark the board so they get put back on in the same place. To bevel the base edges use a Base File Control with the desired amount of bevel. A good chrome file like the World Cup File must be used to file the edges of a snowboard. The material used on the edge is very hard, so the rusty file out in the garage isn't going to cut it. With the board base up on the Board Grip place the file guide and file on the far edge. Pull the guide and file along the base edge, make sure the guide is kept flat on the base. The file will only cut in one direction, so make sure the handle or "tang" on the file follows the rest of the file.

It is possible that the file won't touch the edge in some spots and remove material. If everything is set up right, this means that there is already a bevel on the board equal or greater than that indicated on the tool. This is fine so long as the bevel isn't way over beveled. Don't force the file or roll the guide over to hit the edge. Over beveling the base edge is bad even if it makes the edge look good. Flip the board around to do the other edge. Once the board has been base beveled, the base edge shouldn't be filed again. Don't worry if the board doesn't feel sharp at this point, sharpening will happen from the side. Slide the board into the Board Grip vertically, with the base facing away. Side edge can be sharpened with both an Edge Angle Pro and World Cup File, or a Precision File Guide set to the desired bevel. Starting on one end pull the file guide along

the edge. With medium pressure use five or six overlapping strokes down the length of the board. Repeat with longer strokes (two or three). And finish with one pass tip to tail for a smooth consistent edge.

Concentrate on using even pressure, and keeping the file guide flat against the base. If the board starts out really dull or the side bevel is being increased, it may take a lot if filing to sharpen and set the bevel on the edge. If the file hits the side of the board before it files the edge, the sidewall of the board needs to be cut back. The Sidewall Planer Pro can be adjusted to remove the sidewall material that would otherwise prevent the file from cutting the edge. Check the bevel with an Edge Angle Pro and a Prisma straight edge; hold the guide against the base, then place the straight edge across the top of the side edge guide. If the bevel is correct, the straight edge will rest flat on the both the side edge guide and the edge.

After setting the bevels with a file the edges may have a slight burr. To smooth out the burr and hone the edge use a DMT diamond stone. With a fine (red) DMT stone start on the base edge, holding the diamond stone against the base then tip the stone enough to match the base bevel.



Run the stone up and down the edge lightly two or three times. Switch to the side edge using a side edge guide and diamond stone for a few passes. Alternate between base and side edge to polish and hone the edge. The finished edge should feel sharp, pull you fingernail across the edge and it should shave some fingernail off. Lightly running your hand along the edge, it should feel really smooth, not serrated. Be careful, a burred edge can cut! A clean edge will ride so much better, making the board turn easier and dig in harder. To keep the edges running smooth, de-burr frequently; as the edge dulls, file the side edge to sharpen the board. Never file the base edge to sharpen the board; this will lead to over beveling, make the board ride bad. If the board gets too sharp on the tip or tail an Edge Grinding Rubber (gummi stone) can be used to dull the edge.

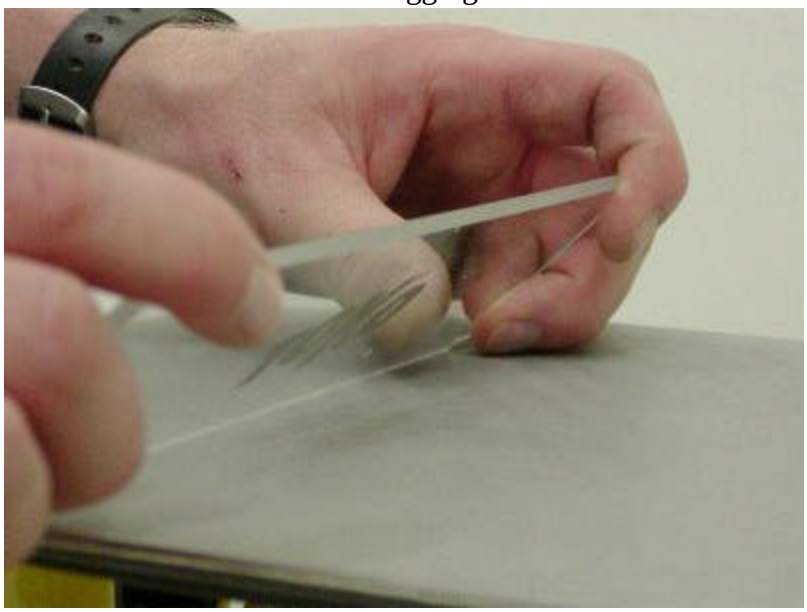
Dulling the tips and tails just a little will keep the board from catching. A good tune will make a board ride sweet, maintaining the edges will keep it riding that way.

WAXING

The other part of keeping your board running, is waxing. Wax comes in a few different applications, liquid wax, paste wax, rub-on block wax and iron-on waxes. Waxing a board is important not only to keep the board moving, but waxing makes the board turn easier and protects the base. A fast board will increase your opportunities for fun, making it possible to carve turns or take airs while everyone else has to go straight just to get back to the lift with out walking. Liquids, pastes and rub-on waxes are what to use on the hill. Just wipe the board dry then apply. The liquids (Express Mini and Express Pocket) and the pastes (Dibloc HF paste and TF90 paste) take about a minute to dry then should be polished in with a Thermo Pad or a clean cloth. The Express Pocket even comes with its own polishing pad. The rub-on waxes like the Express Blocx and Dibloc HF rub-on can be rubbed on and ridden, although polishing will maximize their effectiveness. Having one of these "cold" waxes in your pocket all the time, means you can wax your board any time it begins to slow down.

Although all waxes can make a board ride better, the best wax for any board is an ironed in hot wax. The base material on a snowboard is made from polyethylene. The base has "pores" that can hold wax. Hot wax gets into these "pores" better than any other type of wax. By heating wax into the base, the base becomes more durable and resistant

to scratching. Hot waxing also lasts longer than all other waxes. Before a board is hot waxed the bindings should be removed, or at least loosened. The screws that hold the bindings on the board can pull up on the base; this can become worse when the board is heated up with an iron leaving dimples in the base. Before hot waxing the base needs to be cleaned. The base material can pick up dirt, especially in wet spring like conditions. Use base cleaner, spray it on, wipe the base clean and let the excess dry. Use only base cleaner, other solvents can damage the base. An iron designed specifically for waxing is very important. There is no telling how hot a clothes type iron will get, generally too hot. If an iron is too hot it will make a lot of smoke, and can seal the "pores" of the base making the base unable to hold wax. After the base has been cleaned, drip wax over the entire base. Then spread the wax out by running the iron from tip to tail just quickly enough to spread the wax. It will take three or four passes, depending on how wide the board is. Once the wax is spread evenly over the board, go back and iron in the wax more slowly. Remember to always keep the iron moving. Straight passes tip to tail are best, this will heat the board evenly and keep the wax on the board. Running the iron in random swirls will plow most of the wax off the board and make a mess. After ironing the board needs to cool before it can be scraped. This takes at least an hour, scraping the wax before its totally cool can pull the wax out of the "pores" in the base. The longer the wax cools the better it will adhere to the base. Wax on top of the base needs to be removed, the wax in the base will make your board fast, the wax on top won't. Start by scraping the wax off with a plexi-glass scraper. The scraper doesn't need to be as wide as the board; a narrower scraper concentrates force better and is easier to keep sharp. Always push the scraper tip to tail, leaning the scraper forward. This will let the scraper run over any scratches in the base without digging in.



After scraping off the wax, a brush such as a white nylon brush can be used to clean any more wax off the surface of the base. Keeping the scraper sharp is important. Use a Scraper Sharpener or a file to sharpen the scraper. With the scraper sharpener, pull the scraper through the sharpener at about a 45 degree angle with one smooth pass, repeat as needed. With a file, secure the file on a flat surface and pull the edge of the scraper squarely along the file.

Choosing a wax for the conditions is important for maximum performance. The temperature of the snow is the biggest factor in determining the wax. Softer waxes (yellow) are used in warmer conditions and the wax gets harder (red then blue) as the snow gets colder. Basic waxes are hydrocarbon waxes (System3). This is similar to candle wax, but formulated specifically for snowboards or skis. System3 waxes are great for everyday riding. They aren't expensive, slide fast and protect the base. To determine what wax to use, a snow thermometer and a wax chart (temp. range is listed on the package) is all that is needed to get started. Once the snow temperature is known use the wax chart to find the wax color. If the temperature is between colors they should be mixed. To mix colors just drip both bars of wax on the board together. Another factor in wax selection is snow type. Not all snow is created equal, there is new snow, old snow, man made snow, and these types can also be mixed together. New snow is natural snow, under magnification real crystals can be seen. This type of snow is aggressive, and needs a slightly harder wax. Once new snow has been ridden on, groomed, or melted and re frozen: it will transform into old snow. Old snow isn't pretty snow flakes any more; it's rounder and less aggressive. Old snow requires a softer wax. Man made snow is made by spraying a fine mist of water into freezing cold air. The tiny droplets of water freeze quickly into sharp random shapes, forming an aggressive snow type. This aggressive snow also needs a slightly harder wax. Just remember it's always better to be a little bit off on the snow temperature or snow type and have a waxed board, than to have a slow dry base.

Waxing everyday is important to keep the base in good condition. It's also a great way to get wax selection figured out. Once basic waxing is understood, a waxer can get more speed and acceleration by utilizing fluorinated race waxes. Fluorinated waxes are what win at big events like the X-Games or the Olympics. Fluorinated waxes (HF Dibloc and LF Dibloc) repel water better (more hydrophobic) making them much faster in wetter snow than hydrocarbon waxes, they also repel dirt a lot better. All snow no matter how white, has dirt in it, especially old snow and man made snow. This dirt is a source of friction that will slow down a board. Another weapon to combat dirt is Molybdenum wax. Race waxes with moly (HF Dibloc grey and LF Dibloc grey) have the best performance in old and dirty snow. The molybdenum added to the wax acts as lubricant to dry friction caused by dirt, it also has antistatic properties. Static is generated by the board sliding on snow, and will attract dirt. Molybdenum with its antistatic properties helps repel the dirt. For events on man made or old snow Molybdenum is always mixed in the race wax. Grooming the pipe, a boardercross course or a race course grinds up the snow creating old snow conditions. Dirt in the form of exhaust and lubricants from the snowcat are mixed in the snow. This in addition to the fact the most parks and pipes are made from man made snow in the first place, create ideal conditions for moly to excel in.

Race waxes work best on bases that have been waxed often. Regular waxing will increase the base's ability to hold wax, so the more a board is waxed, the better it will be able to absorb the race wax. For competitions final preparation of the board is very important. After the race wax has been scraped off, the base must be brushed clean. Brushing the board aggressively with a white nylon brush followed by a horsehair brush should thoroughly clean the surface of the base. Polish the base further with a Thermo Pad, by now the base should start to have a shinny appearance. At this point the board will run really well. For maximum speed and acceleration a final layer of HelX or

JetStream should be applied over the ironed in race wax. HelX is Toko's best overall glide wax. It is best when the snow is wet or glazing. HelX needs to dry completely before polishing – there should be a white powder residue on the base before polishing. JetStream is 100% fluorocarbon; it takes the performance of the race wax in the base a step further. The super concentrated fluorocarbons bond to the fluorinated race wax in the base, forming an ultra fast top layer. JetStream comes in two varieties JetStream New Snow and JetStream Old Snow. Not only are they different fluorocarbons engineered for different snow types, but JetStream Old Snow has Molybdenum added for extra dirt resistance. JetStream comes in both powder and block form. For boards and alpine skis JetStream is rubbed on making to block easiest to use. Start with a completely brushed out and polished base; it is very important that there is no wax on the surface of the base. Rub on a thin layer over the entire board. More isn't faster when using JetStream, so use light pressure don't use multiple layers. Polish the thin layer of JetStream into the base with a Thermo Pad. Friction generated with the Thermo Pad will bond the layer of JetStream to the base. This is very important for durability, so use firm pressure on the Thermo Pad and rub vigorously. Finish with a polishing brush. Although JetStream is the ideal choice for a final layer, it isn't the only one. For a lot less investment Dibloc HF Rub-on and NanoTec LF2 offer incredible performance as a finish to a race wax.

Competing or not, riding a well tuned and waxed board will maximize performance and fun.

TOKO®
THE WAX & CARE COMPANY

Climb High Inc/Toko USA
Toko Sales and Marketing Office
752 South 200 West
Heber City, UT 84032
866-TOKO USA www.TokoUS.com