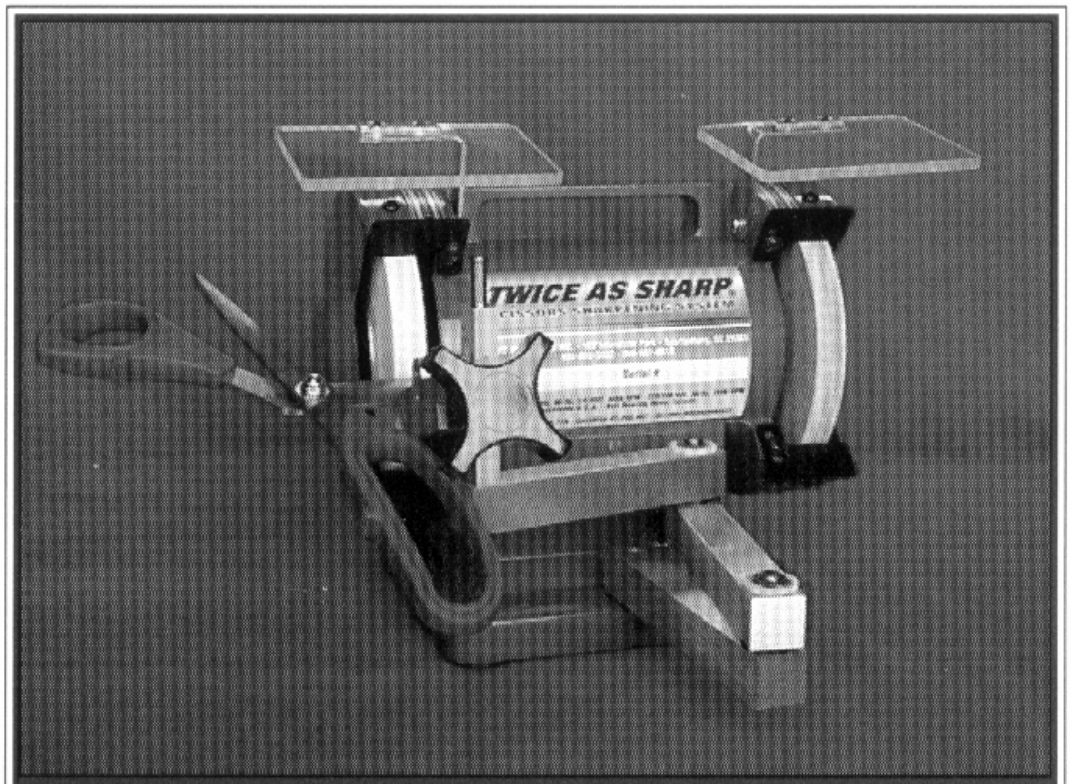
OPERATORS MANUAL



TWICE AS SHARP ®

Scissors Sharpening System

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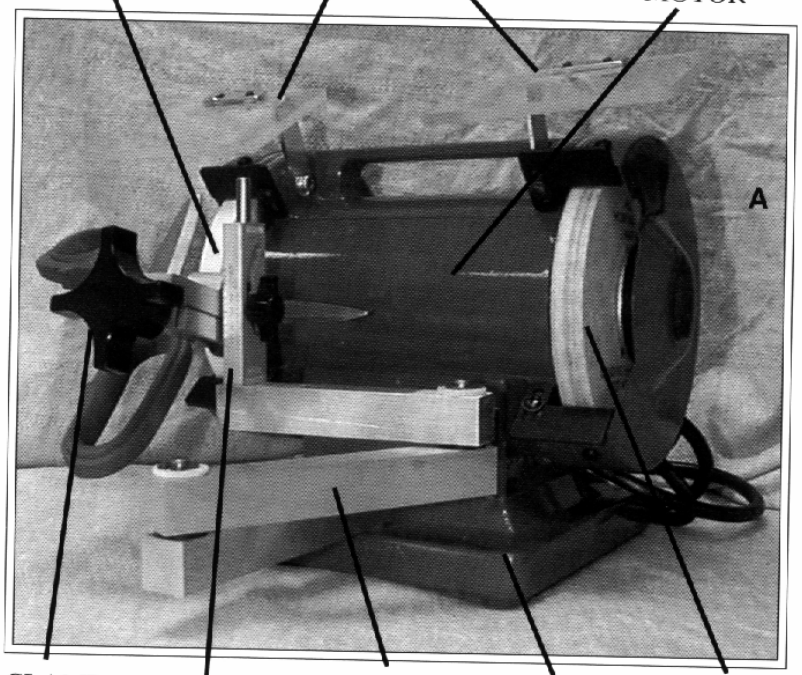
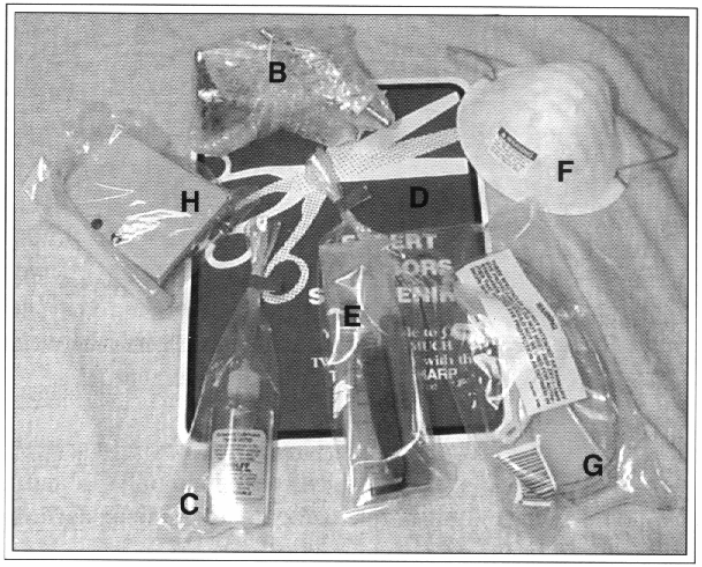
PART NAMES FOR SCISSORS AND SHEARS SHARPENER

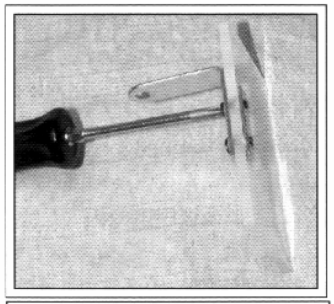


PARTS INCLUDED WITH THE TWICE AS SHARP®

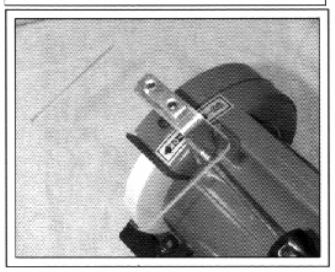
	DESCRIPTION	QUANTITY
A	Twice As Sharp® scissors sharpener	1
B	Scissors Clamp #30004	1
	Operators Manual	1
	Instructional Video	1
C	Scissors Lubricant # 20700	1
D	Scissors Sharpening Sign # 20400	1
E	Pink Hone # 20600	1
E	Dressing Brick # 20620	1
E	Angle Gage # 23000	1
E	Hex Wrench # 20500	1
F	Dust Mask # 20200	1
G	Safety Glasses # 20300	1
H	Safety Shield # 20100	2
H	Screws for Safety Shield	2
H	Washers for Safety Shield	2



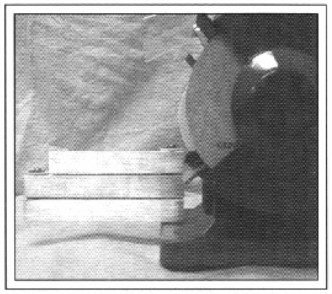
SET UP AND SAFETY

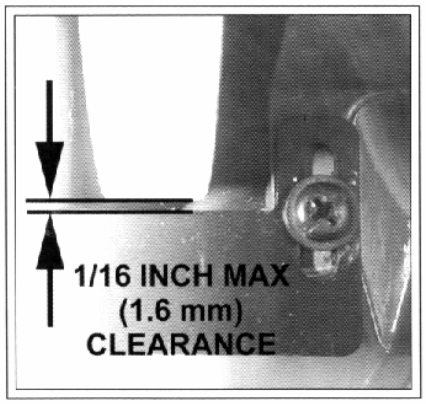


Inspect machine for shipping damage. Look for broken or bent parts. Notify freight carrier if damaged. Assemble plastic eye shields as pictured. Attach to the machine with screws provided. *NEVER OPERATE MACHINE WITHOUT EYE SHIELDS IN PLACE.*



Bottom arm set is fastened to the machine with a friction adjustment. Pull arm set straight forward for sharpening position. If bottom arm ever loosens, tighten with hex wrench provided until it moves, but with quite a bit of resistance.

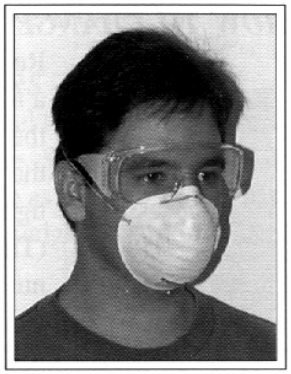




Be sure both wheels are tight and there are no chips in the left wheel. Damaged wheels can fly apart ***and*** cause serious injury. Adjust the two finger and two tongue guards to a maximum of 1/16 inch clearance between the wheel and the guards.

Plug machine into a 3 wire grounded receptacle only. Stand aside and let it run for one minute before using it the first time. Follow this step also after replacing a grinding wheel.

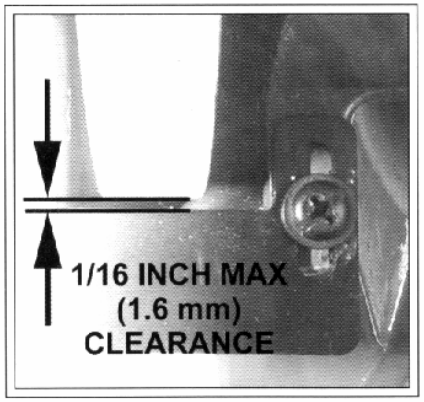
SAFETY CONTINUED



Use safety glasses and face mask to catch dust and grit. (Glasses provided are only for protection from flying grit and not intended for production work with danger from flying parts.)

MACHINE MAINTENANCE

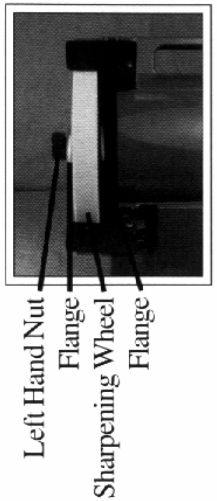
NEVER OIL any part of your scissors sharpening machine. Motor bearings are sealed ball bearings. Arm bearings are self lubricating and need no lubrication. Brush off grit as necessary. Replacement of worn wheels on page 10. If clamp movement becomes stiff or difficult, loosen angle knob and clean the grit out.



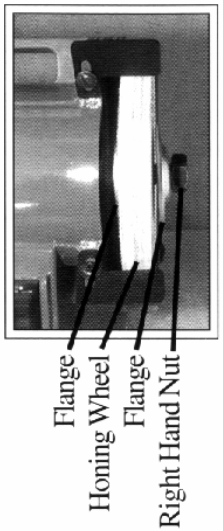
As the wheels wear adjust the two finger and two tongue guards to maintain the maximum 1/16 inch between the wheels and the guards.

After changing wheels, dressing wheels or adjusting the two finger and two tongue guards, make sure eye shields are in place and securely fastened.

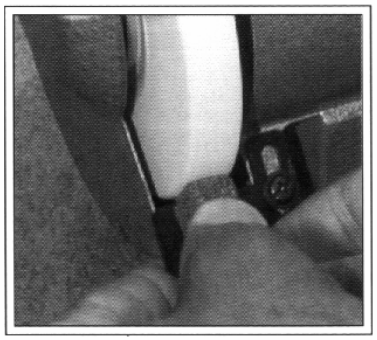
HOW TO CHANGE THE WHEELS



Remove the three screws holding the end cover with a #2 Phillips screwdriver. Take cover off. Loosen the nut holding the wheel with a box wrench. Hold the wheel between your fingers when loosening or tightening, never put side pressure against the wheel. (The left wheel has a left hand nut and loosens clockwise.) Remove wheel and replace with factory wheel. ***Paper blotters*** must be on each side of wheel. ***Never use*** without blotters. Tighten nut firmly and turn by hand. If wheel has too much side movement, loosen, rotate and retighten until you get the least amount of side movement. Replace cover and screws. ***(Never run sharpener without covers on).*** A new wheel must be allowed to run for at least one minute before using. ***Do not*** stand in front of sharpener during the first minute. ***Never use cracked or chipped wheels***.



DRESSING AN OUT OF ROUND WHEEL

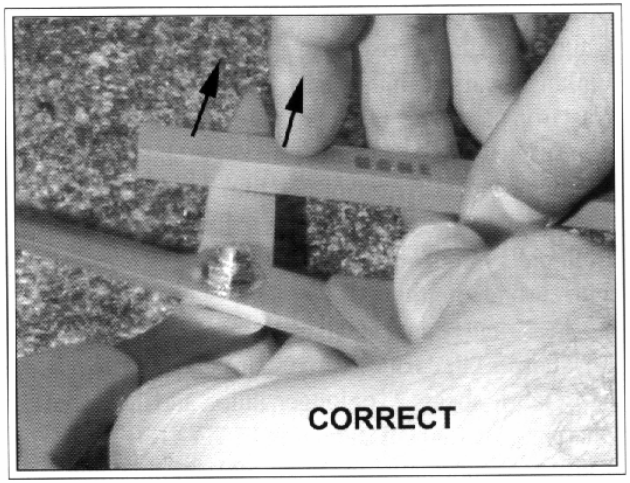


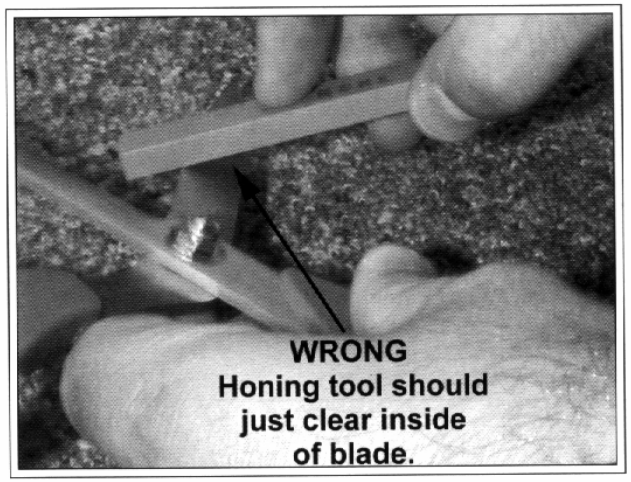
This may be necessary during the life of the wheel if scissors bounce or chatter. Small grooves in the wheel will have no effect on sharpening. Use the same steps when replacing the honing wheel. If machine vibrates, loosen and rotate wheel(s) until it runs smoothly.

STEPS TO SHARPEN SCISSORS & SHEARS

STEP 1: HONING DAMAGED SCISSORS

Test scissors by opening and slowly closing to feel for nicks. Nicks and rough spots should be removed before sharpening. Slide the rectangular pink hone down the inside of the damaged blade as shown. Hold hone almost flat. Hone as little as possible as it dulls the edge and must be done before sharpening.





STEP 2: SELECTING ANGLES

The following angles are used on most scissors today and produce the greatest customer satisfaction. Sharpening old scissors with the new angles produces the desired cutting ability. Scissors that have been previously resharpened were often done at the wrong angle.

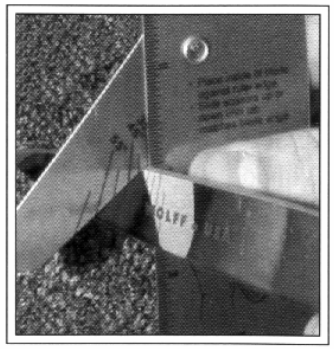
✂ ***SHEARS ARE NEVER TO BE SHARPENED AT NEGATIVE ANGLES.***

USES-TYPES OF SCISSORS AND SHEARS

0°	Children's safety scissors.
5°	Pinking shears (0° if they have been ground flat or negative),
10°	Cast iron paper shears, and many surgical. (On surgical it is best to measure angle and match).
20°	Bandage shears. (Low priced imports are often soft steel and must be sharpened at flat angles to hold an edge).
25°	Embroidery, cuticle, nail, grass, and hedge trimmers, most blades with cutting lengths of 1 °" or less. (Professional beauty and barber, page 24).
30°	For sharper edges on short scissors such as embroidery.
35°	Most fabric shears 7" or longer, tailor, and industrial shears.
40°	Sharper edge for heavier cutting.
50°	Knife edge, normally one blade 50° and the other blade 20° (see page 24). For thick, hard to cut material 50° to 55°.

NOTE:

Steeper angles actually stay sharp longer on good quality shears. When in doubt on angles, use the plastic angle gage available from factory. (Plastic gage prevents damage to cutting edges).



SPECIAL ANGLES FOR INDUSTRIAL SHEARS

	CUTTING USAGE/TYPE SHEAR
45°	Canvas & heavy leather, usually 10" to 14"; 50° & 20° for knife edge shears.
15°-25°	Fiberglass, quartz, any type shear (Note: glass is harder than steel and quickly breaks edges)
35°	Kevlar™ (aramid), any type, polish 1 blade Note: shears require heavier set and often corrugation on blade to stop slide. This is difficult material to cut. Kevlar ™ is a registered trademark of Dupont. Contact factory for more details.
Match	Surgical, any type, measure angle.
10°-15°	Tin snips, long length, heavy metal.
15°-20°	Tin snips, short length, thin metal.
35°	Poultry, regular cutting, evisceration, polish both blades.
Match	Synergist coated, any type match manufacturer's angles

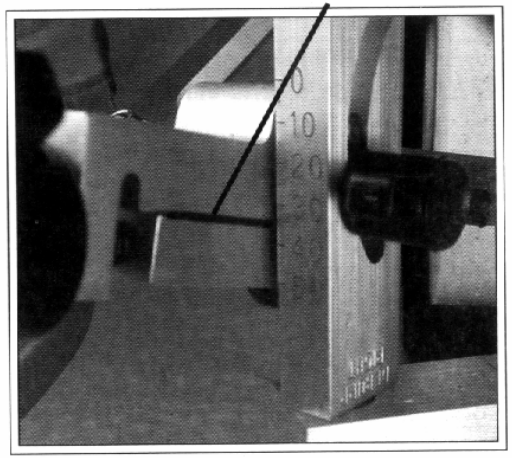
Special problems, contact factory at 800-888-3832

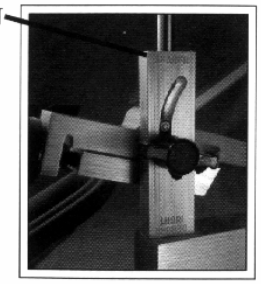
STEP 3: SETTING CUTTING ANGLE

Set angle by this line

Loosen small black knob and move the clamp to the desired angle. The angle is determined by the break line (space) between the upper and lower sections of the clamp.

NOTE: Sharpen all scissors with the same angle setting before resetting the angle to save time. Small variations in angles won't noticeably affect cutting.





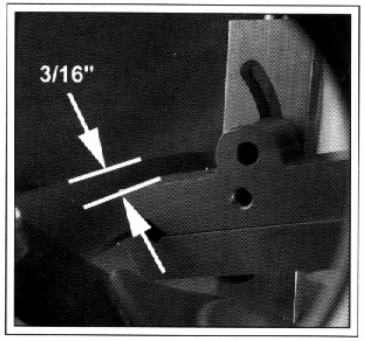
STEP 4: INSTALLING CLAMP

Place scissors clamp in the hole in the top arm. The word SHARPEN must be on top as pictured.

STEP 5: CLAMPING SCISSORS

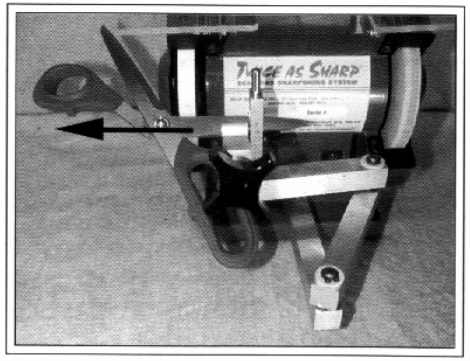
Place scissors in clamp. Be sure that the inside of the blade is facing you (up) as pictured on the right. Tighten large black knob until scissors are held firmly. Small scissors may be clamped on handle or pivot. True left handed shears, see page 20. You won't be able to clamp left handed shears with inside facing up.

For the most accurate sharpening, the blade should protrude about 3/16 inch above the clamp. Teeth on pinking shears must face upward. For true left handed shears, see page 20. Very large shears need to be clamped closer to the tip to allow for full sharpening.

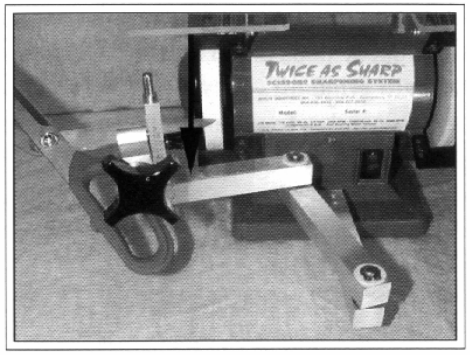


STEP 6: SHARPENING SCISSORS

To sharpen, slide blade across the LEFT wheel slowly with a light pressure against the wheel. Keep arms in the position shown and move fixture from right to left. If machine slows down, use less pressure. Slide blade from pivot to tip.



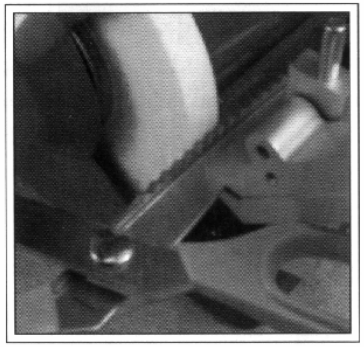
Release pressure from wheel when tip reaches center of wheel. Repeat until a burr can be felt along the entire length of the blade. This burr, on the inside of the blade, shows that this step has been completed. You feel the burr by sliding your finger towards the cutting edge. A curved cutting edge is sharpened by keeping the edge parallel to the grinding wheel.



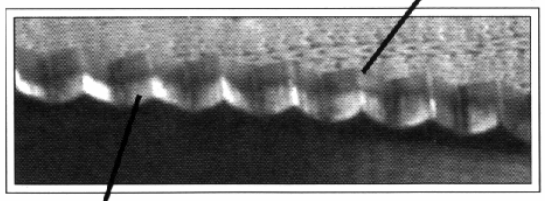
PINKING SHEARS

BE SURE THAT THE TEETH FACE UP!

(True left handed shears; follow instructions on page 20. Teeth will then be down.) NEVER sharpen between the teeth. Note 0° to 10° angle. Pinkers are sharp when new grind is across the full V grooves and tips of V's come to a sharp point.



Dark area at top of blade is where the pinking shear will cut.



Pinking Shear Lap Line

Light area at bottom of blade where pinking shear does not cut.

If the lap line is not visible do not attempt to sharpen. Sharpen pinker through step # 8 and test cut on 1 - 2 layers of cloth. If they cut, stop; if not, do step # 9 for both blades.

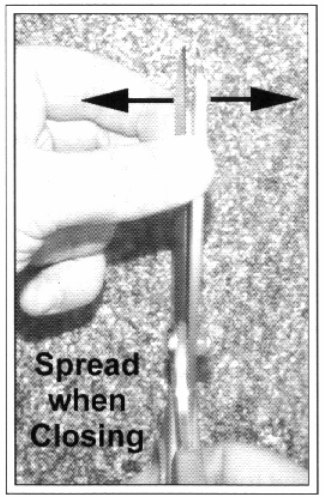
STEP 7: REPEATING STEPS 5 & 6

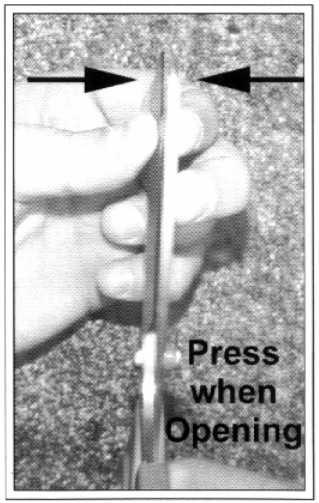
Release scissors by loosening large black knob. Turn scissors over and repeat steps 5 & 6 unless the other blade has serrations you don't wish to grind off. Serrations are useful on kitchen, poultry, thinning shears, and a few barber shears. Shears can be serrated with the diamond corrugating file after sharpening.

STEP 8: DEBURRING

NEVER CLOSE SCISSORS THAT HAVE BEEN NEWLY SHARPENED UNTIL YOU DO THE FOLLOWING:

Both sides have now been sharpened and have burrs on them which require careful removal to prevent damage to the cutting edges. On the first two closings, the blades ***MUST*** be pushed apart while closing. If the burrs cut into each other, the cutting edge will be damaged. Press the blades together firmly while opening the scissors to pull the burrs back from the cutting edge.





EXCEPTION: To deburr cast iron shears, ***cut through paper***, (do not spread blades apart). All sharpening creates burrs, but with proper handling, scissors can be made twice as sharp as most brand new scissors.

IMPORTANT

DO NOT LET BLADES TOUCH EACH OTHER DURING THE FIRST TWO CLOSINGS.

STEP 9: HONING

Clamp scissors again as you did to sharpen, then lift clamp out of the bearing hole and turn clamp upside down. Swing top arm to the right to hone on the right hand wheel. Slide the blade against the

right wheel with firm pressure several times. Slide from pivot to tip, stopping when the tip is in the center of the wheel. Repeat several times until a light honing burr is created. Remove scissors and close the blades cutting off the tiny honing burr.

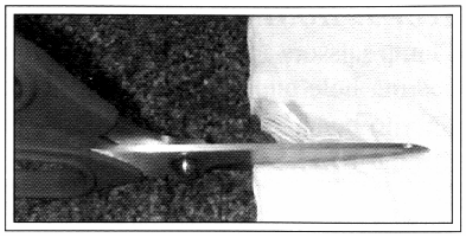
DO NOT SPREAD THE BLADES

CLOSE THE SHEAR TO CUT OFF THE BURR, THEN HONE THE SECOND BLADE IF NEEDED, CLOSE THE SHEAR AND CUT OFF THE HONING BURR.

CRITICAL STEP

It is normal to hone one blade to prevent slide. However on pinkers, grooming shears and shears used to slide cut, both blades are honed. If scissors do not cut properly, repeat the honing step # 9 - Remember if you are honing both blades ***you must close*** the shear ***after each*** blade.

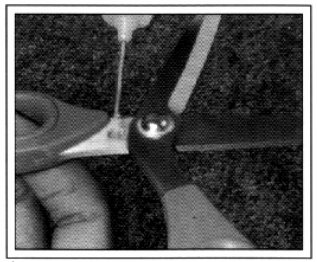
STEP 10: TESTING



Your scissors are now sharp. Close several times normally, then wipe clean with cloth and test as follows:

Pinkers, embroidery: ..... 1 to 2 layers, 8 to 11 oz. double knit
Kitchen: ..... 3 to 4 layers, 8 to 11 oz. double knit
Fabric scissors: ..... 6 or more layers, 8 to 11 oz. double knit
Knife edge: ..... 2 to 24 layers, 8 to 11 oz. double knit
Paper scissors: ..... test on 2 layers of newspaper
Barber: ..... 1 layer paper towel, hair if available
Hair thinning shears: ..... 1 layer of 20 lb. copy paper
Surgical shears: ..... 1 layer of latex rubber
(Some latex has talcum powder on it and must be wiped off both shears & latex.) Cutting 1 layer of heavy nylon tricot will test for burrs. If scissors do not perform properly, hone or resharpen if needed. With a little practice, you should be able to sharpen 20 to 30 pairs an hour.

STEP 11: LUBRICATING AND CLEANING



Put one drop of scissors lubricant, Part # 20700 on the pivot and along the blades. Wipe off excess fluid and lint. This lubricant dries quickly and will not stain or attract lint as oils do. It also improves pivot life and feel. The film it leaves on the blades helps stop rust. (Lubricant furnished with this machine is available as a replacement part.)

SHARPENING FOR PROFIT

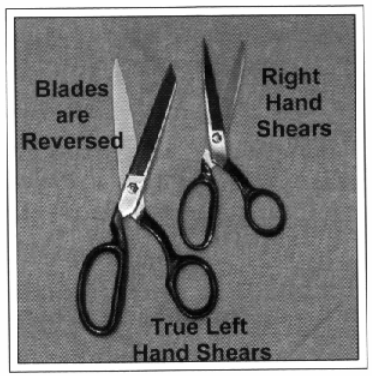
With this sharpener, you can do professional work and should charge accordingly. Approximate retail prices for 1998-1999 are as follows:

Small scissors, embroidery etc. ..... $3.00 to $5.00
Fabric shears 7" to 9" ..... $4.00 to $7.00
Industrial shears, tailor 10" to 12" ..... $5.00 to $7.50
Kitchen, paper shears ..... $3.50 to $4.50
Pinking shears ..... $5.00 to $7.00
Knife edge or special shears ..... $5.00 to $7.00
Professional barber and grooming shears .... $5.00 to $15.00
You will charge the lower charges when the shears retail from $35.00 to $50.00.
Above prices on barber and grooming shears are based on using the professional honing wheel.

Occasionally you will find scissors that have defects that will not sharpen out. We suggest you do not waste time. Simply return them to the customer without charge. The shears should be better than they were and the customer will not be unhappy. (If you sell scissors and shears, you may be able to make a sale.)

We recommend using the OOKAMI GOLD® sharpening system to sharpen salon shears. These shears are hollow ground with a convex cutting edge.

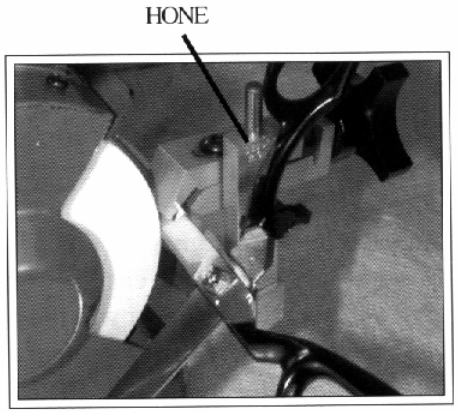
SPECIAL INSTRUCTIONS FOR LEFT HANDED SHEARS



On true left handed shears the blades are reversed. The thumb blade is on the right side of the finger blade.

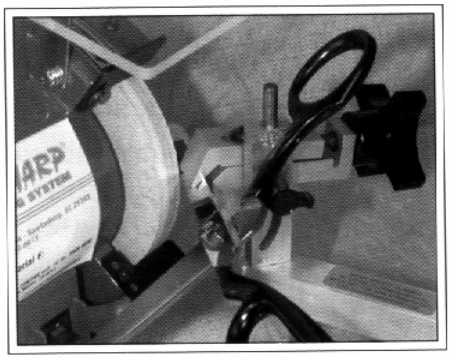
Note: Be careful of some scissors that claim to be lefts, but are really right hand blades with left hand handles.

1. Set the angle at which the scissors are to be sharpened and put the clamp in the "hone" position (hone is up and readable).



2. Clamp the scissors with the outside of the blade facing upward (handles to the left).

3. Sharpen the blades and remove the burrs as you would with right hand scissors.



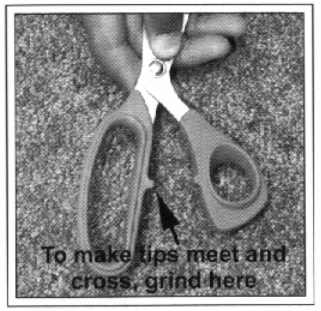
4. Leave the clamp in the "Hone" position when you move to the polishing wheel.

5. Hone the blades on the right hand corner of the honing wheel, with your left hand.

6. Test the scissors and perform finishing steps.

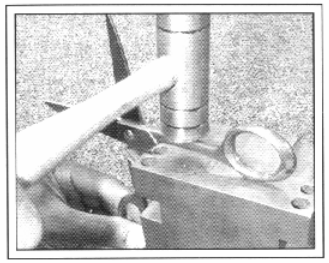
RECONDITIONING OF SCISSORS AND SHEARS

After resharpening, it adds value to your work and satisfaction to your customer if you check the following items.



Making Tips Match

Soft or Plastic Handled Shears: Grind material from handle so that tips meet and cross slightly.

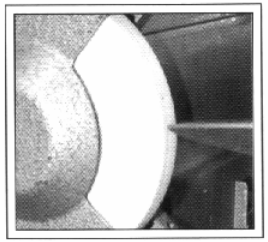


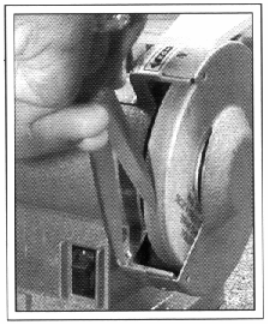
Metal Handled Shears: Bend the handle as shown by placing the thumb handle on a vise or steel block and hitting with a hammer until the tips cross each other slightly. If you over bend, turn the scissors over and bend back.

<u>WARNING</u>

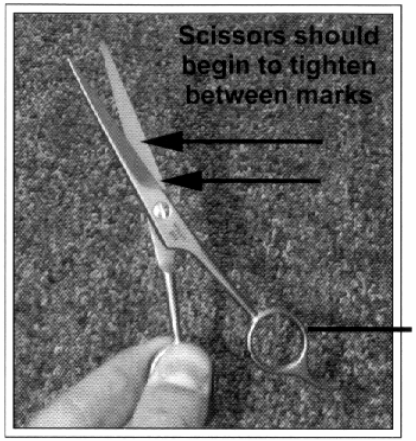
Cast iron shears are brittle and will break. Cast iron has a coarse grain structure and can be seen by looking between blades behind the screw. You can also test by filing on the handle. If metal is hard, don't attempt to bend. Metal should file away easily to signify being able to be bent.

Finishing the Tips: With scissors closed, press the tip of scissors straight into grinding wheel. This insures that both blades match. Be careful not to over do this. Polish the back of tips to prevent scratches and snags. Open scissors and hold the outside of the tips against the honing wheel. Hone as pictured.



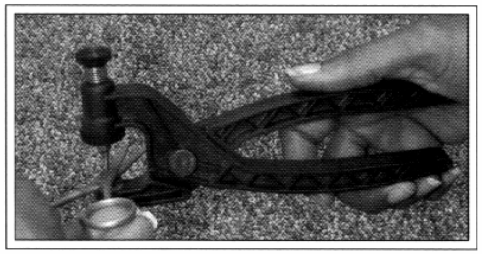


Balancing Shears or Setting Free Fall



Set free fall by holding one handle vertically and allowing the other blade to fall freely from a fully open position. The blades should begin to touch slightly at position shown. Adjust screw or tap on head of rivet to tighen or loosen blades as needed.

Let this blade fall free. It should begin to tighten in the positions shown.

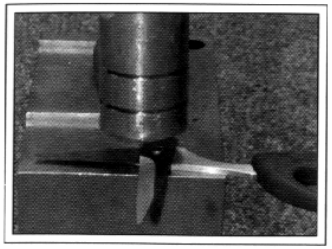


NOTE: Scissors pliers are available from your supplier or factory. Pliers help prevent damage to screw heads.

Screws

The use of a scissors set screw pliers is important to keep from damaging the head of the screw. Squeeze the pliers firmly before turning. If the screw is smaller than the blade, remove the bit and install the correct size bit. A drop of scissors lubricant should be applied to the back of the screw so it will turn easier. A drop of lubricant under the head will clean out foreign matter from the pivot so free fall adjustment won't change. If you need screws, assortments are available from the factory.

Rivets



To loosen blades, place head of rivet over a hole in a block of steel or open vise (3/8" opening) and tap back of rivet with hammer. To tighten the blades, place head of rivet on steel block or vise and tap back of rivet with hammer.

ALWAYS USE LUBRICANT under the screw head before you adjust. Barbers may like their shears looser to reduce fatigue, but loose shears may not cut correctly as they tend to spread apart.

IF THE SHEARS STILL DO NOT CUT, CHECK THE SET OF THE BLADES.

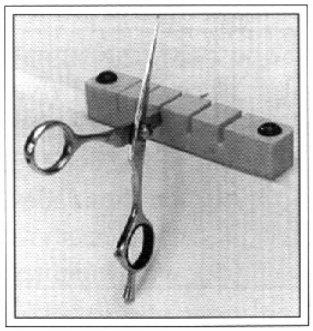
With the shears closed there should be daylight between the blades where only the tips and the ride area are touching. The blades should also flow in a positive curve; no dips or kinks.

Any problems with the set of the blades should be adjusted and the shears re-tested.

NO GOOD - No gap under the pivot, one blade is straight, the other has too much set.

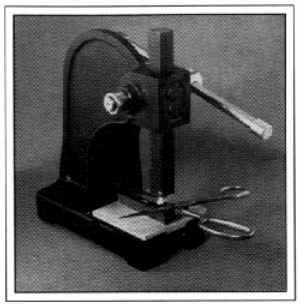
NO GOOD - Blades come together in the middle and leave a gap near the tips that will not cut.

GOOD - Gap under the pivot and proper set to the tips. Gap = .006" - .012" (2-4 sheets of paper)



Adjust set using Set Adjusting Tool, part # 23110 for small scissors and shears.

To adjust set on large shears use Scissors Press Accessory, part # SPA110.



SPECIAL INSTRUCTIONS FOR KNIFE EDGE SHEARS

These shears will have two angles, one about 20° and one about 50°. (Maximum angle possible with machine is 57°). Sharpen the flat angle first with an angle of approx. 20°. Next reset the clamp to about 50° and sharpen the knife edge. Close and deburr as in step #8. Reclamp the knife edge in the fixture (the edge you just sharpened) and hone, step #9. Hone only one edge, the knife edge. Handle with care as knife edges are very sharp and will cut 20 to 36 layers of cloth. Sharpen flat blade first and knife edge second. After honing, cut off the honing burr.

SHARPENING PROFESSIONAL BARBER SHEARS

Many of the better barber shears used by professionals are now sharpened at 35° or more. We recommend at least 35°. Follow the regular instructions for normal sharpening or instructions below for super sharp edges.

HAIR THINNING SHEARS

Sharpen the straight blade first, deburr, hone and test. If they do not cut properly check to see that blades are crossing each other, rehone. If the comb blades are damaged you may hone them. You may remove the slots when you hone the comb blade.

HIGH PERFORMANCE BEAUTY SHEARS

Many Japanese and German beauty shears require special sharpening methods. Convex blades should be sharpened on the OOKAMI GOLD® sharpening system.

If your machine is not equipped with the professional honing wheel, you SHOULD install one in place of the regular buffing wheel. This wheel makes shears up to 50% sharper and most of the time honing (buffing) is enough to re-edge without grinding. This is the best way to sharpen professional shears. BE CAREFUL as these edges are as sharp as razors. Practice first on several pair of inexpensive stainless shears trying a 35° to 40° angle. If hairdressers like your sharpening of these, then you will have no problem with high quality shears. (This is the safe way to start).

A. Match the original angles as closely as possible by placing the clamped shear against the sharpening or honing wheel (MOTOR OFF) and adjust angle to match the cutting edge. You also can measure the angle with the angle gage that comes with your scissors sharpener. Older shears with flatter angles may be improved by increasing angle to at least 35°.

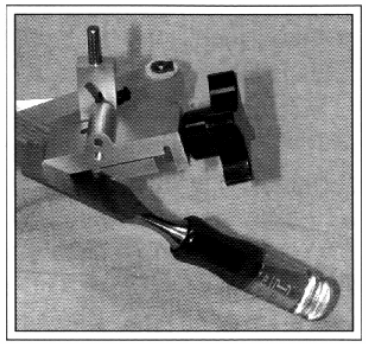
B. Grind shears only if they are very dull or if you are making a steeper angle. If you do grind, do it VERY LIGHTY until you feel a slight burr.
(***Do not over sharpen***, this reduces the overall life of the shears).

C. Deburr normally by spreading blades apart when closing. Squeeze when opening to be sure burrs won't damage edges. As in sharpening step # 8, page 16.

D. Hone one blade until a burr is formed, then close the shear on two layers of paper towels cutting off burr and repeat with other blade. If the customer insists on corrugations, the blade as sharpened on the sharpening stone is usually rough enough. If you need to use a corrugating file, don't hone the blade to be corrugated. We recommend using the diamond file part # 22200 to corrugate.

E. Repeat honing steps until each blade has been honed and a light burr has been created. Close shears after each honing. Test on one or two layers of Viva™ paper towels or hair. If they do not cut easily or cleanly, then re-hone and cut the burr off each blade again. Round and polish tips. Adjust free fall, as they may be quite loose and still cut. When testing do not push handles sideways forcing blades together as you might get false results, instead test by closing the blades with no side pressure. Charges for this work range from $5 to $15.

SHARPENING OF
WOOD CHISELS
BONE CHISELS
SEWING MACHINE KNIVES
CUTTING TOOLS



A wider clamp with a slot in the side is available so that long tools can extend below the clamp as pictured to the right. This allows the sharpening of tools not possible with a standard clamp. The wide clamp may be too wide for some applications so it is sold as an extra item.

WOOD, BONE, AND OTHER CHISELS

Most chisels have angles of 45° to 50°. If the angle is more than 55°, which is the maximum clamp setting, set the clamp to the maximum angle and move chisel higher in the clamp until it matches the sharpening wheel (with motor off). Turn the machine on and sharpen until you feel a small burr at the cutting edge, then deburr as described above with pink hone without removing chisel from clamp. Then turn over and readjust the chisel in the clamp so the edge is centered on right wheel (with motor off). Turn the motor on and hone the chisel until a light burr is created. Hone burrs away from cutting edge with pink hone for best edge.

Note: Some sewing machine cutting knives can be sharpened on the Twice As Sharp®

SEWING MACHINE CUTTING KNIVES

You should match the original angle. Place the cutting edge parallel to the face of the clamp, then slide as straight as possible across the face, or if necessary, the side of the wheel. Don't wear the wheel too thin if side sharpening. Without removing from the clamp, hone the burr away from the edge with pink hone. Next turn clamp over to the hone position and polish the blade on the right wheel. Hone burr away again from edge, using the pink hone.

CARBIDES

Today many special tools and cutting devices are being made of carbide due to its hardness and long life. Some surgical scissors have carbide inserts. Two things tell you that it is carbide: first, its gray color; second, if you try to sharpen it, the sharpening wheel will wear rapidly and the carbide won't grind away. You must use silicon carbide or diamond wheels. Diamond is the best, but for limited use, silicon is suitable. Call the factory for recommendations on the type of wheel and grit to use. The factory diamond wheels are the more expensive type made to sharpen both steel and carbide.

SHARPENING CARBIDES

Match the angle and sharpen. Carbides are so brittle that they do not create burrs so it is not necessary to deburr on the right wheel. The cutting angle is usually quite flat, 10^0 to 30^0. A 240 grit diamond is suitable for roughing but good edges require 400 to 600 grit. Diamonds cut quickly so do not over sharpen.

SCISSORS TYPES

Scissors are usually short and only have room for one finger in each handle. Shears are longer and have room for at least two fingers in one handle.

NAIL or CUTICLE
curved blades

BARBER or BEAUTY
5" to 7"

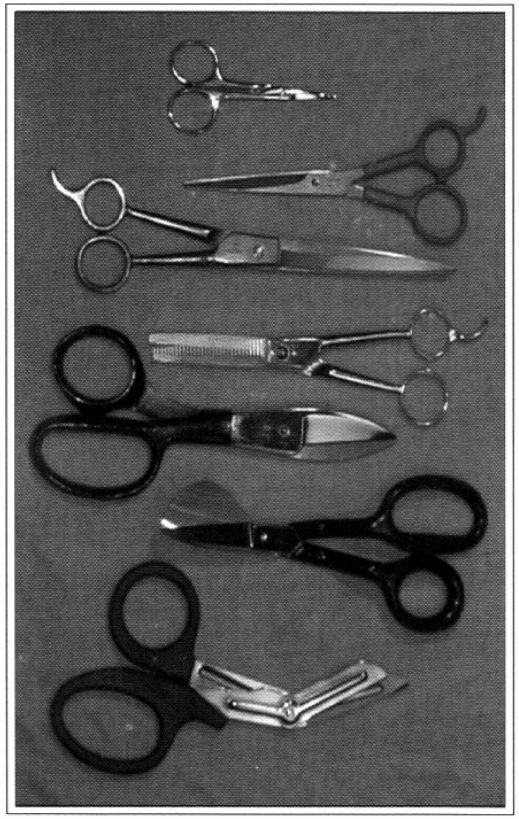
GROOMING
5" to 10"
often with safety tip

HAIR THINNING

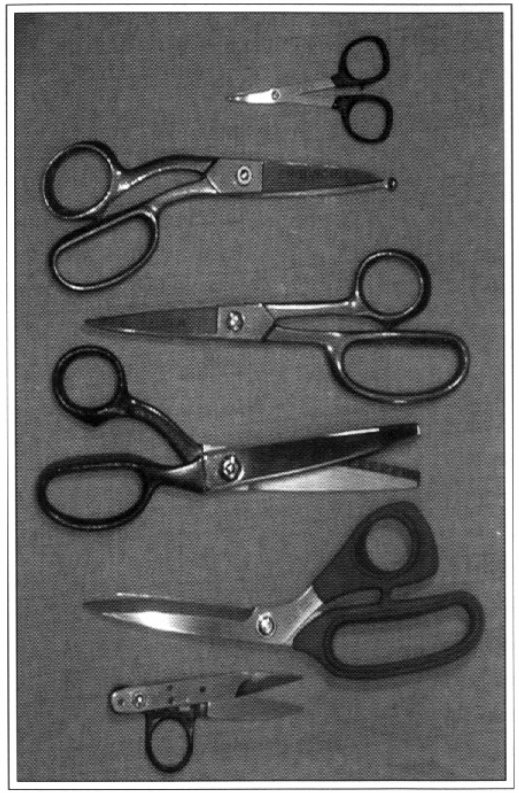
HIGH LEVERAGE
short cutting blades
with large handles

CARPET SHEARS
handles bent to allow
blades to sit flat

BANDAGE SCISSORS



SCISSORS TYPES



EMBROIDERY
2 sharp points
often with plastic handle

POULTRY
often with ball at tip

STRAIGHT TRIMMER
5" to 10" long
often with plastic handle

PINKING SHEARS

BENT TRIMMER
6" to 14" long
often with plastic handle

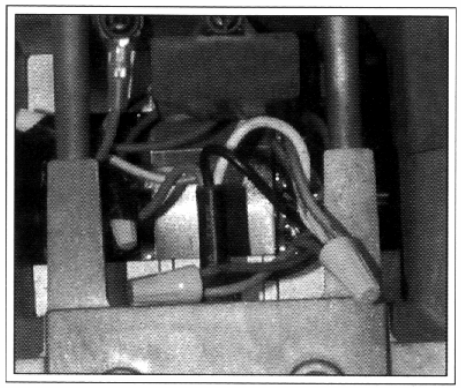
THREAD CLIP
also called a nipper

CONVERTING FROM 110 VOLT TO 220 VOLT

* * * * WARNING * * * *

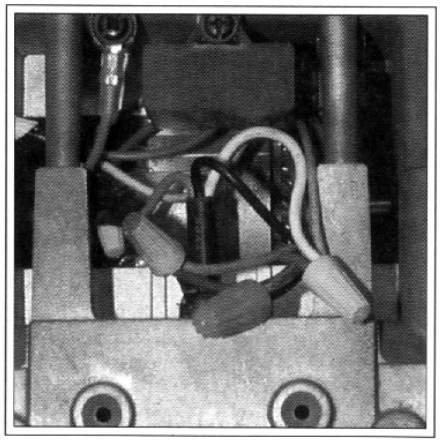
UNPLUG THE SHARPENER FROM POWER SOURCE BEFORE ATTEMPTING TO CHANGE THE SETTINGS.

To convert the Twice as Sharp® scissors sharpening system from 110 volts to 220 volts.



1. Turn the sharpener on its back. Remove the four feet from the bottom of the sharpener. Remove the base plate to expose the current connections.

2. Find the wire nut with the black and red wires from the motor windings and the gray wire from switch position #2. Remove the black wire and reconnect the other two.



3. Find the wire nut with the gray and yellow wires from the motor windings and the white wire from the line cord and red wire from switch position #3. Remove the yellow wire and reconnect the other three.

4. Connect the yellow and black wires from step 2 and 3 together with a new wire nut.

5. Install the base plate and four feet. Plug machine into a 3 wire grounded receptacle only and check out the sharpener for proper operation.

SCISSORS AND SHEARS TERMS DICTIONARY

Balance: The final adjustment steps of scissors and shears sharpening are referred to as balancing or finishing.

Bearing: Any material between the screw and the blade it pivots on is a bearing. This may be a nylon washer or a tiny ball bearing.

Bow: (see Set)

Bumper: Between the handles (at the point they touch) of fine barber and beauty shears, there is often a small rubber or plastic shock absorber, called a silencer or bumper. This serves as a stop for the shears and keeps them quiet as the handles come together.

Carbide: Carbide is fine particles of metal combined with carbon. It is harder and more brittle than hardened steel. Because of its hardness, it is used for masonry drill bits and metal cutting saws.

Carbon Steel: Carbon steel is iron (Fe) with about .5 % - .8 % carbon added for hardening. A carbon content that is too high causes extreme brittleness.

Cast: Casting is metal poured into molds while heated to a liquid state. This is not commonly used, except for cast iron shears.

Ceramic: Ceramic is a porcelain like material, (usually with a high alumina content), pressed from a powder and fused at a high temperature. Ceramics are very hard and have a long wear life, but are also brittle and subject to breakage and chipping. Ceramic shears are best returned to the importer for sharpening.

Convex Blade: The outside of a convex blade flows (rounded) into the cutting edge without an obvious bevel. This adds strength to the blade and cutting edge.

Corrugation: Corrugations are small teeth on the scissors cutting edge (one or both blades) that provide holding power to keep the material (hair, fabric..etc) from sliding. These are found mostly on pet grooming or low priced barber and beauty scissors.

Cut Length: The length of cut is measured from the pivot to the tip on scissors and shears.

Forged: Forged shears are stamped to shape while the metal is red hot (soft). This produces high carbon shears that are good to high quality. Most large tailor and industrial shears are made this way.

Free Fall: Free fall is the measurement of how far the scissors close while holding one blade tip pointed up and letting the other handle drop. This may be considered the point where the blades contact each other.

Hardening: Martinsitic (hardenable) steels are heated to 1550^0 F for carbon steel and 1950^0- 1975^0 F for stainless. They are then quenched rapidly. Carbon steel is usually cooled in salt pots, by immersing blades to just past the ride. This leaves the handles soft, so that they can be bent to size the tips. Stainless steel is often done the same way. When stainless is hardened in a vacuum oven, the entire blade and handle are hardened. It is hard to bend these handles without breaking them. After quenching, blades are cooled to about -100^0 F. This converts retained austinite (soft) particles to hard martinsite. The steel is now very hard , but extremely brittle and must be drawn in an oven at 375^0 - 400^0 F for about 1 hour to make it flexible (ductile).

Hardness: Metal hardness is measured using the Rockwell C scale.

Shears	54 - 60 (occasionally 61 - 62)
Files	60 - 62
Drill Bits	52 - 55

Hollow Grind: The inside of a hollow ground scissors blade, from the cutting edge to the back of the blade, is concave or hollowed-out. This hollowed-out area produces a lined inside edge which gives a smoother feeling cut. (Less metal to rub.) Most finer, high quality, barber and beauty shears are ground this way.

Ice: This is a metal hardening process. Stainless steel is heated to almost 2000^0 F and then cooled to about -100^0 F. All quality shears are ice tempered, even if not marked.

Length: Scissors and shears are measured overall from tip to the end of the handle (including any tang).

Overlap: The blades must cross one another (overlap) all the way to the tip to perform the cutting action. (see SIZING)

Pivot: A pivot can be any fastening device that holds the scissors blades together.

Ride: The ride is the area just behind the pivot and where the two blades come together. (see SET)

Scissors: Scissors are usually smaller than shears and only have room for one finger and the thumb.

Set: The set of the scissors is the amount of gap between the blades. With the blades closed, only the tips and the ride actually touch. The set provides the spring pressure that causes the blades to stay touching during the cutting action. Too much set and the blades cut into one another or are very tight. Too little, and the material being cut folds between the blades.

Shears: Shears are usually larger than scissors and have room for more than one finger and the thumb.

Silencer: (see Bumper)

Sintered Metal: Made in a powdered form, scissors are pressed to shape, then hot isostatic pressed to form a solid piece of metal.

Sizing: Sizing is setting the overlap of the blades, especially the tips.

Stainless Steel: Stainless steel is made from steel with 11% to 18% chromium added for high quality and hardness. (Stainless steel shears have about 16% to 18% chromium.) Also, the addition of manganese and molybdenum add hardness and toughness. Cobalt may also be added for improved feel and toughness.

Stamped: The shears blades are stamped from rolled steel using a formed die. These are the lowest cost shears to produce and are often very durable, but may not be as smooth feeling. Most plastic handle fabric shears are made this way.

Steel: Iron with carbon and other elements added.

Tang: An extension beyond the end of a scissors handle that provides a finger rest would be considered a tang. Some tangs are removable. (see SCISSORS, SHEARS)

Titanium: Titanium is a gold colored microscopic coating added to shears to improve wear life.

Twist: In some scissors the set of the blades is provided by twisting the blades toward one another. This is common in many European scissors. (see SET)

PARTS LIST FOR SCISSORS SHARPENER