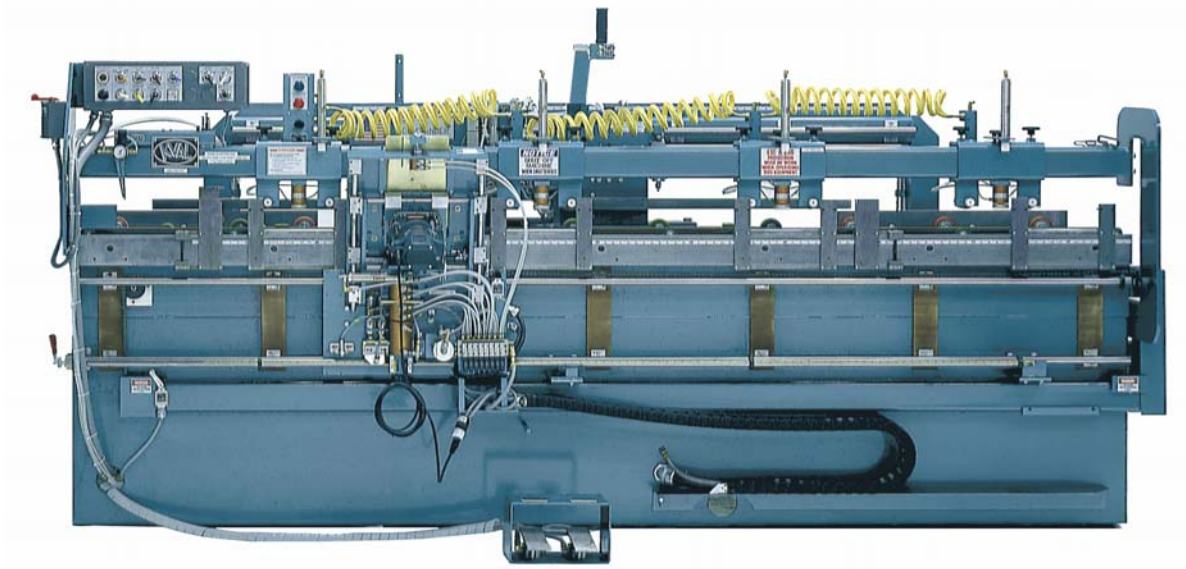
KVAL INC.

INSTRUCTION MANUAL



Commander

Door Pre-Hanging Machine

REV.1

CONGRATULATIONS ON YOUR PURCHASE OF A NEW KVAL

COMMANDER

SERIAL No._____

DATE OF PURCHASED_____

This manual is designed with safety in mind. We at KVAL want to begin FAST and SAFE production as soon as possible. It is very important that all OPERATORS and MAINTENANCE personnel read this manual thoroughly. We have included important safety information that will help prevent serious injury; as well as complete maintenance, and troubleshooting instructions.

Proper operation and maintenance of your new KVAL machine will guarantee many years of trouble-free, fast-paced production.

KVAL INC.

OPERATOR'S & PARTS MANUAL

For further information about this manual or other Kval Incorporated products, contact the Customer Support Department, Kval Incorporated, 825 Petaluma Boulevard South, Petaluma, CA 94952. In the U.S and Canada, call (800) 553-5825 or fax (707) 762-0485. Outside the U.S. and Canada, call (707) 762-7367.

Kval Incorporated welcomes your opinion regarding this document. Please send them to the Customer Support address shown above.

Proprietary Notice

825 Petaluma Blvd So.
Phone (707)-762-7367 • Fax (707)-762-0485

www.kvalinc.com

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Chapter 1

Customer Service Information

KVAL is happy to help its customer make the most of their investment, and help solve any problems that may occur. When you call, please have the electrical print, air print number, and the serial number of the machine ready, so that we are able to accommodate your needs efficiently.

HOURS

6:30 AM to 4:30PM Pacific Standard Time – Monday thru Friday

Phone: (707) 762-7367

Fax: (707) 762-0485

www.kvalinc.com

Returning Parts / Equipment to KVAL

Before returning parts and/or equipment to Kval Inc. please call KVAL at (707) 762-7367 to receive a RMA # (Return Merchandise Authorization number).

*** Note**

Non-Warranty returns are subject to **15%** Re-stocking Charge.

When you call:

1. Have your Packing Slip and/or invoice #'s available
2. Have reason for return available

When sending merchandise back:

1. Make sure that the Item(s) you are returning are securely packaged and well protected from shipping damage.
2. Including Packing Slip #
3. Include your RMA # on the outside of the package so our shipping receiver will see it.

Kval tries hard to satisfy its Customers, if you have any questions concerning merchandise purchased through KVAL, please call.

Getting Started

Your new KVAL Machine arrives at your plant crated, banded, taped and has painted set collars on all shafts; keeping all of the precision moving parts secure during shipping.

1. Move the machine as close to the area it will be stationed before removing the crate to protect against damaging the machine with the forklift.

2. Remove the machine from the crate. Be careful! Anytime the machine is lifted to remove the skids there is a chance of the machine dropping suddenly, and damaging the machine, or injuring people near the machine.

3. Remove all painted set collars from the shafts. Just about every shaft on the machine has set collars to secure the moveable assembly mounted to the shafts.

4. Take off any tape securing the various buttons, switches and knobs.

5. Level your KVAL machine by putting metal shims underneath the corners of the base. Leave a clear shot from the bolt holes in the foot pads to your shop floor. Now, make sure the machine won't rock back and forth.

6. Once the machine is level, anchor it to the floor so that it won't move across the floor during operation. KVAL recommends a ½ RED HEAD, TRUE BOLT ANCHOR in each of the foot pads. When drilling the concrete for the anchor bolts use a 5/8 bit.

Note

KVAL wants to provide the industry's safest and highest quality wood working machines. The following page is a quality control and safety checklist. Our technicians have already performed an initial quality control check before shipping your machine. Please review the checklist and return "Acknowledgment Copy" to KVAL Verifying complete contents.

Chapter

2

Safety First Danger!

This section contains important safety information. Failure to follow these safety guidelines may subject the operator to physical hazards that may result in serious bodily arm, or death.

Responsibility

It is the responsibility of each employee to maintain safe working conditions in his or her area. Failure to understand and correctly follow this procedure is direct violation of safety rules and regulations. Violations of this policy can lead to severe injury.

PROCEDURE

To lockout or tag out a piece of equipment, the following steps must be taken:

1. Assess the equipment to fully understand all energy sources (multiple electrical supplies air and/or hydraulic pressures, spring tension, weight shifts, etc.)

2. Inform all affected personnel of the eminent shutdown, and the duration of the shutdown.

3. Obtain lock and tags from employer.

4. Shutdown machine(s) by normal means, i.e., disconnect switch(s), air pressure relief valve(s), on/off button, etc. NOTE: Control power switches do not serve as adequate shutdown devices. The main source(s) of energy must be disconnected as well. Also, ensure that all mechanically stored energy has been released, i.e., lifting booms lowered to bottom of travel, carriages in "HOME" position etc., No one may remove a tag or lock installed by someone else. Only the person who attached the tag or lock is authorized to remove it.

5. Once the lock and tag is in place, the employee must try to operate the machine to ensure all energy sources are defeated.

6. When maintenance or repairs are completed, the person that did the work must ensure all tools, spare parts, test equipment, etc. are completely removed and that all guards and safety devices are installed.

7. Before removing the lock and tag, the person who attached them shall inspect the equipment to ensure that the machine will not be put in an unsafe condition when re-energized.

8. The lock and tag can now be removed (only by the person who place them), and the machine can be re-energized.

9. The tag shall be destroyed and the lock and key returned to the lockout center.

In addition to safety concerns, this policy is required by OSHA regulation 1910.147 and Cal OSHA'S SB198 ruling of July 1991.

Lock out and Tag Out Procedure

1. **P ....** PROCESS SHUTDOWN
2. **R ....** RECOGNIZE ENERGY TYPE
3. **O ....** OFF - SHUT OFF ISOLATING DEVICES
4. **P ....** PLACE LOCK AND TAG
5. **E ....** ENERGY RELEASE STORED ENERGY (0 ENERGY STATE)
6. **R ....** RECHECK CONTROLS AND RETURN TO PROPER SETTING

ENERGY TYPES

Recognize the Types of Energy to Shut Down

1. Electrical Energy
2. Hydraulic and/or Pneumatic Energy
3. Fluids and Gases
4. Mechanical Energy

ACCIDENT SITUATIONS

• **Accident Start Up**
Equipment can accidentally be turned on and your hands may be in the point of operation or while you are inside.

• **Electrical Shock**
You can be accidentally electrocuted if the power is still on or if it is accidentally turned on.

• **Hazardous Materials**
If released can go into confined areas or the work area.

• **Stored Energy**
You could be caught in equipment that can move due to stored energy, even with the power off.

The Solution Is Quite Simple — These Accidents Can Be Prevented Using The P-R-O-P-E-R Lock-Out Procedures.

LOCK RULES

1. Use an appropriate “Lock-Out Device”, such as Lock Tongs, or a Lock Tag. Each person must attach his or her own lock to the Lock-Out Device.

2. **Identify Locks**
   Each lock will be identified by a number or a name. A lock without a tag is not good enough. Additional information that identifies the person / persons doing the work must be on the tag. Also the type of work that is being performed should be on the tag.

3. **Sign The Tag**
   In some instances one tag is enough, however, the tag must be signed by each worker. In some circumstances a supervisor will also need to sign the tag.

4. One Key Per Lock

5. Never give your key to anyone else.

Recheck controls and return to proper setting

P-R-O-P-E-R ELECTRICAL LOCK-OUT

P Process Shut Down
Open disconnect before pulling the plug. Shut down process or equipment.

R Recognize Energy Type
Recognize the correct power source.

O Off! -Shut Off all Power Controls
Shut off machine and electrical energy at both machine and main power switch. There may be more than one source of power and all must be shut off. If necessary,
electrical drawings and a supervisor may need to be involved.

P Place Lock-Out Device, Lock and Tag
Each person working on equipment needs to put his or her lock on the switches and sign the tag.

E Energy - Release Stored Energy
Bleed electrical capacitors if any.

R Recheck Controls and Return To “OFF” Setting
Recheck the start button and properly test that you have
zero energy state.

P-R-O-P-E-R HYDRAULIC AND/OR PNEUMATIC LOCK-OUT

P Process Shut Down
Shut down process using recommended procedures.

R Recognize Energy Type
Recognize all sources of energy – the electric that powers the pumps or compressors, and the air or hydraulic valves themselves.

O Off! -Shut off all Power Controls
Shut off each energy type.

P Place Lock-Out Device, Lock and Tag
The shape or location on some valves may be difficult to lock out. If there is not a specific lock out tag out procedure in place you should ask your supervisor.

E Energy - Release Stored Energy
Bleed the stored energy by bleeding the air line and draining the compressor, or by using other prescribed methods. Keep in mind that when bleeding stored energy
it could cause some parts of the equipment to move, as it is being held by the stored energy.

R Recheck Controls and Return To "OFF" Setting
Return controls to proper settings.

P-R-O-P-E-R FLUIDS AND GASES LOCK-OUT

P Process Shut Down
Shut down process using recommended procedures.

R Recognize Energy Type
Recognize the material and its hazards. If material is hazardous, use the proper protective equipment. Even water can become a hazardous fluid under high
pressure.

O Off! -Shut Off all Isolating Valves
If a job requires breaking in to a line close off isolating device, blanking if necessary. Some valves may be difficult to lock out. A locking bar or chains may be
needed. Check with supervisor.

P Place Lock-Out Device, Lock and Tag
Sign tag.

E Energy - Release Stored Energy
Release pressure and drain to achieve zero energy state.

R Recheck Controls and Return "OFF" Setting
Recheck line and test properly and make sure you have zero energy state.

P-R-O-P-E-R MECHANICAL ENERGY LOCK-OUT

Mechanical Energy may be released at the point of operation, or where two or more points of operation come together. This is where you might get caught. In most cases blocking mechanical energy is done in addition to shutting off the primary source, such as electrical, hydraulic and pneumatic. Some examples include inserting restraining pins or bars in the point of operation or block under a lift. In cases where these blocks to mechanical energy are not locked in place, they should not be the primary means of shutting off energy. Mechanical energy can also be stored.

1 Gravity
Things that are up can fall of their own weight. Pins or blocking may be required.

2 Springs
BOING! can spell DEATH. Release tension or compressed springs by using methods prescribed by the equipment manufacturer.

3 Tensions
Things under tension can spring in. Release tension by using prescribed method by equipment manufacturer.

P Process Shut Down
Shut down the process.

R Recognize Energy Type
Recognize all forms of energy – Need to be shut off, such as electrical and mechanical. Mechanical is usually a secondary energy source closest to point of operation.

O Off! -Shut Off all Power Controls
Such as switches, valves and other isolating devices.

P Place Lock-Out Device, Lock and Tag
Place lock on the isolating device and sign tag.

E Energy - Release Stored Energy
Release, spring or tension to achieve, zero energy state.

R Recheck Controls and Return To "OFF" Setting

ZERO ENERGY START UP

Zero Energy State to Start-up to Operating State
Starting the equipment is just as important as Lock-Out/Tag-Out in terms of safety.

Start-up
- Inspection
- Clean up
- Replace guards
- Check controls
- Remove locks
- Visual checks

Inspect
When work is finished the equipment must be inspected for proper adjustment before starting equipment.

Clean Up
All materials and debris must be cleaned up. Any combustible materials and old parts used during repairs must be cleaned up.

Replace Guards
Replace all guards to the equipment. If adjustments can not be made with the guard on after start-up, leave off only the ones to be adjusted after start-up.

Check Controls
Make sure all switches are in the off position. In some cases the machine can start automatically when energy is restored.

Remove Locks
Each person must remove his or her own lock or tag. This will ensure you are in a safe place when the equipment is started.

Visual Checks
If the equipment is too large to see all around it, station personnel around the area and sound the personnel alarm before starting the equipment. If your operation is more complex, having many pieces of equipment and a lot of people, a comprehensive Lock-Out/Tag-Out procedure may involve additional steps. You will need to ask your supervisor about these procedures. A specific lock out procedure may be posted at each machine. On larger or long term maintenance projects or installation projects, the procedures should be explained to all participants and a copy of the procedures posted on site for the duration of the work. Provisions which ensure protection during shift changes when contractor or outside help is used also need to follow the Lock-0ut/Tag-Out Procedures. Comprehensive Lock-0ut/Tag-Out may use a gang box or other system to ensure that locks are secure and not removed without authorization.
Remember Lock-Out Tag-Out procedures work because you are the only one with the key to your lock. Proper Lock-0ut/Tag-Out can save lives, limbs and money. Help make your work environment safe for yourself and your fellow employees. Make sure you follow the P-R-OP-E-R Lock-0ut/Tag-Out procedures, and that those around you do also.

YOUR LIFE MAY DEPEND ON IT.

http://www.concrete-pipe.org/sab.htm

Safety Guidelines

ELECTRICAL

Electrical circuitry on this machine is protected by an approved lockable disconnect circuit. In addition to this equipment, you must install an approved disconnect for the electrical power supplying this machine

COMPRESSED AIR:

The compressed air system connected to this machine should have a three-way air valve for shut-off and pressure relief. The air supply providing the pressure to this machine also has a three-way air valve for the supply line.

OPERATING SAFETY:

Prior to changing any cutters or doing any maintenance work, you must disconnect, tag out, or lock out the electrical, air pressure and hydraulic systems. This should be done in accordance with the State and/or Federal code requirements.

COMPLIANCE WITH CODES AND REGULATIONS:

It is advised that you request an on-site State safety review of your installation of this machine. This is to ensure conformance to any additional specific safety and health regulations which apply in your area.

OPERATORS TRAINING:

You must ensure that all operators of this machine be trained to know the potential electrical hazards, pressure pinch points, rotating cutters, and other similar hazards. It is also your responsibility to train the operators, or potential operators on how to operate the machine safely.

OTHER HAZARD CONTROL ACTION:

If you believe that any part or operation of this machine is in violation of any health or safety regulation, it is your responsibility to immediately protect your employees against any such hazard and bring the matter to our attention for review and correction, if deemed advisable.

You will not that additional detailed safety guidelines are included in the operating instructions of this manual. We will be pleased to review with you any questions you may have regarding the safe operations of this machine.

Chapter

3

SPECIFICATIONS

The Commander is KVAL's best-selling and most flexible door machine. It automatically machines up to four hinges and also machines for cylindrical lock or dead bolt. Since the Commander can simultaneously route hinge jambs, it is ideal for distributors of architectural doors and residential pre-hangers.

The Commander is designed to route and bore for lock and hinges in flush or stile and rail doors up to 2-1/4" thick by 4' wide and 9' long and wit a minimum width of 18". It also accommodates raised panels or molding up to ¾" thick. The jamb clamping system compensates for jamb thickness and will accept flat, split and rabbeted jambs up to 1-1/2" thick with a 5/8" stop, or 1-7/8" thick overall. There is no limitation on jamb width.

Hinge Routing: Automatic hinge-routing unit accommodates both ¼" and 5/8" radius hinges up to 5-1/2" utilizing turret-stop adjustments. Hinge centers are adjusted by positioning collars on a removable plug-in shaft below the router and sliding jamb clamping fixtures into position. Extra shafts may be set up and "plugged in" for rapid hinge center adjustments. During the routing sequence the router automatically travels along the removable shaft to each collar and dapps the pocket. Full hinges up to 4" X 4" can be attached to the doors and jambs.

Lock: Face bore is adjustable from 2-3/8" to a 5" backset. The faceplate is adjustable for square or bevel up to 3-1/2 degrees from 1" X 2-1/4" up to 1-1/4" X 12". Self-Centering clamp system ensures accurate latch and faceplate machining regardless of door thickness. Both drill motors feature Accu-flex collet chucks so standard straight shank tooling may be used.

Uncrating the Commander

Commander Installation

Remounting Components:
Slide the routers back into their bases and plug them in. While testing the machine, remove all router bits. This includes drill bits for the lock. Remount the main electrical box to the commander's rear leg on the in-feed end.

Bolting the Optional 555 Door Sizer:
Rest the off-feed end of the 555 on the leveling brackets welded to the commander's frame. Screw in the mounting bolts from the 555 into the commander finger tight. Align and drive in the roll pins from the inside of the commander's frame. Tighten the bolts and fasten the 555 electrical junction box back in place. An electrician or the Kval tech rep will reconnect the wires disconnected fro shipping.

Leveling the Commander and the Optional 555 Door Sizer:
Set a level on the Commander's hard board (Ryertex) runner, below the jamb clamps and insert sheet metal shims under the low leg. Level width wise by place a level on the 1 ½" shafts supporting the lock machining carriage, again using sheet metal shims to bring up the low leg.

Electrical Hook Up:
We recommend using a licensed electrical contractor to hook the machine into your buildings electrical system. Code approved circuit interruption equipment and lockable wall mounted disconnects are necessary for both the single and three phase services; otherwise, the service wires connected to the main panel on the backside of the Commander will not shut off for maintenance or repair work. Amperage varies depending on the optional equipment; check the stamped amperage rating on the specification plate. Once the wall disconnects are wired; tag and lock them out. The single phases connect at the labeled block inside the panel. These connector blocks allow either 110V service with a jumper between "hot" terminals or 220V split phase with as single common. Three phase wires are connected to the panel disconnect switch—remove the shield at the right of the fuse block to make connections. Be sure to connect an appropriately sized grounding wire to the ground lug.

Rotation Check:
Close the panel door and switch on the power disconnect. Pull on the control transformer control panel. Turn off all the selector switches except the lock bore drill, and press the master start button followed by the emergency stop button. If the rotation of the lock drill is wrong, lock out both the single and three phase wall disconnects, then switch two of the tree phase leads connected to the commander's main panel disconnect switch.

Air Service:

The standard Commander is rated at 8 CFM. Check the spec plate if the optional H-1000 or 555 was ordered with your Commander. Air should be supplied inside the left rear leg to the Filter/ Regulator / Lubricator module. Once the machine is up and running, sight through the glass on top of the lubricator, and turn the adjustment screw so one drop every two cycles is fed to the system. Check the filter bow daily and empty if its more than half full of water.

Finally, if your plant is located in a humid area we recommend a air dryer on your compressed air system.

ANCHORING THE MACHINE TO THE FLOOR

When you have set-up and test run your machine to ensure that it is feeding the material properly KVAL recommends anchoring the machine to the floor with ½ Red head, True Bolt Anchors in each of the foot pads. An alternative way to bolting the machine, you may want to use Epoxy and hardened threaded rods to prevent the bolts from vibrating loose. KVAL doesn't require the use of epoxy though its added fastening strength is significant.

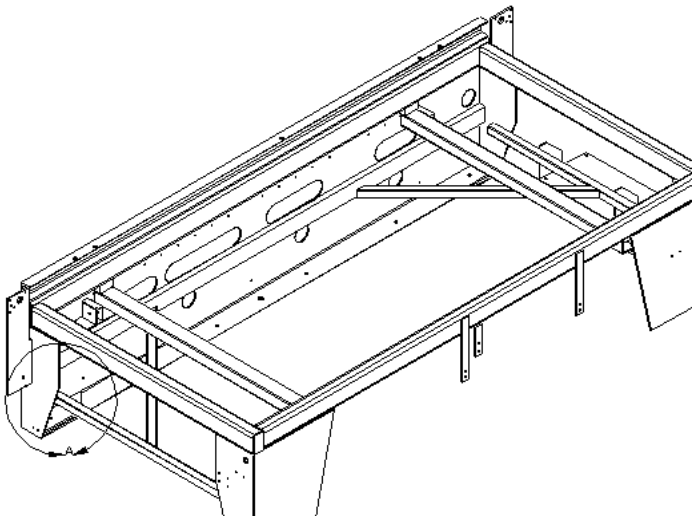
- Standard Anchoring Instructions:

  * With machine in place and leveled, drill 3" deep holes in the concrete using a **5/8"** dia. masonry bit, using the mounting hole as a guide.

  * Clean out holes with an air compressor to ensure that the anchor heads get a firm bite on the walls of the holes.

  * Insert anchors through the mounting holes in the foot pads and into the holes you have drilled into the concrete. If an anchor's expansion sleeve binds inside the hole, simply tap the bolt head with a hammer until the binding stops.

  * Tighten bolts until they are snug. Avoid over tightening the bolt as this may cause the head of the bolt to break.



- Anchoring Instructions using Epoxy:

  * With machine in place and leveled, drill 3" deep holes in the concrete using a **9/16**" dia. masonry bit, using the mounting hole as a guide.

  * Clean out holes with a air compressor. Complete hole preparation with use of a nylon brush (do not use wire brush).

  * When starting a fresh cartridge of anchoring epoxy, epoxy must be an evenly blended light gray color. Insert nozzle into the bottom of the hole. Fill hole to ½ the hole depth.

  * Insert 1/2", (hardened) threaded rod into the bottom of the hole using a slow twisting motion. This insures the epoxy fills voids and crevices. Hardening begins in 7 minutes @ room temperature.

- * After recommended cure time, bolt in place.

Maintenance Schedule

KVAL recommends the following maintenance schedule to ensure that the machine operates properly. Refer to this section for steps to perform maintenance.

Daily, Monthly, Six Month Maintenance

Daily Preventive Maintenance	
Op	**Operation Description**
Clean	Blow off dust from the entire machine.Wipe down the outside of the machine with a clean dry cloth.
Check	Check tooling for wear.
Clean	Wipe off the photo eyes with a clean dry cloth, and check to ensure that all fastening nuts are snug.
Check	Check the air pressure to make sure it is set at 80 psi to100 psi.
Clean	Empty any Dust Collection Units.
Check	Check for obstructed flow when excessive sawdust appears.
Check	Check the air filter water trap. Empty if full.

Weekly Preventive Maintenance	
Op	**Operation Description**
Check	Check the machine for smooth motion through a complete door cycle
Clean	Clean linear bearings and the chrome shaft with a clean dry cloth, then lubricate.
Check	Check all air lines & electrical wiring for kinks or rubbing.
LUBE	Refill lubricator with an ISO 32 standard hydraulic oil (KVAL part# SYSLUBG)

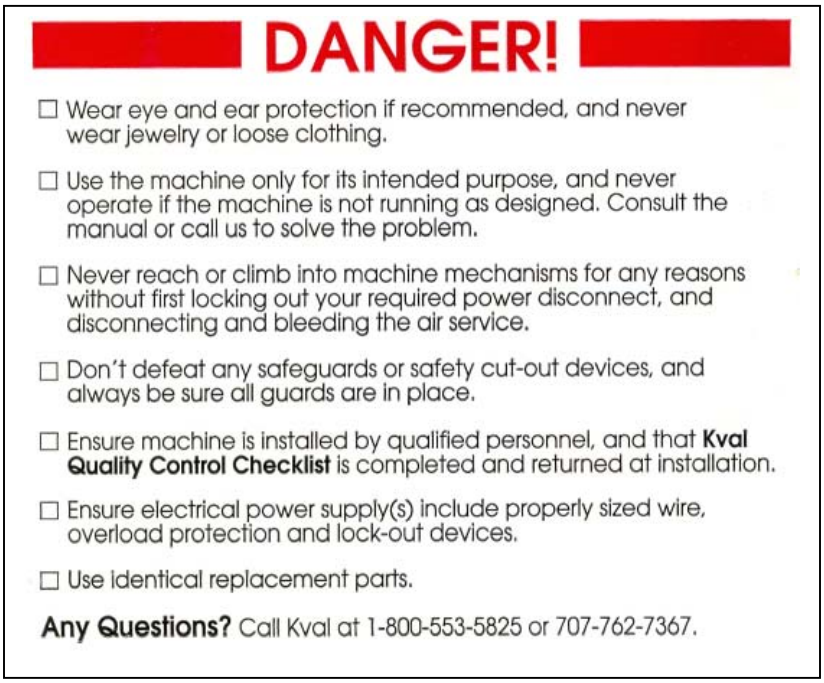
Six Month Preventive Maintenance	
Op	**Operation Description**
Clean	Wash filter and lubricator bowls with soapy water.
LUBE	Grease all bearings and tighten all bolts. Access to some grease fittings is difficult and will require a special needle point grease tip (supplied with your system).
Clean	Clean and lubricate all slides and cylinder rods with dry silicone spray.
Tighten	Tighten all bolts.
Back-up	Backup computer software.
LUBE	Lubricate linear bearings and chrome shafts with silicone.

Lubrication Schedule

KVAL recommends the following lubrication schedule to ensure that the machine operates properly.

TABLE 3-1. Recommended Lubrication Schedule

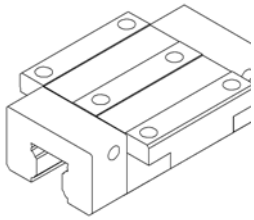
Type of Assembly	Recommended Schedule	Recommended Lubrication Type
Linear Bearing	Every 250 Hours of Machine Operation	Dura-Lith Grease (KVAL P/N Lube EP-2)
Pillow Block Bearing		
Flange Block Bearing		
Ball Screw	Every 80 Hours of Machine Operation	
Air Line Lubricator	One drop of oil every 2 or 3 cycles Check the lines every week to two weeks	Either lubricant listed below is approved to use. • KVAL P/N SYSLUBG • Chevron AW Hydraulic Oil 32 • G-C lubricants light AW R&O • Mobile DTE 24 • Shell Tellus32 • Gulf Harmony 32
Gear Box	2000 Hours of Machine Operation or six months of operation	• AGMA #8 gear lube • MOBILUBE HD 80 W-90 • or equivalent



LUBRICATION REQUIREMENTS

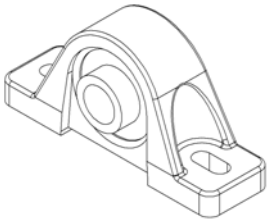
Linear Bearings:

If bearing is equipped with a grease fitting, it should receive 1 Gram (one pump from grease gun) of Dura-Lith Grease (KVAL P/N Lube EP-2) grease every 30 days. Bearings without grease fittings have been pre-lubricated at the factory and do not require further lubrication.



Flange Bearing:

Dura –Lith grease; 1 gram every 60 days.

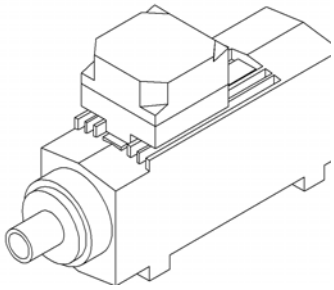


Lubricate special high speed bearings:

With optimal long time PD2 (KVAL P/N Lube PD2) bearings must be re-lubricated once every 60 days.

Perske High Frequency Motors:

Spindle motor(s) are installed pre-lubricated. For re-lubrication use lithium based NLGI grade 2 grease. The only greases currently approved for use in Perske motors are Optimol Longtime PD2 or LDS 18 Special A (KVAL P/N LUBE PD2). Failure to use the approved products voids warranty.



Approved Lubrication Products:

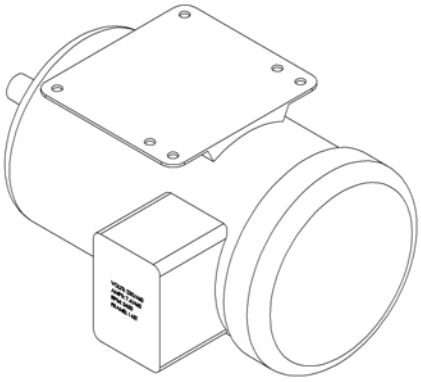
Chevron AW Hydraulic Oil 32 – or KVAL P/N SYSLUBG or G-C lubricants light AW R&O or Mobile DTE 24 or Shell Tellus32 or Gulf Harmony 32.

Lubricator Adjustments:

Using knob on the top of the lubricator, adjust until one drop per every other cycle is used (as observed through sight glass.) Turn flow all the way open the reduce flow to proper specifications.

Gear Motor Lubrication Requirements:

Oil change is recommended after 2000 hrs. or six months of operation. Use AGMA #8 gear lube or MOBILUBE HD 80 W-90 or equivalent.



Mist Oil Lubrication:

Spindle housing mist oilers require syslube lubricant, available through KVAL. Optimum flow is 3 to 5 drops per minute @ 5-10 psi.

NOTE: These oils cannot be interchanged.

NOTE: On the Commander-DI front section there is about 34 bearings that have zert fittings either use a pin fitting or a zert fitting to lubricate these bearings.

Priming the Lubricator:

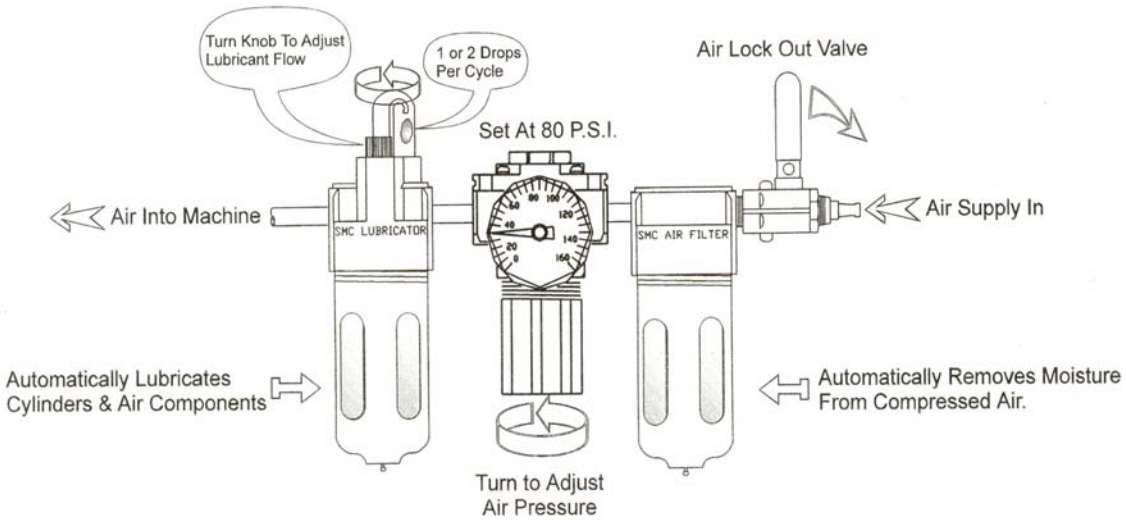
New and used machinery run out of oil from time to time. It is a good practice to check your machine lubricator to insure that it is putting the proper dose of oil in the air lines. Usually 1 drop every 3-4 cycles is a good rule of thumb.

To prime the lubricator, find an air line on the Front Section of the machine that is energized, and disconnect it, allowing the air stream to bleed air pressure away from any persons. Direct the air stream at the machine so you can see when there is an oily film blowing out of the air hose. **NOTE:** It might take up to **15 minutes** to get a good prime. When this is accomplished, place the air line back into its original position.

Repeat this same procedure for the back section and other trouble areas.

Check the lines every week to two weeks

Figure 1: This shows how to adjust the lubricators and shows the air lock out valves 1 drop every 3-4 cycles



ZERK FITTINGS

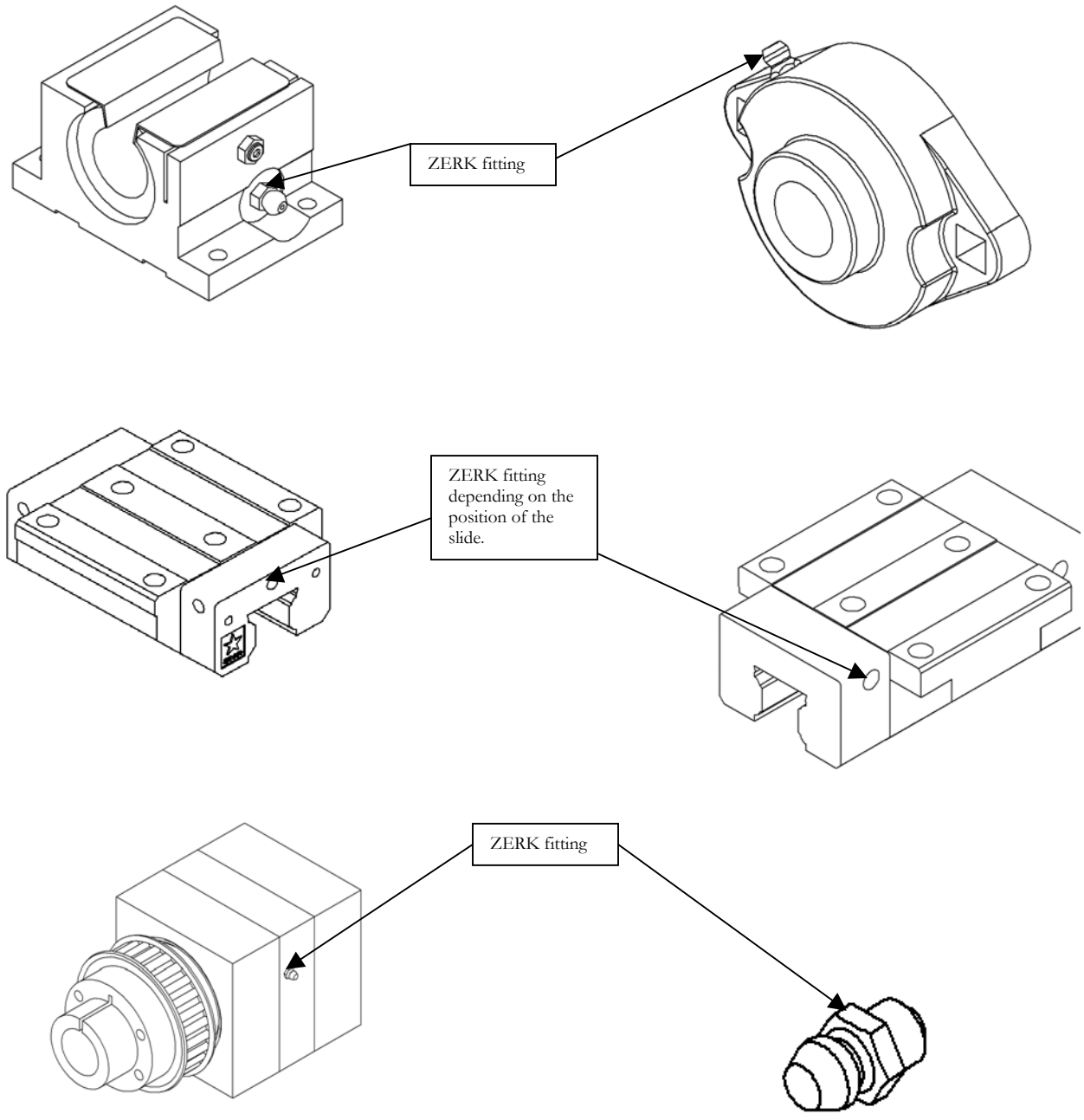


Figure 2: This shows how to adjust the lubricators and shows the air lock out valves 1 drop every 3-4 cycles

CONTROL PANEL OPERATIONS

Jamb Clamp Pedal:

The jamb clamp pedal is used to clamp the jamb into position for routing jamb pockets. Adjust the clamp pressure by turning the regulator knob located beneath the main control panel. Clamp pressure has been factory set at between 45 & 55 PSI. KVAL recommends that clamp pressure not be adjusted higher than 55 PSI, due to jamb flex, resulting in jamb pockets being cut too deep. The bar running from the door clamp pedal to the jamb clamp pedal, causes the jamb to unclamp when the door is released

WARNING:

Make sure that Hands are clear of the Clamps at all TIME!

Door Clamp:

The door clamp pedal secures the door into position for machining.

Warning: Keep yourself, and other clear of the commander while clamping – especially the Front face clamp and jamb indexing fixtures.

Door Width Adjustable:

The door width adjustment drum switch is located on the left end of the commander. Unclamp the machine using the Door Clamp Pedal. Turn the door width adjustment drum switch while watching the width indicator move up or down the measurement scale on the left end of the Commander's frame. Release the door width adjustment switch when the width indicator reaches the measurement of the width of your door with in +/- ¼"

Control Transformer:

The control transformer button turns on the power within the electrical box.

Start Machine:

The start machine button turns on the Commander's motors, and computer. The start machine button does not start the commander's cycle of operation.

Back Section/ Both / Front Section:

This switch allows the operator the choice of machining hinge pockets, or lock preps independently. The BOTH command combines these functions in one machining pass.

Lock Bore Off / Reg. / Deep:

The REG. command machines bypass doors. The DEEP command machines normal bores and different diameter cylinder and dead bolt holes without having to remove the drill bit. Deep is used to access the second larger diameter cutter shaft.

Bolt Drill Off/ On:

The Bolt Drill selector switch controls the operation of the bolt drill. Select On for bolt drill machining.

Face Plate Off/ Reg. / Extend Time:

Small plates take less time than large plates for mortise locks. Set this switch to EXTEND TIME for large plates or you will machine incomplete face plate routs. The amount of time that is allowed can be adjusted with a potentiometer mounted on the outside on electrical box. Loosen the nut and adjust the screw head counter clockwise to decrease time, or clockwise to increase routing time.

Extend Hinge Router Time Off / On:

The selector switch increases the amount of time the router takes to complete cutting passes. The Extend Hinge Router Time ON switch is ideal for hard woods, laminates, and deep hinge pockets. Select off for normal machine. NOTE: When in the EXTEND mode it is necessary to readjust the flow controls to slow cylinder operation. If the router stalls, slow down cylinders until router cuts smoothly. These adjustments will probably take a few test cuts to tune.

Front Section Skip #2 / All:

Skip #2 command instructs the machine to skip the routing the center hinge. "ALL" command instructs the machine to rout all hinges.

Front Section, Override In-feed Limit:

The arrow button sends the hinge carriage to the right. The In-feed limit button overrides the limit switch to return to a hinge pocket and machine it again.

1. Normally the "Start" button on the auxiliary panel sends the carriage to the left, then if the hinge router has been selected, the next press on the start button will send it to the right, machining as it goes.

2. If the router carriage is returning to the left, pressing the In-feed limit button will stop the carriage, and pressing the "Start" button again will cause the router carriage to move to the right and resume cutting the next pocket that it comes to.

3. There are some "dead zones" caused by the set collars and proximity sensors, in which hitting the In-feed limit button will kill the router carriage. If this happens, hit "Emergency Stop", then "Master Start", the "Start". You will quickly learn where the "Dead Zones" are and avoid them: basically, just make sure that you bring the carriage back past the collar for the pocket that you want to machine and you will be in business.

Auxiliary Control Panel

Emergency Stop:

The "Emergency Stop" button instantly halts the Commander's cycle of operation. The motors will BEGIN to slow to a stop, cutters retract.

Start Sequence:

This button begins the Commander cycle of operation. "Start Sequence" only start the machining that the operator has selected from the OPERATING CONTROLS.

Door Stop:

Pull the "Door Stop" button to raise the out-feed stop fro LEFT HAND doors. Push to lower the out-feed stop.

Lock Location (Optional):

Shifts the lock machining carriage left or right depending on door hand.

Feed Mode (option):

Auto In:

Door will automatically clamp in position, operator manually unclamps and exits the door.

Auto In / Out:

Door Only:

Automatically machines the door and out feeds the door.

Door & Jamb:

Automatically machines the door and jamb 1 second after jamb is clamped.

Feed (Option):

Jog FWD:

Manually controls the feed belts, shifting toward the out feed end of the machine.

Jog REV.

Manually controls the feed belts, shifting toward the in feed end of the machine.

Start Sequence (FRONT/BACK) (option):

Front:

Activates the front section with out activating the back section (lock section)

Back:

Activates the back section for multi positioning for deadbolt, without activating the front section (hinge routing).

FRONT SECTION

Commander Hinge Section:

You will need a damaged door or a cull door to use when you make your initial set up. Roll the door into the machine and pull it back against the in-feed stop. Consider this stop to be the fixed stop. It is on the left end of your machine, calibrate all the tapes for setting hinge and lock locations from this location. Please don't move this stop unless you want to calibrate every tape on the machine.

Hinge Locations:

The commander will do almost any common door size and hinge routing pattern, the versatility comes at a price however, since door swing change-overs are slower than most straight pre hanging machines when you switch from interior to exterior doors. There's a simple way to make it just as fast explained below under "Alternate Pre Hanging Set Up"

Standard Hinge Center Set Up:

Reference hinge locations from the top of the door; to the top of each hinge pocket. For instance 7'-11" hinge centers on an 80" door requires setting the first and third collars 7" and 65-1/2". To move a hinge location, loosen the appropriate collar on the shaft below the hinge router. Slide it so that its left edge indicates the measurement on the tape. Notice that there's two center shaft supports just in case your collar location overlaps. Be sure to set the collars so that the tightening screws are horizontal, or the screw heads set the ferrous proximity sensors on the router carriage. Tighten the collars firmly.

Instead of moving the collars for popular hinge patterns you can buy extra collar bars and the exchange the whole bar with another that's already set up. Three bolts secure the shaft in place. The collars can even be roll pinned in place although a nail polish or paint slippage mark make moving collars easy to spot.

Next, move the jamb reference blocks so they match the setting of the collars below. Use a "T" handle Allen wrench (provided) to loosen the set screws clamping these reference blocks in position. The white marks stamped into each block shows from which direction to read the tape.

The door and jamb cylinder clamp fixtures that slide sideways so you can center them on the jamb reference blocks. Loosen the four retaining knobs and line up the white plastic clamping pads on the cylinders with the jamb clamping blocks.

Setting the Off Feed Stop:

To machine opposite swing doors, the off feed stop needs adjustment according to the formula.

Off Feed Stop = First Hinge + Last Hinge + Hinge Size

You can now set the Off Feed Stop to the location you just calculated by loosening the socket head bolt and sliding the stop so that its left edge indicates what you calculated on the tape.

Hinge Size:

Determine the hinge size by the turret mounted on the right side of the router, and spacer pins for door and jamb backsets. Turn air pressure off at the router with the slide valve so you are able to move the router easily. Don't forget to turn it back on again before you machine doors.

Adjust hinge width by rotating the stop turret. Two stop turrets are provided for this location: on for ¼" radius bits, and one for 5/8" radius bits. On each turret, the longest bolt gives a 3 ½" hinge, the middle bolt is for 4" and the shortest is for 4 ½". The Flat side of the turret exposes a stop pin hole used for odd sized hinges, we can provide four position turrets if you determine a need for them (like alternative pre-hanging setup.) Change this pin when the radius of the hinge router changes.

Hinge Backset Door:

If you are using a ½" bit, the length of this pin will be the same as the backset that you desire. Add 3/8" to the pin length for 1 ¼" router bits… in other words use a 5/8" pin for a ¼" backset. Some machines are set up to cut completely through the stile. In this case all backset pins are 5/16" longer and no pin is used to cut through the bottom skin.

Hinge Backset Jamb:

Space stop pins limit the cutter travel up into the jamb. Notice that this pin contacts a bolt mounted to the chip out assembly. The chipout block is spring loaded up to the contact the jamb edge during the jamb routing sequence. The cutter is indexed off the edge of the jamb, to compensate for bowed jambs. Select the proper pin from the pin chart for the distance that you want to cut into the jamb.

NOTE:

If you machine jambs wider than 7 ½" turn the cylinders around so that they clamp down on the jamb. Bowed jambs still machine correctly although hinge mounting will take a bit more effort.

Exterior Doors:

When you wish to machine exterior doors you will probably need to change hinge sizes as explained earlier. Two other adjustments are also necessary.

To minimize pocket tear out; the hinge router should cut less than half the bit diameter on its first horizontal past in to the jamb; and then into the door. To make this happen you need to adjust the routers tilt in height by adjusting the cylinder stack.

The stack needs to be raised 3/8" for exterior doors and lowered the same amount to go back to 1 3/8" doors. To adjust' turn off the hinge section's slide valve; loosen the black ratchet handle that clamps the lower cylinder stack bracket in place and then turn the 4 prong black knob. The roll pin indicator in the slot will be stationary while the slot and scale (reference door thickness) will go up or down.

If no tape is present on you machine, adjust the stack so that the center of the cutter hits the lower edge of the jamb when the router swings into position on and interior jamb. Make a mark next to the roll pin. Make another mark 3/8" below the first one. When you set up for exteriors, the cylinder stack and the lower mark will rise until it aligns with the roll pin.

The second adjustment positions the chipout block so it's centered for door thickness when the router tilts in. Shut off the router slide valve and pull out the pin. Slide out the 3/8" thick steel shim with the notch cut in the middle. Insert the shim under the bracket for 1 ¾" doors, and above the bracket for 1 3/8" doors. If the jamb only needs to be raised 1/8" or ¼" Alternate spacers are included with the machine in 1/8" and ¼" thicknesses. Use both of these spacers in place or the 3/8" spacer, and arrange them above and below the chipout for proper height and spring tension.

Changing Chipout Blocks:

If you are not machining jamb, it is rarely necessary to change the hinge section chipout block because only the left edge of the cutout is likely to chip, and a block with a 5" cut in it could work for shorter hinges as well. Notice that the same block can be used with either ¼" or 5/8" radius cutters.

To minimize tear out in the jamb the chipout block should have a cut in it the same length as the hinge width.

Machining New Hinge Chipout Blocks:

To machine a new block, use a 1 ¼" diameter bit: It's awkward to make multiple passes with a ½" bit. First turn off the machine, and the routers, and slide the hinge router air valve off. Remove the pin that limits upwards router travel into the jamb, and bolt the new chipout block in place – you will need to hold the router up manually so the bit clears the new block.

Make sure that you have the proper pins selected for the hinge length (Horizontal Travel), and that the router setting is the proper depth of cut. With the router turned off, plug it into an external outlet and put on a face shield and dust mask. Hold the router up so the bit clears the right top edge of the chip out block; and cinch it on. Lower the router all the way down from the RIGHT corner. Then push it left as far as it will go. Tilt the router into the door cutting position to rout the bottom corners of the chipout block. When finished, plug the router back into its own outlet, turn it on, replace the top pin and turn the slide valve back on.

Setting the Jamb Stops:

Just as the left hand stop is the fixed stop on the Commander, the left hand jamb stop is a fixed stop. Its normally factory set for a 1/8" header clearance. Adjust the right jamb stop by reading the tape under it against the left edge of the stop.

Thinking about the examples so far with the off feed stop set at 76" setting the jamb stop at 76 1/8" would give and 1/8" head clearance. The correct pin is a ¼" long, inserted in the jamb stop for indexing flat jambs. Note that the pin length must be less than the depth of dado for the jamb to set flat against the stop.

For rabbeted jambs, use the indexing block. A pin should be selected for the block that is ½" longer than the thickness of the stop on your jamb. For example, if the stop is 5/16" thick, use a 13/16" pin. The header clearance references form the position of the jamb stop on its tape.

Alternative Set Up for Pre Hangers:

It's clear at this point that adjustments for interior to exterior doors involve more than most standard pre-hanging machines. We have a simple solution that eliminates adjustments to the hinge centers, off feed end stops and left and right shift. Unfortunately you will need to live with the same hinge centers for both interior and exterior doors.

For example, if you run 7-11 hinge locations with 3 ½" hinges on your interiors then your exteriors with 4" butts will be 6 3/4" and 10 ¾" respectively.

Here's how it works. Set the machine up normally for 3 ½" centers. We will send you a three position turret to replace the pin on the left side of the hinge router that's changed for ½" or 1 ¼" diameter router bits. Two of the turret positions will do the same thing as the pins-set the router for it diameter. The third position will be located ¼" back from the 1 ¼" diameter bit position.

We will also send you a new four position turret to replace your standard 5/8" radius turret. Three positions are standard, the fourth position is ¼" back from the 3 ½" hinge rout. When both the special ¼" back positions are selected you will get a 4" hinge rout with the same centers as the 3 ½" pocket.

All the settings for opposite swing doors will be the same as interiors since the pockets have not shifted ½" towards the right. You should color code the new turret bolts for reference. Also, when cutting 4" butts with this set up you must remember pockets will be shifted ¼" from the collar settings on the router indexing shaft.

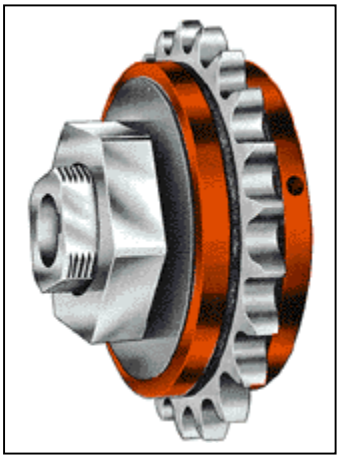
To machine special doors with centers different from your prehungs, we highly recommend using the standard turret positions – with the standard hinge center set up explained earlier. It's just plain confusing otherwise.

Double Beveled Doors:

Since, the router depth must be readjusted; change to a worn out chip out block, or a used block for beveled hinge pockets. Adjust the router to the correct depth and you are ready to go. If you need to do the jamb at the same time as the door, you will need to install beveled jamb referencing blocks (or "H" blocks) that we can supply; other wise, if you rarely rout jambs with bevel doors we suggest routing the jambs separately before changing the router to 3 degrees. You can even mount half hinges and then drive in the pins with door and jamb out of the machine.

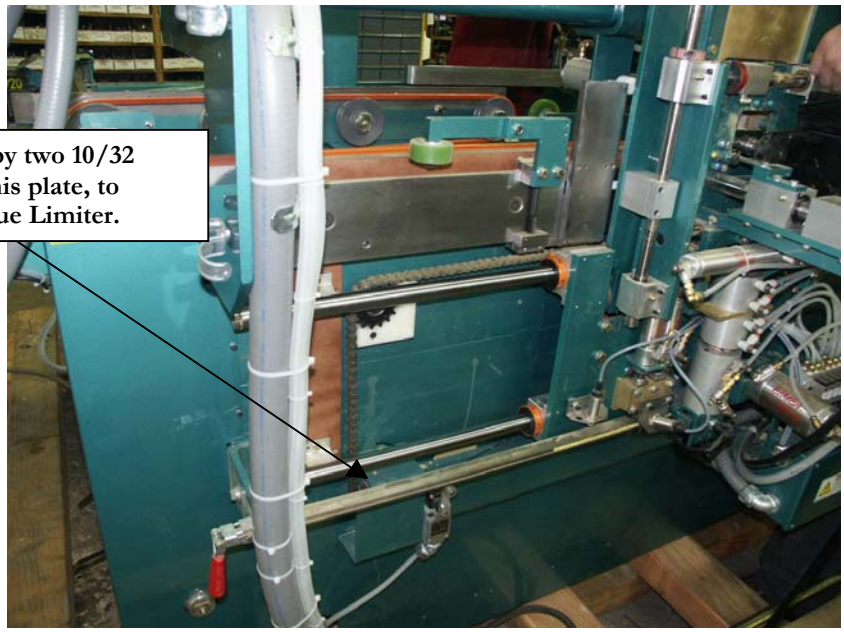
Dalton Torque Limiter OSD:

On your KVAL Commander Line's front section there is a Dalton Torque Limiter. This torque limiter is a safety device used by KVAL to ensure operator safety in the front of the machine incase of accidental start up. The torque limiter should allow the front carriage to move with a ample amount of force almost having to use your body weight. This is different from operator to operator. To adjust the torque limiters do the following.



1. Remove the plate that is covering the sprocket and torque limiter.
2. Once removed loosen the two set screws on the nut this will allow you to make your adjustments accordingly.
3. Once you have adjusted the torque limiter to its appropriate setting tighten the set screws down so that the bolt does not move.

NOTE: Do not get any grease or oil between the friction pads or the torque limiter will not work properly especially during this adjustment.



Door Hinge Backset: Bottom Pin

Standard Set Up

Cutter Radius	3/16"	1/4"	5/16"	3/8"
1/4"	3/16"	1/4"	5/16"	3/8"
5/8"	9/16"	5/8"	11/16"	3/4"

With Cut through the Bottom Skin Set Up
*** Optional - Requires modified H Blocks**

Cutter Radius	3/16"	1/4"	5/16"	3/8"
1/4"	1/2"	9/16"	5/8"	11/16"
5/8"	7/8"	15/16"	1"	1 1/16"

Jamb Backset: Top Pin

Cutter Radius	1 1/8" Pocket	1 3/8" Pocket	1 5/8" Pocket
1/4"	2"	1 3/4"	1 1/2"
5/8"	2 3/8"	2 1/8"	1 7/8"

*** 3 Degree Special Set-Up Information:**

***When cutting at 3 degrees you must subtract 1/32" from the Jamb Pocket Top Pin AND Door Hinge Backset Bottom Pine.**

***From zero degrees to 3 degrees your overall pocket decreases 1/16".**

Setting Up For a Cut Continued

1 3/4" Door w/ 4" hinge 5/8" Radius

- Turn off Slide valve.
- Put Front section turrets to middle position.
- Put 2" Jamb pin in.
- Adjust router tilt in height up 3/8"
- Adjust 1/4" shim on top of spring for chipout tilt-in clearance.
- Install 5/32" pins for jamb height.
- Turn on slide valve

1 3/8" Door 3 1/2" Hinge 5/8" Radius

- Turn off slide valve.
- Put front section turrets on longest bolt position.
- Put Jamb pin in 2 5/16"
- Adjust router tilt in height down 3/8".
- Adjust 1/4" shim on top of plate for chipout tilt in clearance.
- Remove 5/32" pins for jamb height.
- Turn on slide valve.

	1/4" Radius		5/8" Radius
Hinge	Left	Right	Left
4 1/2"	1/4"	1 1/8"	5/8"
4"	1/2"	1 3/8"	7/8"
3 1/2"	3/4"	1 5/8"	1 1/8"

Commander Exterior Door Reveal Adjustment

The chipout block on the router carriage serves two functions; (1) to reference off the jamb, (2) reference off the door. When changing either the reveal measurement, or the thickness of the door, it is necessary to adjust the position of the chip out block relative to the new thickness and reveal

measurement. The chipout adjustment shims on the top of the routing carriage need only be added or removed; Spacer Stop pins inserted into the "H" block, and adjust the cylinder center line.

To adjust reveal for different thickness exterior doors, there are a few simple steps to follow:

1. Turn off electrical power and air supply.
2. Place the appropriate Spacer Stop pins into the "H" block (behind the "H" block as you face the machine).
3. Insert or remove the chipout adjusting shims at the top of the routing carriage as necessary.
4. Loosen the handle at the base of the routing carriage (below orange pancake cylinders).
5. Turn the round knob just above the handle you have just loosened to adjust the stroke of the cylinders (Cylinder Centerline Adjustment Knob)
6. Re-tighten the handle above the cylinder centerline adjustment knob
7. Turn on electrical power and air supply.

High Frequency Router Depth Adjustment:

The High Frequency Router has special adjustments based on a turrets and 2 set collars. Loosen the 2 set collars and rotate the turret to the desired bolt for the proper depth that you want to rout the hinge pocket at. See the following pictures.

Turret Bolts for the Hinge Depth

Set Collars for Depth adjustments.

SETTING UP THE BACK SECTION:

Commander Lock Section:

Lock Section Location:
LEFT and Right (Standard) before moving the lock section, it must be unclamped. The lock section, positioned with an air operated clamp attachment, squeezes the upper bearing shaft on the right hand side of the lock carriage. This clamp releases by flipping the toggle valve marked "Clamp" on the handle bar to the "OFF" position. If the machine clamps the door and you want to move the lock section for a second lock: flip the "index" toggle valve to the "OFF" position also. This will release the self centering chip out clamp as well as the edge clamping, while maintaining the claming on the front side of the machine. The indicator on top of the lock section reads the distance from the fixed in-feed stop. For determining the lock location for doors machined off the off feed stop uses the following formula:

LOCK SETTING = OFF FEED STOP LOCATION – LOCK LOCATION

LEFT and RIGHT Shift with Multi-Stop for Locks Section (OPTIONAL):
This system uses a "pickle fork" attached to an air cylinder to position the lock section. A 1" shaft is mounted behind the indicator tape parallel to the bearings shafts. Clamp collars to the shaft at common lock locations. On top of the indicator tape, little clamp on indicator arrows can locate positions corresponding to the collars. To move the lock section, flip both the clamp and the index toggles on the handlebar to the "off" position. This will unclamp the shaft clamp, retract the indexing "pickle fork" and release the self centering and edged clamping of the lock section, even if the door is clamped (in this case, the door and jamb clamps will remain clamped). Now, push the handlebar so that the lock indicator is within ¼" of the desired location and flip the clamp and index toggle valves to "ON".

To initially set up the collars

1. Use the tape reader to position the lock section.
2. Clamp the lock section with only the "Clamp" valve.
3. Go behind the machine, loosen up a shaft collar and move it directly above the "pickle fork"
4. Activate the "index" valve, thus trapping the collar with the "pickle fork".
5. Tighten the shaft collar securely.
6. Attach on the indicator arrows above the tape in line with the indictor attached to the lock section.

OPERATING INSTRUCTIONS

LOCK BORE OFF, REG, DEEP:

The REG command machines bypass doors. The "DEEP" command machines normal bores and, different diameter cylinder and dead bolt holes, without having to remove the drill bit. Use the "DEEP" command to access the second larger diameter cutter on the shaft.

LOCK BORE DIAMETER

Lock out air and electrical service. Use the collet wrenches to put in the appropriate face boring bit for the diameter hole to be bored. Any time you use different size diameter bit, USE A NEW CHIPOUT BLOCK.

WARNING!

If CHATTERING, SMOKE or EXCESSIVE NOISE occurs at any time during the operation of the lock bore drill, HIT THE EMERGENCY STOP IMMEDIATELY. Check lock bore set up, or the drill bit alignment with the chipout block, and the aluminum chip out block housing could end up being machined along with your door!

LOCK BORE BACKSET

CAUTION: Change chipout location and face bore AT THE SAME TIME. Turn OFF the AIR AND ELECTRICAL services. Tag and Lock out the machine. Failure to follow these instructions may cause expensive damage to the bit and the aluminum chip out support bracket.

To change backset you must align the bottom drill with the chipout block housing:

1. Loosen the shaft set collars on chipout housing shafts.

2. Turn the rotating stop turret until the desired backset is attained. Use the chart below for specific backset measurement information.

BACKSET	TURRET BOLT LENGTH
2 3/8"	SHORT
2 3/4"	MEDIUM
5"	LONG

3. Push chip out block housing firmly against the stop bolt.

4. Re tighten shaft set collars.

5. Repeat same procedure for drill.

MAKE SURE CHIPOUT AND DRILL ARE ALIGNED PROPERLY!

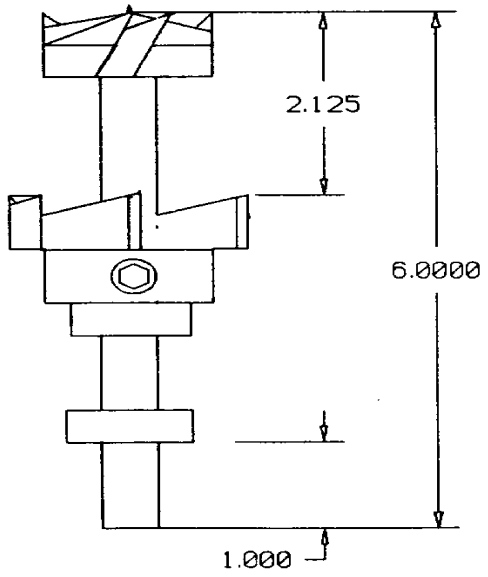
ADJUSTING BACKSET TURRET BOLTS:

The drill and chipout block must align with the drill or the chipout block will become egg shaped. In other words, the two short bolts may not be the same, but they need to each be 3/8" shorter than their respective middle bolt, and 2 5/8" shorter than their respective long bolt.

Extensions for the chipout shafts and the face drill bearing shafts are included for drilling a 5" backset. The extensions are stored beneath the bolt drill. They can be left in place on their respective shafts if you do not need the additional clearance for machining narrow doors.

TWO STAGE FACE DRILLING

It is possible to drill two different diameter holes with the same cutting tool. The drawing represents a 2 1/8" counter bore bit mounted on the shank of a smaller diameter bit. Care must be taken that 2 1/8" be maintained between the tip of the ring cutter teeth and the teeth on the main cutter or door face tear out will result.



Turning the selector switch to REG allows the smaller bit to drill through the door - but not so deep that the counter bore touches the door. "DEEP" sends the counter bore all the way through the door until it just etches a groove in the chip out block.

IF THE DRILL TRAVEL IS WRONG HERE ARE SOME SUGGESTIONS:

You may need to adjust the bit's depth position in the collet.

TO ADJUST:

(1**) Slide the bit in or out, and relocate the collar so you will have a reference for the next time you use this set up.**

(2) **Adjust the limit switch arms (REG and DEEP trigger points), or the actuating rod that trips the arms. The limit switch actuating rod is threaded and drilled to accept a 1/4" shank stop pin. With a 3/16" stop pin installed the machine is properly adjusted for machining 1 3/8" thick doors or, with no stop pin installed for machining 1 3/4" thick door. MAKE SURE THE CORRECT STOP PIN IS INSTALLED FOR THE THICKNESS OF THE DOOR YOU ARE MACHINING.**

Face Plate Set Up:

Always be sure the machine is turned off and disconnected from air when making adjustments to the lock sections. Also, be sure that the drill motors have come to a complete stop.

The size of the face plate is determined by four stop pins. Two of these are mounted on rotating turrets.

Plate Length:

To adjust the plate length or horizontal travel,, change the two pins. If the plate router is set up for a 2 1/4" cut, it will be necessary to remove the bolt which holds the right slotted stop in place. Consult the pin chart in the manual for pin lengths.

Plate Width:

Plate Router Vertical Travel - Plate router vertical travel is established by rotating stop turrets like those found on the hinge section. These turrets have four positions: setups for 1" and 1 1/8" for either a square edge or a three degree beveled edge.

The bolts are color coded:

- Red = 1" Square Edge
- Blue = 1 1/8" Square Edge
- Silver = 1" Beveled Edge
- White = 1 1/8" Beveled Edge

Notice that no changes need to be made to these turrets in order to change among doors of varying thicknesses since the lock section centers the door when it clamps. If for some reason the face plate is not centered on the latch hole, you can adjust the screws that contact the turret bolts. If both the plate and latch hole are off center contact KVAL for instructions on shimming the self centering clamp system. In no case should you adjust the bolts in the turrets since these are micrometer set at the factory. Self Centering For 2 1/4" Thick Doors May Require Moving The Roller Wheels On The Lock Section To The Lower Set Of Holes, Diagonally Adjacent To Each Of The Present Wheel Mounting Locations.

PLATE ROUTER DEPTH:

The router ring sets plate cut depth. When the machine is set up to machine three degree bevel face plates the router needs adjustment inwards. Use pencil marks on the router motor to set square and bevel depths.

SWITCHING TO BEVEL PLATES:

There are handles attached to the two position blocks that restrict the pivot in position of the face plate router. The blocks have half round notches cut at different depths that mate with the upper shaft of the face plate router carriage. To adjust for bevel plates, loosen the ratchet handle on the front of the lock section, then pull up all the way on the 4 pronged handle before re tightening the ratchet handle. Repeat this process on the other end of the lock section.

If you have any problems with inconsistent plate depth be sure that both bevel locks are mating correctly with the upper router carriage shaft. Stop nuts attached to the upper 4 prong knobs make adjustments straight forward.

SIDE DRILL (LATCH HOLE):

The side drill bit has a 4" long fluted section. For 5" back sets and over bored dead bolts you'll need to put in a 6" bit. Be certain the machine is locked out electrically and disconnect air service. Finally, wait until the bit has come to a full stop before getting out the collet wrenches. Be Certain That The Face Plate Router Depth Is Correct And That The Router Cord Is Fastened To The Router; Otherwise The Long Bit Will Eat The Router.

`Before setting up the back section you should test the various assemblies without bits or cutters installed to ensure that everything is functioning properly.

1. Remove the two drilling bits from both the lock bore and the side drills, and back out the plate router so that it won't drag on the door edge and turn it off using the router switch

2. At the control panel turn on the lock bore and side drills and bolt plate router, and turn the back/front/both selector to back.

3. Turn on the control transformer and press the start machine button, push the start sequence button at the operators panel

4. Lock bore and router should come up at the same time, and move through their respective motions

5. Lock bore and routers lower

6. Bolt drill will then move inward.

Check to ensure the cycle performs as previously stated. Look for sticking or uneven movement of each assembly. Look for physical obstructions interfering with proper movement of the assemblies.

Once the back section is running smoothly, replace the two drill bits in to the respective collets, turn on and push in the plate router using the Acuflex wrench. Fine a cull door you can ruin and make a practice cut following the next few steps.

After the bits have been installed you are ready to put a new chip out in by removing the two 1" collars in front of the chip out housing. Then you can slide the whole assembly off to expose the old chip out for easy replacement. There are four 1/4" flat head bolts that hold the two plates that hold the chip out in place. By loosening one side of the plate you can remove the old chip out and replace it with a new one. It is critical that the chip out is tight and flush with the tow brackets otherwise the chip out can vibrate loose.

1. Load the door into the machine.

2. Clamp the door in place using the 'Door Clamp' foot pedal.

   * Be careful to avoid the pinch points such as between the hinge router faces, H blocks, door edges, etc…

3. Press the 'Start Sequence' Button.

   Note: Pressing the 'Door Clamp' foot pedal should bring in the lock section and pivot down the jamb clamps / chip-out assemblies.

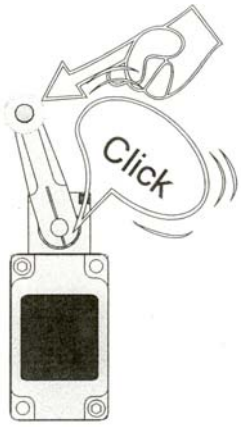
Chapter

4

TROUBLE SHOOTING

LIMIT SWITCHES

If a machine suddenly stops in mid cycle check the limit switches, a worn limit switch arm or a misadjusted limit switch is more than likely the cause. Depending on the model of limit switch you receive the amount of "pre-travel" (amount of movement from the arms resting position) is either 5 or 20 degrees before the limit switch actuates (Clicks). If the arm is moved to the full extents of its travel and you do not here the limit switch "Click", the switch needs to be adjusted here is how you adjust it follow the following drawings.



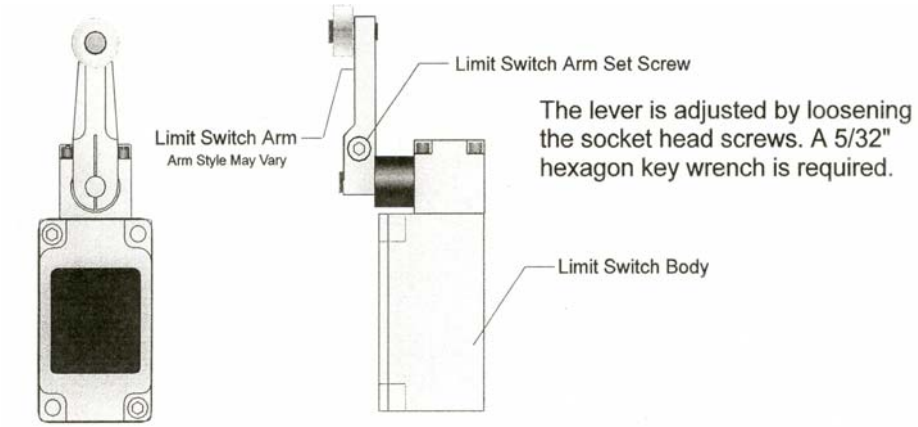
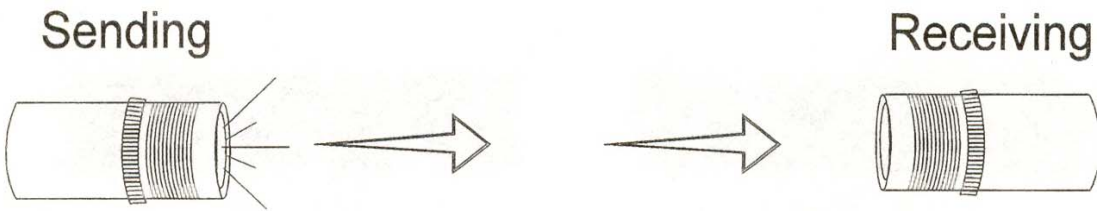
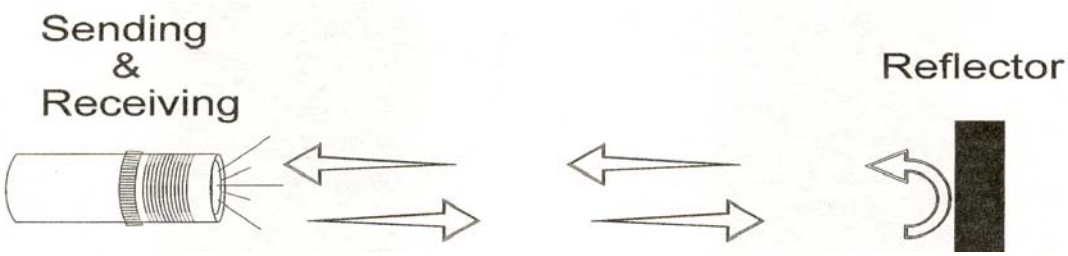


PHOTO EYES



The sending and receiving eyes "talk" to each other when the beam between the two is broken by either a door a moving part on the machine such as the thru beams, these beams may either stop operation or initiate operation depending on their location and function.



The sending and receiving units are in one unit, these operate in the same manner as the ones described previously.

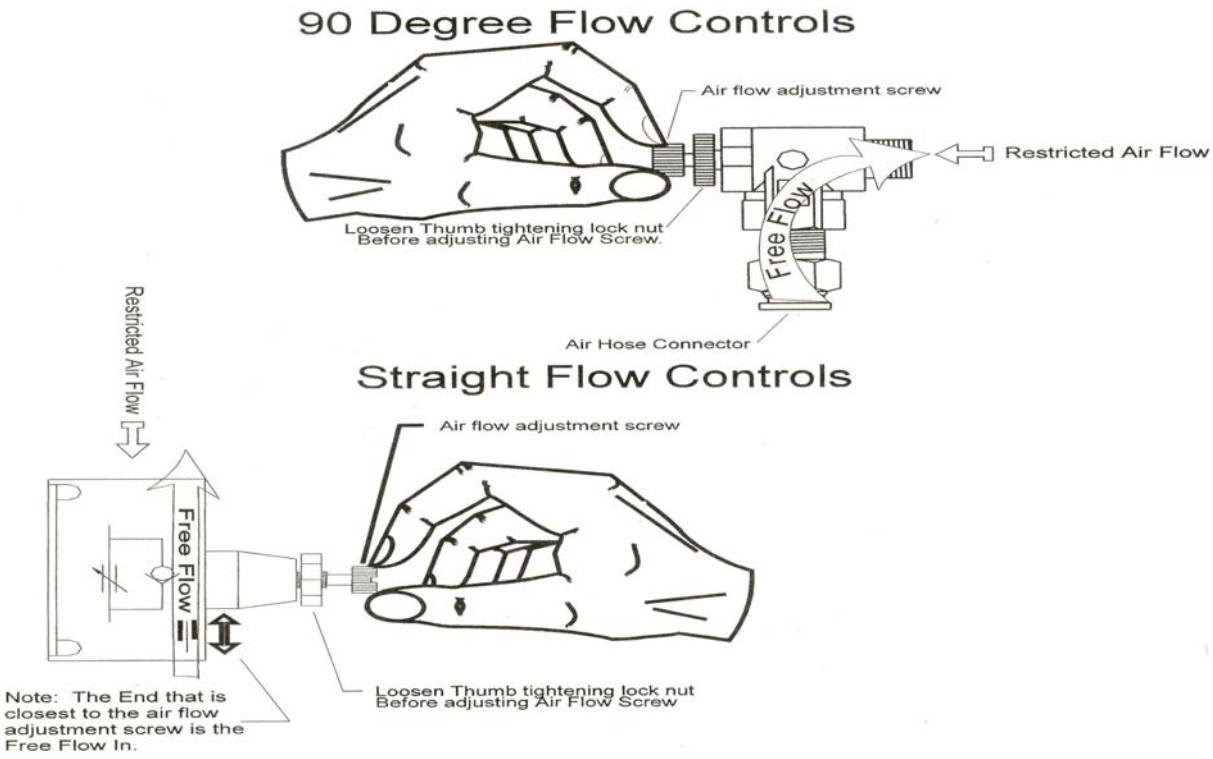
Note: When a machine stops for no reason it is usually the fault of dirt photo eye or a misaligned limit switch arm.

GENERAL AIR CIRCUITRY TROUBLE SHOOTING

IF A CYLINDER IS NOT FUNCTIONING CORRECTLY HERE ARE A COUPLE OF ITEMS TO CHECK:

1. Check the air pressure to the machine.

2. Check the flow controls to see that they are adjusted correctly and to the proper specifications.



3. Check for and obstructions to the cylinders such as screws or a misplaced tool etc… * FOLLOW ALL SAFETY GUIDELINES AND SIGNS DURING THIS PROCESS.

4. Check the air valves:
   The air valves can be manually operated by pushing the slotted button on the end of the valve. If you wish to keep the valve open, the push button assembly can be removed using and open ended wrench and inserting a 3/8" N.C. cap screw. DO NOT over tight when reassembling the valve.

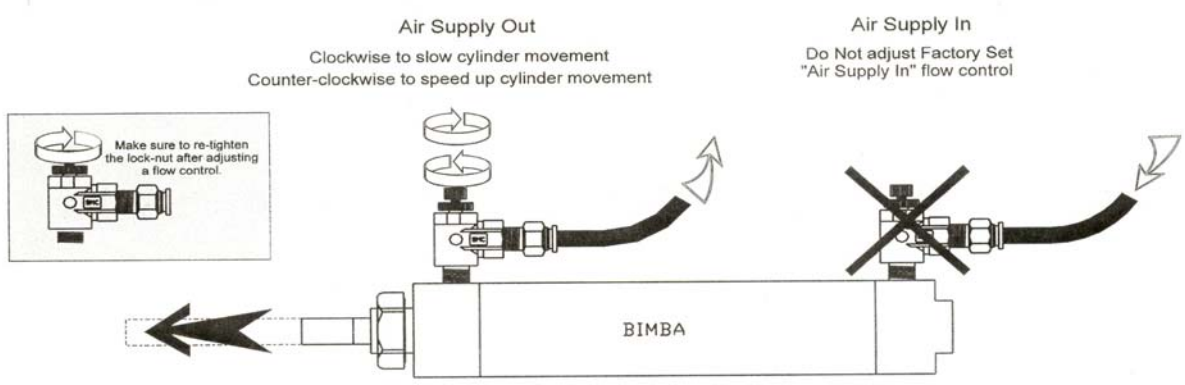
5. If the valve seems to be leaking, the seals may be dry or contaminated with water or it maybe that the cylinder "O" rings are damaged and air is passing from one side to the other side of the cylinder. It maybe is necessary to purchase a rebuild kit or a new cylinder.

6. If the valve is not receiving an electrical signal, see "Electrical Trouble Shooting" instruction. It might be necessary to call in a specialist or check with KVAL customer service at 1-800-553-5825
   If an Air Leak is coming from an exhaust port on the air bank:

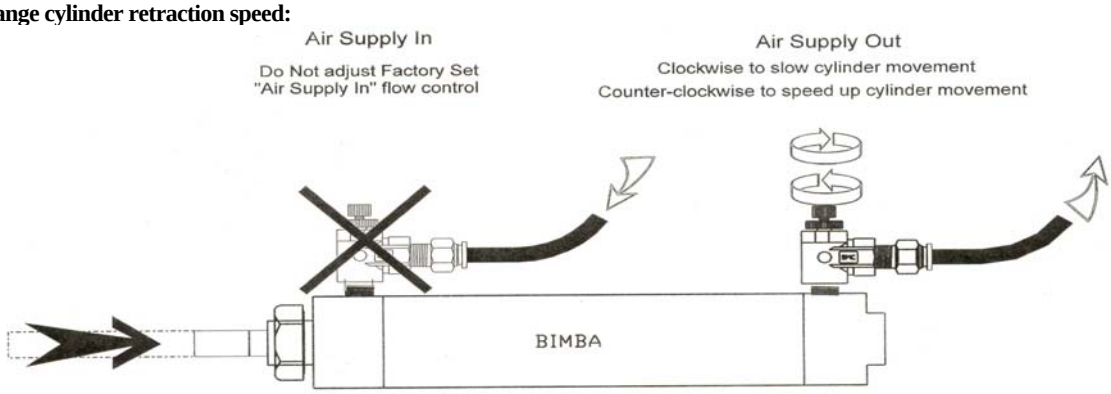
Check the solenoid for the manual override. If the solenoid has a manual override you can push each of the buttons one at a time. When the air leak stops or weakens it usually means that one or more of the cylinders that the solenoid is operating are faulty.

Adjusting the flow controls to change the cylinder extension speed is done by the following drawing. Please review this drawing as this adjustment is not done in a normal manner.

To change cylinder extension speed:



To change cylinder retraction speed:



BASIC ELECTRICAL TROUBLE SHOOTING

The electrical component systems are designed to expedite the troubleshooting process and minimize "down time". In general, component systems have the input or feed functions at the top. Output or load functions are positioned at the bottom. Most two voltage electrical panels are designed with the LOW VOLTAGES on the LEFT, and the HIGH VOLTAGES on the RIGHT. The majority of the system components are labeled with numbers that correspond with the electrical prints included in the electrical box door.

Computer controlled machines have signals on the computer that light when the input or output functions are energized, respectively. Computer controlled as well as non-computer controlled machines have white lighted, 120V control power terminal strips. This will indicate power supply from the respective circuits.

Idec controllers also have lights on them for the input and output functions. You can easily find out which circuits are failing by watching the lights turn on or off. Compare the lights on the IDEC controller to the electrical diagram to determine what systems are being affected.

IF THE POWER STOPS DURING NORMAL OPERATIONS: DE-ENERGIZED:

1. Check that the input disconnect switch is not turned off.
2. Check that all of the emergency stop buttons are in the normal position.
3. Lock Out and Tag Out the main power source.
4. Turn the panel disconnect switch in the off position, open the electrical panel door.
5. Observe the disconnect switches. Look for loose or broken wires at the disconnect then at all of the components.
6. Check for continuity of all fuses with an OHM meter.
7. Check motor overloads by pressing each white button (usually at the bottom of the panel in SEQUENCE, if one is tripped there will be a slight resistance to touch and a click as it is reset.

DANGER

The following checks will require the electrical panel to be energized these trouble shooting checks MUST BE PERFORMED BY A QUALIFIED ELECTRICAL TECHNICIAN.

1. Remove lock and tag outs on the main power sources

2. Manually close disconnect switches and energize the control circuit or transformer with its respective switch. Observe that the numbers 1, 3 & 4 are lit on the white lighted terminal strip.

3. This tells you that there are no overloads or emergency stops tripped. On computer controlled units, make sure that the POWER and RUN lights are lit at the lower left of the computer.

4. Most electrical problems are related to mechanical malfunction (i.e. stuck motors, jammed chain, non tripped limit switches, etc...) The most common failure is an improperly adjusted limit switch. To check a limit switch, manually operate the limit switch. If the computer terminal strips lights, the switch needs to be re-adjusted. For more information on the limit switch see the manufactures information at the end of this manual.

5. If a solenoid valve is suspected, and not cleared in the air checks section mentioned previously, it can be electrically jumped to check operation.

FRONT SECTION DOES NOT FUNCTION PROPERLY

FRONT SECTION IS NOT TURNED ON AT THE CONTROL PANEL:

1. The front section will not operate if the front/back/both selector switch at the control panel is not turned to either front or both. Check to ensure that this switch is properly selected.

THE SIX SHOOTER IS NOT MOVED FULLY TO THE RIGHT:

1. The front section will not operate if the Six Shooter has not been rolled all the way to the right at its home position and makes contact with the limit switch located at the upper right corner of the Six Shooter track frame.

THE THROUGH BEAM LENSES ARE DIRTY:

1. In order for any of the photo eyes or through beams to operate correctly they must be clean. Wipe off any dirt, grime, or saw dust and check for operation again.

SOMETHING IS WRONG WITH THE CYLINDERS THAT MOVE THE FRONT SECTION

MOVE FRONT SECTION TO THE "IN POCKET POSITION" THEN DO THE FOLLOWING:

1. Check to ensure that the 8" and 1 7/8" cylinders are all fully extended.

2. Check to ensure that the 1-1/4 cylinders are fully retracted.

ONE OF THE CYLINDERS IS BAD:

1. Check each cylinder on each front section assembly, looking/ listening for air leakage from the seals, connecting air lines, valve bank that operates the cylinder or cylinder stack.

THE ALIGNMENT OF THE CYLINDER SHAFTS IS OFF:

1. The shafts that connect the 8", 1-7/8" and 1-1/4" cylinders together in order to position the front section in different heights in order to perform various front section functions must be perfectly aligned to prevent binding, which will cause improper extension/retraction of the cylinders. Check the alignment and adjust as necessary.

THERE IS AND OBSTRUCTION BLOCKING THE THROUGH BEAM:

1. Look to see if there is wood or tools blocking the free travel of the carriage. Check that the air pressure is at operating specifications, and adjust as necessary. Check the air cylinder to see if the seals are bad.

2. One of the router cords maybe dangling in front of a photo eye (or its line of sight). Check to ensure that all router cords are properly tied out of the way.

GUARDS ARE MISS-ALIGNED:

1. Check that each of the guards is squarely positioned on the front sections(s); adjust as necessary. This is a common problem if the guards were removed for maintenance.

THROUGH BEAMS ARE NOT LINED UP:

1. The through beams, which focus through each of the four front section routing assembly guards (through the holes drilled through the sides) must be accurately aligned for proper operation. To make sure that your through beams are correctly aligned by running a piece of string from one photo eye, through each of the router guards to the photo eye on the other end of the machine. Check to ensure that the string aligns directly from the center of the photo eye lenses, through the center of the holes, on a level plane. If they don't then adjust the photo eye brackets until they do.

2. Alignment can only be accomplished when the front section is up and ready to go into the pocket. Loosen the (2) ¼-20 bolts on the photo eye brackets to adjust.

FERROUS PROXIMITY EYE THAT CONTROLS THE ROUTER CARRIAGES MOVEMENT DOWN AND TO THE RIGHT IS OUT OF ADJUSTMENT:

1. Make sure that the ferrous proximity switch is clean and close enough to read the metal flag that it is looking for in order to initiate the next phase of its cycle of operation.

ONE OR MORE THROUGH BEAMS ARE BAD:

1. When the front section is down and out of the way, the through beams should light up to indicate that they are operating. If they don't light up replace.

ENVIRONMENT TOO COLD:

1. The lubrication required for smooth movement of all assemblies must be sufficiently warm to afford any of its viscous qualities. If it is very cold in your shop it will prevent smooth movement of the front section (as well as other assemblies). Let the machine dry cycle for a while to see if range and smoothness of motion returns. If the warm up time helps the problem put a heater near the machine to keep the oil from coagulating.

WIDTH ADJUSTS DOESN'T FUNCTION PROPERLY

WIDTH ADJUST PHOTO EYES ON BACK SECTION ARM ON IN FEED SIDE ARE POSITIONED TOO CLOSE TO THE EDGE OF THE DOOR:

1. The width adjust photo eyes on the back section arm on the in feed end of the machine should be positioned so that there is a 1 ¼" gap from the center-line of the photo eye to the edge of the door. This allows the back section to move in tighter against the door. Note: to shrink the distance between the "H" block and the back section, move the photo eye toward the back of the machine. To increase the distance between the "H" block and the back section, move the photo eye closer to the front of the machine.

UNSATISFACTORY HINGE POCKETS

FUZZY HINGE POCKETS:

Fibrous debris with a peach fuzz appearance around the perimeter of the hinge and face plate pocket usually is a good indication that your router bit is dull, and needs to be replaced.

It might also indicate that the speed in which the router is moving within the pocket is to fast.

RING AROUND THE POCKET:

This is an indication that the arbor is running out, or the arbor is not tight in the router collet.

Another tip is to check the router bit and see if the carbide tip has a chipped tip.

FEED SYSTEM SURGING:

If the feed system surges at high and low speed, it usually means that the IR comp on your DC drive board needs to be adjusted. Call a KVAL technician for more information.

FEED SYSTEM MOVING DOORS TO FAST:

If the feed system is moving doors into the door stop to fast check the DC drive board. It may be that your maximum speed is set too fast and is not allowing the machine to react to the door before changing to slow speed. To adjust, slow your speed down.

If slowing the maximum speed down does not remedy the situation, you may need to lower your minimum speed. Minimum speed should be set to a smooth crawl.

SETTING UP BOLT PLATE LENGTH:

The Commander is capable of machining bolt plates 2" to 12" long. To adjust the bolt plate length simply adds or removes telescoping spacer pins as required. Make sure that the same amount of spacer pin is added to both the left and right sides.

LOCK BORE TWO STAGE FACE DRILLING:

It is possible to drill two different diameter holes with the same cutting tool. The drawing represents a 2-1/8" counter bore bit mounted on the shank of a smaller diameter bit. Care must be taken that the 2-1/8" be maintained between the tip of the ring cutter teeth and the teeth on the main cutter or door face tear-out will result.

Turning the selector switch to REG allows the smaller bit to drill through the door but not so deep that the counter bore touches the door. Deep sends the counter bore all the way through the door until it just etches a groove in the chip out block.

It is important when switching from 1-3/8" doors to 1-3/4" thick doors that you use the proper shims to make the difference up between the two door thicknesses. There is a pin holder located next to the lock bore motor that engages the two limit switches which dictate where the cutter stops its movement in the door.

The pin holder holds a 3/16" pin, ½ the difference between the two door sizes by adding the 3/16" pin when machining a 1-3/8" door; it will limit the travel so you don't destroy the chipout.

The side drill bit has a 4" long fluted section. For 5" backsets and over bored dead-bolts you'll need to put in a 6" bit. Be certain the machine is locked out.

Our Mission: Innovation, Quality and Honesty!

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