

GENERAL OPERATING AND MAINTENANCE INSTRUCTIONS FOR DIAMOND PACIFIC LAPIDARY SLAB SAWS

The DIAMOND PACIFIC Lapidary slab saws are used to make accurate cross section cuts through large and heavy pieces of semi-precious material, geological specimens, core samples and other non-metallic material. They have been engineered and built to grip a hard mass securely and to move it into a rotating diamond saw blade in a straight line parallel with the plane of the blade.

Your saw meets requirements of the Federal Occupational Safety and Health Act (OSHA) and those of California OSHA (Cal-OSHA).

The safety features are provided to protect the user. They must be maintained in place when the saw is operable. The safety features should not be altered or bypassed.

These features include:

- A steel hood, with 1/4" plexiglass viewing window completely encloses the cutting process. This hood is interlocked with the motor and **MUST** be closed to operate the saw. Attempting to open this hood while the saw is running will stop the motor and saw operation to protect the user from the operation and spray of coolant.
- The hood is provided with a bracket to maintain the hood open when setting-up. The safety pin **MUST** be inserted in the holes in this bracket when the hood is up, in order to prevent it from accidentally dropping.
- The electric motor is equipped with over-load protection and provided with manual reset.
- The motor belt drive is provided with a steel guard to prevent accidental personnel contact. This belt drive guard **MUST** be maintained in place when the saw is operable.
- The electrical wiring on the saw is grounded. When plugging in the cord to house power, be sure you use a grounded receptacle. **DO NOT USE ADAPTERS OR REMOVE THE GROUND PRONG ON THE MACHINE CORD.** A Ground Fault Circuit Interrupter (GFCI) may be added and is recommended if operating the saw in a damp or wet area.
- Material Safety Data Sheets (MSDS) for the recommended coolant and for the diamond cutting wheel are provided with your saw. These should be reviewed and all precautions listed should be followed.

These features are provided to assure compliance with safety codes, to assure your safety and to maximize the life of the saw.



STANDARD FEATURES

- ✓ Hood - Standard Models TR- 18, TR- 24, and TR-36 have metal hoods with a plastic window.
- ✓ Blade coolant deflector is adjustable.
- ✓ Arbor shafts are engineered for strength and rigidity, machine tuned for proper fit of bearings and blade.
- ✓ Blade flanges are machined steel to meet safety code requirements. They are designed with the necessary relief to provide proper contact with and support of the saw blade.
- ✓ Pulleys and belts are completely covered to meet safety requirements.
- ✓ All motors are equipped with reset over-load protection.
- ✓ Arbor ball bearings are factory lubricated and sealed to protect them from abrasive contaminants.
- ✓ Vise is made of cast aluminum, faced with replaceable hardwood jaws. Opening designed for maximum capacity of saw. Selector plate and drop pin for coarse setting and handle in front for screw feed tightening.
- ✓ Saw box is engineered using steel plate welded and fabricated to provide a rigid, stable base for the saw mechanism.
- ✓ Carriage is cast aluminum frame, V-groove roller bearing travels along matching V-track on rigid steel supports. Wide lateral crossfeed movement, crank operated for cutting multiple slabs.
- ✓ Automatic shut-off switch is adjustable for length of cut.
- ✓ Power switch located at front of saw for maximum safety.

To operate your slab saw, simply install and adjust the slab saw as described on the following pages and you are ready to begin cutting.

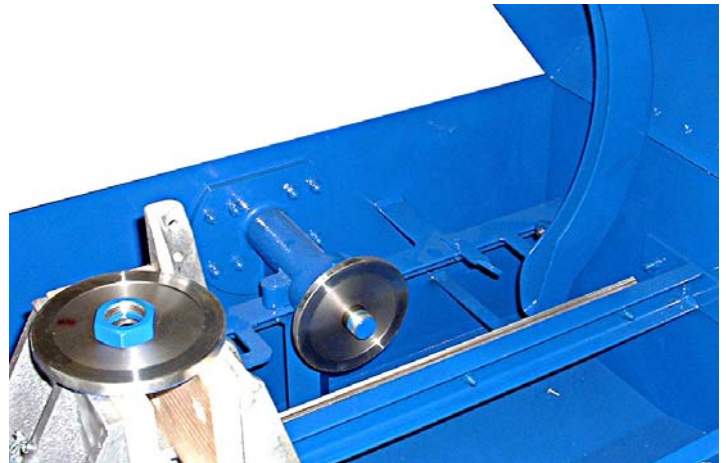
INSTALLATION AND ADJUSTMENTS

During Installation and Adjustments, including V belt tensioning and adjustment, blade installation and general cleaning, **REMOVE THE POWER CORD FROM HOUSE POWER**. Any time the hood is open insert the safety pin in the hood bracket to prevent accidental closing of the hood and actuation of the motor.

- A. **LEVELING THE SAW IS A MUST!** Saw rails must be level to achieve straight flat cuts. They should be level side to side. To set saw level, place level across tank edges, side to side. Using leveling bolts adjacent to casters, level front and back. Re-check. **RE-LEVEL IF SAW IS MOVED.**
- B. **V-BELT ADJUSTMENT - motor and arbor drive**
- (1) Remove wing nuts and belt guard cover.
 - (2) With V-belt on motor and arbor pulleys, loosen hex nut below motor mount plate until the weight of the motor is being supported by V-belt.
 - (3) Tighten the hex nut (above plate) until the motor mount assembly is secure.
 - (4) Check V-belt tension at the mid-point between pulleys by pushing V-belt. Deflection of V-belt should be 1/2"-3/4". If tension is not correct, adjust motor mount up or down accordingly. **CAUTION:** Excessive V-belt tension will cause blade vibration, resulting in equipment damage.
 - (5) Install belt guard cover before turning on power.

C. **INSTALLATION OF BLADE**

- (1) Remove arbor hex nut (turn counterclockwise)
- (2) Remove outer flange.
- (3) Raise Blade Guard.
- (4) Place blade on arbor shaft.
NOTE: Flanges must be kept clean and free of all foreign particles.
- (5) Replace outer flange.
- (6) Replace hex nut and tighten (firmly).
NOTE: To prevent arbor shaft from turning, hold pulley or shaft - never the blade.
- (7) Lower blade guard.
- (8) If a new blade is being used it must be broken in by making two or three cuts through a dressing stone to expose the diamonds.



D. **ELECTRICAL POWER**

Make sure you place your slab saw on a sturdy and level floor near a power outlet. It is important to ground the motor and keep the motor cord as short as possible to prevent power loss.

E. **COOLANTS**

A lapidary diamond saw blade cannot cut properly without a lubricant, which also acts as a coolant. An ample supply must be directed into the saw cut, enough to lubricate the rim and the workpiece and to flush out all debris. A commercial cutting oil such as DIAMOND PACIFIC ROC-OIL is recommended. We do not recommend the use of plain water when slabbing. If residue remains in the coolant/lubricant, cutting performance will be reduced. Dirty coolant/lubricant should be replaced. Fresh coolant should be added until the blade is immersed, approximately 3/8" in a splash method system.

A recirculating system is more efficient than a splash method system, since it directs more coolant/lubricant into the saw cut. With either system an ample supply of coolant/ lubricant must be used to keep the workpiece, and particularly the diamond saw blade, as cool as possible.

All new [Diamond Pacific](#) saws come equipped with a recirculating system. The tank holds approximately 15 gallons of coolant (23 gallons for TR-36). Place the recirculating tank under the outlet on the saw tank. Place the recirculating pump in any section to the rear. Hook tubing to pump and barbed fitting at rear of tank. Plug pump into outlet on tank leg. This outlet turns the pump on and off with the main motor.

OPERATION

A. SELECTION OF WORKPIECE / VISE OPERATION

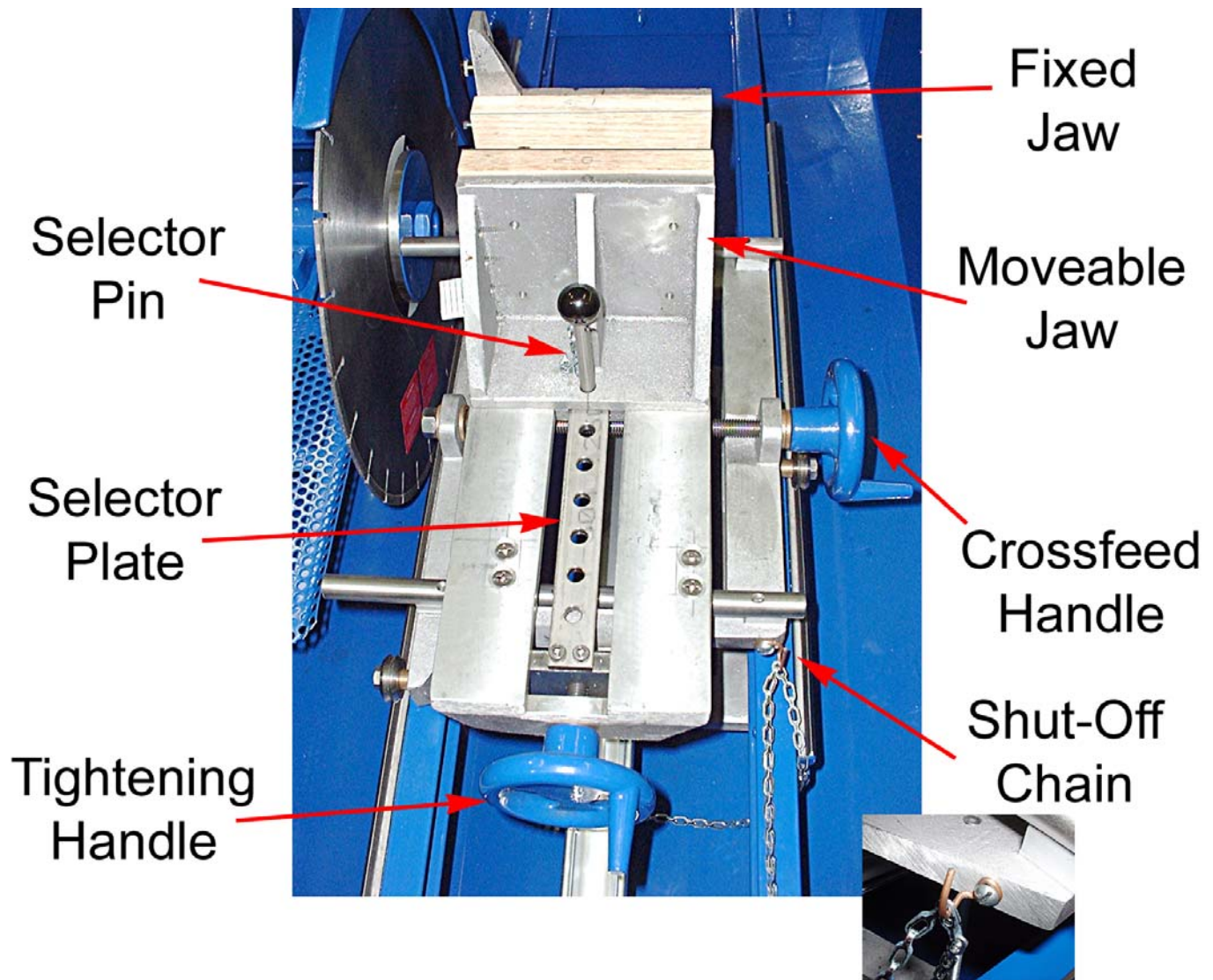
- (1) Select workpiece in accordance with model (see table).

Maximum Workpiece Sizes			
Model	Blade Size	Height	Depth
TR-18	18"	6-3/4"	7-1/4"
TR-24	24"	8-3/4"	18"
TR-36	36"	14"	25"

- (2) Turn vise tightening wheel clockwise to release tension on moveable jaw. Remove adjusting pin and slide moveable jaw towards front of saw.
- (3) Place workpiece in vise against fixed jaw.
 - a. The surface of workpiece must not deflect blade from cutting plane. At all costs, avoid side pressure on blade to prevent damage to blade.
 - b. Be certain that workpiece does not protrude below vise.
 - c. If multiple parallel slabs are desired, position workpiece to protrude sufficiently from vise (on blade side) so that rearrangement of workpiece will not be necessary.
- (4) Slide moveable jaw towards rock and insert adjustment pin in closest hole in adjustment plate.

- (5) Turn vise tightening wheel counterclockwise to tighten vise jaw against stone. Use wood wedges to help lock stone securely in vise.

B. AUTOMATIC SHUT-OFF



The steel trip chain, if properly adjusted, will shut off the power upon completion of cut. To adjust chain for automatic shut-off, proceed with the following steps.

- (1) Position workpiece in vise and secure.
- (2) Position vise so that workpiece will clear blade (rotate crossfeed handle clockwise).
- (3) Move carriage to a position on way bars so that all of workpiece has cleared the cutting edge of blade. (Move carriage with hydraulic feed control set in "return" position)
- (4) Remove slack from shut-off chain and hook chain over wire hook on carriage.

- (5) Move carriage to a position in front of the blade to prepare for first cut.

C. CARRIAGE CROSSFEED

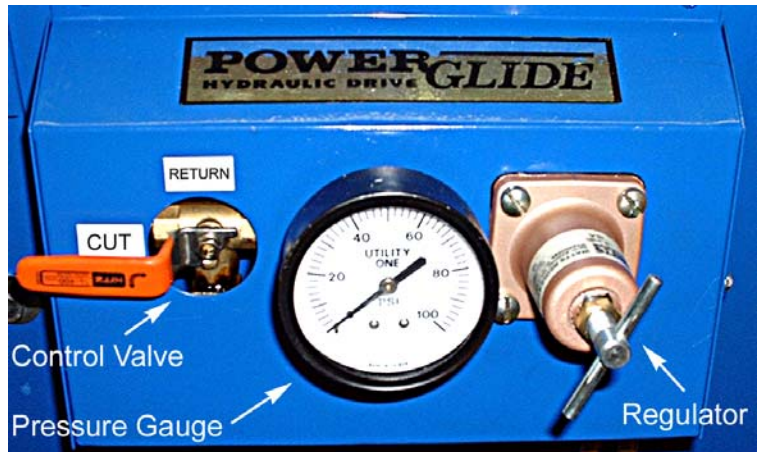
The carriage assembly includes a crossfeed handle which moves the vise towards or away from the blade to allow for the cutting of parallel slabs.

- (1) Be certain workpiece is sufficiently extended to left of vise for several cuts to be made without moving workpiece in vise.
- (2) Make first cut and return carriage.
- (3) Note position of crossfeed handle.
- (4) Turn handle counterclockwise until desired thickness is set. Each revolution of the handle will move the workpiece approximately 0.075". It will require between 1 and 1½ revolutions to compensate for the thickness of most standard blades with approximately 1½ additional revolutions for each 1/8" of slab thickness. Once you determine the number of revolutions required to make your desired slab thickness simply use this number each time.

D. POWERGLIDE HYDRAULIC FEED

The Powerglide Hydraulic Feed on your [Diamond Pacific](#) slab saw allows for maintaining a steady pressure while cutting.

- (1) Select workpiece, clamp in vise and adjust shut-off chain as described previously.
- (2) Position carriage and vise so that workpiece is in front of blade, near but not touching. Wipe sludge from V-track and roller bearings.
- (3) Lower hood and place control valve in the "return" position.
- (4) Start motor and check for coolant flow to the blade.
- (5) Move control valve lever towards the "cut" position while watching for the carriage to start moving.



NOTE: this is the most critical part, the cut must be started slowly so as not to allow the blade to be pushed to the side by the workpiece thus damaging the blade.

- (6) Once the workpiece contacts the blade, allow the carriage to move forward very slowly (by adjusting the position of the control valve lever) until the blade has cut a groove in the workpiece so that there is no chance of blade deflection.
- (7) Move the control valve to the “cut” position to allow the regulator to take control of the feed rate.

(8) Regulator Adjustment

The regulator has been factory preset to a low pressure to avoid blade damage upon start-up.

- a. Loosen regulator lock nut.
- b. Adjust regulator to desired pressure (turn regulator stem clockwise to increase pressure, counterclockwise to reduce pressure).
- c. Tighten regulator lock nut.

Note: the pressure gauge will only give an accurate reading while the saw is actually cutting. If there is no back-pressure on the carriage, the reading will be considerably below the actual regulator setting.

- d. The pressure required will vary with the type of stone being cut, the lubrication being used, the saw blade being used etc. In general softer stones will require lower pressures and harder stones will require higher pressures.

NOTE: DO NOT OVER-PRESSURIZE Too much pressure on soft stones will not allow the blade to clear waste from the kerf. Too much pressure on hard stones can overheat and slow the blade. In all cases excessive pressure can break the slab, leaving a large tip that may jump past the blade edge and dish the blade. If the motor sounds too slow, or if the saw is not cutting with a uniform sound, reduce the feed pressure. In all cases do not exceed 30 PSI to avoid blade damage.

- (9) At the end of cut the automatic shut-off will stop the saw. Move control valve to “Return” position, open hood and pull carriage back so that workpiece will clear front of blade.
- (10) Adjust crossfeed to obtain the desired slab thickness.
- (11) Return to step (2) on page 6.

[MAINTENANCE](#)

A. SLAB SAW

- (1) Wipe track and roller bearings of all grit and sludge before every cut.
- (2) Keep V-belt tensioned properly.
- (3) Change coolant when dirty.
- (4) Inspect vise blocks. (replace if necessary)
 - a. Remove flat head screws.
 - b. Remove hardwood blocks.
 - c. Replace with appropriate blocks.
- (5) Keep carriage roller bearings in contact with way bars. If, upon movement of carriage, any of the roller bearings do not roll, adjust as necessary.
To adjust: Tighten the bolts that secure upper and lower carriage castings.
- (6) Check frequently for blade and carriage alignment and bearing wear - see "Trouble Shooting and Repairs" section.
- (7) Inspect flanges - see "Trouble Shooting and Repairs"
- (8) Clean plastic viewing port. Use rubbing alcohol (isopropyl) or spray-on de-greaser and a soft cloth. Do not use soaps or abrasive cleaners as they will scratch the plastic.

B. BLADE

- (1) Inspect blade condition with straight edge.
- (2) To increase diamond protrusion and improve cutting action, occasionally sharpen the blade by cutting two or three times in a blade sharpening stick.

TROUBLE SHOOTING AND REPAIRS

A. NO POWER

- (1) Check all connections, especially the motor cord for breaks in the insulation. Keep motor cord as short as possible to prevent power loss.
- (2) If motor still does not run, turn machine off, wait five minutes, press reset button and turn on power.

B. IMPROPER CUTTING

- (1) Check level of saw.
- (2) Check blade condition.
 - a. Have repaired if needed.

- b. Sharpen
- (3) Check V-belt tension.
- (4) Check to see if pulleys are slipping on shaft.
- (5) Check coolant.
- (6) Check flange condition. If flanges, when placed together, do not lie perfectly flat, they need to be resurfaced or replaced. Be certain flanges are clean and free of debris.
- (7) Check condition of arbor shaft surface. If blade does not fit snugly, shaft may be worn and will need to be replaced.
- (8) Check arbor bearing assembly. Test for shaft play (any movement other than rotation)
 - a. Radial play: grasp blade end of shaft and try to move it back and forth.
 - b. Axial play: try to move shaft in and out.

NOTE: Any arbor shaft play indicates worn bearings or a bent shaft.

DO NOT OPERATE SAW UNTIL THIS CONDITION IS REMEDIED.

- (9) Check bearing alignment **NOTE:** Machine must be sitting on level floor and a straight blade must be used for this check.
 - a. Use a level to check vertical alignment.
 - b. Place a dial indicator or caliper in vise and position vise so as to obtain a reading at the front edge of the saw blade.
 - c. Mark blade at point reading was taken, rotate mark to rear of saw.
 - d. Move carriage so that the measurement can be made to the same spot on the blade at the rear edge. (do not move crossfeed) and repeat measurement to the mark on blade made previously.
 - e. If the measurements do not match (should be within 0.002"), or the vertical adjustment is not level, the arbor shaft will need to be realigned.
 - 1. Slightly loosen bolts on arbor flange bearing on outside of saw tank.
 - 2. Tap arbor shaft one way or the other.
 - 3. Recheck alignment and repeat until shaft is straight.
 - 4. Tighten bolts.

TR Hood Safety Latch



Latch pin will hang on outside of saw when hood is closed.
Insert pin when hood is raised to latch hood in upright position.