



## ADANAC SKI CLUB

### ***TUNING INSTRUCTIONS***

Maintaining the condition of your skis and boards is undoubtedly one of the easiest ways to improve your on-snow technical ability. In this handout you will learn how to tune your equipment effectively and efficiently but do remember these are the basics and with practice and experience you will develop your own tricks. This in turn will make skiing much more enjoyable, safer, and give you more confidence. We often think our equipment works fine, however we may not realize what it feels like to ski on properly tuned gear.

### **Required Tools:**

This is just a basic list of what you should have. Some are optional but what is listed here should get you started. If you want to expand your wax kit talk to your coach.

- **Vices.** Preferably a 3 piece set made of steel such as the ones from swix or toko or a like manufacturer that grab the ski in the middle. The ones that use a boot insert are acceptable as well. This is one of the most important tools for proper tuning because it gives you a good platform to work from. This is a tool that can last a lifetime so it is something worth investing into a good set.
- **Flat Files.** A good file can be bought for as little as \$10-15. You don't need to buy files from that wax companies that can run up to \$100 or more. A single cut flat file 8" or 10" is best, but make sure your file will fit in file guides and base levels.
- **File Guide.** For sharpening side edge. To start you can get a less expensive guide that has multiple angle settings. As you work more and more it is beneficial to get individual tools for every angle you use. Start by getting an 89°.
- **Base bevel.** Skis are increasingly coming beveled straight from the factory with a base bevel. Start with a 0.5° bevel.
- **Waxing Iron.** This is another item that you get what you pay for. If using an old home iron make sure the iron doesn't have steam holes in the base. It is recommended to get a purpose made wax iron. They have better temperature control.
- **Elastic bands.** Thick elastic bands such as the ones that come wrapped around broccoli are excellent for holding your brakes down while you work.
- **Plexi Scraper.** A good thick plexi scraper is used for scraping the base. The thicker and stiffer the better.
- **Diamond Stones.** Diamond stones help polish and sharpen the edge. Unlike files, diamond stones don't wear out.
- **Wax.** A small amount of wax should be in your kits for training and base prep/cleaning at home. A small amount of all temperature range of hydrocarbon waxes should be in your kit.
- **P-Tex candle.** Used for base repair at first this should only be used under the supervision of your coach. After you have learned how and are confident in when and how to use it you can do it on your own.

- **Metal scraper.** Metal scrapers are excellent for multiple applications. They can be used to scrape and clean the base, drip P-Tex on, and if flat and even can be used as a true bar.
- **Brushes.** Brushes are used to prep and finish the base. A medium coarse brass brush is best for prepping the base. A nylon and/or horsehair finishing brush is a good idea but to start with not as important.

That is a pretty good start and should let you do most or all the steps below. Remember you can always ask your coach for help or for other special tools out of the team kit.

## **STAGE # 1: Base Preparation**

### ***Tools needed:***

Ski Vises

Elastic Band

True Bar(or metal scraper)

Sharp plexi scraper

P-tex candle

Flat block (a woodworking sanding block works well or you can wrap the sand paper around a brush, or even a flat file).

Sand paper (#120, 150, 220, 400 grit)

Brass Brush

Protective Glove (optional but most of us at some point slip and cut ourselves)

**Step 1:** Scrape your base with a sharp plexi scraper.

**Step 2:** Next you'll need to inspect for any gouges in the base from rocks or trees. Also check the sidewall and top sheet for large gouges or scrapes.

**Step 3:** Secure your skis in the vices and use a heavy elastic band to keep your ski brakes out of the way.

**Step 4:** If you have a gouge that can't be worked out with brushes or sandpaper you can use a P-Tex candle. First remove any excess material around the gouge and roughen the area with sandpaper. Light your P-tex candle; hold over an old piece of cardboard or metal scraper until you get a smaller blue flame. Drip the P-tex onto the damaged area until it fills slightly above the base. Be sure not to drip any carbon on the base (a large orange flame indicates this), and keep the flame clean by dripping the dirty P-tex onto the cardboard. Let this harden for at least 15 minutes. For larger, deeper gouges or gouges near the edges it may be beneficial to bring them into a shop to have a shop pro repair it.

**Step 5:** Remove the excess P-tex with a sharp metal scraper as you would scrape wax off. Start in the middle of the P-Tex and move to the edges

**Step 6:** Next remove your ski from the vice and rest it on your shoulder towards a light and place your "true bar" or straight edge on its edge. This is one of your most important instruments because it determines whether your base is convex or concave. Be sure to check along the entire surface. If the "true bar" can be rocked from side to side then the base is "high" or convex. On the snow this may feel as if you cannot get any edge hold making controlled turning difficult, almost like you're skiing on a tennis ball. However, if the base is concave or "railed" you'll see excessive light under the center area of the "true bar". On the snow this may feel as if your ski or board is on rails and guides too

strongly, turns poorly, or seems grabby or catchy.

**Step 7:** These conditions may be remedied by wrapping 120-150 grit sand paper around a flat block and using long strokes from tip to tail to remove material until flat. Periodically check your progress with your true bar. You may want to finish with a finer 200-400+ grit paper. In general, finer sandpaper is used when the snow is colder and coarser paper is used when the snow temperature is warmer/wetter.

**Step 8:** When the base is flat always use your brass brush several times to unclog and clean the structure you've created by sanding.

**Note:** if your skis are severely "railed" you may need to flat file first (See Stage #2). Lastly, if your skis base is in extremely poor condition or you are competing it is a good idea to take your skis into a specialty shop and ask for a "base grind" to start you off on the right track. However, be sure to check their work with your "true bar" before leaving the shop. Ask them only to 'flatten the base' so that you can do the Base Edge Prep (Stage #2) by yourself. Base grinding should only be done with the advice of your coach. Base grinding removes a lot of material so a ski can only be ground so many times before there is nothing left to grind. It is often more effective to work the problem out by hand.

**Coaching Tip:** Not only are skis that are "railed" or "base high" dangerous they may drastically interfere with skill development. This may lead into more and more negative interpretations of how your training and competitions are going. The more control and input you have with your equipment on a day to day basis will not only allow you to feel like you will have less interference from things that are not in your control but you'll also start to see a closer relationship between your performance and the condition of your equipment.

## **Stage # 2: Base Edge Preparation**

### **Tools Needed:**

Flat File

Masking tape (optional)

Diamond Stone and/or Ceramic Stone

Permanent Felt Pen (optional)

Base Bevel Tools (0.5, 0.7, 1.0 degrees)

In Step One we learned how to and the importance of base preparation of your skis not only for safety reasons but also for enhanced skill development. We also mentioned that if your base is severely "railed" (edge high) you might need to flat file first before sanding or grinding (done at a shop). When we ski friction is generated between the base and the snow, which in turn leaves us with this "railed" condition if your base is left un-waxed for long periods. Even brand new equipment may come edge high and therefore flat filing will need to be completed before your first day on the snow to prevent frustration. (Check with "true bar" or "parallel bar"). Depending on snow conditions and individual preferences, skis and boards may be sharpened differently. Generally speaking a 0.5 to 1.0 degree base edge bevel is most common. The current trend is as follows: **0.5-0.7 degrees** – for all Slalom skis. **0.5-1.0 degrees** – or all GS/SG skis.

**Notes:** A 1.0-degree base bevel at the front of the ski (10-30cms) allows the ski to "Smear" or "Butter" the top part of the turn easier (allows the skis to pivot with ease

especially on steep terrain or in a tight GS course where 'pure carving is not achievable'). This will eliminate the "grabby" feeling thereby making your turns much easier if 'steering' is required. Start by trying 0.5 degree bevel on all of your skis and increase as desired.

REMEMBER: you can always increase base bevel but you CANNOT decrease it without regrinding/flattening your base. A 0.5-degree base bevel is more aggressive which means that the skis do not steer/pivot/slide as easily as a 1.0-degree base bevel.

**Step 1:** Remove any burrs (by hand or by base bevel tool) with your diamond stone to make flat filing easier.

**Step 2:** Mark your edges with the permanent felt tip marker to enable you to see how much base edge you are removing (optional- mostly for new tuners).

**Step 3:** Insert WC Base File into the Base Bevel Tool and place rubber band over file (optional).

**Step 4:** Lay the file across the base so that it is slightly less than perpendicular and/or up to 45 degrees to the edge. Now begin pulling the file towards you with long **easy** passes letting the file do the cutting. Remove the entire black marker as evenly as possible and do one edge at a time (optional) OR until the entire width and length of the edge is consistently 'shiny'.

**Notes:** if your base(s) maintain their flatness from frequent waxing and providing you don't do any rock damage you will **not** need to flat file every time you sharpen or side file your skis! Once you are satisfied with you base bevel you leave it and you maintain the skis/boards sharpness by side filing (see Stage #3) Always base bevel the edge furthest from you = you WILL need to file from tip to tail on edge, then flip the ski/board around and file from tail to tip. THIS IS CORRECT!

### **Stage # 3: Side Edge Preparation**

#### **Tools Needed:**

Diamond Stone/Ceramic Stone (optional but recommended)

Gummy Stone (optional)

Body File or Side-Wall Removal Tool

File

File guide - 1,2,3 or 4 degrees

When we "carve" on our skis and boards there is one contact point between skier and the snow - our edge(s). To attain optimal balance on an edged ski or board it is crucial that our edges be consistently and accurately sharp throughout its entire length. This makes "committing" to the ski or board much easier on harder and faster types of terrain as well as making the ski respond better on easier terrain. This increased sense of "trust" in your equipment will have a definite link to speeding up your learning progression, and make it that much easier to bridge the gaps between you and your onsnow goals.

To attain the utmost accuracy and consistency when side edge tuning it is necessary to have a "file guide". The most common file guides range in bevel from 1-4 degrees. Determining the right degree of side bevel varies greatly from personal preference to your ability level. For example a very skier who can create a large amount of edge angle throughout a turn may notice an improved edge hold on hardpacked conditions with an increased degree of edge bevel. 3, 4 and even 5-degree side bevels are quite common these days particularly on Slalom skis. (*i.e. 0.5 degree base bevel and 4 degree side bevel is very common at the higher levels*)

**Step 1:** With your ski on its side in the vise (base facing away from you) remove all burrs with your Diamond Stone. This is necessary to increase the life of your files too as burrs will damage the teeth of your files but not the Diamond Stone!

**Step 2:** With your Body File or Side-Wall Removal Tool remove some of the sidewall (right beside the edge). Proper side filing can be performed only when sidewall is removed!

**Step 3:** Place your file on top of the file guide (choose a 1 or 2 degree file guide when starting out). Pull the file guide towards you with long even passes ensuring that the filings are always shooting out towards your stomach. The rule of thumb is that your edges should be consistently sharp and smooth. Finish by placing the diamond stone and/or ceramic stone on the file, so you don't change the bevel. This will remove any small burrs from filing and

to polish the edges ensuring they are extremely smooth, clean and sharp. Maintaining sharpness is easiest when this step is done frequently - simply carry your file guide, file or stone with you.

**Troubleshooting:** *If the file seems to slip, skip or nothing is happening, it is due to excessive sidewall, burrs or a loaded file.*

**Solutions:** *Use body file or sidewall tool to remove more sidewall, remove burrs with the diamond stone or clean the file with the file card.*

**Step 4:** Remove microscopic burr with your gummy on the apex of the edge. Run the gummy from tip to tail light just once or twice. This will not take sharpness away if done lightly and will make the ski less aggressive. Next, de-tune your tips and/or tails (optional) with your gummy stone.

**Note:** 3-4 med-hard passes is enough. This will make the initiation and completion of "steered" turns easier. The amount to de-tuning depends on your equipment, skill level and personal preference.

#### **Stage # 4: Cleaning**

##### **Tools Needed:**

Brass Brush

Nylon Brush

Scraper

Fiberlene (optional) or clean cloth

Wax (low temp. hydrocarbon is best)

Waxing Iron (with out holes is best)

Now that your skis and boards are flat, structured and sharp they need to be thoroughly cleaned due to all of the handling, filings and impurities left in the base. Cleaning the base and its structure can be more important than choosing the exact wax for optimal gliding characteristics. Whether you chose to sand the base with a flat block or had it ground by a specialty shop it is important to remove the dirt out of the 'peaks and valleys' that were created from either process.

**Step 1:** The best way to clean the base is to wax it and then immediately scrape it - known as "Hot Scraping". This draws out the impurities that may be in the base. Repeat 2-3 times or stop when there is no longer any dirt in the wax that you are removing

**Step 2:** Use your brass brush (nylon brush can be used as well) to thoroughly remove wax from the "structure" in the base after scraping.

**Step 3:** Remove tiny wax particles left over from brushing with a clean dry cloth or

“Fiberlene” (optional)

### **Step # 5: Waxing**

#### **Tools Needed:**

Wax  
Iron  
Scraper  
Nylon Brush  
Horsehair Brush  
“Fiberlene” or clean cloth  
Ski straps

Choosing wax depends on whether or not you are competing or how fast you want the skis to run. Purchasing wax nowadays can be rather confusing. To help make it a little easier for you here are 3 main categories for the types of waxes and some of their characteristics:

**Hydrocarbon waxes:** are typically the least expensive and fine for all-round skiing and are great for the “hot scraping” method of base cleaning. Best to buy in bulk.

**Low Fluorinated Waxes:** Work well in all conditions and are more expensive than the Hydrocarbon waxes. Good for those who enjoy recreational racing and training.

**High Fluorinated Waxes:** These are the fastest, work the best in certain conditions and are the most expensive. Used mostly by those who are involved in competition.

**Step 1:** Choose the type of wax that best describes your needs. Once you have done this you may need to consider the following depending which wax brand you have chosen: air temperature, snow temperature, humidity, snow type and cloud cover. Every wax company has its own directions included which range in complexity based on your specific use. For those just starting out the most important thing to remember is to wax frequently to prevent the “wearing” of your base due to friction. It will definitely make the sport more enjoyable and save you much energy.

**Step 2:** Preheat iron and touch wax to the base of it and allow dripping along the entire base.

**Step 3:** Use the iron to melt to the wax into the base making sure the iron is always moving (if the wax smokes decrease the temperature of the iron). Keep working the wax into the base until the underside of the tip and tail become warm to touch. If the base becomes dry melt more wax onto it. Allow a cooling time of at least 20 minutes (overnight is better).

**Step 4:** Scrape excess wax from base and edges.

**Step 5:** Remove the remainder of the wax from the structure with your nylon and/or horsehair brush. The finish on your skis should appear shiny upon completion. To protect the work you’ve done you’ll need to strap the skis together.

These 5 stages of ski tuning will help you to enjoy your sports more!

And remember a race coach can only help you so much if your tools aren’t in optimal condition. Therefore, if you want to get much more value out of training, or competitions, learn to do most or better, all of your ski maintenance by yourself. With practice you will soon develop a “feel” for tuning and realize what a difference it makes in your skiing.