

## Troubleshooting

### 1. Blade won't cut

If your Raytech blade won't cut, there is one answer: the blade needs dressing. The diamonds must be exposed in order to work. Through the years, there have been a few cases where Raytech blades have not been adequately dressed when they left the factory. There have been no cases where the blades did not have a full diamond content. If the blade won't cut, dress it. Instructions are in the section entitled, "Dressing The Blade".

### 2. Blade does not cut straight

a. Check for dished blade. Use a straight edge along one side of the blade and then the other. If the blade shows a bow in one direction or the other, it is dished and should be returned to the factory for repair as described in the blade repairs section.

b. Blade needs dressing. See section in Blade Dressing.

c. Machine out of alignment. See section on aligning saws.

d. Arbor bearings loose. Check arbor by trying to wiggle it from side to side. There should be little perceptible play. If the bearings are loose, the arbor assembly can be replaced.

### 3. Saw Noisy

a. Bearings loose. See section d above.

### 4. Half Nuts Jam and Twist Under Load

a. Check for gummed up or distorted threads on power feed screw. Wire brush screw clean if possible, otherwise, replace.

### 5. Saw Leaks Oil

Some oil spray leakage is normal, but if leaking is appreciable, the following should be checked:

a. Check for presence of gasket (06060) and washer (06063).

b. Tighten bolts which retain the power feed assembly, (20026) and the guide rod plate (06041).

c. Check table gaskets (06105).

d. Check fit of the table gasket against top of sump liner. To adjust this fit, loosen the three nuts which hold the table hinge to the sump, press the table and its gaskets down snugly against the sump liner and retighten.

## 10" SLAB & TRIM SAW

### Operating Instructions

#### Mounting the Blade

Unpack the 10 X 040 Green Blazer blade normally packed with the hood, and install it on the arbor. Check the direction arrow on the side of the blade. The pink sheet, packed with the blade, gives details of proper mounting.

The arbor is reached as follows:

1. Remove the 1/4" wing-nut and hinge open the belt guard.
2. Remove the belt by grasping it and moving it back toward the motor pulley while pulling it to the side to spring it off the pulley.
3. Lock the vise and carriage in place by lifting the power feed cam to engage the brass half nuts.
4. Remove the 3/8" wing-nut hold-down under the front of the table and hinge up the table, exposing the arbor.
5. Remove the 1/2"-20 arbor nut and 2 1/4" dia. clamp flange and tip the blade through the table slot and onto the arbor.

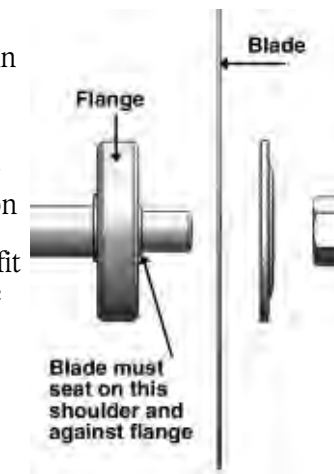
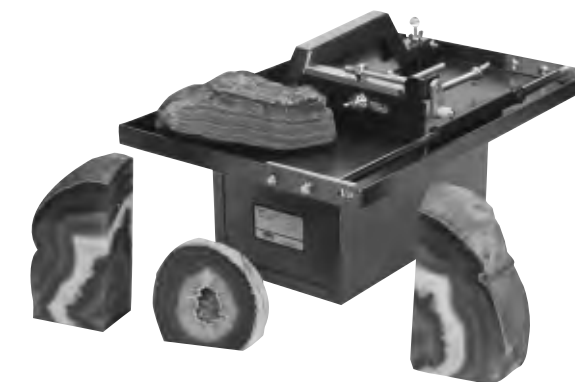
NOTE: Do not unscrew the arbor housing from the table as it is locked in place in precise alignment with the carriage mechanism. It is not necessary to remove it to install the blade.

The blade must be located on the 5/8" diameter arbor shoulder and fully seated on the drive collar. The blade-to-arbor fit is very close, and caution should be used not to bend the blade when installing it. The blade can usually be twisted or wrung into place on the shoulder, but if it will not fit onto the shoulder, check for any burrs on the arbor or blade and remove them with a fine file.

After the blade is mounted, rotate the arbor by hand. The side-to-side wobble of the blade rim should be less than 1/32", and the periphery of the blade should run true within 1/64".

**CAUTION: DO NOT USE KEROSENE MIXTURES WITH LOW FLASH POINTS.**

Suitable coolant oils are the light machine oils such as Raytech Lapidary Saw Oil or Shell Pella Oil 21. Corvus oil and mineral seal oil have also been successfully used. Water based coolants, such as the so-called soluble oils, are not suitable for slabbing agate and similar tough cutting materials. The water based coolants have been used satisfactorily for slabbing soft rock and for miscellaneous light trimming of all materials. If water based coolants without oil additives are used, it is a good idea to oil the working parts of the machine frequently. Cold cream makes a good lubricant to keep the carriage sliding freely on the guide rod. Your lapidary dealer is usually the best source of cutting oil for your saw.



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## General Operating Instructions

### Filling the Saw

To determine the correct amount of coolant to add, simply pour the coolant slowly onto the saw table while the saw is running. The correct fill level has been reached when a steady stream flies off the blade and hits the table in front of the blade. When making deeper cuts with the thin blades, a much deeper immersion up to about 1-1/2" will reduce the blade distortion from heat and greatly improve the quality of the cuts and the blade life. On start-up, the deep immersion will cause the blade to throw an excess of oil, but this effect will disappear when the blade is up to speed.

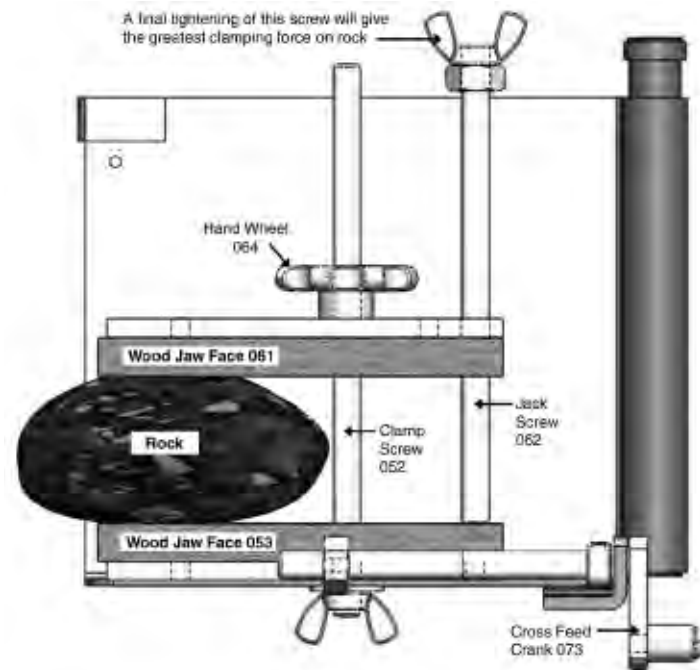
### Clamping the Rock in the Vise

It is important that the rock be clamped securely in the vise because if it should slip while the cut is in progress, the blade may be kinked. To clamp the rock, it is placed between the hardwood jaws. The jack screw on the right side of the vise is turned in or out until the jaws are approximately parallel when they bear on the rock. The hand wheel on the clamp screw is then tightened until the jaws firmly grip the rock. A final tightening is made with the jack screw. The rock must be clamped in place tight enough so that even a twist with the hand will not cause it to move in the jaws. Wood shims or wedges are used, if necessary, to hold the rock steady.

Sometimes it is found helpful to grind or saw a flat on the rock to ensure a firm grip. An interesting approach to holding the rock, and also one that will permit slabbing it completely from one end to the other, is to cast it in a block of plaster or concrete. This method is especially efficient where many small pieces are cast into one block and slabbed at one time.

If several parallel slabs are to be made, be sure to leave sufficient rock protruding from the jaws.

Once the rock is tightly gripped, it can be positioned for the first cut by moving the jaws across the carriage by means of the cross feed crank. The 3/8"-16 wing-nut on the front of the carriage locks the vise jaws in place and must be loosened before the cross feed is used, and then relocked again to hold the jaws in position while the cut is made.



### Use of the Cross Feed

The cross feed screw can be used for setting the thickness of the slab that will be made. The cross feed screw will move the jaws 1/16" for every full turn of the cross feed crank. For example, to make a 1/4" thick slab, after the first trimming slice is made, the crank should be turned 5 revolutions, counter clockwise. The first turn will advance the rock sufficiently to compensate for the stock removal of the blade in the first cut. The next four turns will move the jaws 4/16" or 1/4" to set the slab thickness. To eliminate the error caused by backlash in the cross feed, all cuts should be positioned by turning the screw counter-clockwise. If, by accident, you advance the rock more than you want, and find it necessary to back up, then back up well beyond the desired setting and make the final adjustment forward (at least one half turn) in the counter-clockwise direction.

### Slabbing

Now that the coolant oil has been added and the rock is firmly gripped in the vise jaws and positioned for the first cut, you are ready to start slabbing. The vise and carriage are slid forward until the rock is almost touching the blade. The brass half nuts are engaged and the Plexiglas hood is put in place. The "blade" switch is turned on, then the "feed" switch. The cut will start shortly, and you can watch the progress through the transparent hood.

If the cut is started on a steeply sloping surface of a hard-to-saw material, the blade may be deflected sideways slightly and start a crooked cut. If this is suspected, the cut should be restarted after the blade has cut a slight notch. Restarting is very seldom necessary with the Raytech saw. Once started, the cut should progress smoothly until completed. The carriage will advance at approximately 10" per hour.

## General Operating Instructions

### Removing the Power Feed Screw

1. Disengage half nut assembly (20032).
2. Slide vise carriage to rear of saw table.
3. Remove roll pin by tapping out of collar at rear end of power feed screw.
4. Loosen set screw on power feed coupling (06059) and remove coupling from the motor shaft by sliding power feed screw to the rear of the table.
5. Slide power feed screw towards front of saw table for removal.

### Half Nut Assembly Instructions

1. Check for the complete half nut assembly as follows:
  - A. half nut, upper and lower halves
  - B. one 10-32 x 1" fillister head machine screw
  - C. one cam assembly
  - D. one spring
  - E. Field alignment instructions
2. Clean the complete table top, vise carriage and power feed screw.
3. Slide the vise carriage to the rear of the table until the carriage clip disengages from the table. Raise the carriage slightly and slide it toward the front of the table.
4. Remove the old half nut by removing the cam assembly and the 10-32 x 1" fillister head screw that holds the two halves of the nut together. When the screw and cam assembly are removed, lift off the upper half of the half nut and remove the spring.
5. To remove and replace the lower half of the half nut, remove the two 1/4-20 x 1/2" carriage bolts and 1/4-20 nuts that attach the rear guide rod plates to the back of the table and raise the guide rod slightly until the old half nut can be removed.
6. Disassemble the new half nut and install the lower half under the vise carriage and lower the guide rod to the table and reinstall the two carriage bolts and nuts into the guide rod plate. **DO NOT TIGHTEN THE NUTS AT THIS TIME.**

Install the spring between the upper and lower halves of the of the half nut, then install the 10-32 x 1" screw into the L.H. hole of the upper nut and tighten hand tight to hold the spring while installing the cam assembly into the R.H. hole on the upper nut. Screw the cam down until it will close completely on the power feed screw and the cam will remain in an upright position. After the cam is set, turn the 10-32 x 1" screw out (counterclockwise) 4-1/2 complete turns.

7. Slide the carriage to the rear of the table and engage the carriage clip to the table and realign the carriage in accordance with the "Field Alignment" instructions. After alignment, it may be necessary to reset the cam assembly to close properly on the power feed screw and have the cam remain in the upright position.

### Be Safe

- Wear appropriate eye protection when grinding or sawing.
- Inspect grinding wheels for crack or chips and make sure blades have clearance before using.
- Plug machine into grounded outlet.
- Don't leave running machine unattended.
- Run with appropriate guards installed (belt guard and wheel guards where appropriate). Operate at recommended speeds.

## General Operating Instructions

### Aligning the Saw

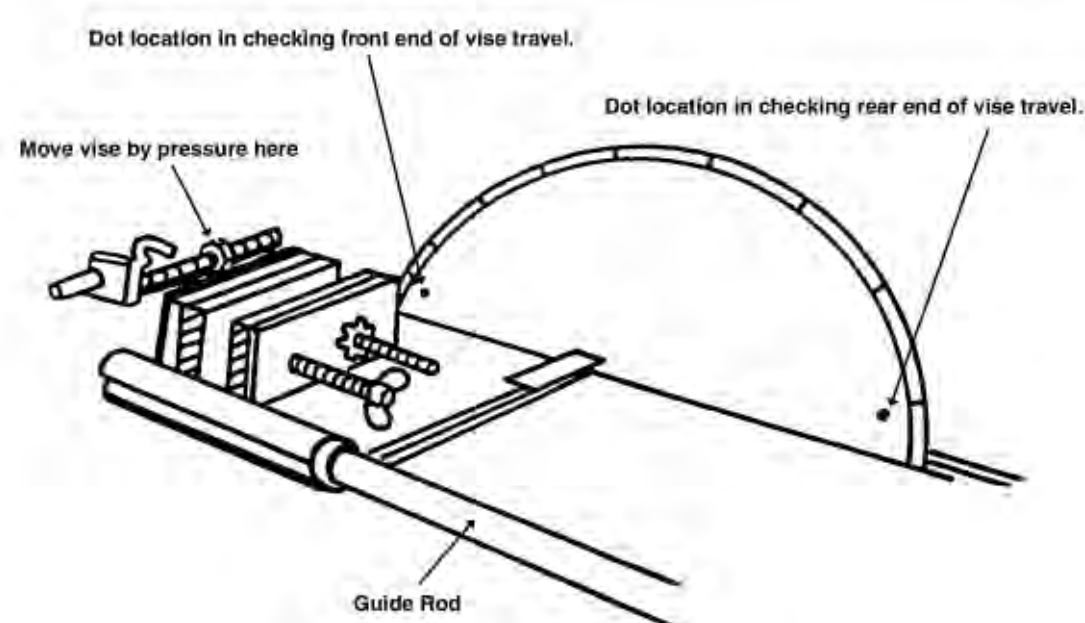
In the event your Raytech saw should lose its alignment, the following steps will serve as a guide to realignment without use of special equipment or return of the unit. In case of persistent difficulty, please contact the factory for assistance.

1. Disconnect the power cord.
2. Install blade on arbor, just as you would for normal cutting, seat squarely and secure nut against the clamping flange. Tighten the table-hold-down wing nut.
3. Using a marking device, such as a felt tip pen, place a dot on the right side of the blade near its rim.
4. Install indicator firmly in the vise jaws, with pointer tip as close to the saw table as practical. A 'trial indicator with .001" graduations is preferred if available, but a sharpened wood pencil is satisfactory. It will be necessary to place a block of wood in the vise so that the indicator would be clamped at the far end of the vise assembly. This is to insure that the indicator will reach both sides of the blade when the carriage assembly is moved from one end to the other.
5. Loosen the split nuts and be sure the vise travels freely on the guide rod, and that the vise hold down clip does not bind in the blade slot. In alignment, to move the vise backward and forward, apply pressure at the hex nut near the top center of the rear vise jaw - this is about central and will avoid side movement of the vise.
6. Rough check - move the vise forward and back and observe clearance of the vise hold down clip in the saw slot. The vise should be as far to the right as possible without this clip binding against the right edge of the slot.

Loosen the two hex nuts holding the front and rear vise positioning plates, one plate at a time, and adjust so vise travels nearly parallel with the saw slot as far to the right as possible. It is necessary to remove the power feed box cover to loosen the hex nuts holding the front plate.

7. Advance the cross feed so the indicator almost touches the saw blade at the mark. (If a dial indicator is used, it must contact the blade to obtain a reading). Tighten the wing nut, locking the vise jaws in position. Move the vise forward and back to compare relation of the indicator point to the dot at both ends of the vise travel. (rotate the blade so the dot is at the point in each position).

8. As in step 6, loosen the positioning plates one at a time, this time aligning the pointer with the dot at the same gap front and back. Again, keep the vise as far to the right as possible. It is desirable to advance the cross feed so the pointer is very close but not touching the blade. A flashlight or other light source backlighting the tip of the pointer enables reproduction of very small gaps, of about 1 or 2 thousandths of an inch. Return the vise to its forward and back position several times to check reproducibility of a setting. In using a dial indicator, the vise positioning plates are adjusted to give the same dial reading at each end of the vise travel. After the positioning plates have been tightened securely and alignment rechecked, replace the power feed cover.



## General Operating Instructions

The power feed screw has been undercut to stop the power feed before the vise and carriage hit the end of the saw, but we do strongly recommend that you stay within earshot of the saw while it is cutting so that if it should jam for any reason, you can quickly shut it down before serious damage to the blade or material occurs. With a little practice, you will learn the steady sound of the smoothly cutting saw and will be able to detect trouble before it becomes serious.

### Dressing the Blade

If the proper oil coolant is used, and if a wide variety of rocks are cut with your Raytech saw, the blade may never require dressing. However, if the blade receives a constant diet of tough sawing material, such as agate nodules, the diamonds may wear down to the metal matrix in the saw rim, and the blade becomes dull. To sharpen the blade, the metal must be scuffed from the cutting edges of the diamonds. The most effective way to dress the blade is to cut several square inches of Raytech Diamond Blade Dressing Stick, or else a chunk of a discarded 220 grit soft bonded silicon carbide lapidary wheel. A hand feed with or without a vise is used for dressing the blade. Other materials can be used for dressing, such as a soft brick, but they are not quite as efficient. To be effective for diamond dressing, a brick should be so soft that it can be drilled with a screw driver blade pushed against its surface and twisted back and fourth.

Remember, if the saw seems overloaded and the blade does not cut freely, it probably needs dressing.

### Cleaning Your Saw

Chips removed in sawing will accumulate on the table, vise, and in the sump. Before slabbing with a power feed, make sure table is clean and vise slides freely. A piece of plastic such as a windshield scraper about 3" wide makes a useful tool for scraping the table clean. After the table is clean, your sump, whether removable or fixed, should be cleaned periodically. If you know that the saw will not be used for a while, it is easier to clean it while still wet rather than letting the sludge dry out in place.

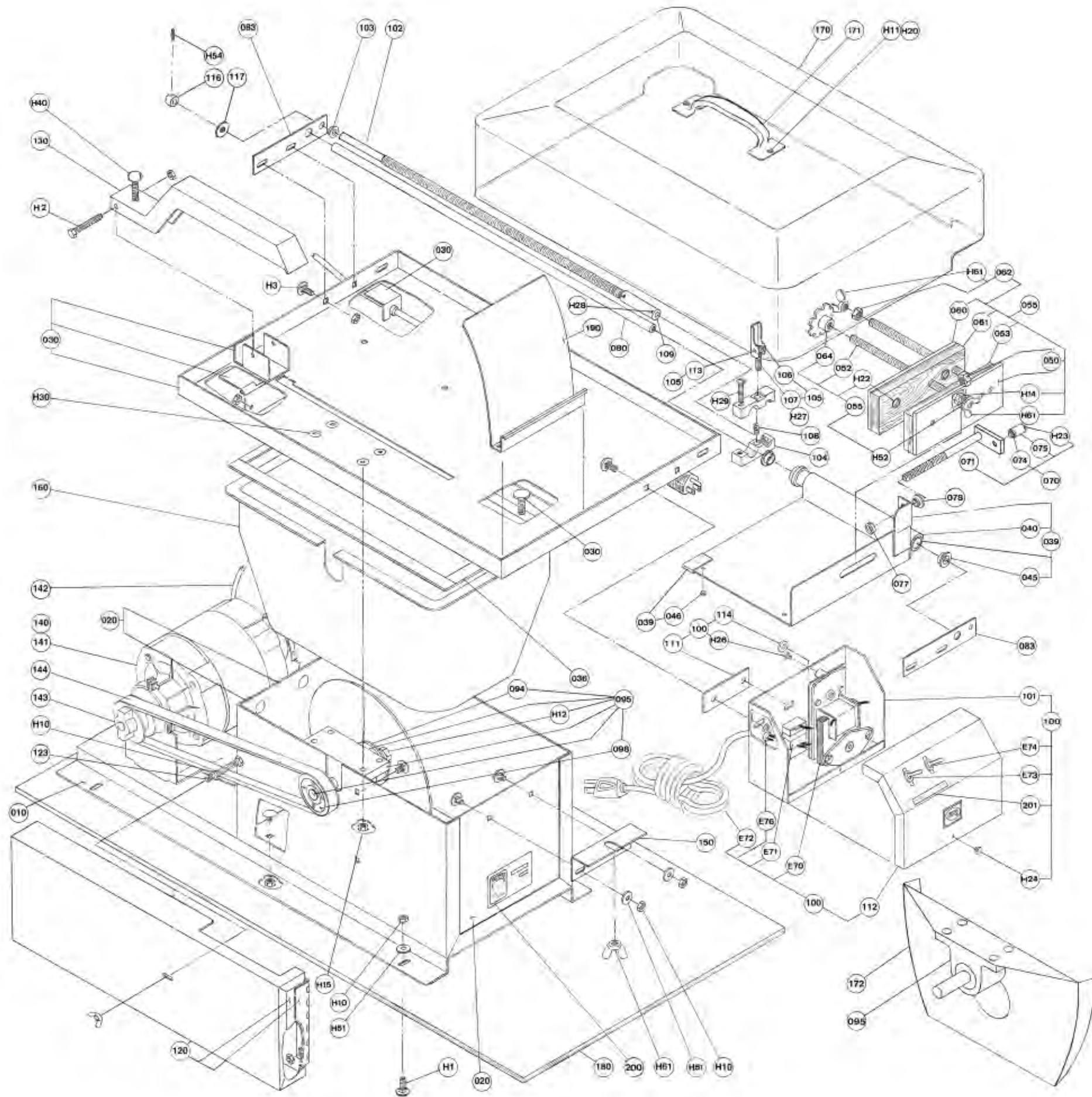
### Choice of Blades

Green Blazer	General purpose lapidary cutting. Continuous rim construction.
Black Blazer	A premium heavy-duty blade that has more diamonds and cuts longer and freer than any other heavy-duty lapidary blade. Especially recommended for the tough-to-cut material such as agate.
Yellow Blazer	A thin, continuous rim diamond-rich blade that cuts very freely and removes a minimum of stock. Recommended for gem materials of high value to the stock lost in cutting.

### Machine Repairs

CAUTION: Machine should be electrically disconnected before any repairs are attempted.

# 10" Slab & Trim Saw Parts



IBM#	LOC.	Description	IBM#	LOC.	Description
20027	010	Motor Base	06072	130	Blade Guard
06001	020	Sump Housing	06074	140	Motor, With Cordset
06005	030	Table Finished	06076	142	Cord set, 3 Feet
06105	036	6" Table Gasket Set	30065	143	Motor Pulley
06013	039	Carriage Assy.	06078	144	V-Belt
06014	040	Carriage Weld.	06079	150	Table Hold down Brack.
06019	045	Guide Bushing	20030	160	Sump Liner
06020	046	Glide	20029	170	Plexiglas Hood
06022	050	Vise Jaw,Frnt.Weld.	06082	171	Handle, Hood
06024	052	Vise Screw, Clamp	06083	172	Coolant Baffle
06025	053	Vise Jaw Face,Fr.	06085	180	Skid "A"
06026	055	Vise Assembly	06086	190	Splash Guard
06027	060	Vise Jaw, Back	04005	200	Name Plate
06028	061	Vise Jaw Face,Back	04001	201	Label, "Blade-Feed"
06029	062	Vise Screw Jack Assy	03294	H-1	Bolt carriage 1/4-20
06031	064	Hand wheel	03068	H-2	Screw,1/4-20 Hex Head
06032	070	Cross Feed Assy	03290	H-3	Bolt carriage,1/4-20x1/2
06033	071	Cross Fd.Screw Assy.	03335	H-10	Nut Hex, 1/4-20 Plated
06036	074	Sleeve, Feed Handle	03317	H-11	Nut, Pal 6-32
06037	075	Bushing, Cr.Feed Handle	03365	H-12	Nut, Hex 1/2-20
06038	077	Collar, Cross Feed	03356	H-14	Nut, Jam, 3/8-16
06130	078	Bushing, Cross Feed	03334	H-15	Nut, 1/4-20 Greer
06087	080	Guide Rod	03436	H-20	Screw, 6-32-3/8 PH
06041	083	Guide Rod Plate	03053	H-22	Screw, 1/4-20 x 3/4 FH
06046	094	Flange, Clamp	03057	H-23	Screw, 1/4-20 x 7/8 RH
20031	095	Arbor Assembly	03529	H-24	Screw, #4 x 1/4
06048	098	Pulley, Arbor	03445	H-26	Screw, 8-32 x 3/8 PH
20026	100	Powerfeed Assy.	03035	H-27	Screw, 10-32 x 1-1/4 Fil.
06051	101	Power Feed Housing	03456	H-28	Screw, Set 10-32 x 1/8
06052	102	Power Feed Screw	03034	H-29	Screw, 10-32 x 1 Fil Hd.
06053	103	Bushing, Power Feed	03063	H-30	Screw, 1/4-20 x 1" Soc.
20032	104	Half Nut Assembly/Brass	03069	H-40	Thumbscrew, 1/4x20 x 2
06055	105	Cam Assembly	03238	H-51	Washer, 1/4 Standard
06056	106	Cam	03246	H-52	Washer, 3/8 Standard
06057	107	Cam Screw	03509	H-54	Roll Pin, 3/32 x 9/16
06058	108	Spring	03333	H-60	Wing nut, 1/4-20
06059	109	Univ Joint Coupling	03352	H-61	Wing nut, 3/8-16
06060	111	Gasket, Power Feed	30211	E-70	Powerfeed Motor
06061	112	Power Feed Cover	05870	E-71	Receptacle, Polarized
06062	113	Rivet	05669	E-72	Cord Set, 7 ft.
06063	114	Washer, Sponge	05911	E-73	Switch, Toggle, 3/4 HP
06065	116	Power Feed Thrust Coll.	05912	E-74	Switch, Toggle, PF
03667	117	Pow. Feed Thrust Wash.	03624	E-75	Terminal, Spade
20028	120	Belt Guard Assy.	05902	E-76	Strain Relief
06070	123	Stud, Belt Guard			