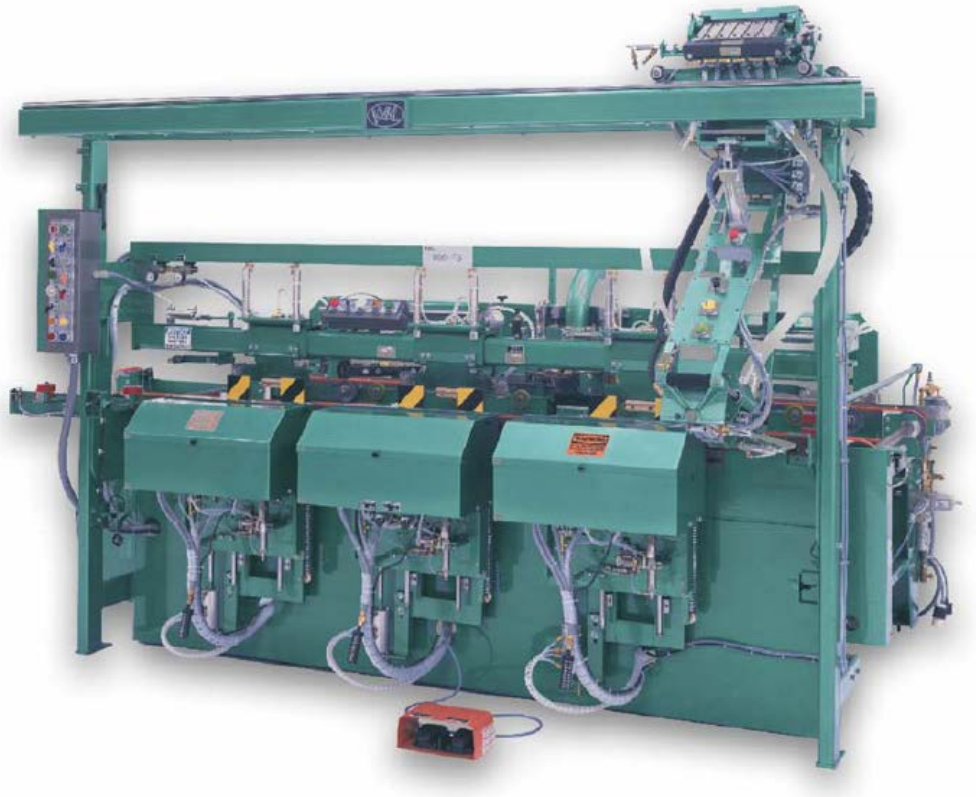
Innovation, Quality & Honesty

990F-3 Pre-Hanging Door Machine Reference

Published: September 8, 2006



Proprietary Notice

Contacting KVAL

Customer Service: For further information about this manual or other Kval Incorporated products, contact the Customer Support Department

- http://www.kvalinc.com/customer_service.html (lists all the representatives, including email addresses and phone numbers)
- Mailing address:
  Customer Support Department
  Kval Incorporated
  825 Petaluma Boulevard South
  Petaluma, CA 94952
- Phone and Fax:
  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 or fax (707) 762-0485
- Business hours:
  Technical Support: 4:00 AM to 4:30 PM Pacific Standard Time, Monday through Thursday
  Friday Technical Support: 4:00 AM to 3:30 PM Pacific Standard Time
  Parts & Service Sales: 6:30 AM to 4:30 PM Pacific Standard Time, Monday through Friday
  (Other sales related inquiries: http://www.kvalinc.com/contact_us.html)
- Email: service@kvalinc.com

Returning Parts or Equipment to Kval

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.

Before returning parts and/or equipment to Kval Inc., please call Kval at (707) 762-7367 to receive an RMA number (Return Merchandise Authorization number). To return parts and/or equipment, please follow the detailed instructions found under "Returning Parts or Equipment to Kval."

Your Feedback is Welcome: To help us design products that make your job easier and your business more successful, we'd like to gain your perspective about your *user experience* with our product – that is, the manual, the machinery, the software, etc. What was easy or difficult to use or to learn? If you could change something about the design, what would it be? If you had a problem, did the manual or software troubleshooting tools help you out?Please email your comments and suggestions for improvement to userexperience@kvalinc.com. (**NOTE**: This is not a way to get customer support. For that, please refer to the Customer Service contact information above.) Thank you!

Congratulations on your purchase of a new KVAL 990F-3

This manual is designed with safety in mind. At Kval, our goal is for you to begin safe and fast production with this machine 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.

Table of Contents

Chapter 1: Introduction

Customer Service Information

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* Note

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

When you call:

Have your Packing Slip and/or invoice #'s available

Have reason for return available

When sending merchandise back:

Make sure that the Item(s) you are returning are securely packaged and well protected from shipping damage.

Including Packing Slip #

Include your RMA # with the parts package.

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.

SEE SECTION "UNCRATING THE 990F-3" FOR INSTRUCTIONS ON UNCRATING AND SET-UP.

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 Information

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 harm or death.

Safety Procedures

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.

Lock-out/Tag-out Procedure

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

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

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

Obtain lock and tags from employer.

Shutdown machine(s) by normal means, i.e., disconnect switch(es), air pressure relief valve(es), 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.

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

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.

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.

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

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

• **Accidental 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 Locks and Tags**
   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.**

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-Out/Tag-Out Procedures.
Comprehensive Lock-Out/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-Out/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-Out/Tag-Out procedures, and that those around you do also.

YOUR LIFE MAY DEPEND ON IT.

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 990F-3 is a high-speed pre-hanging door line with the additional flexibility to machine 6'8" doors for three hinges and up to 8' doors with four hinges. Change over from one door to another door takes only a couple of minutes and requires no tools. The 990F-3 can be equipped with the optional Six-Shooter to install 3-1/2" X 3-1/2" hinges, as well as the optional Eight-Shooter which can install the 4" X 4" hinge. This machine is usually configured with a door handler and a 700-C assembly machine with 8' 0" capability with the 960-3 jamb router.

The 990F-3 is designed to run 1-3/8" and 1-3/4: doors with a minimum width of 18"and a maximum width of 48" and door lengths from 6' 8" to 8' 0". The machining includes an automatic routing of either 3-1/2" to 4" hinge pockets, on both the door and jamb, and a cylindrical lock with face plate. The cycle time is approximately 10 seconds. Hinges maybe attached by hand or by the optional Six-Shooter or Eight–Shooter while the door is still clamped in the machine. Total running time varies from door to door about 35-55 seconds. However this depends on the operator and the material flow.

This machine is equipped with a solid state touch screen that replaces the mechanical switches in previous versions. The touch screen has the capability to view the status of the photo eyes and switches for quick diagnosis of many common problems, with out having to open the electrical panel or even the operator leave his work station. Also the touch screen includes daily and lifetime totals for doors.

Uncrating the 990F-3

Receiving the 990F-3:

The 990F-3 is crated before shipping to protect the machine from damage that might occur while in transit to your location. The vast majority of the time our machine arrives intact, but unfortunately sometimes that's not the case. When you receive you machine, look it over for missing bolts, or part box(es) that have shaken loose in the truck.

Uncrating your Machine:

When you receive your machine all the moving assemblies have either been taped, banded, or painted set collars installed to prevent any movement during shipping. Before beginning set-up procedures, make sure that all shipping materials have been removed.

Tools Required:

Hammer

Pair of wire cutters

1/2" Ratchet, 13/16", 15/16", 3/4" sockets

Razor blade knife

Floor Jack

Fork Lift

3/16 Long "T" handled Allen Wrench

Uncrating Procedure:

If machine is fully crated remove all the 1” X 6” boards from the crate and the 2” X 4” frame.

Move the machine to its approximate location.

Carefully cut and remove all banding and tape from part boxes, electrical panel, control panel, buttons, knobs and switches.

Bolt the electrical box to its proper location on the machine frame.

Un-bolt and remove the cross pieces from the skids.

Remove the lag bolts that secure the machine to the skids from the four foot pads at the corners of the machine.

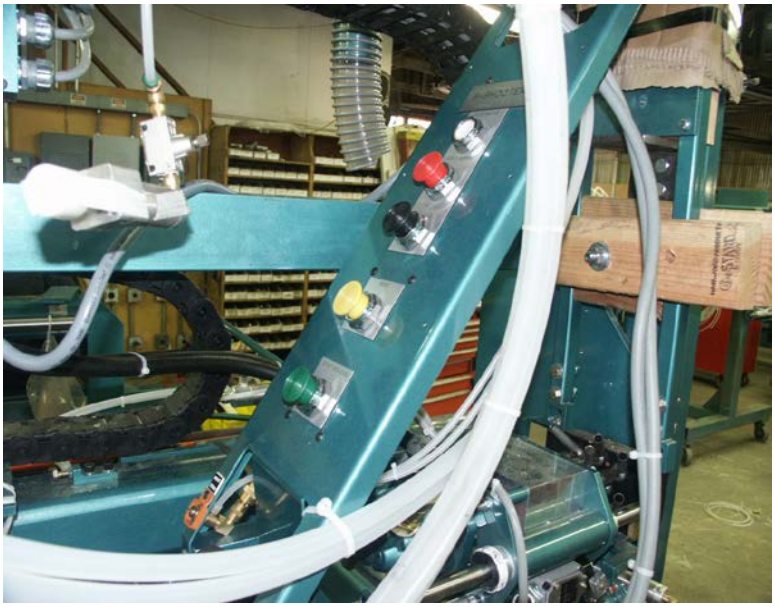
Jack up one end of the machine above the skids.

Carefully pull skids outward far enough that when the machine is lowered the frame rests on the ground

Remove all the painted set collars securing the various assemblies in their shipping locations

Remount / Insert all routers and bits provided in the part boxes.

Remounting the Six-Shooter:



KVAL partially disassembles the Six-Shooter to protect it during shipping.

Many of the air hoses have been disconnected from the screw receiver block for safe shipment of the 990F-3

A block is banded between the hopper and the pedestal it is mounted to.

The screw driving unit is split from the hopper assembly at the pivot. Then the screw driving unit is rotated 90 degrees and bolted to the vertical tube at the right hand corner of the machine.

The hopper assembly is shifted about 2 ft. to the left of the screw driving unit and bolted in place

Re-assembly:

Remove any tape or banding from the screw driving unit and the hopper assembly.

Unbolt the hopper assembly from its mounting location.

Unbolt the screw driving unit from its mounting location.

Rotate the screw driving unit so that the hand grip is pointing outward.

Attach the screw driving unit to the pivot point on the hopper assembly.

*This equipment is fairly heavy and caution should be used when remounting and assembling the Six Shooter. If there are any questions about this process please call KVAL'S Customer Service Department.

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.

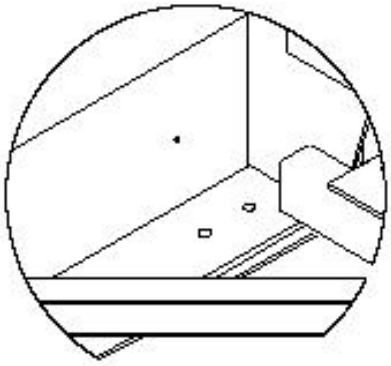
- **Standard Anchoring Instructions:**

  * 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 a blowout-bulb or 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 bolt to break off.

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



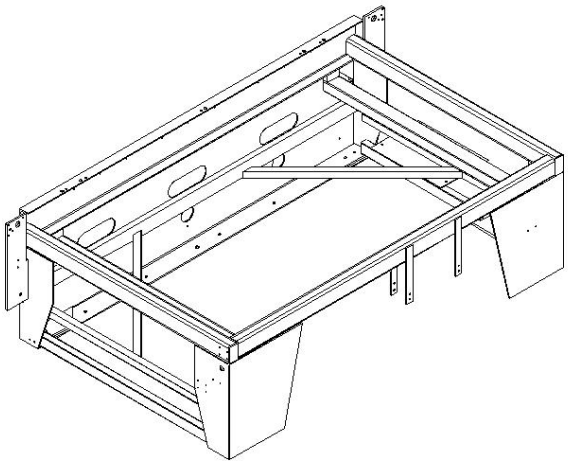
- **Anchoring Instructions using Epoxy:**

  * 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 blowout-bulb or 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 at room temperature.



- * After recommended cure time, bolt in place**.**

Chapter 4: Operation

This chapter introduces the 990F-3's operational structure and gives instruction on operating the machine.

Touch Screen Panel Operations:

First Screen:

The first screen that will be present upon machine start-up will be the following screen. There are five different options from which to choose. They are: Auto Run, Maintenance Feed & Width, Maintenance Back Section, Manual Run, and Machine Data.

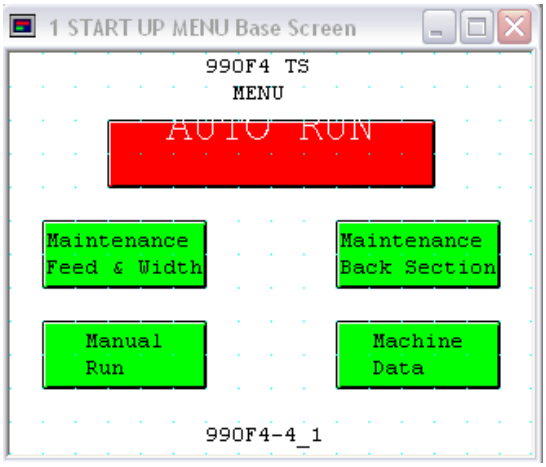


Figure 1: This is the first screen of the 990F-3 which shows the 5 options, Auto Run, Mainenance Feed & Width, Maintenance Back Section, Manual Run, and Machine Data

Second Screen:

When Auto Run is chosen, the second screen appears and displays all the options available to the operator. The main functions such as (R.H., L.H. Disable Auto Feed, Feed Mode and the emergency Stop and start sequence button) are chosen at the center of the machine with a switch. The other commands such as hinge lengths and number of hinges are chosen at this screen. Number of hinges changes based on the length of door you choose. When a button is pressed on this screen its color is changed to signal that the button is active or has been pushed

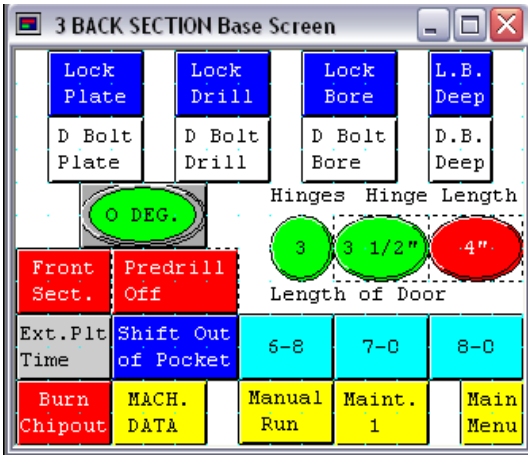


Figure 2: This is the Auto Run screen which is used throughout normal operations.

Third Screen:

When the Maintenance Feed & Width button is pressed the following screen will pop up. Each of the open circles represents the electronic eyes on the machine. This will allow you to check for any problems and find out where the problems are. Also helps to find defective eyes. Once done here you can go back to Auto Run or you can go to maintenance 2.

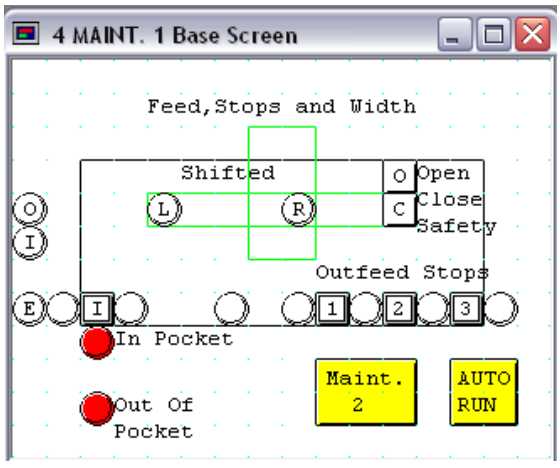


Figure 3: This is the maintenance feed & width screen, this screen shows all of the eyes on the front section good for trouble shooting the machine.

Fourth Screen:

When the Maintenance 2 or Maintenance Back Section button is pushed the following screen pops up. This gives you the indicators and eyes of the back section again used with trouble shooting for the machine. The open circles will light up if they are activated.

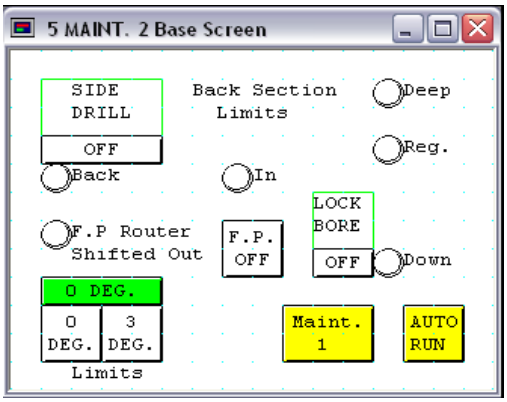


Figure 4: This is the maintenance back section screen this screen shows the eyes for the back section and is also a good trouble shooting point.

Fifth Screen:

When the Manual Operation button is pressed this is the screen that pops up. You can change all of the settings as you would with out the touch screen. You can turn the auto width adjust on or off. Change the feed speeds and directions. Also manually open and close the machine and turn the routers on and off. Also from this menu you can return to the Main Menu, Auto Run, or Maintenance 1 menu (maintenance Feed & Width).

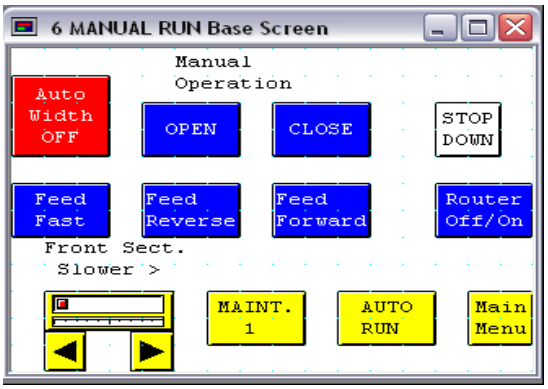


Figure 5: This is the manual run screen used only when the manual run button is selected.

Sixth Screen:

The sixth screen is the Machine Data screen. This screen shows the total number of doors for the machine and the daily total. The reset button will only reset the daily total. When you press the back button it goes back to the main menu screen.

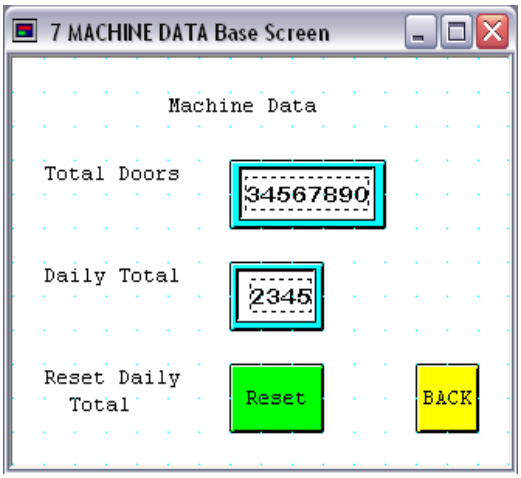


Figure 6: This is the machine data screen which shows the total doors ran through the machine and the daily total on the machine the daily total is the only one that can be reset.

Control Panel Operations

IMPORTANT FOR MACHINES WITH PRE-DRILL:

Remember when removing air from a machine equipped with pre-drill that you mush have the front section routers out of pocket position, meaning to the right and all the way down. **If the routers are left in pocket the gearbox will be damaged.**

Control Transformer:

The 'Control Transformer' button activates the electrical current into the machine from the electrical box.

Start Machine:

The 'Start Machine' button energizes the machine in order to begin telling the machine its operating commands.

R.H. Door L.H.:

The RH door LH selector switch tells the machine whether the door being machined is a right hand door, or a left hand door.

Back Section / Both / Front Selection:

Controls the lock section (back), hinge section (front), or you can run both at the same time (both).

Off Lock Bore/ Reg. / Deep:

The 'Reg.' command machines bypass doors. The 'deep' command machines normal bores, different diameter cylinder and dead bolt holes without having to remove the drill bit. 'Deep' is used to access the second larger diameter cutter on the shaft if using a double headed cutter for different hole diameters.

Bolt Drill On:

The 'bolt drill selector switch' allows the operator to turn on the bolt drill.

Face Plate Reg /Off / Extend Time:

Choose 'Reg' to allow the 990F-3 to automatically rout the face plate, select the Extend time when the face plate is longer than 2 1/4". Use the rheostat located on the backside of the electrical box to control how much time is needed to complete the size of the face plate you desire choose 'Off' if you are not going to machine face plates.

Feed Mode Off / Auto / Feed Through:

Turn 'Off' in the manual mode. Select the 'Auto' position to automatically feed the door and clamp it. The 'Feed Through' position allows the door to pass through the 990F-3 with out machining.

Feed Jog FOR / Jog Rev:

Moves door forward or backward when the machine is in the 'manual mode'

Slow Feed:

The 'Slow Feed' button slows the feed of the 990F-3 when held in.

Disable Auto Feed:

The 'Disable Auto Feed' button allows the operator to manually turn off the feed system temporarily if the next machine in the line is not ready to receive the next door.

1-Pass Front Routers 2 Pass:

Allows the operator to select extra router cutting passes for hard woods. It is also used to break in new chip outs.

Width-Adjust Open / Close:

The 'Width Adjust' button manually opens or closes the back section for different size doors.

Disable Auto-Adjust:

Defeats the auto adjust feature, preventing the 990F-3 from repeatedly auto sizing the same size doors as they feed into the machine.

Shift Routers Out of Pocket:

Sends routing carriages to their home position in order to change turret settings and /or index spacer pins. Also used for energizing front section after a mid cycle shut down.

Center Hinge:

Center hinge preparation can be turned on and off with a push pull air valve near the front of the machine.

Start Sequence:

The 'Start Sequence' button starts the 990F-3 cycle of operation after the door and jamb have been clamped in position.

Emergency Stop:

The 'Emergency Stop' button halts all operations of the 990F-3

Optional Operating Controls:

Pre-Drill Off/On:

Turns the Pre-Drill option on or off.

Pre-Drill Router Horizontal Pop-Up stop override:

To gain access to the router right side pocket adjust the pop-up stop. Push the feed slow button and the door stop foot pedal OR both at the same time, when the front section carriage is in the pocket position located on Plate 8 and PICS

Pre-Drill Lock Out:

When equipped with the pre-drill option, this button turns off the center pre-drill. Used in conjunction with the center router control.

Deadbolt Shift:

Shifts lock section to deadbolt predetermined location.

Deadbolt Bore:

Turns Deadbolt Bore on and off.

Bolt Drill:

Turns Bolt Drill on and off.

Face Plate Dead Bolt:

Turns face plate on or off

Side Drill (Latch Hole)

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 electrically and disconnect air service. Finally, wait until the bit has come to full stop before getting out the collet wrenches.

Be certain that the face plate router depth is correct and that the router chord is fastened tot the router as shown, otherwise, the long bit will eat the router.

Lock Bore Diameter:

Lock out air and electrical service. Use collet wrenches to put in the appropriate face boring bit. Replace chip out block with a new one, or a block previously used for the hole diameter.

Router Operating Controls:

Center Router:

The 'Center Router' Fabco push / pull button turns on or off the center router. Used in conjunction with the 'Pre-Drill Lock Out' control.

Router On / Off:

The 'Router On / off switches are located on the router body. These switches turn on or off all power to the routers.

3- or 4-Pocket Configurations:

When changing from 3 pocket to 4 pocket loosen the jamb clamp housing and slide down to the positive stop for 3 pocket and slide up to the positive stop for 4 pocket. Only move number 2 and 3 jamb clamps. This lines up the jamb clamp with the "H" block to create better support, during routing and Six Shooter Sequence.

Foot Pedal Operating Controls

Door Clamp:

The 'Door Clamp' foot pedal clamps and then un-clamps the door after each cycle of operation, when the machine is in the manual mode.

Jamb Clamp:

The 'Jamb Clamp' foot pedal clamps the jamb in both the auto and manual modes.

Controls on the electrical box

Speed Control Front Section:

This rheostat, located on the side of the electrical panel, adjusts the program scanning of the 990F-3 operating program. This will cause the front section assemblies to operate faster or slower when the flow controls are adjusted to accommodate the change in program speed.

Back section Face Plate Control Time:

This rheostat, located on the side of the electrical panel, adjusts the program scanning of the 990F-3 operating program. This will cause the back section face plate to operate faster or slower when the flow controls are adjusted to accommodate the change in program speed.

700-C Reset:

This button is used if the operator at the 700-C has not reset his machine. The operator of the 990F-3 then can reset the machine so the finished door can then move to the next station (700-C).

This button can only be activated if the 700-C:

has no door staged with in it

The last stage- meaning the out feed wheels have been activated.

Six-Shooter

The Six-Shooter is an option that allows for the ease of application of hinges on to a routed door and door jamb. The following are drawings of what the six shooter looks like.

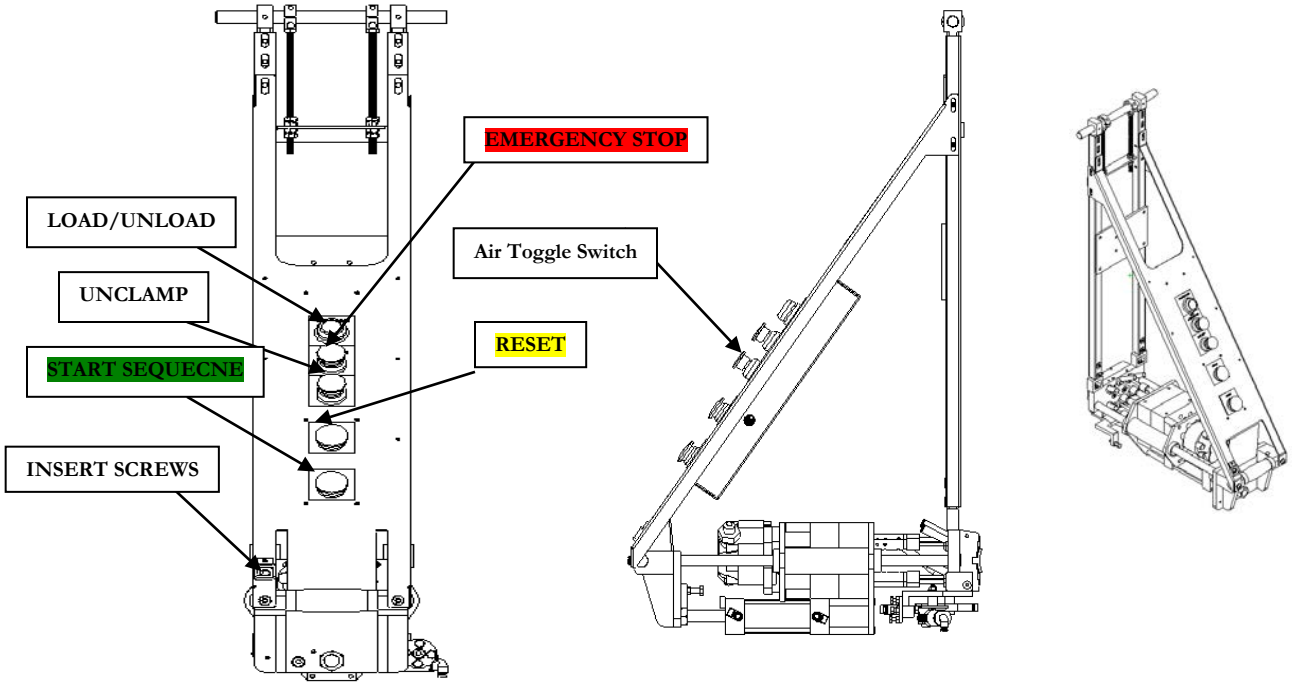


Figure 7: This is an overview of the main controls on a Six Shooter with the quick dump hopper, the difference in this and a regular six shooter is the "Load/Unload" button and the "Air Toggle" switch.

Six-Shooter Operating Controls

Insert Screw:

When the Six-Shooter is in the pocket position and the operator has inserted a hinge into the screw receiver block hinge holder you are now ready to insert screws. This function can also be used to clear jammed screws.

Start Sequence:

The start sequence drops Six-Shooter into pocket while starting motor for hydraulics. It also drops the screws down aided with air injection (if equipped) to speed the screw feed process.

Reset:

Reset raises the Six-Shooter, putting all the cylinders back in the Start position.

NOTE: If tilt cylinder is set to retract too fast, it can cause the Six Shooter to jump out of the pocket and bounce on the top rail.

Unclamp:

Allows the operator a choice to release the door either from a foot pedal or a Six-Shooter mounted mushroom button.

Emergency Stop:

Emergency Stop is used in conjunction with the Reset Button.

In the event of crises with the 990F-3 the emergency stop button will only work on the Six-Shooter.

Hopper Slide Valve:

The hopper slide valve provides the operator a remote air shut-off that controls air flow to the screw hopper to aid in un-jamming debris in the screw drop zone.

Safety Insert Screw Slide Valve:

The insert screw slide valve provides the operator a remote air shut-off to prevent the Six-Shooter head from moving in when performing maintenance on the screw driver assembly. It also is a good practice to shut slide valve OFF when not in use.

Screw Driver in close trap

This allows the Six-Shooter to hold the Apex bits in close to the screw receiver tubes. This prevents the screws from bouncing out during the screw application. It is also helpful when replacing bits or doing maintenance on 3-degree bevel front section. Just plunge the head and flip the trap out of position. This will allow the head to retract to the back position.

Optional Controls:

Load / Unload:

If equipped with quick dump hopper (OPTION Z), this button would be used to operate this option.

Six-Shooter Gear Installation and Maintenance:

Before performing any maintenance or repairs **lock** and **tag out** the machine. To remove the gearbox you must first remove the gear motor and plunge cylinder.

Removing the Gear Motor:

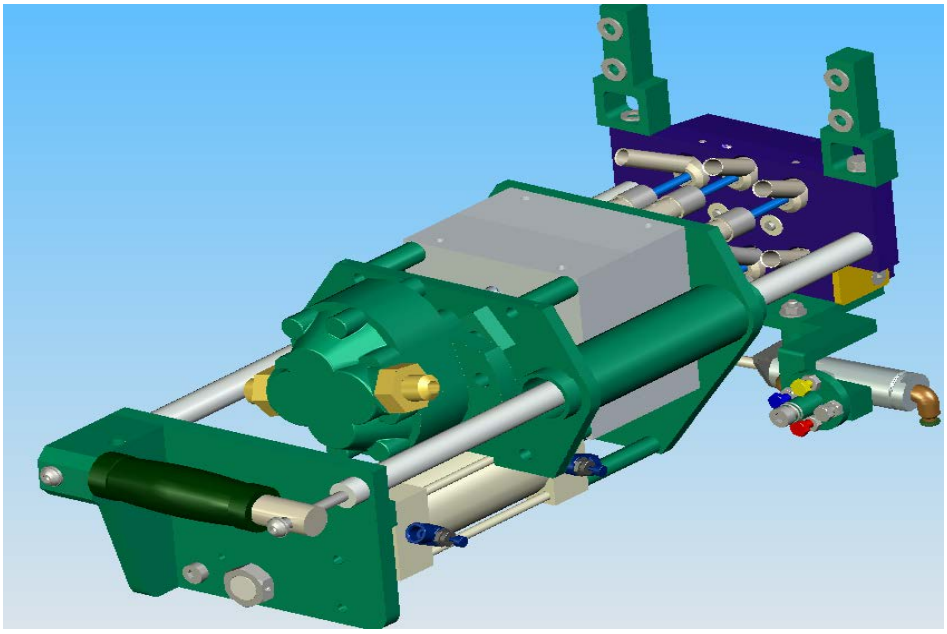
Remove hydraulic (A) and (B) lines from gear motor. Note locations relative to the REROTH label to correctly re-connect after replacement see (Hydraulic Motor Hook up)

Loosen the coupler set screw nearest the gear motor.

Remove (2) 3/8" bolts that secure the motor to the mounting plate.

Slide gear motor off the shaft.

NOTE: If gear motor does not move easily, CAREFULLY use a SMALL pry bar to remove the motor.



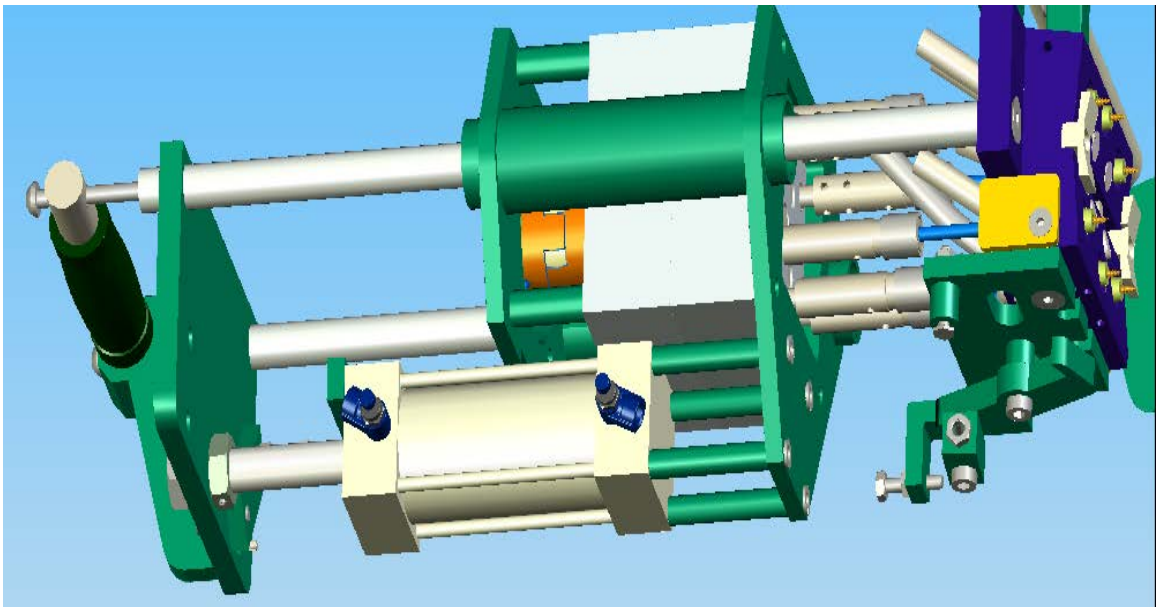
Removing the Plunge Cylinder:

Mark the (4) airlines connected to the plunge cylinder then disconnect.

Remove the (4) bolts w/spacers that secure the cylinder to its mounting plates.

Remove the 3/4” N.C. nut that fastens the rod end of the cylinder to the front plate of the Six-Shooter carriage.

Cylinder should slide easily.



Removing Gearbox:

Slide the Gearbox toward the Six Shooter hand grip.

Remove all screw driving bits

While supporting the gearbox with a free hand remove the (4) bolts, redi-rods, and spacers that secure the gearbox to its mounting plates.

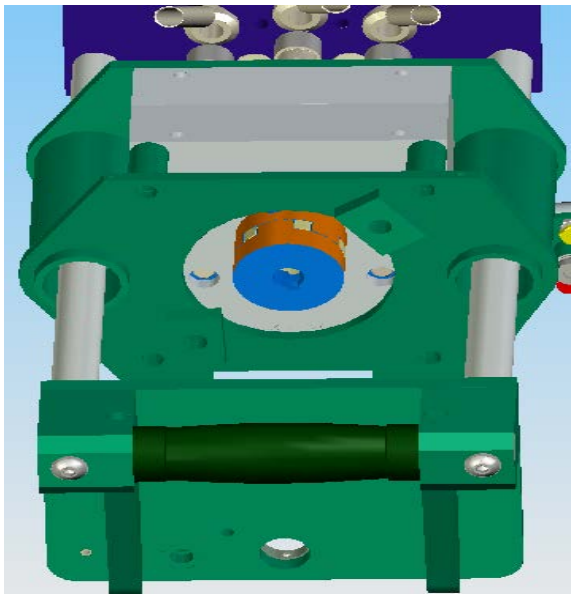
Slide the gear motor mounting plates apart evenly to prevent binding.

Gearbox can now be removed.

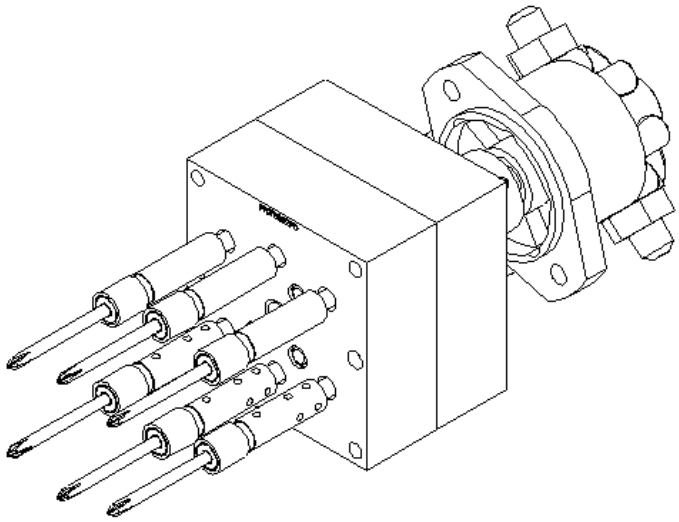
Loosen the Set-Screw that secures the Coupler to the Reducer and Gearbox shaft.

Slide Coupler from the reducer and gearbox shaft.

Note: If gearbox does not easily slide out, use a block of wood to GENTLY tap the Gearbox loose.



Gear Box Maintenance:



Once disassembled and part is replaced, reassemble the gear box as follows:

Step 1: Replace the 9 bearings back into proper position as shown in the following picture.

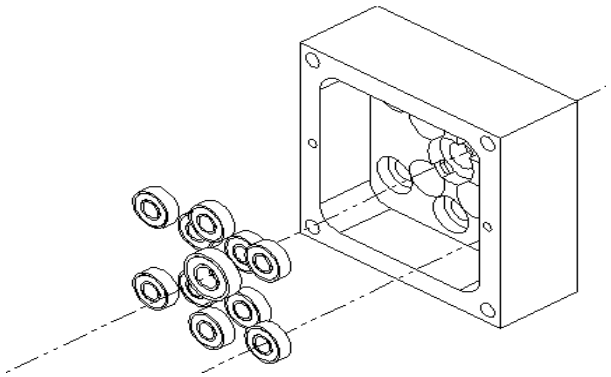


Figure 8: Insert each of the bearings in to a proper slot shown in the figure above make sure that the bearings are in good shape.

Step 2: Next replace the shafts and gears into the proper bearings as shown make sure the roll pins are in place in the shafts and gears or the shafts will rotate freely without the gears.

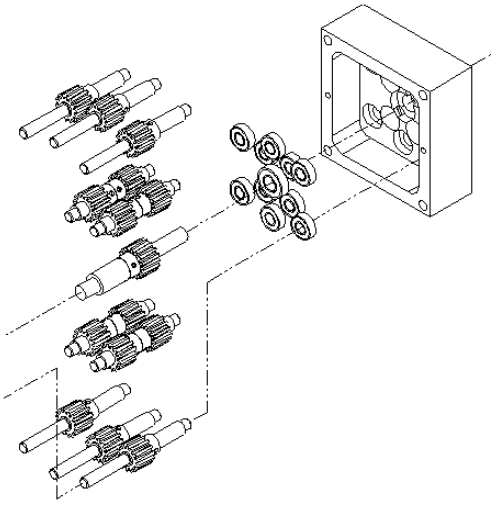


Figure 9: Making sure that all of the roll pins are placed properly in to the shafts set the shafts in to the bearings from the step above.

Step 3: Next apply the rest of the bearings to the shafts. The easiest way to do this is to lay the fist section of the gearbox on its back so that the shafts are pointing upward. This will allow for the weight to work with you and not against you during assembly.

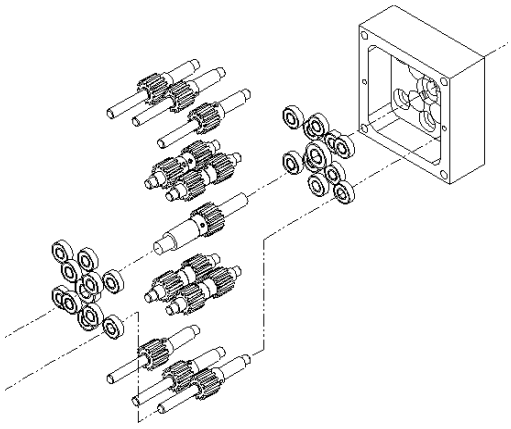


Figure 10: While sitting the gearbox half on its back apply the bearings to their proper shafts again make sure that they are all in good shape.

Step 4: Finally set the other half of the gear box back on top of the shafts aligning the shafts with the output holes on this half of the box. Bolt together accordingly.

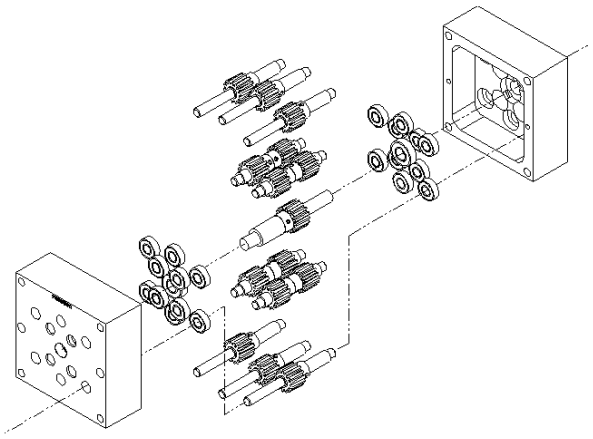


Figure 11: Making sure that the holes are all aligned

Reinstalling the Gearbox:

Slide the coupler against the hardened thrust washer on the keyed gearbox shaft.

Tighten the coupler set-screw nearest to the gearbox against the keyway.

Align the (4) gearbox mounting holes with the 4 mounting holes on the gearbox mounting plates.

Slide the mounting plates together. Insert the 4 redi-rods, spacers, and then screw fastening nuts on loosely.

Insert screw driving bits into their respective collets.

Slide the gearbox assembly into the screw receiver tubes to check alignment.

Tighten the gearbox mounting bolts.

Re-Installing the Plunge Cylinder:

Slide rod end of the cylinder through the hole in the front plate of the Six Shooter carriage.

Loosely screw the 3/4” nut onto the end of the cylinder rod.

Line-up mounting holes on cylinder with the mounting holes on mounting plates.

Insert and tighten the four mounting bolts with spacers.

Tighten the 3/4” nut on the end of the cylinder rod.

Re-attach the air lines using the markings you made during removal to guide proper connections.

Re-installing the Gear Motor:

Slide the gear motor into the coupler (fastened to the gear belt shaft). Make sure the keyways are lined up.

Tighten the set screw nearest to the gear motor against the keyway.

Line up gear motor base plate mounting holes with two mounting holes in the mounting plate. Insert the 3/8” bolts and tighten.

Re-attach hydraulic lines (A) and (B) to the gear motor

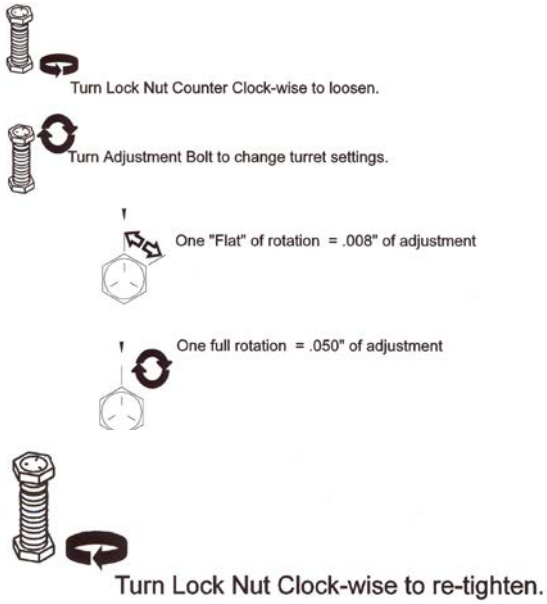
Front Section

Preliminary Hinge Center Set-Up:

During preliminary hinge center set-up you will be positioning the “H” blocks, setting the door stops for the left and right hand doors, and adjusting the jamb stops. During this set up procedure check positioning of each of the assemblies before adjusting. In most cases they will already be positioned to you specifications by our technicians during manufacturing. The standard or general setup is that for 3 pocket the hinge centers are 29-1/4” and for 4 pockets the hinge centers are 25-1/4”

The first router is a fixed router and is the zero position on the machine so to set a 7” distance from the top of the door to the top of the hinge you must move the door stops accordingly.

To adjust the hinge pocket routing left or right underneath the router is a all thread bolt when in the home position is bumped on to a stop to the left of the head housing. To adjust the router left or right for the left side of the hinge pocket loosen the lock bolt on the all thread bolt with a 9/16” deep socket and then a 1/2” regular socket to make the adjustments left or right to move left you rotate counterclockwise to move right you move clockwise.



Position “H” Blocks:

The center routing station is precisely located in the center of the machine, and is the reference point for all set-up procedures. To initially set up the machine you do not need to have a door in the machine. During this set up we are only concerned with getting the distance between “H” blocks to agree with you hinge center specifications.

Measure center-line to center-line from the center routing station “H” block to one of the “H” blocks on the outboard routing stations.

If spacing is incorrect adjust the hinge center on the opposite end of the machine, measuring from the center “H” block. If adjustment is needed, loosen the two “H” block mounting bolts and nudge the block until the distance is the same as your specifications.

Re-tighten routing station mounting bolts… re-check measurement, adjust if necessary.

Repeat step 1-3 until hinge centers are to you specifications.

Centering Routers within the “H” block:

Once the “H” blocks have been positioned to coincide with your hinge center dimensions you have to center the router within the “H” block. With routers properly centered you can move the entire “H” block without having to re-adjust router positioning.

Shift router as far left as possible.

When centering the router, reference off the tip of the router bit cutter blade which has been rotated to extend as close as possible to the inboard edge of the “H” block.

Adjust router position so that the blade tips are 1” from the (left) inside edge of the “H” block.

Shift router as far right as possible.

Adjust the router position so that the blade tip is 1” from the (right) inside edge of the “H” block.

Repeat for all routing stations.

Setting up the hinge backset:

The hinge backset on the 990F-3 is controlled by two turret stops on each of the four routing carriages.

The turrets are located at the upper left, and lower left areas on each routing carriage.

Make sure that the turrets are rotated so that the same bolt color is being used for the top and bottom turrets.

The top turrets at each routing station controls the backset and width of pocket routed in to the jamb.

The bottom set of turrets control the backset and width of pocket routed into the door.

Changing the Turret Settings:

Pull out on the turret plate (the part that rotates)

Continue rotating the turret until the desired bolt color is directly in line with the stop bolt.

The stop bolts(s) are located directly below the top turret and directly above the bottom turret set. See following diagram.

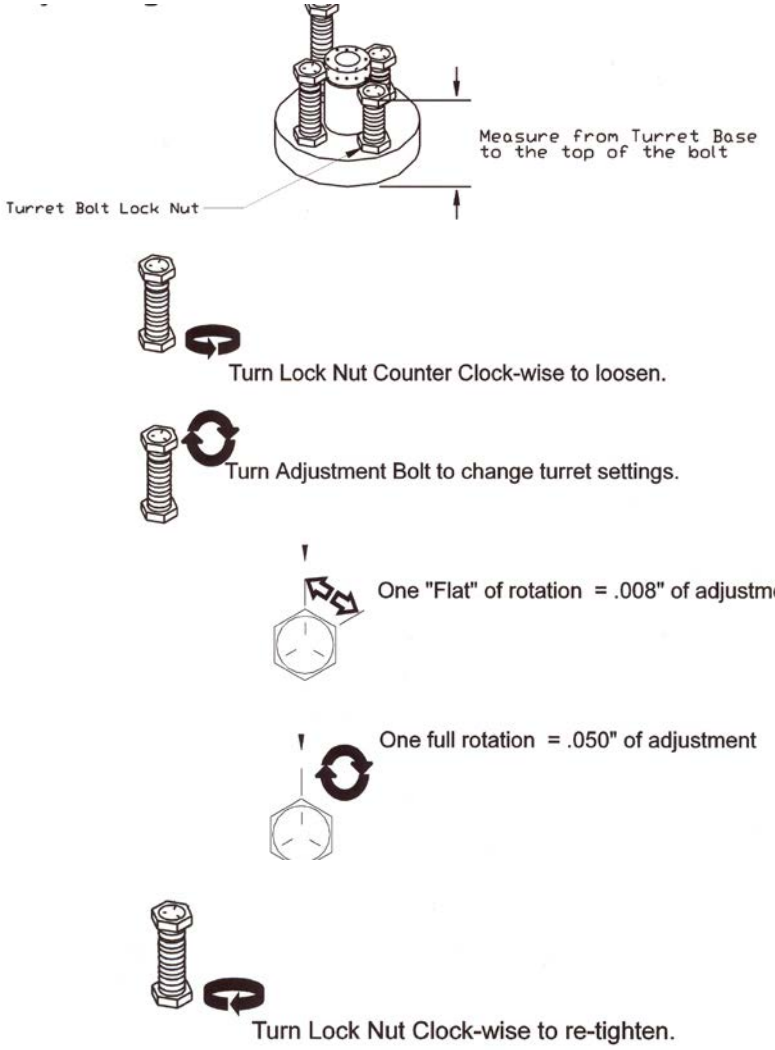


Plate Width: Plate Router Vertical Travel

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 1/8" for either a square edge or a three degree beveled edge. These 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 change is needed to be made to these turrets in order to change among doors of varying thickness 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 micrometer set at the factory.

Plate Router Depth:

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

Switching the Bevel Plates:

The 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 retightening the ratchet handle. Repeat this process on the other end of the lock section.

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

Hinge backset adjustment

The KVAL 990F-3 has been factory set for (unless otherwise specified by the customer):

1 3/8" thick doors

1/4" hinge backset

1 1/4" reveal between door and jamb

1 1/8" hinge pocket & jamb

The machine offers consistent hinge backsets by indexing the hinge pocket location off of the bottom door face. This design allows doors to vary in thickness (as they often do) with out affecting the backset.

When turret bolts are adjusted for longer extension the backset dimension is increased. When the turret bolts are adjusted for the shorter length, the backset dimension is decreased.

Note:

When turret bolts are adjusted to change backset dimension the hinge pocket width is also affected. It will be necessary for you to decide whether the backset or hinge pocket width is the critical dimension and setup accordingly.

Setting the Doorstops:

The 990F-3 comes equipped with two door stops; one for right hand doors and one for left hand doors. The doors stops accurately position the door so that the hinge locations are consistent.

With hinge centers set and the routers centered within the "H" block, you are now ready to set your door stops. Remember 990F-3 always reference off of the top of the door. Right-hand doors reference off of the left indeed door stop. Left-hand doors reference off of the right out feed door stop.

To set you door stop use your specification from the top of the top hinge pocket to the top of the door (7" in a 7-11 set-up).

Machine door. Measure from the top of the door to the top of the hinge pocket. If the pocket is less than 7", move the stop away from the hinge router. If the pocket is more than 7", move the stop towards the hinge router.

Loosen the door stop fastening bolts. Slide foreword or backward until the inboard edge of the door stop is positioned 1" less than your specified dimension from step 1.

Tighten door stop fastening bolts.

Load a door, clamp it, and trout the hinge pockets into the door only.

Measure your hinge centers, and the distance from the top of the pocket to the top of the door. If hinge pocket locations are correct you can set-up your jamb stops. If hinge centers are off, or the distance from the top of the pocket to the top of the door is incorrect, re-adjust the door stops or "H" block locations before setting up your jamb stops.

Change-over between Hinge Sizes

Setting Up Hinge Pocket Length:

The hinge pocket length is controlled by telescoping stop pins located at (A) and (B) on the 990F-3 router index spacer pin locations illustrations. Your machine has been set-up to rout 4" hinges when a 1" pin is inserted in (A) and (B) pin holders; 3 ½" hinges when an additional 1/4" pin is inserted into the end of the 1" pin if you machine is equipped with the pre drill option. If your machine has no pre drill option then 4" hinges use a ¾" pin; 3 ½" hinges use a ¼" insert in to the ¾" pin

If your hinges are larger or smaller than the factory settings the adjustable stop bolts that oppose the telescoping pins (A) and (B) must be adjusted to compensate. Before adjusting the stop bolts make sure that the correct spacer pins have been installed. Hinge pocket length adjustable stop bolts are adjusted as follows

Make a test cut by routing both door and jamb.

Measure the pockets and check for there consistency.

Loosen the adjustable stop bolt lock nut

While counting the number of revolutions or adjustments you are making. Turn the stop bolt clockwise to increase pocket length, and counter clockwise to decrease pocket length. Each flat adjustment or revolution is .009 in.

Re-tighten turret bolt lock nut.

Using the amount of adjustments in step 4 repeat steps 1-5 for the remaining hinge pocket length stop bolts if all pockets were consistent. If pockets are not consistent then each bolt will have to be adjusted as needed.

Door Width Minimum / Maximum Limits:

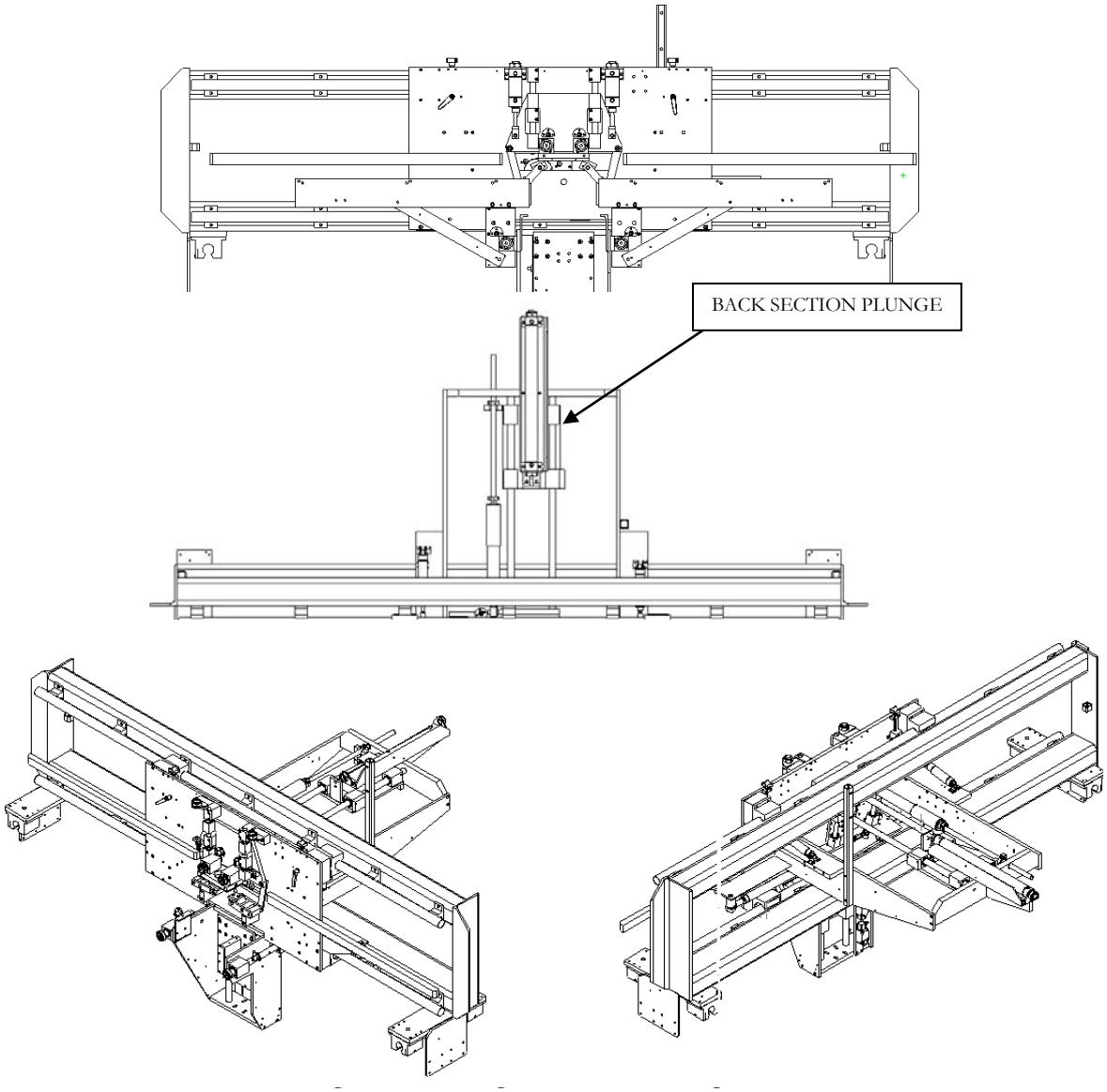
The minimum door width on a 990F-3 is 1' 6". Depending on various options it could be more than the minimum door width. The limit switch is located on the back section right side edge clamp cylinder bracket.

The door maximum width is set so that you can machine a 4' door. That limit switch is located on the back section right back side bearing plate.

Chipout Replacement / Break-In:

When replacing a chipout on your KVAL back section it is wise to break it in manually by turning the lock bore switch on and then clamping the machine, closing up the self centering on a cull door. Move to the back of the machine where the electrical solenoids are located and manually activate the solenoid. This moves the lock bore up and through the door and into the chipout. Be careful no to stall the motor when it is drilling through the door and into the chipout. (In other words, manipulate the button so that the drill isn't moving too fast).

Setting up the Back Section:



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.

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

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

Lock bore and routers lower

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.

Load the door into the machine.

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…

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.

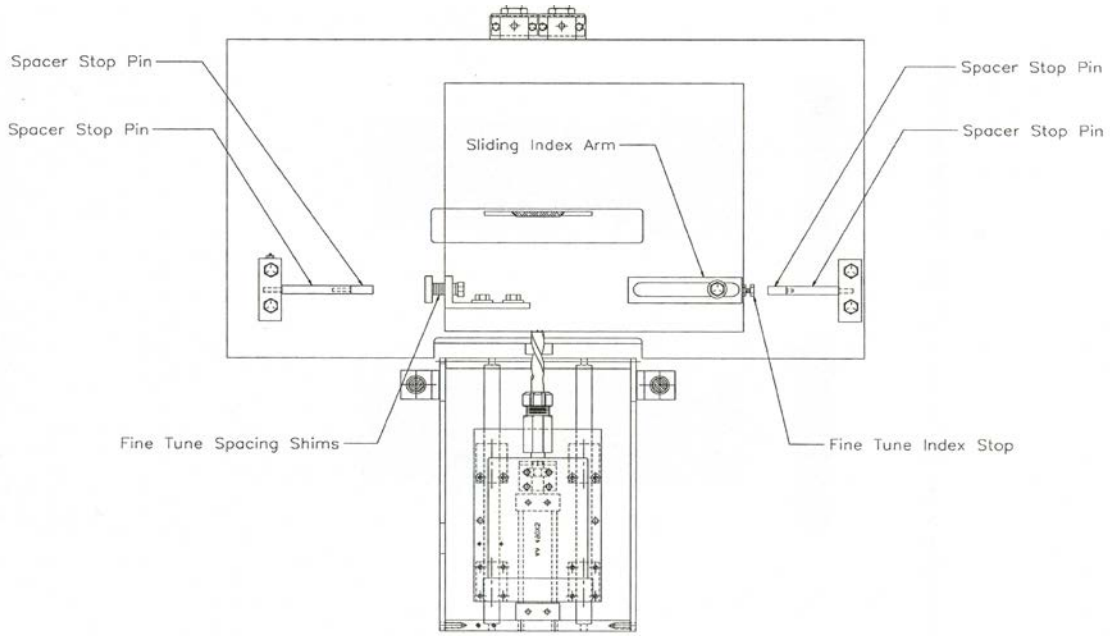
Setting Up Lock Height:

Now that the hinges are in there right places, and your door stops have been set, you can adjust the lock section to put the lock in the right place, relative to the door stop.

NOTE: Check door to make sure it is square. It is important that you set the lock height with a good door. Check the door for square by measuring the door diagonally point to point, and again from opposite points (measure an "X" across the door). If both measurements are the same, the door is square and good to go for set-up.

First clamp door against the stop that the machine is set-up for. Normally the back section shifts away from the door stop that is being used. Also, depending what your hinge locations are from the top of the door, down to the back section location will vary from one machine to the next.

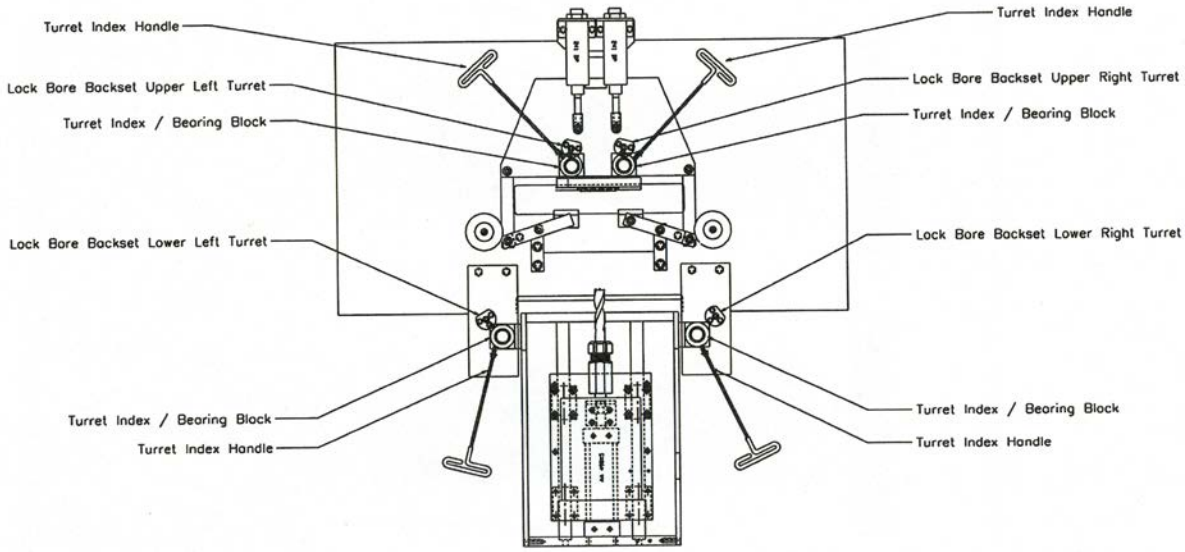
The standard set-up would be 2" of stop pin in both stop locations to equal 44 from the top to the center line of the lock bore.

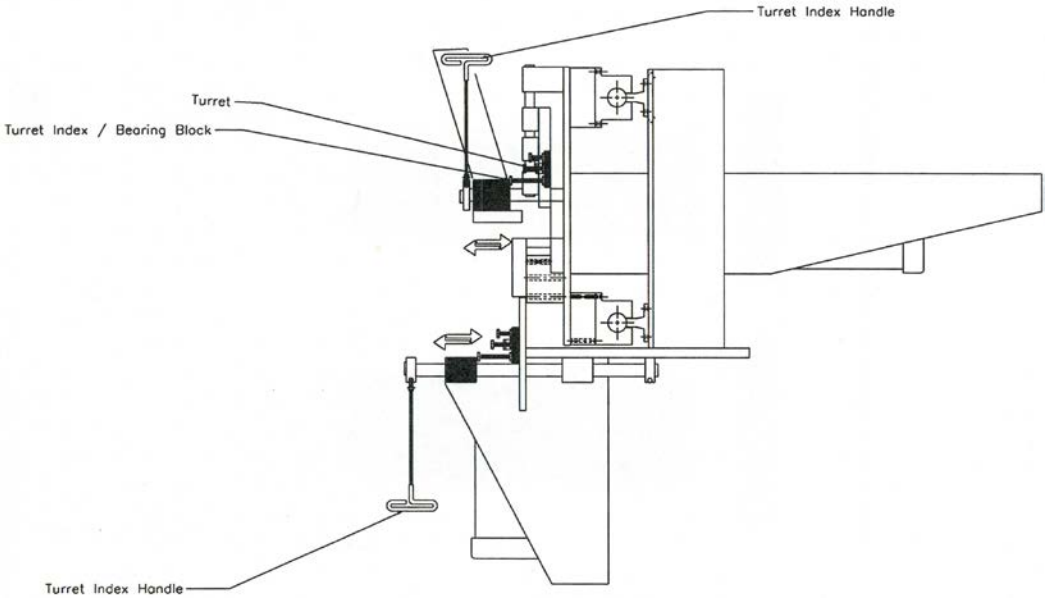


NOTE: To change the lock bore location; you can add or subtract pins to get the desired position to remove stop pins. It is recommended that you turn power OFF, as well as the air supply at the slide valve located next to the back section valve bank where the air supply enters the back section.

Setting Up Lock Bore Backset:

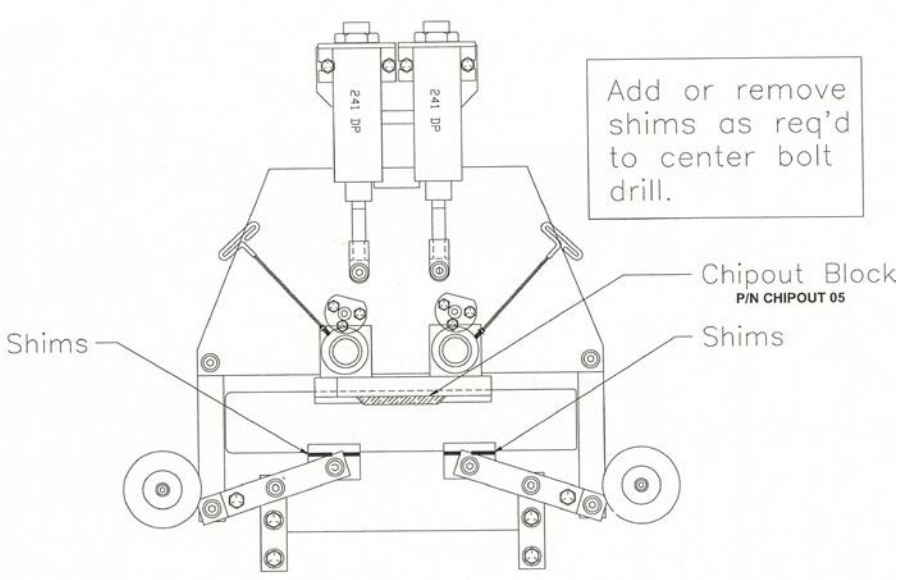
The lock bore backset (the distance from the center line of the lock bore to the door's edge) is controlled by four adjustable turret stops. KVAL's factory setting for the lock bore turrets accommodates 5", 2.75" and 2.375". See the following diagrams.





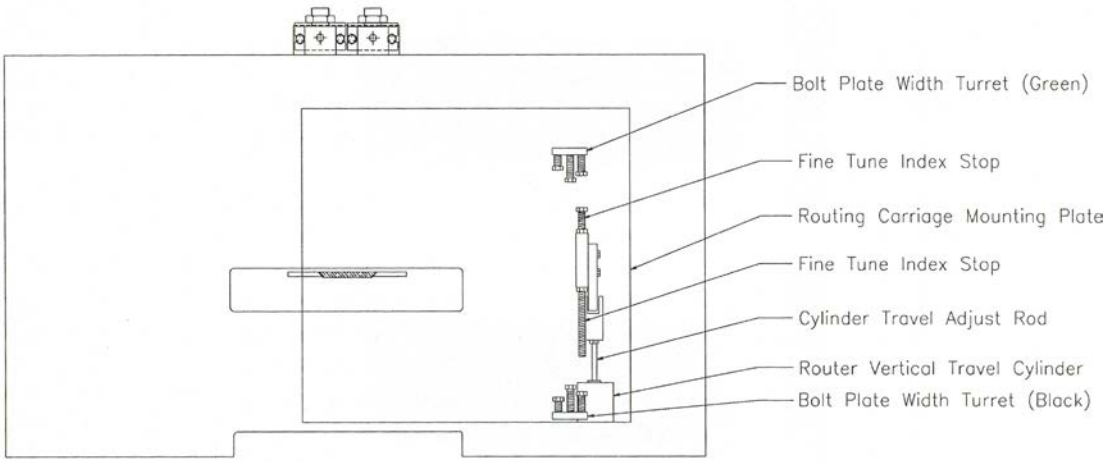
Self – Centering Adjustments:

This can be done by following the diagram provided.



Bolt Plate Width Adjustments:

This is done by adjusting the bolt plate width turret and index stop see following diagram.



Side Drill (Latch Hole)

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 electrically and disconnect air service. Finally, wait until the bit has come to full stop before getting out the collet wrenches.

Be certain that the face plate router depth is correct and that the router chord is fastened tot the router as shown, otherwise, the long bit will eat the router.

Lock Bore Diameter:

Lock out air and electrical service. Use collet wrenches to put in the appropriate face boring bit. Replace chip out block with a new one, or a block previously used for the hole diameter.

40” Lock Location

When running a 44” lock location, the back section should have 1” pins on both sides. When the “L.H., R.H.” switch is used, the back section will shift from left to right to achieve a 44” lock location form the top of the door.

When running 40” lock location the following steps must be followed.

Turn the “L.H, R.H.” switch to R.H. This will shift the back section towards the out-feed end of the machine.

Go to the back section of the machine and add a 4” pin to the in-feed end of the back section. This will give a total of 5”

There is a “40” Lock Location” switch located on the side of the electrical box also on the back side of the machine. Switch it to the “ON” position.

Go back to the front of the machine and switch the “L.H., R.H.” switch to the “L.H.” position. The back section will then shift toward the infeed end of the machine, against the 5” pin which was just put in. As long as the “40” Lock Location” switch is in the “On” position, the back section will stay in this position to achieve a 40” lock location. Even when the “L.H., R.H.” switch is used during normal operation, the back section will not shift. When the back section is locked in this location you will achieve a 40” lock location on both L.H. and R.H. doors.

To change back to 44” lock location, the following steps must be completed.

Turn the “L.H., R.H.” switch to the “R.H.” position

Go to the back of the machine and turn the “40” lock location” switch to the “Off” position. The back section will then shift to outfeed end of the machine.

Take the 4” pin out, leaving the 1” pin in. You are now ready for normal operation with a 44” lock location.

Chapter 5: Maintenance

Maintenance Schedule

Daily:

Blow off dust from entire machine.

Lubricate linear bearings and chrome shaft with silicone.

Wipe down machine

Check tooling for wear

Empty water filter bowl if not a self draining system

Photo eyes should be wiped off and checked to ensure that all fastening rings are snug.

Check the air pressure

Check the Chip-Out blocks for wear.

Refill lubricator with proper type of oil (see lubrication requirements)

Weekly:

Check machine for smooth motion through a complete cycle.

Clean linear bearings and chrome shaft, then lubricate.

Check air pressure to and on the machine

Adjust the lock flow controls.

Check all air lines & electrical wiring for kinks or rubbing.

May and December Check-Ups

Wash filter and lubricator bowls with soapy water.

Grease all bearings and tighten all bolts.

Clean and lubricate all slides and cylinder rods with dry silicone spray.

*Carburetor cleaner can be used to remove pitch. If carburetor cleaner is used, re-lubricate the affected surface.

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.

Priming the Lubricator:

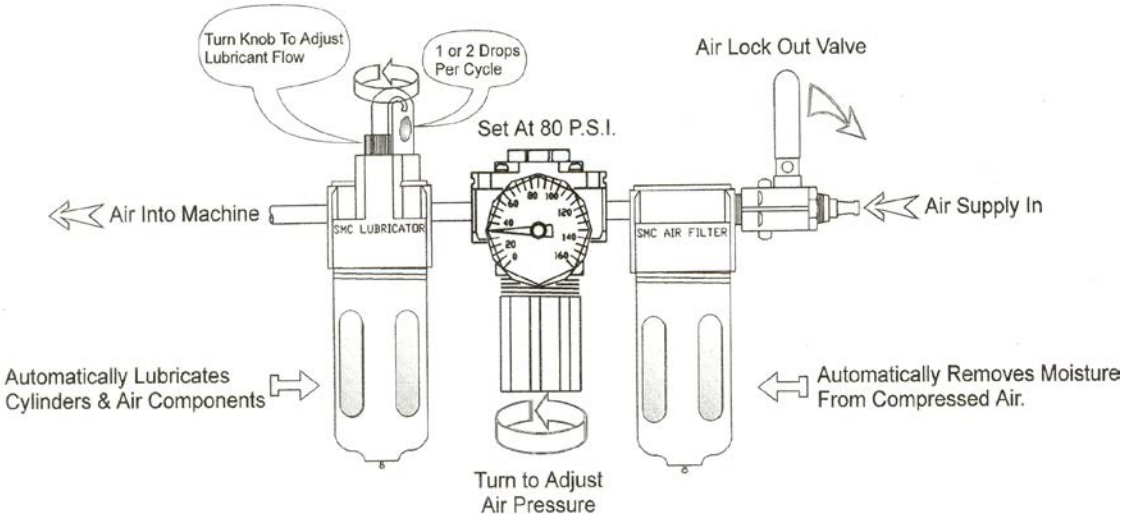
New and used machinery run out of oil from time to time. It is a good practice to check your machine lubricator to insure that it is putting the proper dose of oil in the air lines. Usually 1 drop every 3-4 cycles is a good rule of thumb.

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.

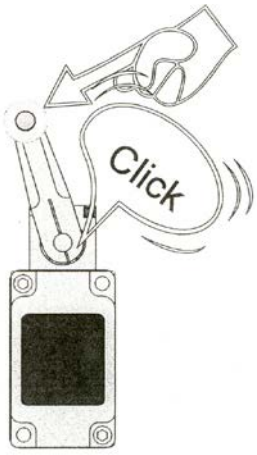
Check the lines every week to two weeks

Figure 12: This shows how to adjust the lubricators and shows the air lock out valves.



Chapter 6: Troubleshooting

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.

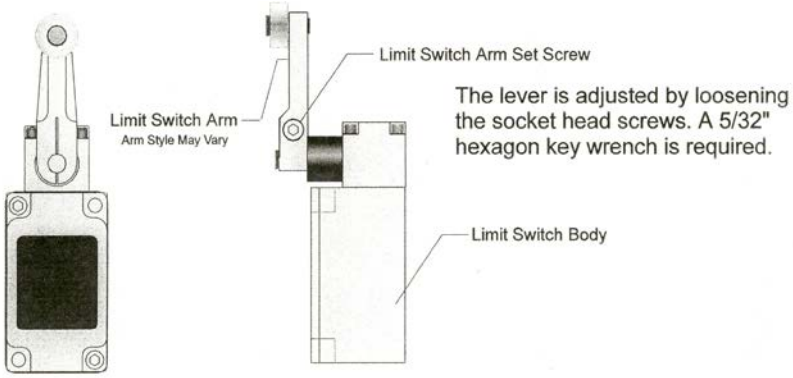
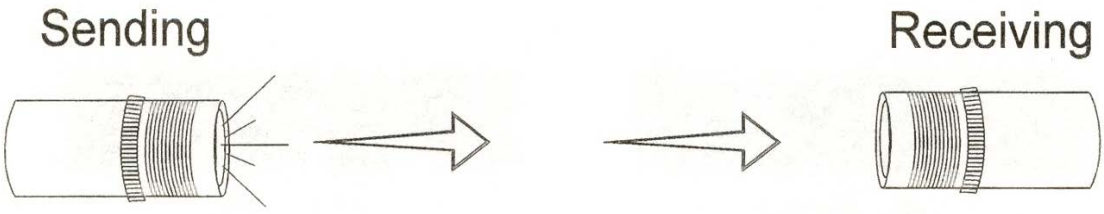
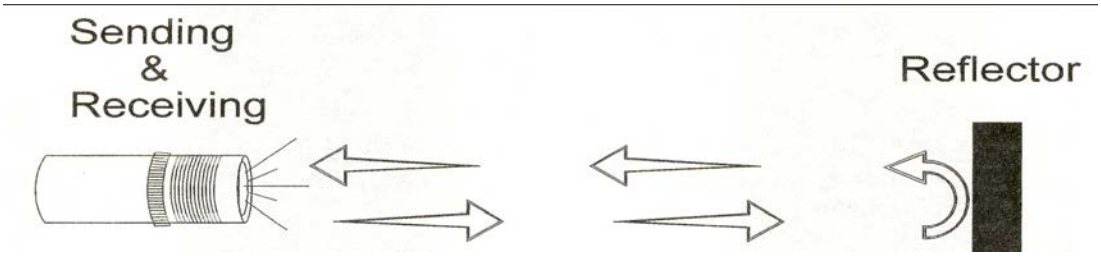


Photo Eyes



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.

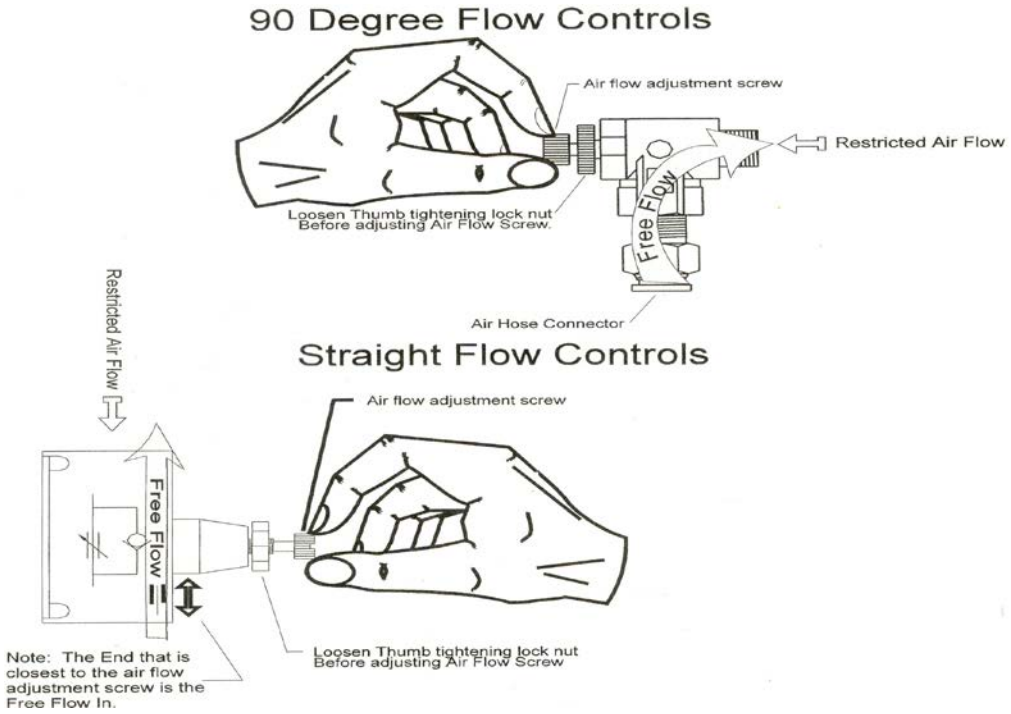
Note: When a machine stops for no reason it is usually the fault of dirt photo eye or a misaligned limit switch arm.

General Air Circuitry Trouble Shooting:

If a cylinder is not functioning correctly here are a couple of items to check:

Check the air pressure to the machine.

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



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

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.

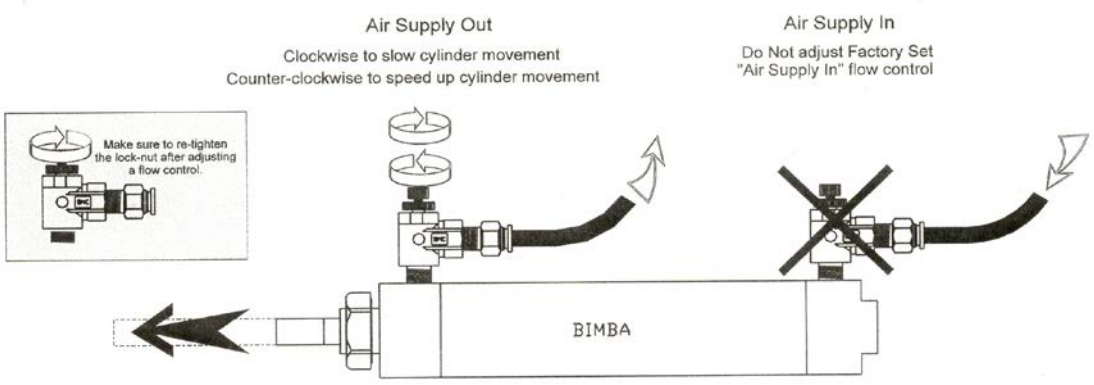
If the valve seems to be leaking, the seals may be dry or contaminated with water or it maybe that the cylinder "O" rings are damaged and air is passing from one side to the other side of the cylinder. It maybe is necessary to purchase a rebuild kit or a new cylinder.

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

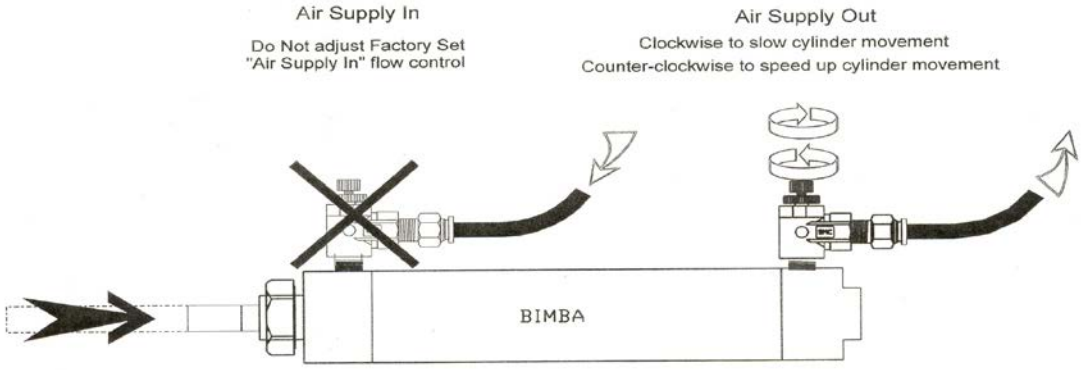
If an Air Leak is coming from an exhaust port on the air bank:

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 Troubleshooting:

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:

Check that the input disconnect switch is not turned off.

Check that all of the emergency stop buttons are in the normal position.

Lock Out and Tag Out the main power source.

Turn the panel disconnect switch in the off position, open the electrical panel door.

Observe the disconnect switches. Look for loose or broken wires at the disconnect then at all of the components.

Check for continuity of all fuses with an OHM meter.

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.

Remove lock and tag outs on the main power sources

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.

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.

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.

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 Property:

Front section is not turned on at the control panel:

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:

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:

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.

Cylinders that move the front section

Move front section to the “In Pocket Position”, then do the following:

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

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

One of the cylinders is malfunctioning:

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

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.

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.

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 misaligned:

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 misaligned:

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.

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:

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 malfunctioning:

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:

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:

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 collit.

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 too 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 990F-3 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.

990F-3 Six-Shooter

If you need to move the hinge routing assemblies to adjust hinge centers, then you also need to move the "H" shaped blocks so that the Six Shooter will pivot, centered on the hinge pockets. With a machined door still clamped in the machine, use a pencil and a small square to mark the edges of the hinge pockets on the side of the Ryertex runner. Take the door out of the machine and loosen the two ½" hex bolts holding the "H" blocks in its slide. Use a scale to center the upper legs of the "H" blocks off the pencil marks you made on the Ryertex. This will give you a good initial setting to start from when you begin driving screws.

Don't forget that the center router station never moves (and in older models the same is true for the center "H" block), you need to adjust the plunger stops that control both the lateral location and length of the hinge mortises.

Six-Shooter keeps running after cycle is completed:

Look to the hopper limit switch and look for the pick off bar to possibly have a jammed screw. If that's the case, turn the slide valve off on both sides of the 091D Bimba cylinder, located on the opposite side of the limit switch. Then you can dislodge the screw with a small magnet; look for burrs and debris that might have caused the problem in the first place. Next clear the screw receiver head of any screws that may have dropped during the un-jamming process.

Hopper Alignment:

Shut off the slide valves, located on the Bimba O91-D cylinder, that prevents screws from dropping down. Push the Six-Shooter start and pivot down to the right hand "H" block.

Once you adjust the collars, push the release button to pivot back the Six-Shooter. Try rolling it from one end of the frame to the other if it doesn't roll freely, loosen the set collars on one axel and twist the lower carriage left and then right until it will roll freely, making sure that the rollers are aligned and there is no binding.

Re-tighten the set collars and double-check that the protruding edge of the hinge holder still rests flat against the "H" block.

Sometimes one side of the hinge holder wants to pull away from the "H" block. If this happens, go to the troubleshooting section "Loose / Screws One side of hinge"

Next, position the Six-Shooter in the left hand "H" block and check that the hinge holder rests flat against the "H" block here too. If not, then the upper support frame needs adjustment (see Trouble Shooting guide). Use the four lateral adjustment bolts on the left side of the upper carriage to shift it sideways until the hinge holder is flat with the "H" block. Be sure to use a level across the tracks on the upper support frame to keep it level while making adjustments.

Roll the Six-Shooter down to the off-feed end of the machine and clamp a fresh door and jamb into the machine. Be sure that neither is warped or twisted, and the Ryertex runners are clean.

Machine hinge pockets (without pre-drill)

When the routers shift out of the way, pivot the Six Shooter into the first hinge pocket. Reach up and activate the limit switch arm.

Push the "Screw Insert" Button. The six shooter lock in the "H" block, the bits should come in, and automatically shut off. The process will leave divots in the hinge pocket, revealing the location of the drills. Repeat this step for the other three hinge pockets. If you have a problem with the Six-Shooter not clamping securely in one of the "H" blocks, go to the troubleshooting section "Kick out". Likewise, if the screwdriver bits refuse to turn off automatically when they have gone in all the way, see the section titled "Stripped or Broken Heads".

Set a hinge in the pockets to check the line up of the hinge mounting holes with the marks made by the screwdriver bits. This will tell you what further adjustment is needed, and serve as a guide in the Trouble Shooting section. Do yourself a favor though, before assuming that adjustments are needed; look for consistent misalignment patterns. Hinge mounting holes do sometimes vary from hinge to hinge, so try a few different hinges first. Also, the screwdriver bit tends to wander a bit when going into empty pockets. It's rare to find a hinge and marked pocket to line up perfectly. In other words, if the line up looks reasonably close, go ahead to the next step and run some screws. On the other hand, if the line up shows marks that are obviously to high or too low, shifted off laterally or cocked at an angle, then go to the troubleshooting section

Shut down both the air and electrical services to the machine. Climb up and dump a box of screws into the hopper. Manually pivot the hopper up and down to load the screws into the front slots. When the front slots are full reset the slide valves on the feed back to activate the hydraulic motor.

With the Six-Shooter pivoted back, push the screw drivers in button followed by the release button. This will clear any screws that may have lodged in the screw receivers mounted in the hinge holder. This should be done every time the machine is started, and any time the Six-Shooter doesn't drive all six screws. If you get 2 or 3 screws caught in the receivers, loosen the set screw that retain the receivers in the aluminum hinge holder and pull them out. Clear the screws again, re-insert the receivers and tighten the set screws.

Place a hinge on the magnetic hinge holder with the knuckle centered between the two small stop bars in the slot, push “Start” to pivot it into the first “H” shaped block followed by “Screw Insert” to mount the hinge. When the driver bits stop, push the “Release” button and inspect the screw pattern. It should look good, but if it doesn’t, try running in all of the pockets to check and see if it is a consistent pattern.

Hinge Laps Side of Pocket or Screws Pulled Sideways:

Make sure that the hinge centers are correct. If they are, check that the hinge pockets are centered within the H-block horizontally. Usually if you are running 3-1/2” X 3-1/2” hinge pockets it will be in the vicinity of 1” on both sides of the pocket within the “H”-block.

The next step is to make an impression of the screw pattern in the already routed hinge pocket. Hold a hinge in the pocket by hand and use the hole pattern as a stencil to outline the screw locations. Then shut off the slide valve on the hopper pick up bar cylinder to prevent any screws dropping. Tilt the Six-Shooter into each pocket location and push the insert screw button. By doing this an impression of the bits will be made into the wood adjust accordingly.

Adjusting the screw receiver block horizontally:

On the screw receiver block there are two brass shims that guide the six shooter into the “H” block position. By adding or subtracting plastic shims behind the brass you can fine tune the location of the screw receiver block in relationship to the hinge pocket. It should be +/- .010 of the center line.

Bit points centered:

If the marks look centered, but the screws are pulled laterally or the hinge laps the side of the pocket the problem is in the hinge holder on the six shooter. Put a hinge in the holder and check the alignment of the mounting holes with the bits of the screwdrivers. If they are miss aligned, the stop bars that center the hinge knuckle in the slot are adjustable so that you can align the hinge hole pattern with the screw driver pattern. If the hinge pin has a head, be sure to set these stops correctly for the left and right hand doors.

If all else fails, if the Six-Shooter more room to locate the hinge by opening up the length of the hinge pockets a little, adjust the plunger stops.

Hinge Laps top or bottom of pocket:

Check to be sure you have a consistent margin at the bottom of all four hinge pockets (+/- .005) and that the door isn’t warped adjust as necessary. Next double check that something hasn’t worked loose such as the flange bearings supporting the 6 Shooter pivot axle. If the machine is equipped with a pre-drill ensure that each head is drilling in the center of the pocket.

Two hinges- bit points too height or too low:

If all four hinges show marks that are too high or too low, go to the next step. If the bit marks are too high or to low at one of the outer pockets and the center hinge pocket, one of the upper frame supports need to be adjusted vertically. Set a level across the tracks to keep it level during adjustment.

All four hinges-bit marks too high or too low:

If all four are too high or low by the same amount you need to raise or lower the 6 shooter. Measure how much the marks vary from center, shut off the slide valves on the screw feeder to prevent screws from dropping out, roll the 6 shooter to the end of the machine. Press the "Start button" to pivot the 6 shooter in against the edge of the Ryertex runner. Check clearance gap between the bottom edge of the hinge holder and the Ryertex, and find a spacer thicker or thinner than the clearance gap by your measurement of how much the bit marks vary from center. For example if the gap is 1/8" and the marks are 1/16" to high you need to find some sheet metal or banding material to create a 1/16" spacer. Loosen the bolts as shown on the next page, and set the bottom edge of the hinge holder on top of the spacer as it rests on the Ryertex. Re-tighten bolts, double check your adjustment by marking another set of empty hinge pockets.

Hinge Laps Corners of the Pocket:

Bit Points cocked at an Angle:

Shut off the slide valves that prevent screws from dropping down when the 6 shooter "Start" is pressed. Roll the 6 shooter to the extreme end of the track and push the "Start" button to pivot it against the Ryertex runner. Check that the top of the Ryertex is parallel. If the gap varies from one side of the hinge holder to the other, loosen bolts as shown on PIC. It is also wise to check that the holder is level. Please note that if you have no idea how big the gap between the bottom Ryertex should be, start with a 1/16" spacer. Re-mark the locations of the bits on another set of empty pockets as necessary.

Crooked Screws:

Occasionally the Six Shooter will drive the screws in cooked and there is nothing you can do about it. Several things cause this, grain patterns in the wood, variations in hinge mounting holes and bad screws. When this is done consistently adjustments are needed.

Split Shell Adjustments:

The split shells are what hold the screws straight as they are driven in by the screwdrivers. Each pair is spring loaded to hold the shank of the screw straight as it starts into the hinge pocket, and then to open as the head of the screw passes through. You can check if they are working right by pushing inward on the end of the split shells-they should be able to move back 3/32" to 1/8".

If one will not move back, then you need to loosen the set screw retaining the spring pressure on the split shell.

If a split shell is locked open the rubber "O" ring may be broken and will need replacement, or something is caught in the receiver. Pull the receiver out to find out what is wrong.

Finally, split shells do wear out and need replacement. We keep a full supply on hand if you need to replace them. Refer to the chart for you individual machine.

Screw Driver Bits:

Bent or badly worn screwdriver bits will cause problems screw driving problems. Again, we keep a full stock of matched length (controls the depth screws are driven in), precision bits straightened (helps keep screws straight as they are driven in). Length of bits should never vary more than .005" from each other.

Speed of Six-Shooter going in:

There is a basic concept that should be understood about driving screws automatically. When the screws are turning they move in a certain distance per revolution. It is important that the follow control on the movement cylinder be set so the speed is sufficiently fast. If it is too slow, the screws will move in faster than the bits. This will cause stripping of the screw head, and the Six Shooter will not drive the screws correctly. It is also possible to change the speed of the screwdriver bits by adjusting the bypass valve on the hydraulic unit. If the speed of the bit rotation is changed, the cylinder speed in will probably also have to be changed. Normally the bypass valve is set at the factory and should not be adjusted without calling a KVAL technician.

Loose Screws

All Screws Loose:

The Six Shooter is designed to drive screws tight, just like a hand drill. With a drill you let go of the trigger when the screw is almost tight and let the inertia of the drill motor tighten the screw. The same principle applies to the Six Shooter except it trips a limit switch arm to shut off the driver motor. The switch is tripped by a ¼" cap screw mounted on the right side of the lower six shooter. If the screws are loose, try adjusting this screw in a little so that the Six Shooter stays on longer.

Other factors that make loose screws are badly worn screwdriver bits, varying lengths of the bits, low air pressure, miss-adjusted T-post, and the speed of the Six Shooter.

Loose Screws at the Top or Bottom of the Hinge:

To change the angle of the Six Shooter Screw Receiver Block, first you need a ladder position yourself safely while making the necessary adjustments to the hopper carriage. Loosen the four collars on the axle that holds the carriage of the Six Shooter hopper and also loosen the four set screws that hold the axle in the side plates from the top. By moving the carriage in or out on the axles, you can control where the head of the Six Shooter will come in contact with the hinge pocket. Make sure that the block is flush with the pocket, go ahead and tighten up the collars before tightening up the set screws. Ensure that the carriage is able to move smoothly back and forth along the top rails. If the carriage isn't smooth there is probably a bind on the back rollers that traps the horizontal shaft. By loosening one side of the collars you can re-align the rollers, usually with out harming the position of the block you just finished adjusting. Once complete, tighten the set screws and check the screw patterns.

Loose Screws On the Side of the Hinge:

If there are loose screws, pivot the Six Shooter into one of the "H" blocks and check if one side of the hinge holder wants to pull away from the brass plate, mounted on the "H" block. If it does not, the clamping systems are probably loose or out of adjustment see "Kick out". If it does, two different adjustments are possible, depending on how far out it is.

Loosen bolts which connect the lower Six Shooter to both the vertical and angled support areas. Grab it by the handle, pull it sideways in the needed direction, and re-tighten the bolts. Check the alignment by positioning it back in the "H" block

Stripped or Broken Screw Heads:

Check the screwdriver bit for wear.

See ‘Loose Screws’, and re-adjust the stop bolt that trips the limit switch (on the right side of Six Shooter), turning the Six Shooter off as the screws bottom out.

Check and see if the split shells are too tight. See ‘Split Shells’

Kick-Out:

Kick out is what happens when you are driving screws and the Six-Shooter kicks out of the “H” block because it did not clamp securely. This happens because the clamp is loose or miss-adjusted, and it can also cause loose screws.

Check the shoulder bolt under the hinge holder that serves as a pivot point for the clamping finger. If it works loose, tighten it up.

Clamp the Six-Shooter in position at the troublesome hinge pocket and check if the clamping finger is getting a full bite on the inverted “T” post, mounted on the cross bar of the “H” block. If not, adjust the “T” post out a little and check it again likewise if the finger is getting a full bite but it is not holding the Six Shooter Firmly in the “H” block, adjust the “T” block inward.

Six-Shooter Multi-Wood Density Screw Stop:

This option is added to most of the Six-Shooters with a simple bolt on procedure. This screw depth turret is use when running different densities of wood. The turret has 4 different adjustment points that can be changed with a twist of the turret.

Not Enough Power to Drive Screws:

If the Six-Shooter gear head and pump rotate, but does not have power to drive the screws, it means that the hydraulic pressure relief valve has failed and needs replacement (part# DAY2A731). This valve is located on the hydraulic reservoir platform just above the hydraulic motor.

Hopper Troubleshooting

Missing Screws:

Make sure the hopper is full of screws but not over filled.

Avoid Stacking Screws:

Whenever the Six-Shooter fails to drive all six screws, clear it to avoid stacking screws in the receivers. Before pushing the Six-Shooter “Start” button, press the “Screw Insert” tack valve to shove the bits threw the receivers. This will clear any screws before going to the next pocket.

If shoving the bits through the receivers doesn’t turn up the missing screws, and the hopper is full, remove the feeder tube clamp and check the funnels for caught screws or other debris. If it isn’t in there then look for obstructions caught in the slide bar, screw feeder slides and hopper slots. Also check for burrs in the screw receiver tubes in the screw receiver block. Double check the split shells by pushing the “Screw insert” and go ahead and run some more hinges. If you have a chronic problem, try the following.

Magnetized Screws:

Sometimes screw manufacturers fail to demagnetize screws before sending them to you. Have your purchasing agent make sure that they are sending demagnetized screws so they will slide freely against the metal within the screw feeder.

Make sure the slides in the screw feeder, plastic feeder tubes, and the screw receivers are thoroughly clean. Blow them off with air…

Check the metal pipes on the screw receivers (where the plastic feeder tubes attach) are not damaged or dented; otherwise the screw tips will sometimes catch as they drop through which can also happen in the funnels mounted in the feeding tube bar.

Not feeding Between the Hopper and Screw Feeder Slides:

Turn off the air service to the machine and check if the screw feeder slides are full of screws. If not manually pivot the hopper up and down to load the screws in to the slots. If they feed freely your ready to go into production. On the other hand check for debris in the hopper slots and screw feeder slides. Check the springs attached to the half round flipper are intact so it pivots the hopper properly. This prevents the screws from bunging up between the hoper slots when the hopper is at full tilt.

Pivot the hopper up and look at the alignment between the hopper slots and the feeder slides. If adjustment is needed, loosen the four set screws in the screw feeder casting holding the hopper pivot pins in position. Shift the hopper laterally to line up the slots and slides, and re-tighten the set screws.

Jamming of the Slide Bar:

Look for debris caught between the screw feeder slots and the slide bar, or beneath the slide bar in the feeder tube.

Pull the feeder tubes off at the receivers an have a helper hold the ends to catch dropping screws. Climb up to the screw feeder and slowly pull the slide bar over by hand to drop six screws to your assistant. If screw feeder jams, go to next step. On the other hand, if it works well manually you probably need to adjust the flow controls that regulate how fast the slide bar goes back and forth; i.e., slow it down.

If the slide bar jambs when you shift it back and forth, either the end cap screw stop needs adjustment, or the slide bar is too tight. To check the end stop, push the slide bar out, extending the cylinder all the way and look at the line up between the ends of the screw feeder slides and entry holes on the slide bar to adjust it back into position.

The slide bar may have to be adjusted on the clevis in the retracted position. It is necessary that the “hook” portion of the slide bar be adjusted so that it does not protrude into the slots when retracted. This is adjusted by screwing in the cylinder rod into the clevis.

Screws ejecting from hopper:

Flow controls to the hopper tilt cylinder are set to fast. They should be set so that there is a smooth shifting motion in both directions when the hopper is full of screws.

Screws ejecting from pick off bar:

If screws are ejecting from the pick off bar, the hopper slide bar cylinder 091D is shifting too fast. It should be set at slow to moderate movement extending and moderate to fast retracting.

Hinge and Screw Quality:

It is imperative that the hinge and screws that are being used in the Six Shooter hold the same tolerance between batch runs, or you may end up spending a lot of time adjusting the machines that compensate for the inconsistent parts

To help minimize screw jamb ups, it is good to inspect the screw boxes before dumping them into the hopper and also check the hinges.

It is recommended that when replacing the drill bits use the APE492BI or an equivalent quality. Any lesser quality can wear the split shells out and sacrifice screw driving quality.

In order to insure that all screw hoppers installed on KVAL machines work correctly to customer specifications, KVAL requests each customer to send 600, or approximately one box, of screws for testing prior to the machine being shipped from the factory. This is to insure that the hopper will feed the test screws correctly and will continue to fee the same type of screws once it is installed. If problems do occur with the feeding of screws once the machine is in production, and no solution can be found please send sample screws to KVAL for testing.

The following is a list of problems that might occur when changing screw type and size.

#9 X 3/4" long flathead Philips drive screws are very good feeding screws under certain condition.

#9 X 5/8" are harder screws to run. 5/8" long screws will flip in a hopper set up for 3/4"

3/4" long screws will not pass through a 5/8" hopper.

5/8" long screws will ride in the rear slot of the hopper, not letting screws passes through.

All magnetized screws will create some problems, anything from sluggish movement to no movement of screws.

Screws with dirt and metal chips will build up in the hopper and create poor movement and jamming conditions.

If head size gets too big, the screws will not pass freely under the cover plates, and will also hang up at the pick-off plate cover.

#8 screws will not run properly in a hopper set up for #9 screws. They will occasionally fall out and jamb.

#10 screws will not run in a hopper set up for #9 screws. They will not pass through the pick off plate.

When changing screw manufacturers, differences in the screws can cause problems with the hopper. Some differences and problems to look for when changing screw manufacturers:

Screw length different

Heads size/ thickness different

Different finish on screw: rough/smooth

Screws might be magnetized

Burrs on threads

Burrs on counter sunk head

Screw material different: harder/softer **can cause problems when driving screws

Philips location and depth differences **can cause problems when driving screws

Size of Philips stamp different **can cause problems when driving screws

Debris in no-sorted screw boxes

WARRANTY

KVAL Inc. will repair or replace any unserviceable parts not covered by their own manufacturer's warranty when malfunction is caused by faulty manufacturing or design up to one year or 2080 hours after the delivery date, whichever comes first. Our warranty does not cover parts that become damaged or unserviceable due to abuse of the machine, or misuse of the equipment as set forth in the material safety data information, and maintenance recommendations in this owners manual.

This warranty does not cover items that wear out during normal use, such as (but not limited to) tooling, chipout blocks, and screwdriver bits. KVAL Inc. is not responsible for costs associated with downtime, lost orders, damage to customer's product or workpieces, or other costs not specifically covered in this warranty. The decision to repair or replace machinery parts under warranty is subject to review of said machinery parts by an authorized KVAL representative and will only be performed if determined by KVAL that part qualifies for repair or replacement as specified in this warranty.

KVAL Inc. is committed to being the industry's finest woodworking machinery manufacturer, and works to maintain a good relationship with its customers.

OPTION R1 – JAMB CLAMP TUBE

KVAL P/N	QTY	PART DESCRIPTION
080111LX	3	SPG 1/4-ID 1-11/32 LG 990F CHIPOUT VERTICAL MOVEMENT 5/16-OD .32 W L/E 990F CHIPOUT. BIN ;9CC;;;;;
ADV240A1B	2	ADV CYL 240 X 2. BIN ;9BC02;8CC;;;;
ADV240M01	2	ADV HDW 240 ROD CLEVIS (BRC-750). BIN ;9BC02;8CC;;
ADV240M02	2	ADV HDW 240 CLEVIS DOUBLE MOUNT W/PIN & SNAP RINGS (B240CM). BIN ;9BC02;8CC;;;
BIM091	6	BIM CYL 091 1 SINGLE ACTING FRONT NOSE MOUNT 1-1/16 BORE. BIN ;9BB01;8CD;
BIM095D	6	BIM CYL 095D 5 DOUBLE ACTING FRONT NOSE MOUNT 1-1/6 BORE. BIN ;9BB01;;8CD;;
CHIPOUT09	3	CHIPOUT,HINGE SECTION (990F-3) 1-1/4 X 1-1/2 X 4-1/2 SPRING LOADED,ASSY. BIN ;1HB;;;;;
FAB2211D	1	FAB HDW 221-1D PIVOT MOUNT FOR 221-SERIES PANCAKE CYLINDERS. BIN ;9BB03;8EB;;;;
FABE121X	6	FAB CYL E-121-X 1 STRK PANCAKE CYL 1-1/8 BORE. BIN ;9BB03;8EB;8BL;;;
FABF221X	1	FAB CYL F-221-X 2 STRK PANCAKE CYL 1-5/8 BORE. BIN ;9BB03;8EB;8BL;;
FABRC38	1	FAB RC-38 ROD CLEVIS FOR 221-SERIES PANCAKE CYLINDERS. BIN ;9BB03;8EB;;;;
NYC50540	6	POLY-MATIC MANIFOLD (1/4 TUBE) WORKING PRESSURE: 27 HG TO 250 PSI 6-HOLE, VEND P/N 54044. BIN ;8CM;2BH;8EE;;;
P100705FS	6	5/8 DIA. 7/16 THICK 5/16 NF THREAD STEEL PAD (990-F2, 990-F3, 990-F4). BIN ;;;;;;
P161607FD	6	1 DIA 1 THICK 7/16 NF THD DELRIN PAD 700B-3. BIN ;;;;;;
P320200-F	6	2 DIA X 1/8 THICK FELT PAD (FABCO PAD) (990-F2, 990-F3, COMMANDER). BIN ;9HC;;;;;
P320505-A	6	2 DIA X 5/16 THICK ALUM PAD 5/16 DRILLED & CSK (990-F2, 990-F3, 990-F4,COMMANDER). BIN ;;;;;;
SMCAS2102	4	SMC FLOW 1/4 RIGHT ANGLE (NAS2200-N02). BIN ;9CD02;8CN;8EE;;;

OPTION R1 – BACK SECTION

KVAL P/N	QTY	PART DESCRIPTION
ADV960A9Z	2	ADV CYL 960 X 8 DC. BIN ;9BC02;8CC;;;;
ADV960M01	2	ADV HDW 960 ROD CLEVIS.(BRC-100) BIN ;9BC02;8CC;;;
ADV960M02	2	ADV HDW 960 CLEVIS MT DOUBLE W/PIN & CLIPS (B960CM). BIN ;9BC02;8CC;;;
ADV960M03	2	ADV HDW 960 CLEVIS EYE MOUNT, SINGLE (BEM750). BIN ;9BC03;8CC;;;
BIM241DP	2	BIM CYL 241DP 1 DOUBLE ACTING REAR PIVOT DOUBLE END MOUNT 1-3/4 BORE. BIN ;9BB02;8CD;;;
BRO12G30	2	SPUR GEAR USE WITH G BUSHING (NSS12G30). BIN ;8CE;;;;;
BRO40H22	3	H40H22 TAPER BORE SPROCKET USE H SPLIT BUSHING. BIN ;;;;;;
BROG16	2	G X 1 SPLIT TAPER BUSHING. BIN ;8CE;;;;
BROH16	3	H X 1 SPLIT TAPER BUSHING (3X576). BIN ;8CE; 9CE02 ;;;;;
BROHB4003	2	IDLER #40 CHAIN 17T X 5/8 BORE SPROCKET (40BB17H). BIN ;8CE;;;;
HUBPB2503	13	PB 250 X 1 PILLOW BLOCK SETSCREW LOCKING RELUBE. BIN ;9CD;8BA;;;;
HUBTPB253	1	TPB 250 X 1 PILLOW BLOCK TAPPED BASE SETSCREW LOCKING RELUBE. BIN ;9CD;8BA;;;;
HUM501A	2	AIR PILOTED VALVE 501A-3-12-20 1/2 PORTS, 275 CFM AT 125 PSI 2&3WAY,N/0&C VAULVE (BLOW-OFF). BIN ;8EE;9BA03;8BD;;;
SMCAS4004	4	SMC FLOW 1/2 STRAIGHT (NAS4000-04). BIN ;8CN;9CD02;8EE;;;
SMCMAN04D	1	SMC MAN 1-NVS4114 & 3-NVS4214 4-STATION MANIFOLD. BIN ;;;;;;
TORYCRS28	2	CAM FOLLOWER 1-3/4 WITHOUT STUD. BIN ;9CD;8BC;;;;

FRAME SECTION

KVAL P/N	QTY	PART DESCRIPTION
530C	1	COMMON PART,MAIN,MOUNTING BASE 920WT,CRS,1/2 X 5 X 5 1/2. BIN ;8CQ;;;;;
90F3-003	10	PHOTO EYE BLOWOFF KIT - INC'S 1 HUMBF1,1 HUMSEF & 1 HUMBF 2 NUTCJ375. BIN ;9AE;;;;;
AIR-DROP16	1	1 AIR DROP FOR DOOR MACHINES USES:(1) BBVAULVE08,(1) NYCAD40204, (1) 000B13, (1) 000B2C AND BRASS.. BIN ;8BE;8AX;;;;
BALCM3534	1	MOTOR 1/3 HP 1725 RPM TEFC 56C 208-230/460 (WIDTH ADJUST) (990-F2, ARCHITECT, 990-F3). BIN ;8MA;;;;;
BIMD241	1	BIM HDW 120,170 FOOT BKT .75 BORE 2.50 LG SLOTTED BASE. BIN ;9BA06;8CD;;;
BLTA031	1	A31 GRIPBELT 33.2" OUTSIDE LENGTH (3X654) (WIDTH ADJUST-DOOR MACHINES). BIN ;9HD;1IZ25;;;;
BOS1617A	4	BOSCH 1617 RTR 1-3/4 HP 120VAC 11 AMP 25,000 RPM 1/2COLLET W/MOD BASE(950-3,960-3,990F-3). BIN ;;;;;;
BRO401406	1	4014 X 1 BORE SPROCKET (40BS14) (1L121). BIN ;8CE;;;;;
BRO401806	2	4018 X 1 BORE SPROCKET (40BS18) (1L135). BIN ;8CE;;;;;
BRO402006	1	4020 X 1 BORE SPROCKET (40BS20) (1L142). BIN ;8CE;;;;;
BROAK3403	2	AK34 X 5/8 GEARBELT PULLEY SINGLE SHEAVE 3.45-OD 3X774. BIN ;8CE;
BROHB4002	2	IDLER #40 CHAIN 17T X 1/2 BORE SPROCKET (G&G040102) (04017E08). BIN ;9CE01;8CE;;;
BUC4000C	1	STC FRL 1/2 FRL COMBO WITH GAUGE (INCLUDES BALL VALVE). BIN ;8BE;;;;;
CENT10810	3	1.75 OD X.207 WIRE DIA. 14LG SWIVEL ENCLOSED HOOK BOTH ENDS (SPC-10810)(990F-3,4 & FX). BIN ;9CD01;9CC;8BA;;;
CHA40120	2	#40 CHAIN CUT TO SIZE-120" (WIDTH ADJUST-DOOR MACHINES). BIN ;8AX;8CG;;;;
CHA4031	1	#40 CHAIN CUT TO SIZE-31" (WIDTH ADJUST-DOOR MACHINES). BIN ;8AX;8CG;;;;
DAY5Z359-A	1	AIR TANK,30-GAL,200 PSI 16 DIA 41 OAL,ASSY. BIN ;8AX;;;;;
DAY6K233	1	MAGNETIC DISC BRAKE FOR C-FACE MOTORS TO 2-HP. BIN ;8MA;;;;;
DOORSTOPA	1	ARCH/COMMANDER/990s BIM122D CLAMP-ON (OUT-FEED) LEFT TO RIGHT FEED. BIN ;;;;;;
DOORSTOPB	1	ARCH/COMMANDER/990s BIM122D CLAMP-ON (IN-FEED) RIGHT TO LEFT FEED. BIN ;;;;;;
EVE85238	3	1-1/4 DIA 5/16-24 THD RTR BIT SPIN ON #EMB-114X (990-F3 FRONT). BIN ;9AA;;;;;
FAB-A009	3	CYL ASSY 990F-3 & 4 HINGE SECT VERT CYLINDER ASSEMBLY.(D521XP14XX & E521XP14XX & ADV490A3H) WITH 1/4 FLOW CONTROLS. (USED ON MACHINES AFTER (05/00). BIN ;9BB03;;;;;
FAB18PMD3	1	FAB VLV 1800 PMD-3 1/8 3-WAY DBL. BIN ;9BB03;8B6;8DC;;;
FABM60-03	3	MUFFLER 3/8 SILENCER FOR THE GAST AIR MOTORS. BIN ;9CC01;;;;;
GAT8C1292	2	HYD HOSE 1/2-ID 292 LONG W/FITTINGS GATES 8C1T 990-FAX2 2-REQ'D (8C1T-8FJX-8FJX-292). BIN ;8CH;8AX;8UA;;;
GRE20059C	1	6"OAL TWIST DRILL 1 CARBIDE TIPPED 6 OAL 4 TWIST BRAD POINT 1/2-SHANK (556315). BIN ;9AA;;;;;
HLPOINTR1	1	HAIRLINE POINTER COMPLETE UNIT (PLASTIC) (1352593). BIN

		;9CD;9CC02;8BA;;;
HUBFB1603	1	FB 160 X 1 2-SQUARE HOLE MOUNT RELUBE SETSCREW LOCKING. BIN
HUBFB2603	2	FB 260 X 1 2-HOLE MOUNT SETSCREW LOCKING RELUBE. BIN ;9CD;8BA;;;;
HUBPB2503	1	PB 250 X 1 PILLOW BLOCK SETSCREW LOCKING RELUBE. BIN ;9CD;8BA;;;;
HUBTPB253	1	TPB 250 X 1 PILLOW BLOCK TAPPED BASE SETSCREW LOCKING RELUBE. BIN ;9CD;8BA;;;;
HUM250A01	1	HUM VLV 250A-3-10-20 (NC) 1/4" 3-WAY PILOT VALVE. BIN ;9BA03;8CM;;;
HUM250A02	2	HUM VLV 250A-3-11-20 (NO) 1/4" 3-WAY PILOT VALVE. BIN ;9BA03;8EE;;;
HUM501A	1	AIR PILOTED VALVE 501A-3-12-20 1/2 PORTS, 275 CFM AT 125 PSI 2&3WAY,N/0&C VAULVE (BLOW-OFF). BIN ;8EE;9BA03;8BD;;;
HUM820A	2	HUM HDW 8-20A MOUNTING BASE FOR HUM250A01 & HUM250A02 PILOT VALVES. BIN ;9BA03;;;;
INASPB120	6	KGXO-12PP 3/4" OPEN SUPER LINEAR PILLOW BLOCK. BIN ;;;;;;
INASPB12OM	6	KGXO-12PP 3/4" OPEN MOD. SUPER LINEAR PILLOW BLOCK(PART# F-393675)MACHINED TO PRINT 8-00-ASSY1. BIN ;;;;;;
INASPB240	4	KGXO-24PP 1-1/2" OPEN SUPER LINEAR PILLOW BLOCK. BIN ;;;;;;
INDXS0303106	7	WHEEL, 3" DIA. X 1-1/4" WIDE 3/8" ID WITH SIMI-PRECISION ROLLER BEARING (XS03031-06). BIN ;;;;;;
KVARBOR18A1	1	ARBOR 1/2DIA SHK 1/4-28 THD 2-3/8 OAL BACKSECTION W/1 HP PERSKE MTR. BIN ;9CG;;;;;
KVARBOR18B1	3	ARBOR 1/2DIA SHK 5/16-24 THD 2-1/16 OAL 990F-3 HINGE RTR W/PERSKE 2HP. BIN ;9CG;;;;;
LIN400001	5	CONNECTING LINK 40 CHAIN. BIN ;8CG;3AG;;;;
LIN600003	21	ROLLER LINK 60 CHAIN (FEED BELT SUPPORT) 7 PCS.PER. BIN ;3AG;;;;;
LOVL09516	2	L095 COUPLING BODY 1 BORE 3-PC FLEXIBLE COUPLING (4X193). BIN ;8BE;;;;;
NTRP0200	11	P-2 NYLATRAC HOSE CARRIER (QUAN/PRICE PER FT) (NTC-6330). BIN ;8UB;8AX;;;;
NTRP2BRKT	1	P-2 NYLATRAC CABLE MOUNTING BRACKETS (PRICE PER PAIR) ORDER (NTC-45828). BIN ;8AX;;;;;
NUTFJ750LH	4	3/4-16 NF JAMB NUT LEFT HAND. BIN ;3AI;;;;;
NYCAR200002	2	Regulator, 1/4" NPT Regulator, Mini (Nycoil AR2000-02)
NYCG361001	2	Gage, Pressure Gage, 1 1/2", 1/8 NPT (Nycoil G36-10-01) (SUB: SMCK10) BIN;9CD01:
PARHN2S6CW	1	Filter, Finite 1/2" Coalescing Filter (G.A.Wirth PN HN2S-6CW)
REIDK85	9	KNOB DK-85 4-PRONG -1/4-20 1-1/4 DIA 1 LONG. BIN ;9CD;9CC02;;;;
RODEND06M	2	TRE-6 3/8 BORE ROD END MALE 3/8-24 MALE THREAD SHANK END (MORSE). BIN ;9CC01;9CC;8BE;;;
RODEND12M	4	TRE-12 3/4 BORE ROD END - 3/4-16 MALE THD SHANK END (MORSE). BIN ;9CC01;9CC;8BE;;;
RODEND12M-LH	4	TRE-12 3/4 BORE ROD END - 3/4-16 MALE THD SHANK END (LEFT HAND). BIN ;9CC01;9CC;8BE;;;
RODENDCB6	2	3/8 LEFT HAND MALE THREAD ROD END (555). BIN ;9CC01;9CC;8BE;;;
RULE1652	2	1 1/2" x 38" PLASTIC RULE ADHESTIVE-BACKED READING L TO R 16 - 52, WHITE/GREEN/RED GRAPHICS, 1" BLANK AT ENDS, TOP-COATED. (OREGON RULE P/N 1 1/2 FR-W16/52L-3LTC/R&G-KVAL) SOME OF THESE ARE IN THE PARTS DEPT OFFICE FOR SHIP OUT
SAF0500	1	ROUTER BIT 1/2 REVERSE HELIX 1/4-28 THREAD 1/2 SHANK (BACK SECTION). BIN ;9AB;;;;;
SLD1250	18	1/8 STUB LENGTH HSS DRILL BIT (5X988).(040808) BIN ;9AB;

SMCAS2101	17	SMC FLOW 1/8 RIGHT ANGLE (NAS2200-01). BIN ;9CD02;8CN;8EE;;;
SMCAS2102	18	SMC FLOW 1/4 RIGHT ANGLE (NAS2200-N02). BIN ;9CD02;8CN;8EE;;;
SMCMAN10B	1	SMC MAN 8-NVS4114 & 2-NVS4214 10-STATION MANIFOLD. BIN ;;;;;;
SMCNVS305	1	SMC VLV NVS3145-0409D 1/2 BASE (SIZE #4 VALVE) (BLOW-OFF) (ON-2, 990-F3 PRE-DRILL). BIN ;8CE;9CD02;;;;
SMCNVS405	1	SMC VLV NVS4114-0009D 1/4 BASE 4-WAY ;8CE;;;;
SPIDER005-H	1	HYTREL SPIDER OR CONNECTOR FOR THE 090 & 095 SERIES FLEXIBLE COUPLINGS. BIN ;9CE01;;;;;
TAPE12LI	1	12' STICK-DOWN TAPE READS R-L 1/2 WIDE READS RIGHT TO LEFT INCH ONLY (1350429). BIN ;9CD;9CC02;8BB;;;
WHI61006	1	2-1/8 2-WING BIT 6-1/8 OAL CARBIDE TIP 1/2 SHANK (BACK SEC). BIN ;9AB;;;;;
WIN920WU4M	1	40:1 RATIO RIGHT ANGLE (2Z952) SPEED REDUCER 43 RPM WINSMITH 920 WN-LR (MOD.FOR WIDTH ADJ.). BIN ;;;;;;

HEAD SECTION

KVAL P/N	QTY	PART DESCRIPTION
BIM090UD	1	BIM CYL 090.5D 1/2 DOUBLE ACTING FRONT NOSE MOUNT 1-1/16 BORE. BIN ;8CD;9BB01;;;;
BIM122DP	2	BIM CYL 122DP 2 DOUBLE ACTING REAR PIVOT DOUBLE END MOUNT 1-1/4 BORE. BIN ;9BB01;8CD;;
BIM128DP	1	BIM CYL 128DP 8 DOUBLE ACTING REAR PIVOT DOUBLE END MOUNT 1-1/4 BORE. BIN ;9BB01;8CD;;;
BIMD129	1	BIM HDW 040,060,090 FOOT MOUNT BRKT .620 BORE 1.88 LG SLOTTED BASE. BIN ;9BA06;8CD;;;
BIMD241	1	BIM HDW 120,170 FOOT BKT .75 BORE 2.50 LG SLOTTED BASE. BIN ;9BA06;8CD;;;
FABE121X	2	FAB CYL E-121-X 1 STRK PANCAKE CYL 1-1/8 BORE. BIN ;9BB03;8EB;8BL;;;
FABX121X	2	FAB CYL X-121-X 3/4 STROKE PANCAKE CYL 1-1/8 BORE. BIN ;9BB03;8BL;8EB;;;
INASPB120	7	KGXO-12PP 3/4" OPEN SUPER LINEAR PILLOW BLOCK. BIN ;;;;;;
INASPB12OM	7	KGXO-12PP 3/4" OPEN MOD. SUPER LINEAR PILLOW BLOCK(PART# F-393675)MACHINED TO PRINT 8-00-ASSY1. BIN ;;;;;;
SMCAS2001	4	SMC FLOW 1/8 STRAIGHT (NAS2000-NO1). BIN ;8CN;9CD02;8EE;;;
SMCAS2201F1	9	SMC FLOW 1/8 NPT - 1/4 OD RIGHT ANGLE FLOW CONTROL (NAS 2201F-N01-07S) (WHITE). BIN ;9CD02;8CN;8EE;;;
SMCAS2301F	1	1/8 FLOW CONTROL UNIVERSAL (SMC NAS2301F-N01-07S). BIN ;9CD02;8CN;8EE;;;
SMCNVSA03	1	SMC VLV NVSA4114-000 1/4 BASE VALVE 4-WAY PILOT. BIN ;9CD01;8CE;;;;

BACK SECTION

KVAL P/N	QTY	PART DESCRIPTION
0832CFS037	8	FLAT HEAD 8-32 X 3/8 SOCKET CAP SCREW GRADE 8. BIN ;5AB;;;;;
15-00-Y	2	BACK SECTION,MAIN,CLEVIS,FREE MACHINE STEEL,3/4 X 3/4 X 2. BIN ;;;;;;
15-00-Z	2	BACK SECTION,MAIN,CLEVIS,FREE MACHINE STEEL,7/8 X 7/8 X 1.650. BIN ;;;;;;
1501C	12	COMMON PARTS,FLANGED WHEEL BEARING SLEEVE,FMS,1/2 DIA X 1. USED WITH BAI150050 TO REPLACE KILF35011 BIN ;;;;;;
527C	14	COMMON PART,MAIN,1 1/2 RAIL STANDOFF,SR24 Shaft Support. BIN ;7AA;3AE;;;;
ACU940005	2	ACURA-FLEX NUT # 9400005 (BACK SECTION LOCK & BORE) (M-2000, EDGE). BIN ;9CC01;9CD03;8BJ;;;
ACUAF122	2	AF122 COLLET 1/2-3/4 CAP. (BACK SECTION LOCK & BORE). BIN ;9CD03;9CC;;;;
ADV490H1R	1	ADV CYL HYD 490 X 5 (BACK SECTION). BIN ;9BC01;8CC;;;;
BAI150050	12	FLANGED WHEEL BEARING, Regular Duty, 1/2 ID - 1 3/8 OD, Flange Width 7/16, FLANGE OD 1 1/2.(KILF35012). ALSO USED WITH 1/2"OD X 3/8"ID #1501C SPACER (SPACER INCLUDED) TO REPLACE KILF35011
BAKSEC00007	2	BACK SECTION MOD KVALBB16A BEARING BLOCK DWG #07 CHIPOUT BLOCK. BIN ;;;;;;
BALM35R202T123C	1	3450 RPM 3-HP MACHINED W/TAPER W/CHUCK (KVASC0028) 208/230- 460V (BALDOR MOD.# 35R202T123). BIN ;9DA02;9DA01;;;;
BALM3613TX100C	1	3450 RPM 5-HP MACHINED TAPER W/CHUCK (KVASC0032)208/230-460 (BALDOR MOD.# 36K887X100). BIN ;;;;;;
BIM1212DP	1	BIM CYL 1212DP 12 DOUBLE ACTING REAR PIVOT DOUBLE END MOUNT 1-1/4 BORE. BIN ;9BB01;8CD;;;
BIM122DP	2	BIM CYL 122DP 2 DOUBLE ACTING REAR PIVOT DOUBLE END MOUNT 1-1/4 BORE. BIN ;9BB01;8CD;;
BIM2418DP	1	BIM CYL 2418DP 18 DOUBLE ACTING REAR PIVOT DOUBLE END MOUNT 1-3/4 BORE. BIN ;9BB02;8CD;;;;
BIM241DP	2	BIM CYL 241DP 1 DOUBLE ACTING REAR PIVOT DOUBLE END MOUNT 1-3/4 BORE. BIN ;9BB02;8CD;;;
BIM242DXD	2	BIM CYL 242DXDE 2 DOUBLE ACTING DOUBLE END ROD MOUNT 1-3/4 BORE. BIN ;9BB02;8CD;;;
BIMC1337	8	BIM HDW 240 FOOT MOUNT BRACKET 1.037 BORE 3 LONG SLOTTED BASE. BIN ;9BA06;8CD;;;;
BIMD1360	2	BIM HDW 120 2-PC PIVOT BKT .250 BORE 2.12 SLOTTED BASE. BIN ;9BA06;8CD;;;
BIMD241	2	BIM HDW 120,170 FOOT BKT .75 BORE 2.50 LG SLOTTED BASE. BIN ;9BA06;8CD;;;
BIMD8309A	2	BIM HDW MRS 090 CLEVIS 5/16-24 NF THD 1.44 LG .250 PIN. BIN ;8CD;9BA06;;;;
BROBK4502M	10	MODIFIED BK45 X 1/2 PULLEY BORE TO 1-1/4-ID FOR NEEDLE BEARINGS (AUTO-FEED). (SUB 160C) BIN ;8CE;;;;;
BRON2	14	1 DIA TIGHTENER SHAFT 3-3/8 OAL 3/4-10 THREAD. BIN ;8CE;;;;;

BRON4D1F	4	N4D1F IDLER FLAT FACE 4-3/8-OD 1 BORE 1-1/16 FACE 2-1/8 SHAFT. BIN ;;;;;;
CHIPOUT05	1	CHIPOUT BACK SECT LOCK BEVEL 5/16 X 3-1/2 X 4" RYERTEX. BIN ;09B;9HB ;;;;;
CPLR0720-HD	1	7/16-20 X 1-1/4 LONG THREADED COUPLER HEAVY DUTY (SUB ASSEMBLY). BIN ;8AX;;;;;
FABE121X	3	FAB CYL E-121-X 1 STRK PANCAKE CYL 1-1/8 BORE. BIN ;9BB03;8EB;8BL;;;
FOS3W250	1	SLEEVE VALVE 1/4 3-WAY. BIN ;9BA02;8CM;8EE;;;
FOS3W375	1	SLEEVE VALVE 3/8 3-WAY. BIN ;9BA02;8EE;;;;
HLPOINTR1	1	HAIRLINE POINTER COMPLETE UNIT (PLASTIC) (1352593). BIN ;9CD;9CC02;8BA;;;
HUBTPB253	2	TPB 250 X 1 PILLOW BLOCK TAPPED BASE SETSCREW LOCKING RELUBE. BIN ;9CD;8BA;;;;
HUM250A01	2	HUM VLV 250A-3-10-20 (NC) 1/4" 3-WAY PILOT VALVE. BIN ;9BA03;8CM;;;
HUM820A	2	HUM HDW 8-20A MOUNTING BASE FOR HUM250A01 & HUM250A02 PILOT VALVES. BIN ;9BA03;;;;
INAKX16PP	2	KX16PP 1" BEARING ONLY. BIN ;;;;;;
INASPB240	2	KGXO-24PP 1-1/2" OPEN SUPER LINEAR PILLOW BLOCK. BIN ;;;;;;
INASPB240M	2	MODIFIED KGXO-24PP 1-1/2" OPEN SUPER LINEAR PILLOW BLOCK. BIN ;;;;;;
KIP38158	2	KIP 5/16-18 THREAD 2.36 STUD ADJ HANDLE (5T63A02K) GN300-63-(5/16-18)-63-BK. BIN ;;9CC02;;;;
KVALBB12A	8	LINEAR BEARING BLOCK W/STD 3/4 BEARING & 2 SEALS 2 LONG 1-1/2 SQUARE. BIN ;9BA01;1-01C;;;;
KVALBB16A	16	LINEAR BEARING BLOCK W/STD 1 BEARING & 2 SEALS 2-3/4 LONG 2 SQUARE. BIN ;9BA03;8CJ;2BQ;;;
KVALBB16D	2	LINEAR BEARING BLOCK (NO BRG) 2-3/4 LONG 2 SQUARE 1-1/2 BORE FOR 1 BRG. MILLED FOR CLEARANCE ON BACK SECTION BIN ;8CJ;2BQ;;;;
KVALSS12	4	SHFT SUPPORT 1-1/2 X 2 X 2-1/2 3/4 BORE (ANODIZED ALUM) (ARCH, CMDR, 950-3, 960-3). BIN ;8CA;2BP;;;;
KYBKG5406	1	SHOCK ABSORBER (GAS OPERATED) KYB-5406 (BACK SECTIONS). BIN ;1-01D;;;;;
LIN400002	4	OFFSET LINK 40 CHAIN. BIN ;3AG;;;;;
MON21750	1	HYD RESERVOIR 2-1750 (700-C, BACK SECTIONS, 985-B) (M-2000). BIN ;9CD02;8BE;8BJ;;
NYCG361001	1	Gage, Pressure Gage, 1 1/2", 1/8 NPT (Nycoil G36-10-01) (SUB: SMCK10) BIN;9CD01:
REIDK59	2	KNOB DK-59 4-PRONG (1-3/4 DIA) 1/4-20 X 7/16 DEEP BLIND HOLE BRASS INSERT. BIN ;9CD;9CC02;;;;
RODEND07M	1	TRE-7 7/16 BORE ROD END 7/16-20 MALE THREAD SHANK END (MORSE) (BACK SEC). BIN ;9CC01;9CC;;;;
RODEND12F	1	TR-12 3/4 BORE ROD END 3/4-16 FEMALE THREAD SHANK END (MORSE) (BACK SEC). BIN ;9CC01;9CC;8BJ;;;
SC112F	2	SPLIT COLLAR 3/4 (15022) 1-PIECE STEEL. BIN ;8BB;3AF;;;;
SC116F	4	SPLIT COLLAR 1 1 PCS (15030) 1-PIECE STEEL (DL-2, CMDR). BIN ;8BB;3AF;;;;
SC216F	3	SPLIT COLLAR 1 2-PCS (15130) 2-PIECE STEEL. BIN ;8BB;3AFNB;;;;

SEAL16	4	SEAL 1-ID 1.567-OD (S-1000) SINGLE LIP (USE WITH KVALBB BLOCKS). BIN ;8CJ;2BQ;;;;
SMC20001R	1	SMC 1/4 MINI REGULATOR WITH CHECK VALVE (AR20K-NO2H-Z) (1/8 BODY WITH 1/4 PORTS). BIN ;9CD02;8CL;;;;
SMC20001Y	1	SMC 1/4 MINI CHECK VALVE REG BRACKET (AR20P-270AS). BIN ;9CD01;8CL;;;;
SMCAS2001	1	SMC FLOW 1/8 STRAIGHT (NAS2000-NO1). BIN ;8CN;9CD02;8EE;;;
SMCAS2101	9	SMC FLOW 1/8 RIGHT ANGLE (NAS2200-01). BIN ;9CD02;8CN;8EE;;;
SMCAS2102	11	SMC FLOW 1/4 RIGHT ANGLE (NAS2200-N02). BIN ;9CD02;8CN;8EE;;;
SMCMAN02	1	SMC MAN 2-NVS4114 2-STATION MANIFOLD. BIN ;8BG;8CE;;;;
SMCMAN05	1	SMC MAN 5-NVS4114 5-STATION MANIFOLD. BIN ;8BJ;;;;;
SMCNVS405	1	SMC VLV NVS4114-0009D 1/4 BASE 4-WAY ;8CE;;;;
SMCNVSA03	1	SMC VLV NVSA4114-000 1/4 BASE VALVE 4-WAY PILOT. BIN ;9CD01;8CE;;;;
SS243216	1	OILITE 3/4 X 1 X 1 SLEEVE BUSHING SS24232-16. BIN ;3AK;;;;;
WESPT7612	6	3 DIA X 3/4 WIDE 1-3/8-ID GREEN POLYTUBE ROLLER 60 DURO (PT7635). BIN ;9CC03;8BB;;;;
WRENCH026	1	1-5/8 THIN PATTERN PUMP WRENCH (1252) (28-052). BIN ;9CC;;;;;
WRENCHER32	1	WRENCH FOR THE ACURA-FLEX NUT (04616)

SCREW CHANGING HOPPER

KVAL P/N	QTY	PART DESCRIPTION
AKR30230	1	5-1/2 WIDE YELLOW BIN (5W871) 10-7/8 DEEP 5 HIGH (30-230). BIN ;8AX;;;;;
BIM126DP	2	BIM CYL 126DP 6 DOUBLE ACTING REAR PIVOT DOUBLE END MOUNT 1-1/4 BORE. BIN ;9BB01;8CD;;
BIMBF0905	1	BF-090.5 SINGLE ACTING FRONT BLOCK SPRING RETURN CYLINDER 1-1/6 BORE 1/2 STROKE. BIN ;9BB01;8CD;;;;
BIMD1360	3	BIM HDW 120 2-PC PIVOT BKT .250 BORE 2.12 SLOTTED BASE. BIN ;9BA06;8CD;;;
BIMD2311	2	BIM HDW 120, 170 CLEVIS 7/16-20 NF THD 1.69 LG .38 PIN. BIN ;9BA06;8CD;;;
HUM250A01	1	HUM VLV 250A-3-10-20 (NC) 1/4" 3-WAY PILOT VALVE. BIN ;9BA03;8CM;;;
HUM820A	1	HUM HDW 8-20A MOUNTING BASE FOR HUM250A01 & HUM250A02 PILOT VALVES. BIN ;9BA03;;;;
NYCAR200002	1	Regulator, 1/4" NPT Regulator, Mini (Nycoil AR2000-02)
SMCAS2201F1	4	SMC FLOW 1/8 NPT - 1/4 OD RIGHT ANGLE FLOW CONTROL (NAS 2201F-N01-07S) (WHITE). BIN ;9CD02;8CN;8EE;;;
NYCG361001	1	Gage, Pressure Gage, 1 1/2", 1/8 NPT (Nycoil G36-10-01) (SUB: SMCK10) BIN;9CD01:
SMCMAN04N	2	SMC MAN 4-VQZ21515L0 W/BASE 4-STATION MINI MANIFOLD (24V VALVES). BIN ;9CD02;8CL;;;;

SIX SHOOTER

KVAL P/N	QTY	PART DESCRIPTION
13-00-23	2	6 SHOOTER,CARRIAGE,ASSY TRAVEL CARRIAGE WHEEL. BIN ;7AA;9DB04;;;;;
13-00-AM	1	6 SHOOTER,MAIN,CONTROL MOUNTING PLATE,Hot Roll,1/4 X 8 X 8 3/4. BIN ;7AA;;;;;
13-00-AZ	1	6 SHOOTER,CARRIAGE,Angle Iron,1/4 X 2 X 2 X4 1/2. BIN ;7AA;;;;;
13-00-CH	1	6 SHOOTER,CARRIAGE,Angle Iron,1/4 X 3 X 5 X 3. BIN ;7AA;;;;;
13-00-H1	2	6 SHOOTER,CARRIAGE,CARRIAGE WHEEL,OEM,. BIN ;7AA;;;;;
37030808	1	HYD 45 DEG ELBOW 3/4-16 MALE FLARE TO 3/4-16 FEMALE SWIVEL (3703-8-8). BIN ;2BN;8BH;;;;
39030808	2	HYD 90 DEG ELBOW 3/4-16 MALE FLARE TO 3/4-16 FEMALE SWIVEL (3903-8-8). BIN ;2BN;8BH;;;;
ADV120M03	1	ADV HDW 120 CLEVIS EYE MOUNT SINGLE (BEM-375). BIN ;9BC01;8CC;;;
ADV240A1R	1	ADV CYL 240 X 5. BIN ;9BC01;8CC;;;;
ADV240M01	1	ADV HDW 240 ROD CLEVIS (BRC-750). BIN ;9BC02;8CC;;
ADV240M02	1	ADV HDW 240 CLEVIS DOUBLE MOUNT W/PIN & SNAP RINGS (B240CM). BIN ;9BC02;8CC;;;
ADV240M03	2	ADV HDW 240 CLEVIS SINGLE MOUNT (BEM-500). BIN ;9BC02;8CC;;;
APE492BI	6	BIT, PHILLIPS 1/4 X 3-1/2 OAL INTERMEDIATE HARDNESS BIT (STRAIGHTENED & SIZED). BIN ;9BA01;9AF;;;;
BIM126DP	1	BIM CYL 126DP 6 DOUBLE ACTING REAR PIVOT DOUBLE END MOUNT 1-1/4 BORE. BIN ;9BB01;8CD;;
BIMD1360	1	BIM HDW 120 2-PC PIVOT BKT .250 BORE 2.12 SLOTTED BASE. BIN ;9BA06;8CD;;;
BIMD15004	1	BIM HDW D-1500-A4 4 AIR TANK. BIN ;9BB02;8CD;;;
BIMD2311	1	BIM HDW 120, 170 CLEVIS 7/16-20 NF THD 1.69 LG .38 PIN. BIN ;9BA06;8CD;;;
CLAMP0031	6	HOSE CLAMP 5/16 MIN 7/8 MAX CAP. FITS 1/4 - 3/8 HOSE (NAPA PART# 505-1206). BIN ;8AX;;;;;
FABOS1	1	FAB OS-1 VALVE, 1-SHOT. BIN ;9CC01;8BJ;8EB;;;
HUBFB1602	2	FB 160 X 3/4 2-SQUARE HOLE MOUNT RELUBE SETSCREW LOCKING. BIN ;9CD;8BA;;;;
MRC304S01	2	BRG 304SZZC .7874 (INA W304PP) (SKF462304) SYNTHETIC SEALS (DL-2, 6-SHOOTER TRACK). BIN ;9CD;8BB;;;;
MUFFBV2	1	BREATHER VENT 1/4 NPT 5/8 OAL 9/16 HEX HEAD (BV-2) BRONZE SCREEN. BIN ;9BA02;8CM;8EE;;;
NYCAR200002	1	Regulator, 1/4" NPT Regulator, Mini (Nycoil AR2000-02)
NYCG361001	1	Gage, Pressure Gage, 1 1/2", 1/8 NPT (Nycoil G36-10-01) (SUB: SMCK10) BIN;9CD01:
P633006-N	2	PAD 3-15/16 X 1-7/8 MOULDED PAD WITH STEEL INSERT 60 DURO GREEN PAD. BIN ;9CC03;8BC;;;;
SC216F	4	SPLIT COLLAR 1 2-PCS (15130) 2-PIECE STEEL. BIN ;8BB;3AFNB;;;;
SMCAS2001	1	SMC FLOW 1/8 STRAIGHT (NAS2000-NO1). BIN ;8CN;9CD02;8EE;;;
SMCAS2102	2	SMC FLOW 1/4 RIGHT ANGLE (NAS2200-N02). BIN ;9CD02;8CN;8EE;;;
SMCNVSA06	3	SMC VLV NVSA4214-000 1/4 BASE VALVE 4-WAY DOUBLE PILOT. BIN ;8CE;;;;;

SYSLUBG	10	HYD OIL, (FLYINGAAW32) 1 GAL CONTAINER (LUBRICATOR & HYD PUMP OIL). BIN ;9GG;1UB;;;;

EIGHT SHOOTER

KVAL P/N	QTY	PART DESCRIPTION
03L388	2	HYD HEX UNION 3/4-16 THD 1/2 TUBE 37-DEG JIC FLARE (03L3-8-8). BIN ;;;;;;
37030808	2	HYD 45 DEG ELBOW 3/4-16 MALE FLARE TO 3/4-16 FEMALE SWIVEL (3703-8-8). BIN ;2BN;8BH;;;;
39030808	1	HYD 90 DEG ELBOW 3/4-16 MALE FLARE TO 3/4-16 FEMALE SWIVEL (3903-8-8). BIN ;2BN;8BH;;;;
13-00-H1	2	6 SHOOTER,CARRIAGE,CARRIAGE WHEEL,OEM,. BIN ;7AA;;;;;
ADV240M01	1	ADV HDW 240 ROD CLEVIS (BRC-750). BIN ;9BC02;8CC;;
ADV240M03	1	ADV HDW 240 CLEVIS SINGLE MOUNT (BEM-500). BIN ;9BC02;8CC;;;
ADV300A1R	1	ADV CYL 300 X 5 (990-F4). BIN ;9BC01;9BC;8CC;;;
ADV300M03	1	ADV HDW 300 CLEVIS SINGLE MOUNT (BEM-501). BIN ;9BC02;8CC;;;
BIM127DP	2	BIM CYL 127DP 7 DOUBLE ACTING REAR PIVOT DOUBLE END MOUNT 1-1/4 BORE. BIN ;9BB01;8CD;;;;
BIMD1360	2	BIM HDW 120 2-PC PIVOT BKT .250 BORE 2.12 SLOTTED BASE. BIN ;9BA06;8CD;;;
BIMD15004	1	BIM HDW D-1500-A4 4 AIR TANK. BIN ;9BB02;8CD;;;
BIMD2311	2	BIM HDW 120, 170 CLEVIS 7/16-20 NF THD 1.69 LG .38 PIN. BIN ;9BA06;8CD;;;
CLAMP0031	8	HOSE CLAMP 5/16 MIN 7/8 MAX CAP. FITS 1/4 - 3/8 HOSE (NAPA PART# 505-1206). BIN ;8AX;;;;;
GAT8C2AT30	1	HYD HOSE 1/2-ID 30 LONG W/FITTINGS (8C2AT-8FJX-8FJX) 8-SHOOTER (1 REQ'D). BIN ;8AX;;;;;
HUBFB1602	2	FB 160 X 3/4 2-SQUARE HOLE MOUNT RELUBE SETSCREW LOCKING. BIN ;9CD;8BA;;;;
MRC304S01	2	BRG 304SZZC .7874 (INA W304PP) (SKF462304) SYNTHETIC SEALS (DL-2, 6-SHOOTER TRACK). BIN ;9CD;8BB;;;;
P633006-N	2	PAD 3-15/16 X 1-7/8 MOULDED PAD WITH STEEL INSERT 60 DURO GREEN PAD. BIN ;9CC03;8BC;;;;
SC206F	4	SPLIT COLLAR 3/8 (15110) 2-PIECE STEEL. BIN ;8BB;3AF;;;;
NYCAR200002	1	Regulator, 1/4" NPT Regulator, Mini (Nycoil AR2000-02)
SMCAS2101	4	SMC FLOW 1/8 RIGHT ANGLE (NAS2200-01). BIN ;9CD02;8CN;8EE;;;
SMCAS3002	2	SMC FLOW 1/4 STRAIGHT (NAS3000-02). BIN ;8CN;9CD02;8EE;;;

NYCG361001	1	Gage, Pressure Gage, 1 1/2", 1/8 NPT (Nycoil G36-10-01) (SUB: SMCK10) BIN;9CD01:
SMCNVSA03	1	SMC VLV NVSA4114-000 1/4 BASE VALVE 4-WAY PILOT. BIN ;9CD01;8CE;;;;
SMCNVSA06	2	SMC VLV NVSA4214-000 1/4 BASE VALVE 4-WAY DOUBLE PILOT. BIN ;8CE;;;;;

NOTES

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