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Serial Numbers 07276 & Up

OPERATOR'S MANUAL



The Challenge Machinery Company
6125 Norton Center Drive
Norton Shores, MI 49441-6081 USA

ChallengeMachinery.com

CHAMPION 370 ***PAPER CUTTER***

Models XG & XT

Sold and Serviced by

F.370-B-O
October 2007

1.0 Introduction

THIS MANUAL is designed to help you get the most from your Challenge equipment. Keep this manual in a safe, convenient place for quick reference by operators and service personnel.

CAUTION

SAFETY ALERT! This symbol means **CAUTION: Personal safety instructions!** Pay special attention to the instructions in bold type. Personal injury may result if the precautions are not read and followed.

READ THIS MANUAL BEFORE OPERATING! Follow precautions and instructions given and you should have years of trouble-free operation. If after reading the manual questions still remain, contact your Authorized Challenge Dealer.

FOR PARTS AND SERVICE, contact the Authorized Challenge Dealer from whom you purchased your machine. Use the illustrations and parts lists at the back of this manual to identify the correct parts needed. Always give the **SERIAL NUMBER** and **MODEL** of your machine to insure the correct parts are sent as soon as possible.

Take a few minutes right now to **RECORD YOUR MACHINE SERIAL NUMBER** in the space provided on the front cover of this manual. Also be sure to fill out the warranty card accompanying your machine and return it to **CHALLENGE**.

If you bought a used machine, it is important to have the following information on record at Challenge. Copy this page, fill in the information and send it care of The Challenge Machinery Company • Attn.: Service Department • 6125 Norton Center Drive • Norton Shores • MI 49441-6081

CHALLENGE MODEL	SERIAL NUMBER	
ATTN	COMPANY	
ADDRESS		
CITY	STATE/PROVINCE	ZIP
PHONE	DATE INSTALLED	
DEALER NAME & CITY		

* WARRANTY INFORMATION *

It is very important that you read and understand the conditions outlined in the *Warranty Information Sheet* attached to the outside of the shipping container of your machine.

The *Warranty Information Sheet* must be filled out completely and returned to THE CHALLENGE MACHINERY COMPANY in order for the warranty to be issued for this machine.

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2.0 Safety

2.1 Precautions

- This machine is designed for one-person operation. Never operate the machine with more than one person.
- Safe use of this machine is the responsibility of the operator. Use good judgment and common sense when working with and around this machine.
- Read and understand all instructions thoroughly before using the machine. If questions remain, contact the dealer from which you purchased this machine. Failure to understand the operating instructions may result in personal injury.
- Only trained and authorized people should operate this machine.
- Do not alter safety guards or devices. They are for your protection. Severe personal injury may result.
- Disconnect power before cleaning or performing maintenance. See Section 2.2 Power Lockout Procedure.
- Observe all caution labels on this machine.
- Be sure the cutter is properly grounded.
- Be sure there is sufficient power to operate the cutter properly.
- Observe all caution plates mounted on this cutter.
- Keep foreign objects off table and away from cutter blade.
- **BE EXTREMELY CAREFUL** when handling and changing the cutter knife. Severe lacerations or dismemberment could result from careless handling procedures.
- Keep the floor around the cutter free of trim, debris, oil and grease.
- When replacing hydraulic parts, loosen the connections slowly to release pressure. Never loosen connections with the machine running.
- If the cutter sounds or operates unusually, turn it off and consult the troubleshooting section of this manual. If the problem cannot be corrected, have it checked by a qualified service person.
- **CRUSH HAZARD-** Keep hand and fingers from under the clamp when clamping paper. Use Jogging Aid to load paper, and use the backgauge to push paper out before unloading. **DO NOT REACH UNDER THE KNIFE AND CLAMP AREA!**
- Never ship machine with the knife installed.

2.2 Power Lockout Procedure

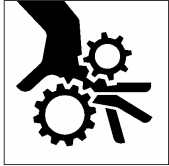
For maximum safety when making adjustments or repairs to your machine, be sure to lock out the main power control switch to which the machine is connected. The switch should be moved to the OFF position and a padlock placed in the loop. The person servicing the machine should hold the key.



Figure 1

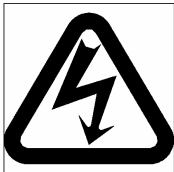
2.3 Warning Label Definitions

The following warning labels are found at various locations on your machine. Read and understand the meaning of each symbol. If a label is lost from the machine, it should be replaced. The item number and location of each label can be found in the Technical Manual.



HAZARDOUS AREA

Disconnect power before cleaning, servicing, or making adjustments not requiring power. Do not alter safety guards or devices; they are for your protection. Replace all guards. Do not operate with any guards removed.



SHOCK HAZARD

Disconnect power before removing cover. Replace cover before operation.

!OJO!



CAUTION This Este simbolo de alerta de seguridad significa ¡ OJO ! - INSTRUCCIONES DE SEGURIDAD PERSONAL. Lea las instrucciones porque se refieren a su seguridad personal. Fall de obedecer las instrucciones que siguen podria resultar en lesiones corporales.

- Esta maquina, junto con sus mecanismos de seguridad, esta disenada para ser manejada por
- **UNA SOLA PERSONA** a la vez. Jamas debe ser manejada por mas de una persona al mismo
- tiempo.
- La seguridad es la responsabilidad del operario que usa esta maquina.
- **LEA DETENIDAMENTE** el manual de instrucciones y las **PRECAUCIONES DE SEGURIDAD** antes de poner a funcionar la cortadora. Pidale a su supervisor una copia.
- El manejo de la guillotina debe estar exclusivamente a cargo de personal entrenado y autorizado para ello.
- **NO MODIFIQUE LOS MECANISMOS DE SEGURIDAD**, estan ahi para su proteccion no deben ni modificarse ni quitarse.
- **DESCONECTE LA CORRIENTE ELECTRICA** antes de proceder a hacerle servicio de limpieza, engrasar, o de hacer ajustes que no requieren corriente. Trabe el interruptor en la posicion **OFF** (apagado); vea "Procedimiento para cortar la corriente electrica" al pie de esta pagina.
- Eche llave a la guillotina y quite la llave cuando la maquina no esta en operacion; vea "Corriente electrica".
- Asegurese de que la guillotina este debidamente a tierra. Vea "Conexion de la fuerza electrica".
- Verifique el voltaje y asegurese de que este sea suficiente para el debido funcionamiento de la guillotina.
- Preste atencion a todas las placas con advertencias instaladas en esta guillotina.
- No permita que objetos estranos esten en la mesa o cerca de la cuchilla cortadora.
- **TENGA SUMO CUIDADO** al tocar y cambiar la cuchilla. Heridas severas y hasta desmembramiento pueden resultar del manejo sin cuidado o negligente.
- El suelo alrededor de la guillotina debe mantenerse despejado y libre de recortes, desperdicios, aceite y grasa.
- Al haber la necesidad de reemplazar partes hidraulicas, afloje todas las conexiones poco a poco para dejar escapar la presion. Jamas debe aflojarse conexiones mientras la maquina este
- andando.
- Si la guillotina empezara a sonar o trabajar diferentemente a lo acostumbrado, desconectela y consulte la seccion "Troubleshooting" (Reparador) de este manual. Si no es posible corregir el problema, llame a su servicio autorizado para que le examinen la maquina.
- **PELIGRO DE MACHUQUE** - Mantenga manos y dedos fuera de la agarradera mientras sujeta el papel. Use el calibrador trasero y su rueda de mano para empujar el papel cortado. **NO PONGA SUS MANOS BAJOLA CUCHILLA O AREA DE LA AGARRADERA.**
- **NO OPERE SIN LAS GUARDAS PROTECTORAS!**

¡ OJO ! PRECAUCION - Como proceder para desconectar la corriente electrica.

Para maxima seguridad durante ajustes y reparaciones de su maquina, verifique bien que el interruptor principal de control de corriente al cual la maquina esta conectada, este desconectado. El interruptor deba ser puesto en la posicion "OFF" (desconectado) y se debe poner un candado en la anilla. La llave del candado debe ser guardada por la persona que estara efectuando los trabajos de servicio o de reparacion en la guillotina.

Desconecte la corriente electrica antes de proceder a hacer cualquier ajuste o reparacion o de efectuar el engrase en cualquier maquina.

3.0 Packing List

Part No.	Description	Qty.
	Basic Machine	1
<i>Extension Side Tables:</i>		
16026	36" Steel Side Table (LH)	1
16027	36" Steel Side Table (RH)	1
49147	Side Table Back Plate (LH)	1
49080	Side Table Back Plate (RH)	1
A-8495	Side Table Support (LH)	1
A-8496	Side Table Support (RH)	1
H-6913-606	Side Table Bolts	10
H-6424-6	Side Table Hex Nuts	10
H-6913-606	Side Table Mounting Bolts (shipped installed)	8
H-7321-6	Side Table Mounting Washers (shipped installed)	8
49012	False Clamp Plate (shipped installed)	1
49055	Knife	2
H-6918-608	Knife Bolts	9
8815	Knife Washers, Special	9
4173	Cutting Sticks (one installed)	4
A-12608-6	Jogging Aid	1
<i>Tool Kit (P/N: K-49000):</i>		
49226	Knife Lifter Assembly	1
5064	Cutting Stick Puller	1
W-178	5/16 Ratcheting Box Wrench	1
W-164	Hex "T" Wrench	1
W-158	5/16 Open End Wrench	1
W-141	1/8"	1
W-137	5/32"	1
<i>Fuses:</i>		
E-2308	3.2 A	1
E-2330-7	5 A.S.B.	1
E-889-35	1 A.S.B.	1
E-889-5	4 A.S.B.	1
E-889-9	8 A.S.B.	1
E-2330-8	6.3 A.S.B.	1
E-2330-3	2 A.S.B.	1

4.0 Specifications

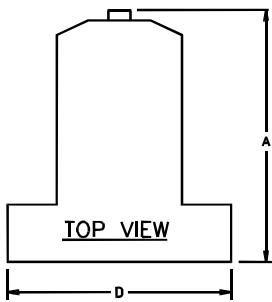
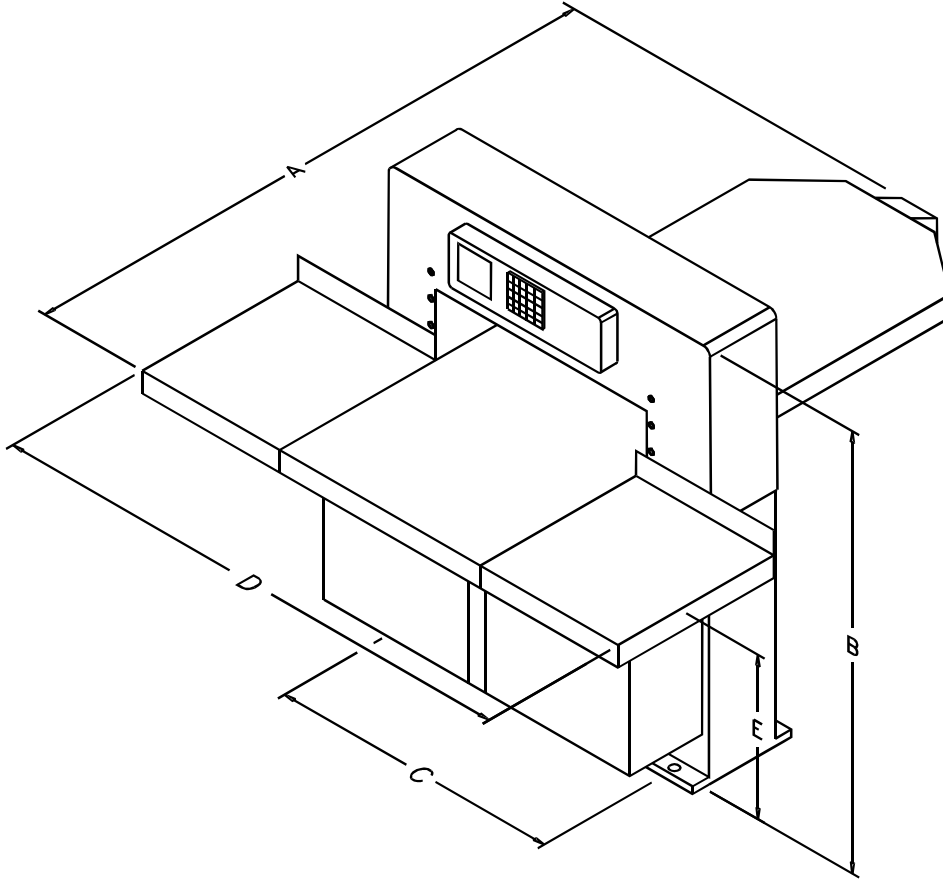
Description	Inch Units	Metric Units
Cutting Width	37"	94.0 cm
Clamp Opening	5-1/4"	13.3 cm
Clamping Force	2000-6900 lbs.	8896 – 30693 N
Minimum Cut – Standard	3/4"	1.9 cm
- w/ False Clamp Plate	2-5/8"	6.7 cm
Table Space		
Front: (std.)	25"	63.5 cm
Back:	40"	101.6 cm
Dimensions		
Table Height	36"	91.4 cm
Overall Height	60"	152.4 cm
Overall Length	86 1/4"	219 cm
Overall Width	48 1/2"	123 cm
w/ Side Tables	109"	276.9 cm
w/o Side Tables	63 1/4"	160.7 cm
Approx. Net Weight	3750 lbs	1701 kg
Approx. Shipping Weight	4200 lbs	1905 kg
Will pass through door:		
Assembled	63 1/2"	162 cm
Table/treadle out	35"	89 cm
Electrical		
Standard: 10 HP, 3 Phase, 60 Hz AC; 208/230V \pm 10% @ 38A or 460V \pm 10% @ 16.5A		
XG series has 4000 cuts on 99 channels.		
Minimum space between cut positions is 0.005" or 0.1mm. Repeat positioning accuracy is 0.003" or 0.05mm.		

Electric Eyes:

- Response time < 68 ms
- Object detection capability – 12 mm

Challenge reserves the right to make changes to any product or specification without notice and without incurring responsibility to existing units.

5.0 Footprint



STANDARD SIDE TABLES

Symbol	Specification	CHAMPION 305		CHAMPION 370	
		Inch	cm	Inch	cm
A	Overall Length	69.5	176.5	86.25	219.1
B	Overall Height	58.5	149	60.0	152.4
C	Mounting-Front	41.5	105	60.25	153
D	Overall Width	78.5	200	109.0	276.9
E	Floor to Table	36.5	93	36.0	91.4
	Net Weight	2550lb	1159kg	3750lb	1701kg

6.0 Installation & Setup

6.1 Inspecting Shipment

This machine has been carefully packed to prevent damage during shipment. However, claims for damage or loss are the responsibility of the recipient. Inspect all shipments as soon as they are received. If there is any noticeable damage, note it on the freight bill. Visual and/or hidden damage must be reported to the claims department of the carrier within 15 days. Contact your dealer if you need any assistance. Check the contents of the box against the packing list on page 8. Make sure there are no missing items.

6.2 Uncrating

This machine is lagged to a wood skid and covered with a triple-walled corrugated container. Loosen the flaps of the carton where they are attached to the skid. When loose, the carton can be lifted straight up. Remove the side tables and accessory box, which are also attached to the skid. Place the cutter/skid about where the machine will be positioned and remove the lag screws from the skid.

Remove the lower shipping block holding the counter weight up. It is secured in place with a lag screw and washers. Remove the upper shipping block, which is also secured in place with a lag screw and washers. If the upper wood block cannot be removed because the knife bar is in the way, wait until the machine is powered up for the first time and remove the upper wood block when the knife bar has been raised under power.

Make sure that both of the rollers, for the counter weight, are riding on the guide shaft. It is possible that during shipping, one may have moved off of the shaft. The rollers are located on the top and bottom of the counter weight. The counter weight is located inside the left front enclosure door behind the clamp cylinder. Make sure if the machine is ever reshipped the counter weight is blocked up so that there is slack in the counter weight chain and the counter weight does not bounce (Figure 2). The counter weight should be blocked/ held up with a wood 2x4 piece of lumber 11-5/8" long. This block needs to be secured in place with a lag screw and washers as shown in Figure 2, page 12.

Remove the shipping block securing the paper deflector. This shipping block is wedged between the bottom of the paper deflector assembly and the mounting pin for the paper deflector extension spring. The shipping block is held in place by a cable tie. The cable tie and shipping block are accessible through the left arch access hole by removing the left arch end cover (Figure 3, page 12). If the machine is ever reshipped, a 1" X 2" piece of lumber (actual size 3/4" X 1-1/2") 17" long should be wedged in between the paper deflector assembly and the mounting pin for the paper deflector extension spring as it was when shipped from the factory.

Before the machine can be run for the first time, the 3/4 NPT plug in the reservoir needs to be replaced with the breather cap, see section 6.8 Hydraulic Check on page 17.

Save the packing materials.

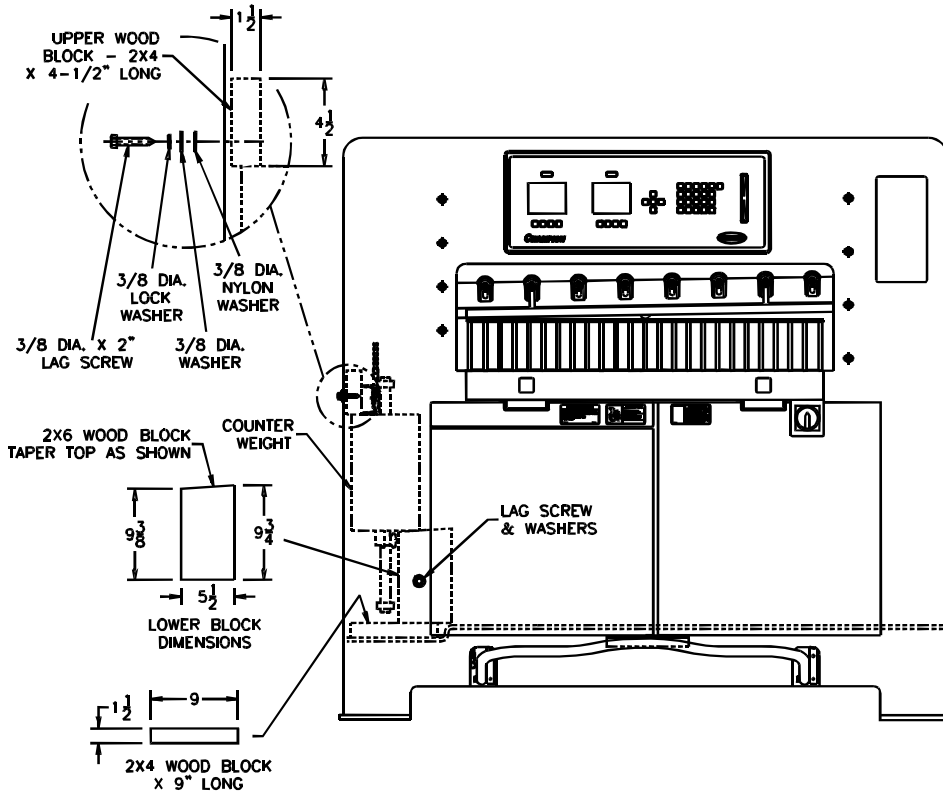


Figure 2

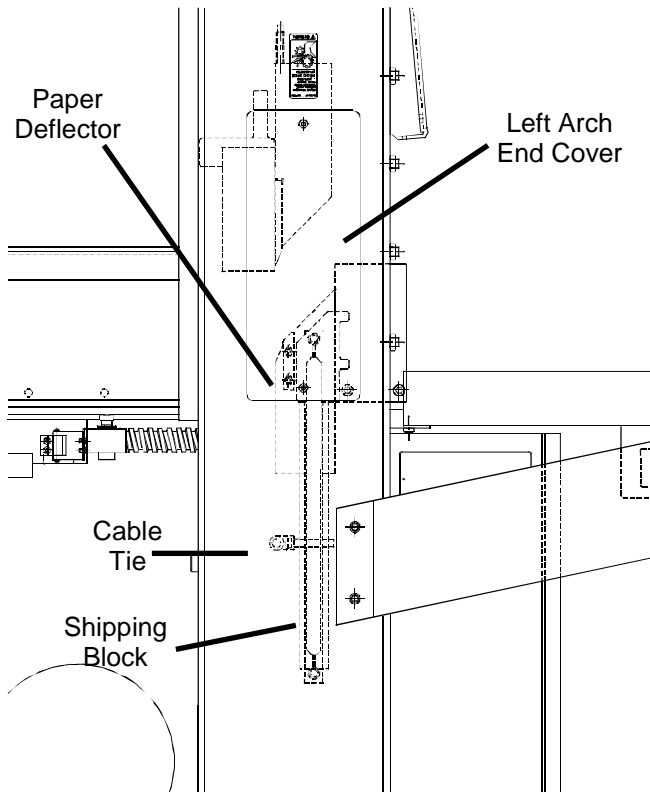


Figure 3

6.3 Re-Crating and Shipping

Save the packing materials and braces. All packing blocks and hardware should be saved or reproduced in order to ship the machine again. If the machine is not repacked as it came from the factory, damage will result when trucked.

- Remove the knife before shipping.
- Brace the back-end of the table to the skid using a 2x4.
- Use a skid larger than the outer tip-to-tip dimensions of the machine.
- Block the counter-weight according to Figure 2.
- Remove the hydraulic breather cap and plug with a $\frac{3}{4}$ NPT plug.
- Always lift and transport from the front of the machine. The carton has lifting instructions, so it must be placed properly on the skid.

Challenge is not responsible for an improperly packed machine. The skid and packing materials are available for purchase from Challenge.

6.4 Lifting Instructions

Professional riggers should do unpacking, handling, and positioning. If handling or unpacking is a problem, your dealer or a local trucking facility should be able to supply or recommend a qualified rigger. This 3750-lb/1701-kg machine should be moved with experienced people and the proper equipment. Do not risk personal injury or damage by attempting to move machinery with makeshift equipment or inadequate manpower.

Lifting straps may also be used to lift the machine by placing the straps around the front and rear of the table. When straps are used in this way, wood blocks must be placed beside the lead screw to prevent damage, (Figure 4). A bent lead screw will cause the backgauge to bind. The lead screw cover must also be removed. Do not strap around the lead screw cover.

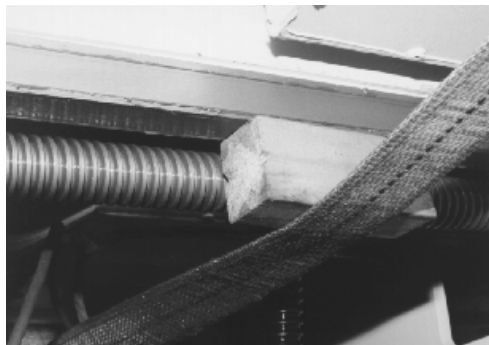


Figure 4

The backgauge should be positioned all the way to the front of the table and straps placed as close to the machine body as possible. Gently lift the cutter, remove the skid and carefully place the cutter on the floor.

6.5 Cleaning

Wipe down the table and bare metal surfaces with a non-flammable solvent such as CRC or blanket wash. The table surface is cast iron and will rust if left unprotected. Coat the table with a non-abrasive wax. A Cutter Care Kit, p/n 16077, with cleaner and wax, is available thru your Authorized Challenge Dealer. The protective film on the console may be removed. Never clean console with petroleum based solvents. Damage will result. See also Operator Cleaning on page 52.

6.6 Assembly: Standard

Unless otherwise specified, the only items that have been disassembled for shipping are the extension side tables. To assemble the table extensions, follow the procedure below.

NOTE: Assembled side tables are awkward and heavy. Use two people to attach the side tables.

1. Install the side table supports. Each support is attached to the frame with two (2) bolts and washers. (Mounting bolts are shipped installed in the frame - remove them to install supports.)
2. Thread the 1/2-13 hex nut, packed with the machine, onto the 1/2-13 X 2-1/4 hex bolt. Screw the bolt into the nut welded on the table support.
3. Assemble the side table backs to the table surfaces. The extension table bolts and hex nuts are packed inside the tool kit box. Tables are installed with the clearance hole for the knife gib adjusting screws towards the middle of the cutter. Make sure the right hand side table back plate is bolted onto the right hand side table, and the left hand side table back plate is bolted onto the left hand side table.
4. Have one person hold the assembled side table in position while the other aligns the holes and threads the mounting bolts with washers. (Mounting bolts are shipped installed in the side of table- remove them to install tables.)
5. Use a 9/16" socket and extension to lightly tighten the mounting bolts, then tap the extension table up or down with a rubber mallet until it is flush with the main table. Run a straight edge or sheet of paper over the seam to check the fit. Make sure your stock will not catch on the seam.
6. Locate the leveling bolt that was threaded into the welded nut on the table support in step 2. You may have to loosen the mounting bolts a little to allow enough play to level the table. When the extension tables are leveled and the surface joints even, tighten the mounting bolts securely. Make sure the 1/2-13 hex nut, threaded on the leveling bolt in step 2, is tightened to prevent the leveling bolt from loosening.
7. The tables are powder coated and need only be wiped down with a dry cloth. DO NOT apply solvents or abrasive cleaners to extension table surfaces. They may cause discoloration or scratches.

6.7 Assembly: Table Out

If your cutter has been shipped knocked-down, it is even more important to have a rigger or qualified personnel with the right equipment to position and assemble your cutter.

Your cutter will arrive in two crates. One contains the arch/base assembly. The second, accessory box contains the parts, accessories, and table. Reassemble as follows:

1. Remove the crate from the arch/base assembly.
2. Remove the accessories from the accessory box.
3. Lift the table out of the accessory box. *NOTE:* Be careful not to damage or bend the lead screw or backgauge drive motor assembly. Use wood blocks beside the screw if straps are used (Figure 4 on page 13).

4. Remove the rear arch cover assembly.
5. Insert the table from the rear of the machine, through the arch. The table is located using two special taper pins through holes on the rear table mounting pads.
6. After locating the table, install the eight (8) table bolts. Seat the taper pins and tighten the bolts.
7. Attach the front and rear side guides. Install the table end cover. Install the rear table polycarbonate cover to the table end cover and side guides.
8. Install the paper deflector through the access point inside the front enclosure, under the table. Depress the deflector with your thumb while installing the assembly to clear the knife bar, (Figure 5). Attach with two 3/8-16 x 1" socket head cap screws.



Figure 5

One socket screw must be installed from inside the arch. Remove the side guard plate for access. Both bolts should have shake proof lock washers.

9. Mount the cut button cable assembly to the underside of the table.
10. Mount the main power disconnect switch to the underside of the table.
11. Fasten one end of the encoder cable, chain carrier to the frame of the machine. Route the carrier chain through the cutout in the table brace. Fasten it to the backgauge carrier. Install a strain relief cable tie to the backgauge carrier to secure the encoder cable. Plug the encoder cable into the encoder. (Figure 6, page 16)

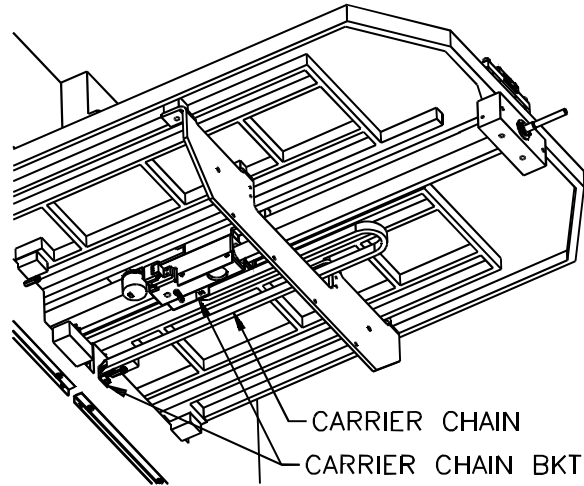


Figure 6

12. Install the forward and rearward lead screw covers using eight 1/4-20 x 1/2" button head cap screws, eight 1/4" flat washers, and eight 1/4" internal tooth lock washers.

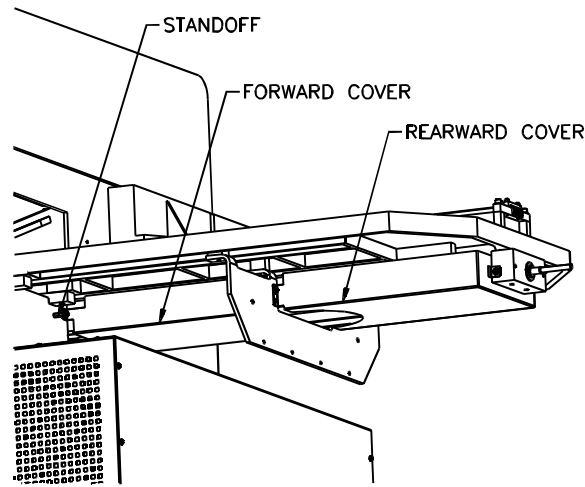


Figure 7

13. Reconnect the backgauge motor cable. From the table, the cable runs through the strain relief bushing into the motor housing, (Figure 8). Attach the wires according to the wiring schematic in the back of this manual for the machine model you have.

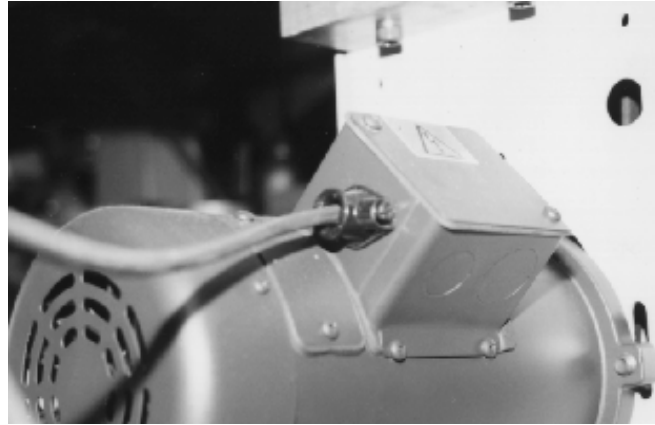


Figure 8

14. Connect the tube from the blower to the plastic connector attached to the air channel cover on the bottom of the table if required. Reconnect the wires to the air blower and solenoid according to the wiring diagram for the machine model you have.
15. Open each electric eye end-cover. Mount the electric eyes to the machine as shown in Figure 9. The end-covers are oriented toward the outside of the machine. Connect each electric eye, leaving the connectors inside the electric eye cases. Replace the end-covers.

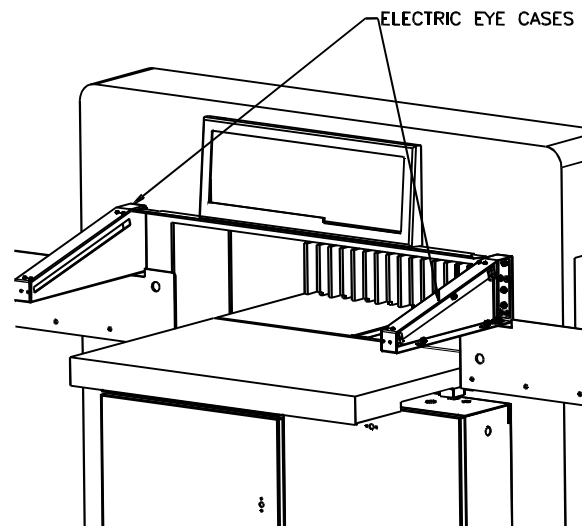


Figure 9

6.8 Hydraulic Check

When the machine is shipped, the breather cap should be replaced with a 3/4 NPT plug. This is how the machine is shipped from the factory. Before the machine can be run for the first time the NPT plug needs to be replaced with the breather cap. Access the plug behind the small cover on the hydraulic power unit cover behind the machine.

The hydraulic reservoir is filled with 15 gallons of grade #46 hydraulic oil at the factory. The fluid level should be checked before operation, and periodically during normal operation. The reservoir is located behind the cutter, beneath the table (Figure 10). The hydraulic tank has a breather cap that

6.0 Installation & Setup

can be removed for changing the oil and checking the oil level. The reservoir should be kept full at all times. Fill the reservoir so that the oil level is 3/4" below the top of the inside of the hydraulic tank.

NOTE: DO NOT OVERFILL. Overfilling may cause leakage when the machine is hot.

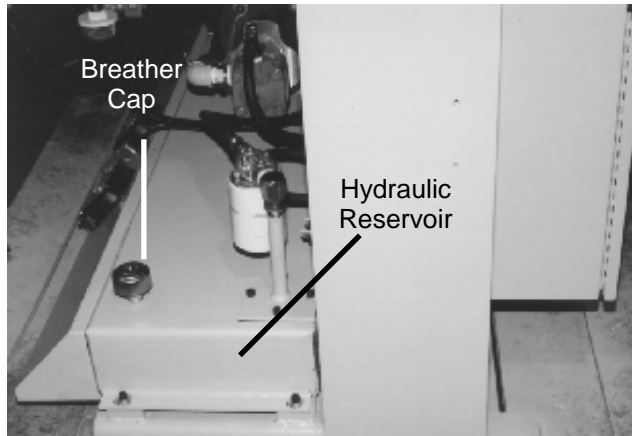


Figure 10

6.9 Power Hook-Up

⚠ CAUTION **SHOCK HAZARD!** Always disconnect power at main power panel before working on the cutter. Lock it out to prevent accidental power up. See Power Lockout Procedure (page 5).

For satisfactory operation, be sure that your cutter is wired for the correct phase and voltage and has adequate power. The correct electrical specifications for your machine are shown on the serial plate. Check the machine serial plate before connecting the power. For future reference, transfer this information to the front cover of this manual.

Watch Setup Voltage- Inadequate power to the cutter can be a major source of problems. Too many machines on the same circuit will reduce the power to each machine. Inadequate voltage will frequently cause overheating, loss of power, and in extreme cases, failure to operate. Test your voltage when the shop is at actual working levels. Challenge recommends a dedicated line with a lockable disconnect to provide adequate power for this machine.

Important: You must have an adequate size circuit and heavy enough wiring for this machine. The circuit size should be a minimum of 20% greater than the amperage rating on the machine nameplate. If a wire is run over 75 feet (23 meters), the next size wire should be used. Check local electrical codes.

Electrical Specifications for Champion 370 cutters:

<u>Volts</u>	<u>Amps</u>	<u>Circuit Size</u>	<u>Wire Size</u>	<u>Metric Wire</u>
3 Phase:460 V	11.5	16.5 A	#12 AWG	4mm sq.
230	25	38	#8	10mm sq.
208	25	38	#8	10mm sq.

6.10 Three Phase Hook-Up

The power source is connected to the cutter through the bottom of the power panel (right hand side). A main power control switch and power cord providing the machine with power is the responsibility of the customer and should be set in accordance with the local electrical code.

1. **DISCONNECT AND LOCK OUT THE POWER** (See Power Lockout procedure, page 5)
2. Thread the power cord through a conduit connector into the power panel.
3. Fasten the ground lead to the ground terminal lug (Figure 11).

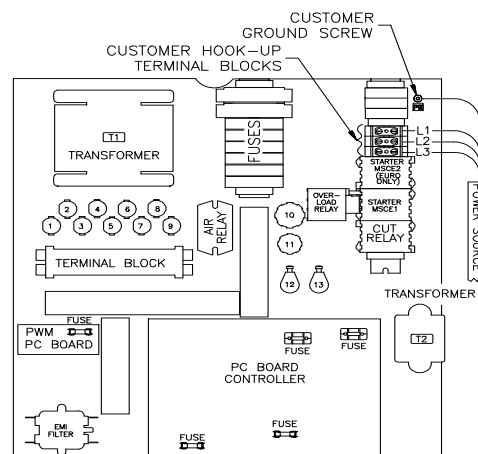


Figure 11

4. Fasten the three power leads to the three terminals of the main power terminal block- L1, L2, & L3.
5. Close the electrical panel doors and latch them. Unlock the main panel and turn on the power. Turn on the main power disconnect switch located on the front face of the table.
6. Press both cut buttons simultaneously to activate the motor and check to make sure it is turning the same direction as the arrow on the motor casing.

If it isn't, disconnect the power and exchange any two leads (L1, L2 or L3) of the power cord as in Figure 12, page 20. The motor will now turn the correct direction.

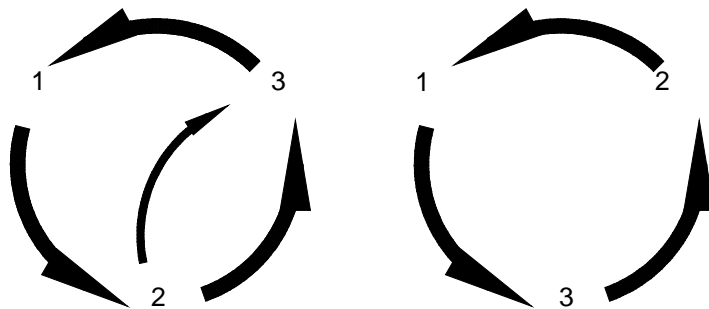
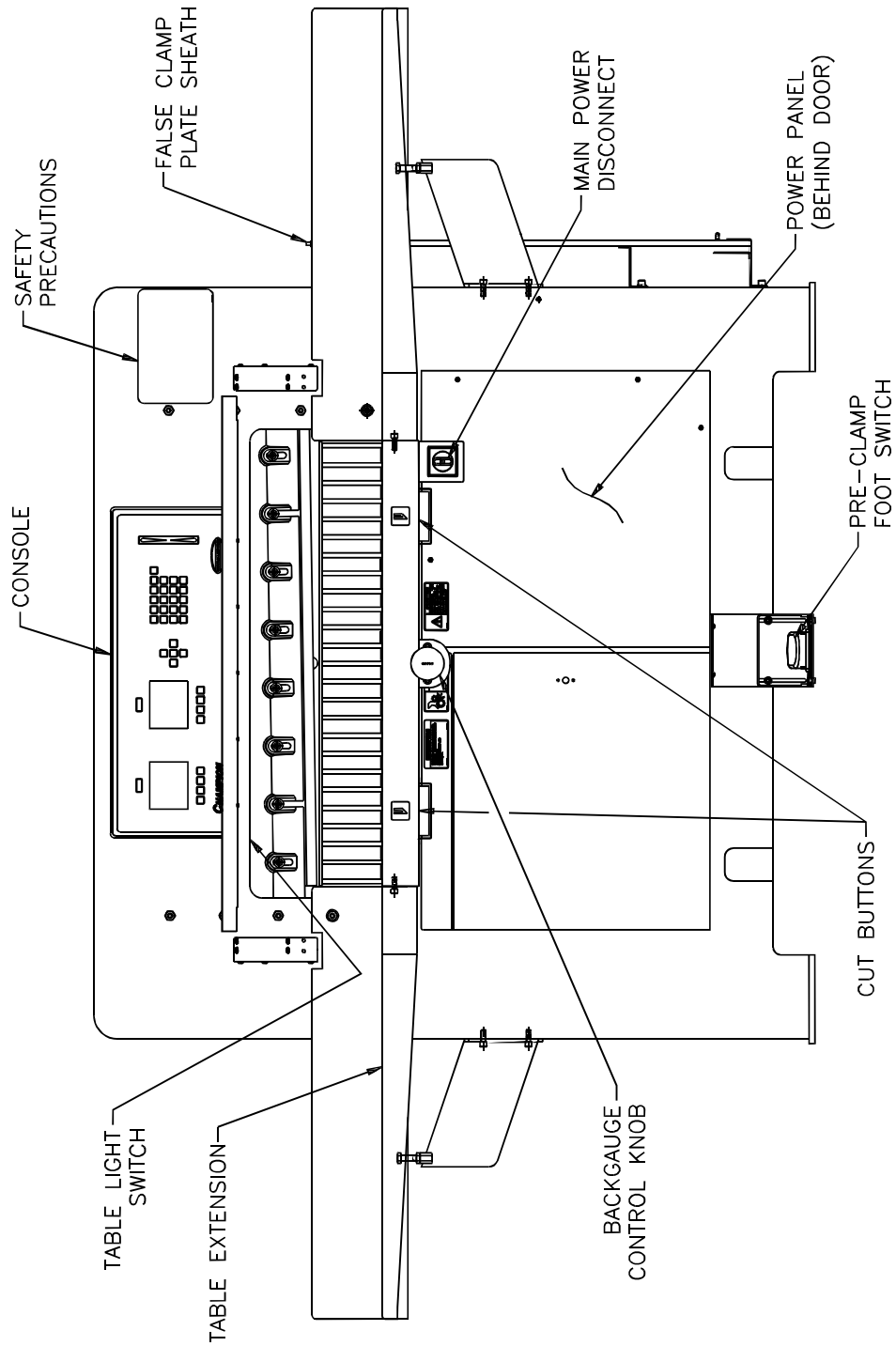


Figure 12

NOTE: DO NOT ATTEMPT TO OPERATE THE CUTTER UNTIL THE REMAINDER OF THIS MANUAL HAS BEEN THOROUGHLY READ AND UNDERSTOOD. CALL YOUR DEALER IF YOU HAVE ANY QUESTIONS.

7.0 Champion 370 Diagram



8.0 Operation

IMPORTANT: DO NOT ATTEMPT TO OPERATE THE CUTTER UNTIL YOU HAVE THOROUGHLY READ AND UNDERSTAND ALL OF THE FOLLOWING INSTRUCTIONS. CALL YOUR AUTHORIZED CHALLENGE DEALER IF YOU STILL HAVE ANY QUESTIONS.

8.1 Power - Main Power Switch

Power is brought to the machine when the main power switch is turned to the "ON" position (Figure 13). The display, table light and line lights are turned on at this time.

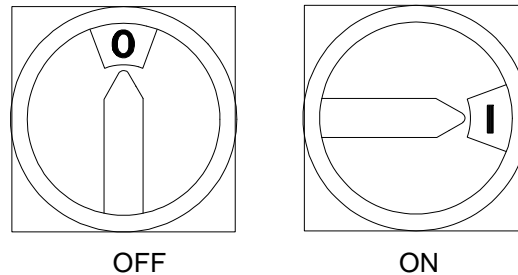


Figure 13

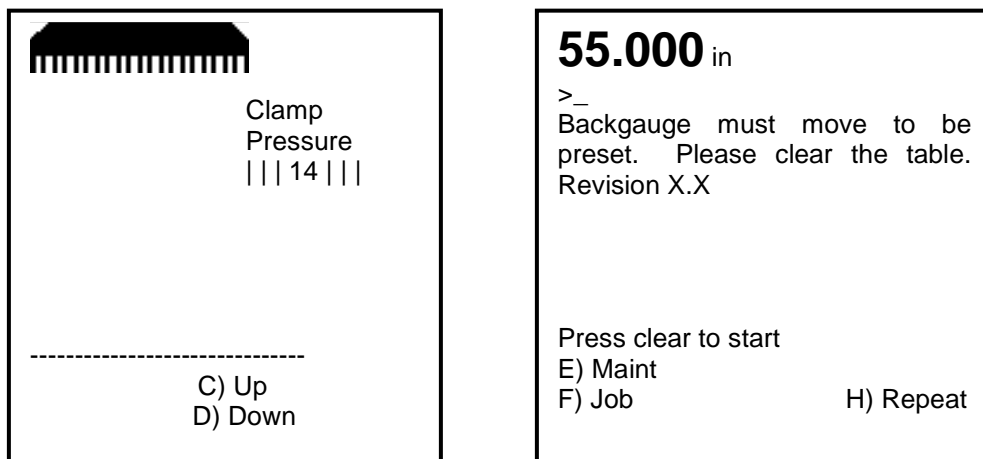
The screen saver will activate and the line lights will shut off after 5 minutes without any activity. This shut-off time can be changed in the Parameters screen of the Maintenance Mode (see the Parameters/Time Out section on page 29). To restore power to the display and line lights, press any button on the keyboard.

8.2 Start Up

Once power has been turned on, the display will show the following:

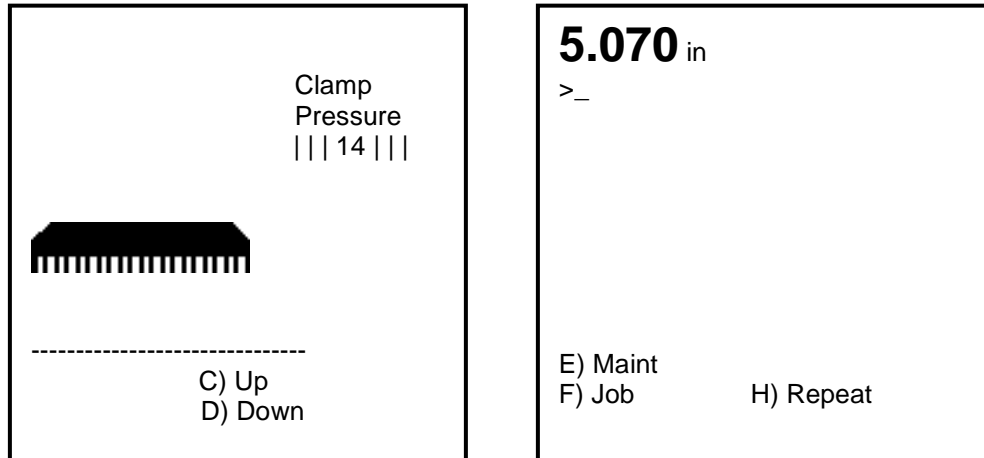
When the CLEAR key is pressed, the backgauge will move to coordinate the true position into the computer (if the knife and clamp are not in the "up" position, the display will prompt the operator to raise them by pressing the cut buttons prior to presetting the backgauge). When finished, the machine will be in "Send Mode" and the display will appear similar to the display shown below.

The backgauge may now be sent to a desired position by simply typing the dimension and pressing SEND (see the Send Mode section on page 27).



8.3 Making a Cut

Place the paper against the backgauge and side guide. Press and release both cut buttons once to start the hydraulic motor. Then press and hold both cut buttons to start the cut cycle. While holding the cut buttons, the knife and clamp will complete the cut cycle. If either button is released at any time during the cycle, the knife and clamp will immediately return to the up position.



Note: Both cut buttons must be released before a new cut can be made. The cut buttons must be pressed within 0.5 seconds of each other in order to make a cut.

CAUTION DO NOT ATTEMPT TO REMOVE TRIM FROM TABLE SURFACE, CLAMP FACE OR KNIFE BLADE UNTIL THE KNIFE AND CLAMP HAVE STOPPED IN THE UP POSITION! DO NOT USE FINGERS OR HANDS TO REMOVE TRIM FROM CLAMP FACE OR KNIFE BLADE! Due to static buildup, fine trim may have a tendency to stick to the clamp or knife surfaces. Fingertips might be drawn into the knife by the clamp if this is attempted. Wait until the knife and clamp have BOTH STOPPED MOVING before removing stock trim.

8.3.1 Shutting Off the Hydraulic Motor

The hydraulic motor can be shut off at any time by pressing soft-key "B" (Mtr Off) or by holding only one of the cut buttons for 3 seconds. The hydraulic motor will also shut off when the screen saver is activated. This shut-off time can be changed in the Parameters screen of the Maintenance Mode (see the Parameters/Time Out section on page 29).

8.4 Jogging Aid

All Champion cutters include a jogging aid as standard equipment. The jogging aid allows the operator to load and align stock without placing hands or arms under the clamp and knife area.

Load and align the paper against the side guide, (Figure 14 on page 24), then square it to the backgauge for cutting.

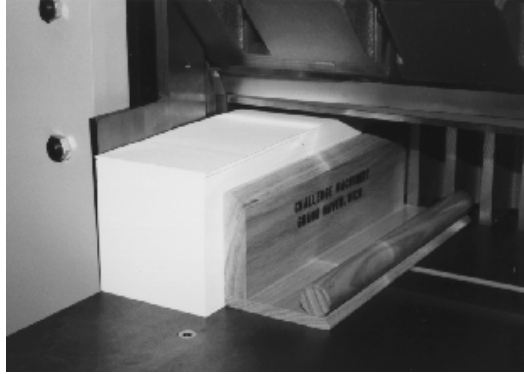


Figure 14

Additional jogging aids can be purchased at your authorized Challenge dealer. (P/N A-12608-6)

! CAUTION

Always remove the jogging aid from the table before making a cut.

8.5 Clamp Pressure Adjustment

The clamp pressure can be adjusted by pressing soft-key “C” (Up) to increase the pressure, and soft-key “D” (Down) to decrease the pressure. The pressure scale ranges from 0 to 15, 15 being the maximum.

8.6 Pre-Clamping

All Champion cutters are equipped with a low pressure clamping feature which allows the operator to clamp paper before beginning the cut cycle. To use this feature, press the footswitch until the clamp presses the paper. While holding the foot switch down, press the cut buttons. Release it once the cut has been completed. Although this is low pressure clamping, avoid placing hands under the clamp at all times.

8.7 Knife Change Alarm and Lubrication Alarm

The Champion 370 XG has two built in alarms that will be displayed after a certain number of cuts. The knife alarm displays a message to remind the operator to change the knife. The lube alarm displays a message to remind the operator to have the machine lubricated. The lube alarm will also display the name and phone number of the Challenge dealer from which the machine was purchased. To reset either alarm, or to change the knife alarm value, see the Knife Count section on page 30. The lube alarm value is factory set at 2,500 cuts and cannot be changed.

8.8 Definition of Keys

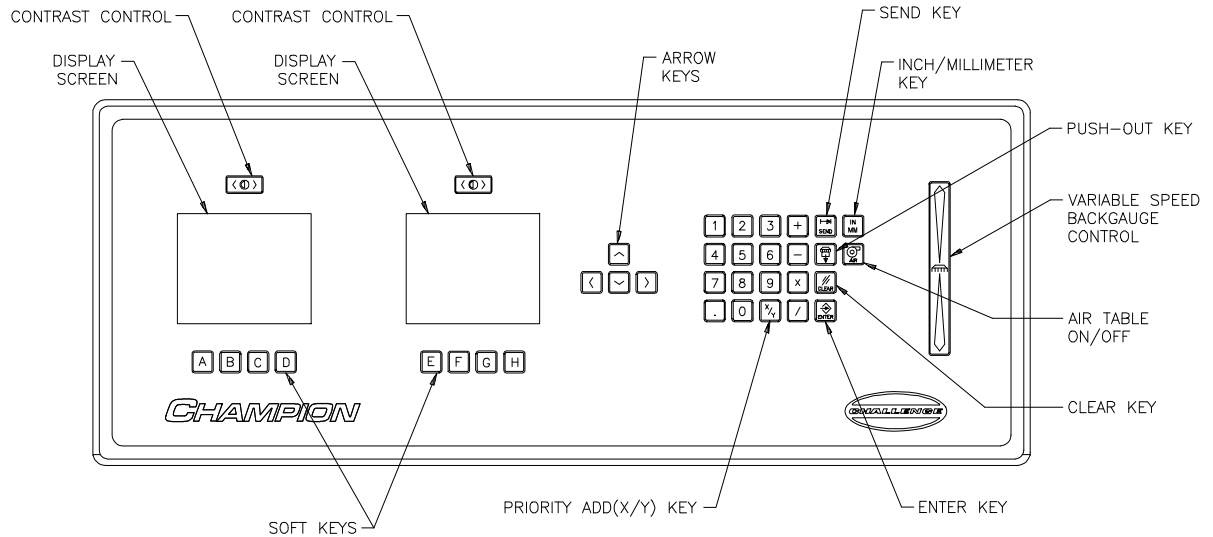


Figure 15

8.8.1 Backgauge Glide Control

The backgauge glide control is used to manually position the backgauge. The speed of the backgauge will depend upon where the actuator is pressed. Press farther from center for a faster speed, and closer to center for a slower speed. To move the backgauge forward, press downward. To move the backgauge backward, press upward. Pressing the center displays true position.

8.8.2 IN/MM Key



This key toggles the display to show the position and programmed send values in inches (e.g. 5.250), inch fractions to the nearest 1/64" (e.g. 5_1/4), or millimeters (e.g. 133.3).

8.8.3 Air Table ON/OFF Key



This key turns the air table on and off.

8.8.4 SEND Key



8.0 Operation

The SEND key is used to send the backgauge to any valid position. If an attempt is made to send the backgauge to an illegal position, an error message will be displayed at the bottom of the screen stating “Number outside limit”. In the Job mode, the SEND key will also advance the backgauge to the next sequential cut position before performing the cut.

8.8.5 Push-Out Key



The push-out key will move the backgauge forward 5 inches (or to the most forward position) and then return it to its previous position. This allows paper to be removed from the cutter without putting hands under the knife and clamp. It also allows the backgauge to run forward under program control if the light beams are blocked for dimensions less than 4.7 inches.

! CAUTION Never place hands in the clamp and knife area. Use the push-out key or the backgauge glide control to move the paper to an area where it can be reached.

8.8.6 Clear Key



The CLEAR key is used to clear error messages and the current entry line.

8.8.7 Enter Key



The ENTER key selects items in the maintenance mode and processes data that has been entered in the other modes.

8.8.8 Priority Add (X/Y) Key



The Priority Add key is used for entering fractions when they are combined with whole numbers. The symbol displayed when this key is pressed is the underline symbol “_”. An example of a number entered using the Priority Add key is 1_1/2.

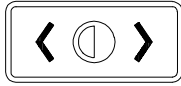
8.8.9 Soft-Keys

There are a total of eight soft-keys labeled “A” through “H”. The functions of these keys change depending on the operating mode. The function of each key can be found on the bottom of the display screens.

8.8.10 Arrow Keys

The four arrow keys can be used in almost all screens. The arrow keys are primarily used for moving the cursor around on the screen, or to toggle between highlighted selections. In some screens, the left arrow key acts as a backspace key.

8.8.11 Contrast Control



The contrast of each display screen can be adjusted by using the contrast control buttons located directly above each display screen.

8.9 Manual Backgauge Control

8.9.1 Backgauge Control Knob

The backgauge may also be controlled using the Backgauge Control Knob located at the front of the table. Turning the knob clockwise brings the backgauge forward. Turning the knob counter-clockwise sends the backgauge backward. The backgauge moves faster, the more the knob is turned.

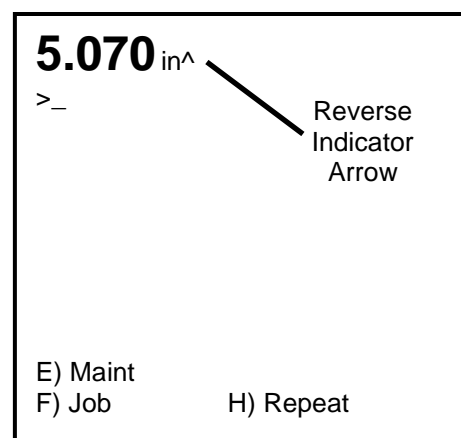
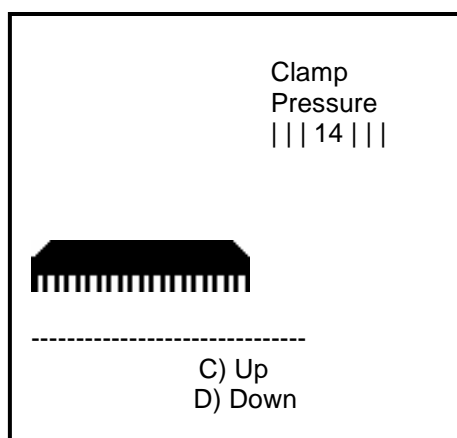
8.9.2 Backgauge Glide Control

The backgauge can be moved manually by use of the backgauge glide control. Press towards the operator for forward travel and away from the operator for reverse travel. The further away from center that the actuator is pushed, the faster the backgauge will travel.

8.9.3 Backlash Indicator

To insure accurate cuts, the backgauge must be brought to the cut position from the rear of the table. In the display, to the right of the backgauge position, there is a small arrow to indicate reverse travel. This arrow should be off when making a cut. Moving back past your cut position, then forward to it, compensates for any play in the backgauge nut and lead-screw.

8.10 Send Mode



8.0 Operation

The send mode is the first screen displayed after the backgauge is preset. From this screen the backgauge can be positioned with the backgauge pinpoint control or by entering a value and pressing the SEND key. A mathematical expression can also be entered as a send value. Simply type the expression and press SEND. You can also enter an equation that begins with the current backgauge position. For example, if you want to send the backgauge 2" forward from its current position, just press [-] [2] and SEND.

The send mode screen can also be used for doing math calculations that are larger than the backgauge's reverse limit. In this case, you must press ENTER to have the result displayed on the screen.

8.10.1 Entering Math

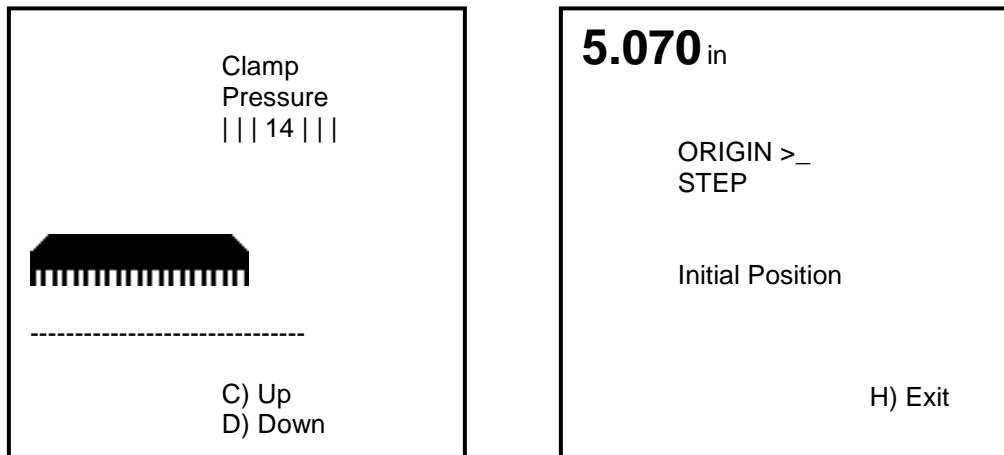
In the simple send mode, the Champion XG is capable of calculating an entire math string such as, $10-5+5 \times 6+2 \frac{3}{4}$. However, the result is limited to 29999.000 and the result cannot be a negative value. In the job mode, and during a send, the result of the calculation must be less than the backgauge limit of 30.500 inches.

8.10.2 Entering Fractions

Fractions are entered with the priority add key X/Y. The symbol displayed when this key is pressed is the underline symbol " ". This instructs the computer to add the fractional portion of the entry before performing the remaining math. This key is useful when entering a formula as follows: $3 \times 2 \frac{3}{4} = 8 \frac{3}{4}$. If a simple plus had been used instead, the result would be as follows: $3 \times 2 + \frac{3}{4} = 6 \frac{3}{4}$.

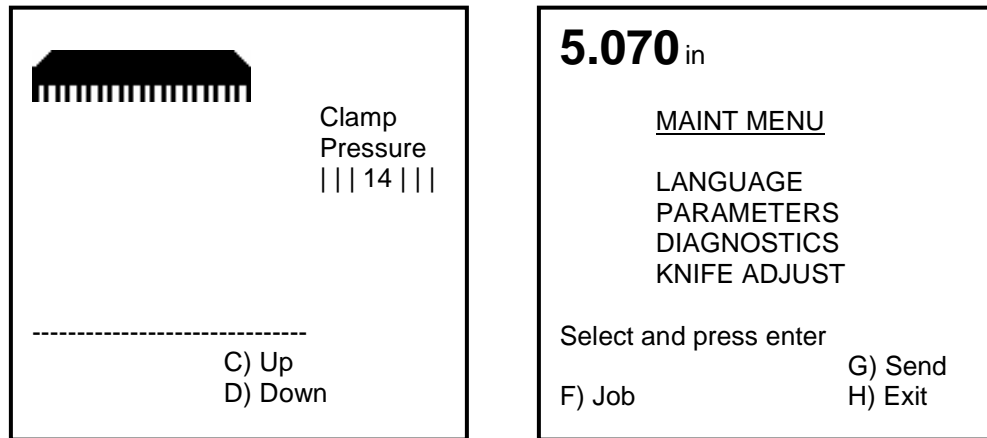
8.11 Repeat Mode

This mode allows the operator to make a series of cuts during which the backgauge moves a specified distance between each cut. To enter repeat mode, press soft-key "H" (Repeat). The display will then look like the one below:



Type in the desired initial backgauge position and press ENTER. The backgauge will then move to that position. Then type in the step value and press ENTER. Position the paper and make a cut. The backgauge will then move forward by the step amount, and a new cut can be made. When finished, press soft-key "H" (Exit) to exit back to send mode.

8.12 Maintenance Mode



The maintenance mode is an area where many machine functions can be set or modified. The four principle functions are: Language, Parameters, Diagnostic, and Knife Adjust. To select a particular function, use the up and down arrow keys to toggle to the desired function and press ENTER. See the following descriptions for an explanation of each function.

8.12.1 Language

In the language screen, use the up and down arrow keys to toggle to the desired language, and press ENTER. All messages will be displayed in the selected language.

8.12.2 Parameters

In the parameter screen, use the up and down arrow keys to toggle to the desired parameter, and press ENTER. See the descriptions that follow for an explanation of each parameter.

8.12.2.1 Time-out

This parameter sets the amount of idle time for which the screen saver activates and the line lights and hydraulic motor turn off. The choices are 2, 5, 10, 20, and 30 minutes. In the time-out screen, use the up and down arrow keys to toggle to the desired time-out, and press ENTER.

8.12.2.2 Push-out

Normally, whenever the backgauge is sent to a larger dimension, a five-inch (127mm) push-out is performed to aid the operator in accessing the paper. In some situations, it may be necessary to turn this feature off. It is recommended that this feature be left on whenever possible. In the push-out screen, use the up and down arrow keys to toggle to the on or off status as desired, and press ENTER.

8.12.2.3 Accuracy Adjust

This parameter provides a means for adjusting the accuracy of the backgauge. To change the accuracy, send the backgauge to 2 inches (50.8mm) and cut some paper. Measure the paper, and type in what you actually measure. The computer will calculate the amount of error and will compensate. A value may also be added to or subtracted from the current value.

8.0 Operation

8.12.2.4 Knife Count

The knife count parameter allows the operator to reset the knife alarm and the lube alarm. The knife alarm displays a message to remind the operator to change the knife. The lube alarm displays a message to remind the operator to have the machine lubricated. The lube alarm will also display the name and phone number of the Challenge dealer from which the machine was purchased.

There are three functions within the knife count parameter: Clear Count, Knife Alarm, and Clear Lube. Select the desired function and press ENTER. See the following descriptions for an explanation of each function.

Select **Clear count** to reset the knife counter when a knife change has been performed.

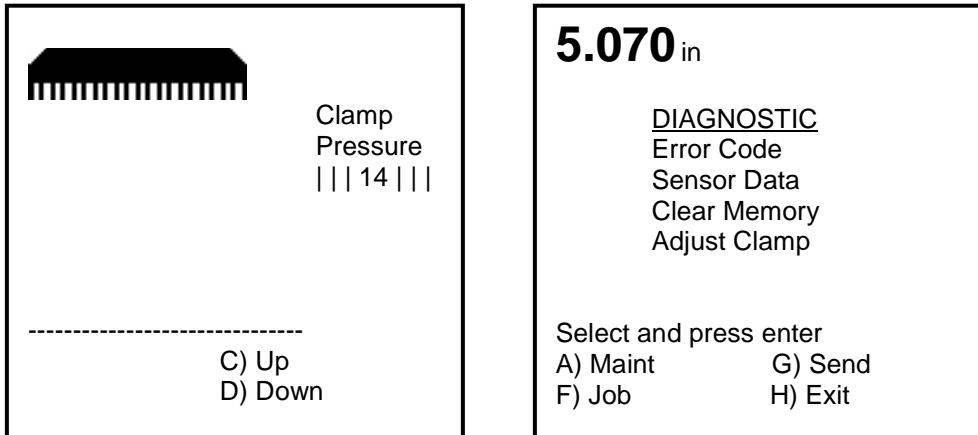
Select **Knife Alarm** to enter or change the knife stroke alarm value. When this value is reached, the display will alert you to change the knife and reset the knife counter. Knife alarm values for the Champion XG are factory set at 2,500 cuts. However, you may want to change this value based on your specific machine applications. See the Knife section for help in choosing a knife alarm value for your machine.

Select **Clear lube** to reset the lube alarm after performing the lubrication requirements as shown in the Lubrication section of this manual. NOTE: The alarm will activate after 2,500 cuts. This value is set at the factory and cannot be changed.

8.12.2.5 Machine Count

The number displayed is the total number of cuts made by the machine.

8.12.3 Diagnostic



The diagnostic area can be very helpful in locating a problem in the event of a machine malfunction. Use the up and down arrow keys to toggle to the desired selection, and press ENTER. See the following descriptions for an explanation of each.

8.12.3.1 Error Code

The Error Code function simply recalls the last five error messages that were displayed. This can be very useful in cases when the malfunction cannot be reproduced in the presence of the service technician.

8.12.3.2 Sensor Data

The Sensor Data function provides a list of computer inputs and outputs (proximity switches, etc.) along with their status (0 for open, 1 for closed). This function allows a service technician to check the status of a switch without removing any covers. Cuts and backgauge movements are allowed in this screen so that the technician may observe the status of the inputs and outputs during machine operation.

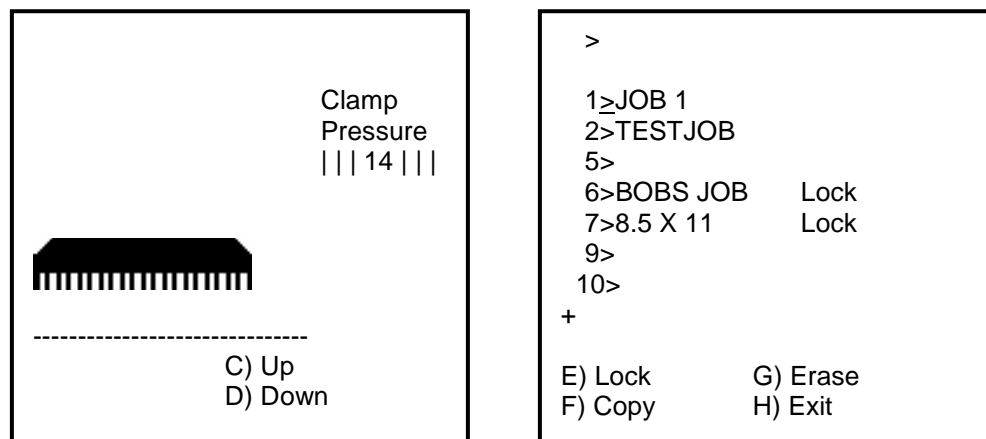
8.12.3.3 Clear Memory

The Clear Memory function resets the memory to a known state. **All cut positions will be erased during this operation.**

8.12.3.4 Knife Adjust

The knife adjust function provides a way for the service technician to change the knife. In the Knife Adjust screen, use the up and down arrow keys to toggle to the up or down status as desired, and press ENTER. Press and hold the cut buttons to send the knife to the desired position (in the knife down mode – hold the cut buttons until the hydraulic motor turns off).

8.13 Job Mode



The Champion XG can be programmed for up to 99 different jobs. A job is a sequence of programmed cut positions. The backgauge moves to each position after a cut cycle is made. Each job can hold up to 99 send values. Pressing soft-key “F” enters Job mode. When the job mode is entered, all previously programmed jobs will be displayed along with their name and lock status. Locked jobs display the word “Lock” after their name. A plus “+” sign at the bottom of the screen indicates there are more jobs programmed than what are displayed. Pressing the left arrow key and the down arrow key simultaneously will page down to the next set of jobs. Page 38 contains an example of how to program a job.

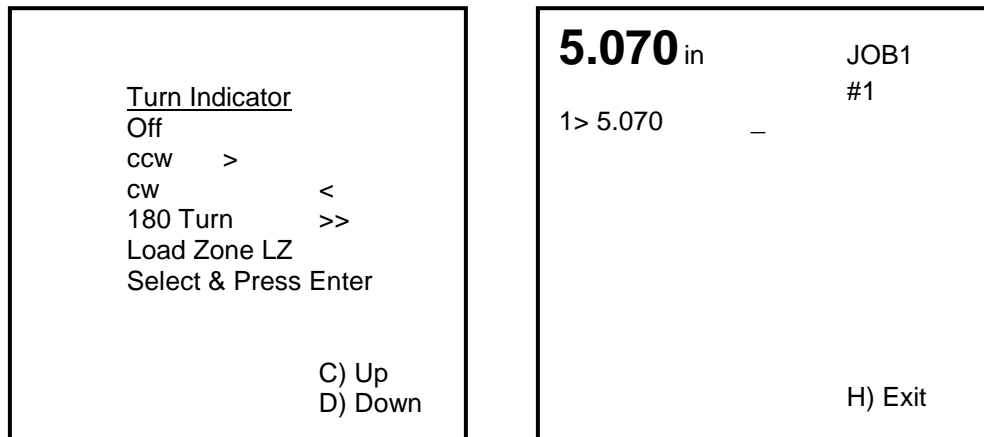
8.13.1 Lock/Unlocking a Job

In the Job Mode screen, the soft-key “E” will display “Lock” or “Unlock” depending on the current status of the job. If a job is locked, the word “Lock” will be displayed to the right of the job name. Locking a job prevents it from being edited. To change the lock status of a job, simply move the cursor to the desired job using the up and down arrow keys, and press the soft-key “E” (Lock/Unlock).

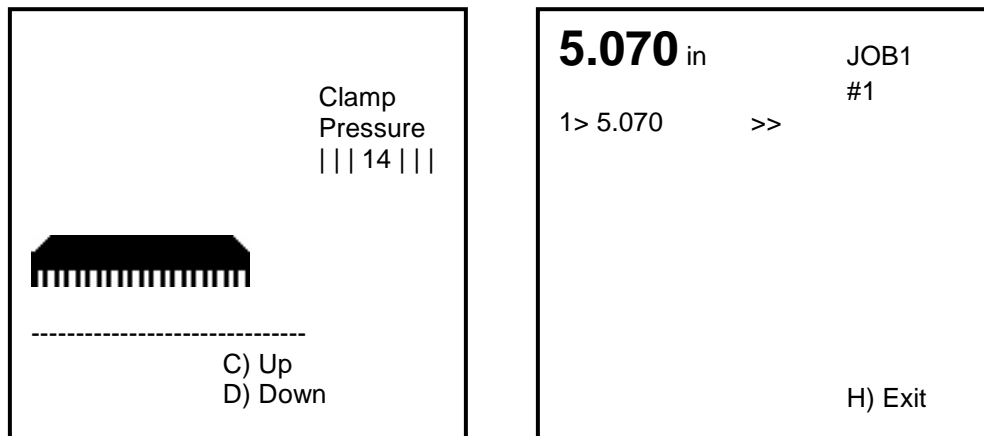
make it impossible to cut at that position. Pressing both cut buttons on a position marked at a Loading Zone will prompt the backgauge to move to the next position in the job. Using a loading position eliminates the need to reach into the knife/clamp area of the cutter when loading a job.

8.13.4.3 Entering Rotation Mark

After entering a send value, pressing the right arrow key, instead of ENTER, will move the cursor to the right and prompt the operator to enter a rotation indicator mark. The display will look similar to the one shown below:



Use soft-keys “C” and “D” to choose a turn indicator. Pressing ENTER will place an indicator mark to the right of the send value, as shown below:



When the desired indicator mark is in place, press the right arrow key. The cursor will move to the right and prompt the operator to enter a clamp pressure (see the following section).

NOTE: All new entry lines will have the same turn indicator mark as the one above it, until it is changed.

8.13.4.4 Entering the Clamp Pressure

A separate clamp pressure can be entered for each cut in a job. To enter the desired clamp pressure, first enter the desired send value (described above), then press the right arrow key and enter the rotation mark if necessary (described above), then press the right arrow key again to move the cursor to where the clamp pressure can be entered. Use soft-keys “C” and “D” to increase or

8.0 Operation

decrease the clamp pressure, or use the numeric keypad to enter a number from 0 to 15 (see Adjusting the Clamp Pressure section, page 24 for information about the clamp pressure setting). This will complete the entry for the current line and move the cursor to the send value of the next line.

NOTE: All new entry lines will have the same clamp pressure as the one above it, until it is changed.

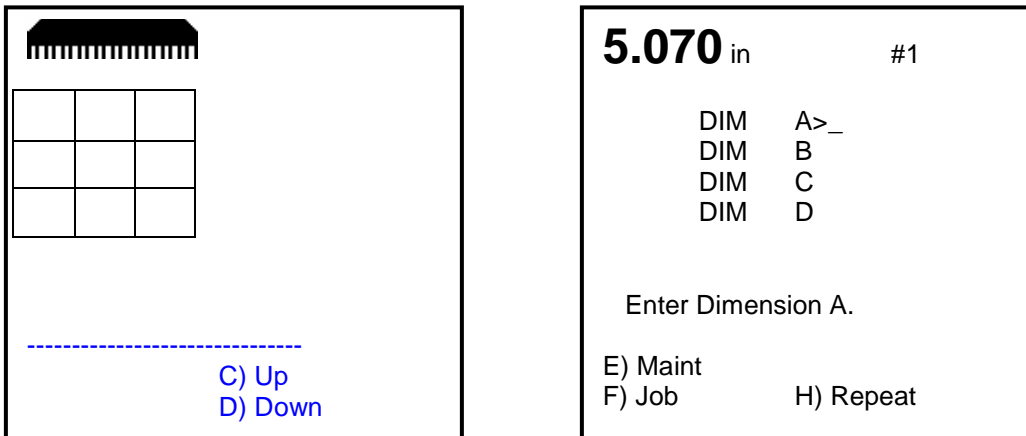
8.13.4.5 Cut and Record

To use this feature when creating a new job, simply send the backgauge to a desired position using the backgauge glide control or by using SEND, then make a cut. The current backgauge position will automatically be displayed in the next available cut location and the operator will be prompted to press ENTER to record the current value. If ENTER is not pressed, the value will not be recorded into the job as a send value. This can be very convenient for setting up a program when the actual cut positions are not known.

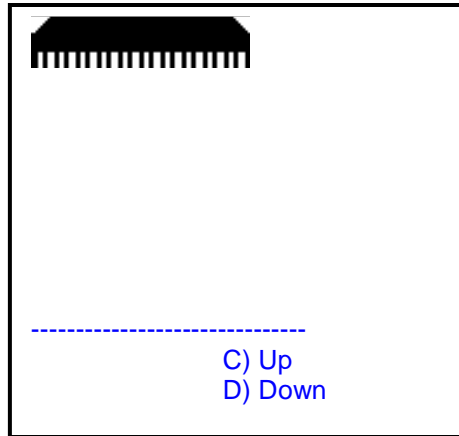
8.13.4.6 Sheet Division Feature

The Champion XG has a sheet division feature that automatically creates a complete set of send values using the parent and finished sheet sizes specified by the user. Since this feature creates an entire set of send values, it is best to use it only when creating a new job. However, this feature can also be used when editing or using an existing job. It will simply insert the new set of send values after the current send value.

Begin by pressing soft-key "A" (Division). The display will be similar to the following:



The program guides the operator through the steps of entering the necessary dimensions. Then the program asks if the columns are to be cut separate (as opposed to stacking the columns and cutting them all at once). Press "1" for Yes or "0" for No. The display will now look similar to the one shown next (it may vary based on the input):



5.070		
OPT	QTY OUT	QTY CUTS
1	8	9
2	8	9
3	8	9
4	6	7
5	8	9
6	6	7
RE-ENTER		
		H) Exit

Use the up and down arrow keys to scroll through the possible layouts. The left display will show each choice visually. Select the desired layout by pressing ENTER. At this point the send values will be automatically calculated and entered, and the job will be complete and ready for use. To make changes, edit the job as described in the “Editing a Job” section below.

8.13.4.7 When Finished

When finished entering send values you may exit the current job by pressing soft-key “B” (Job) to go back to the job mode screen or soft-key “D” (Exit) to exit to send mode. Or you may use the current job for cutting by pressing the down arrow at the last line and following the instructions in the “Running a Job” section (page 36).

8.13.5 Editing an Existing Job

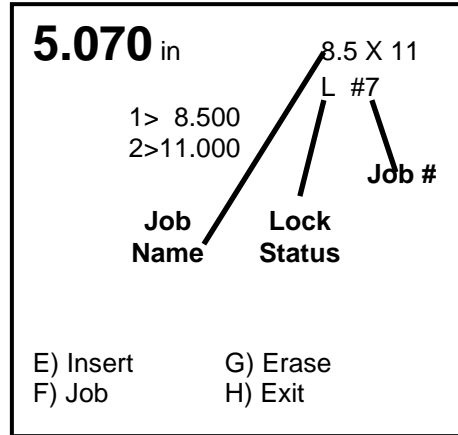
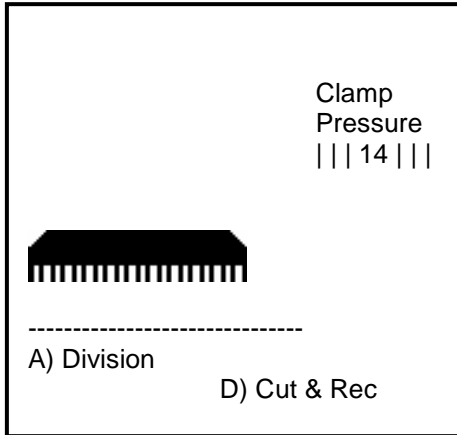
8.13.5.1 Editing the Job Name

The job name can be edited (or added if an existing job does not have a name) in the job mode screen. To edit the name, move the cursor down to the desired job number by pressing the down arrow key. Then press the right arrow key to move the cursor to the desired character position and edit the character by pressing the up or down arrow keys to toggle between characters of the alphabet. Numbers can be entered directly by using the number keys. Pressing CLEAR clears the current character. When finished, you may either go to the current job by pressing ENTER, or go to a different job, or exit job mode.

8.13.5.2 Editing Send Values

To edit send values of an existing job, start by opening the desired job from the job mode screen. A job is opened by one of two methods: pointing at the desired job with the cursor and pressing ENTER, or by entering the job number with the keypad and pressing ENTER. Once a job has been opened, the current job number will be displayed in the upper right corner. NOTE: If the job is locked, it cannot be edited.

Send values can now be edited by moving the cursor up or down to the desired send value and then typing over the existing value. To page up and page down, press the left and down arrow keys simultaneously.



To insert a send value, press the soft-key “E” (Insert). This action moves all send values down and provides a blank line after the current send value.

Send values can also be entered using the “Cut and Record” feature. Move the cursor to the line where the send values are to be inserted. Then press soft-key “D” (Cut & Rec). “C & R” will appear in the upper right corner of the left display. Each cut will add the current backgauge position as a send value. When finished, press soft-key “D” (Cut & Rec) again to exit cut & record mode. If there is a blank line where the cursor is, press the down arrow and it will disappear.

To erase a send value, press the soft-key “G” (Erase). This will remove the cut value currently being pointed to by the cursor. To backspace over the current send value without removing the line, press the left arrow key.

When finished editing the job, you may exit the current job by pressing soft-key “F” (Job) to go back to the job mode screen or soft-key “H” (Exit) to exit to send mode. Or you may use the job for cutting since it is already open.

8.13.6 Running a Programmed Job

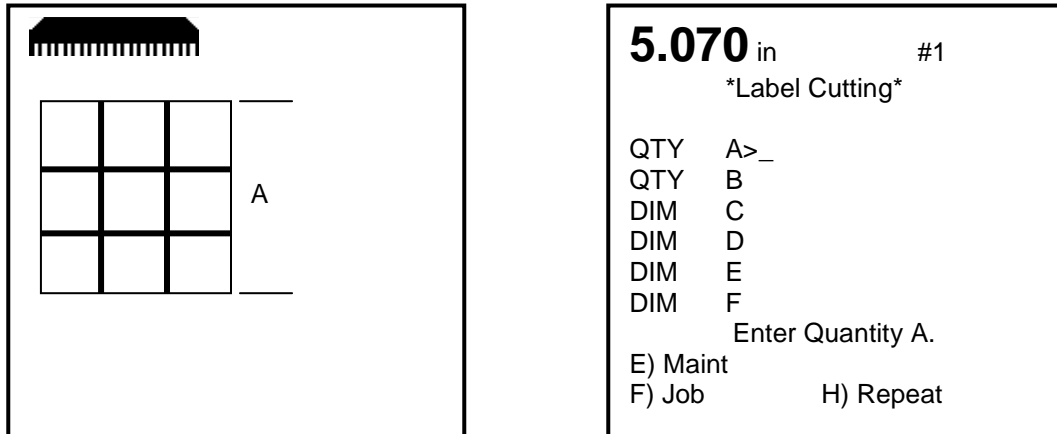
To use an existing job for cutting, you must first open it by using one of two methods: move the cursor to the desired job with the arrow keys and press ENTER, or enter the job number with the keypad and press ENTER. Once a job has been opened, the current job name and number will be displayed in the upper right corner. Now press SEND to move the backgauge to the first programmed position (or send value). Make a cut by pressing both cut buttons. Once the cut is made, the backgauge will automatically push out the paper (only if the next position is larger than the current one, and if “push-out” is enabled) and move to the next programmed position. If the job was created using the “Sheet Division” feature, the left screen will display a diagram of where to place the paper for each cut. After the last cut in the job is made, the backgauge will move to the first cut position of the current job. Pressing SEND at any time during the job will send the backgauge to its next programmed position without making a cut. A plus “+” sign will be displayed at the bottom of the screen if more cuts remain in the current job.

8.13.7 Exiting a Job

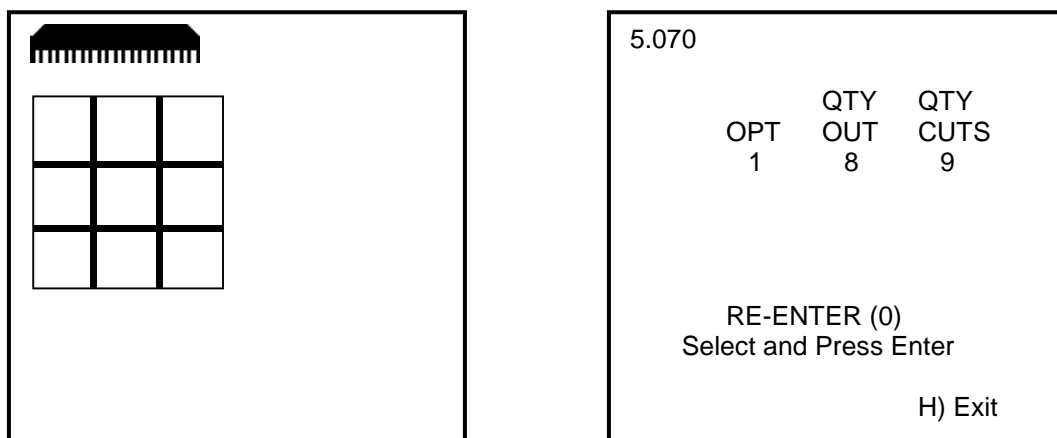
To exit an open job, press the soft-key “F” (Job) to return to the job mode screen, or press the soft-key “H” (Exit) to exit to the send mode screen.

8.13.8 Label Cutting

A label-cutting feature is also provided on the Champion XG. After providing the label quantity, size, and gutter, the machine will automatically create a programmed job. Begin by entering the job mode, select a job number and name (optional) then depress ENTER. Depress the soft-key "C" (Label) under the left hand display. The display will be similar to the following:



The program guides the operator through the steps of entering the necessary information. A & B are label quantities, C & D are the actual label size and E & F are gutter dimensions. Then the program asks if the columns are to be cut separate (as opposed to stacking the columns and cutting them all at once). Press "1" for Yes and "0" for No. The display will now look similar to the one shown on the next page (it will vary based on the input).



Use the up and down arrow keys to scroll through the possible options (if more than one). The left display will show each choice visually. Select the desired option, then press ENTER. At this point

the send values will be automatically calculated and entered. The job will be complete and ready for use. To make changes, edit the job as described in the “Editing a Job” section below.

8.14 An Example Job – XG Model

The following is an example of how to program a job that will be used to make two cuts: one at 8.5” and one at 11”.

1. Turn on the machine and press CLEAR to preset the backgauge. Press the soft-key “F” (Job) to go to job mode.
2. Type in an unused job number and press ENTER. Note: It must be a number that does not correspond to an existing job. All existing jobs will be displayed on the screen (you may have to scroll through them to see them all). If you wish to replace an existing job with the new job, first erase the existing job by moving the cursor to it and press the soft-key “G” (Erase). Now type in the new number and press ENTER. In this example, job #'s 1, 2, 5, and 6 already exist. We will use job # 7 for our new job. Press “7” and ENTER.
3. The cursor will move down to the new job number. At this point, press the right arrow key once to move the cursor to the first character position. Now name the job “8.5 X 11”. To do this, press “8” on the number keypad. Then press the decimal “.” key and so on. To enter the spaces and the letter “X”, use the up and down arrow keys to toggle through the alphabet and press the right arrow key to move to the next character position.

Now press ENTER to begin programming the job.

4. To enter the first send value of 8.5”, simply type in 8.5 and press ENTER. The cursor will move to the second line. Now type 11 and press enter. At this point, you could exit and save the job by pressing the soft-key “H” (Exit) to exit to send mode, or the soft-key “F” (Job) to exit back to the job mode screen. However, lets use this job to cut paper.
5. Press the down arrow key once. This will remove the blank line 3 and move the cursor to the first send value (8.5”). Now press SEND. The backgauge will move to the 8.5” position. Place the paper to be cut against the backgauge and press the cut buttons. Once the cut cycle is complete, the backgauge will push out the paper and move to the next send value (11”). Now position the paper again and make another cut. After the cut is made, the backgauge will push out the stock and return to the first cut position, ready to repeat the current job.
6. Now lets lock the current job so it cannot be edited. First, exit back to job mode by pressing soft-key “F” (Job). Now move the cursor down to the new job using the down arrow key. Now press the soft-key “E” (Lock) to lock the job. A lock symbol will appear indicating the job has been locked.
7. To exit back to send mode, press the soft-key “H” (Exit).

9.0 Operating Tips

- Use a jogging aid to align stock. This will reduce the chance of an accident by not having to reach under the knife or clamp. Likewise, use the backgauge to push out stock before removal.
- Never attempt to remove paper trim clinging to the blade or clamp until they have stopped moving!
- Carefully lay out each sheet before you start cutting. Find the best-cut pattern to give you the most pieces out of the sheet. If the sheet will be folded, be sure the grain of the paper is running in the same direction as the fold or you will get a rough edge on the fold.
- If an accurate cut is necessary for close register work, you **MUST** have a sharp blade in the cutter. A dull blade will pull or draw the stock and cause uneven cutting. See Knives section, below.
- Clamp pressure should not be increased to eliminate draw without first checking for knife sharpness. Draw from a dull knife can only be eliminated by installing a sharp knife. See Knives section, below.
- Appropriate clamp pressure will vary from one stock to another. As a rule, you should have enough pressure to securely hold the stock but not so much that the stock is unacceptably deformed. Excessive clamp pressure causes pile distortion and inaccurate cutting.
- To make stock slide as easily as possible on the cutter table, wash the table with non-offset powder or with a silicone/rust preventative.
- Mark the gripper edge and the guide edge of printed stock and make sure the first cuts are with these guide edges against the backgauge.
- Measure printed stock to check for shrinkage or expansion of the paper from humidity. You may have to disregard the printed cut lines and make your own.
- Use pre-clamping to remove air from an aerated pile.

10.0 Routine Maintenance/Adjustments

10.1 Knife Care

! CAUTION

CAUTION: ! KNIFE SAFETY ! Knives are **DANGEROUS!!!** They are heavy and very sharp, even after use. Keep the edge away from your body and keep the area clear of others when handling knives. Never touch the cutting edge! To prevent personal injury and damage to the knife, always keep knives in their holders with screws tightened. You are aware of the dangers, but others may not be. Never attempt to hone, polish, or service the knife in any way. Failure to follow safety procedures may result in severe lacerations or dismemberment.

- Make sure the knife lifter is properly installed, see instructions following.
- Keep handling of unprotected knives to an absolute minimum.
- Clear off the cutter table before removing knife.
- Have a scabbard on the cutter table and insert the knife immediately.
- Warn people of any unprotected knife.
- Knife changing is a **ONE PERSON OPERATION**. Having more than one person changing knives increases hazard.

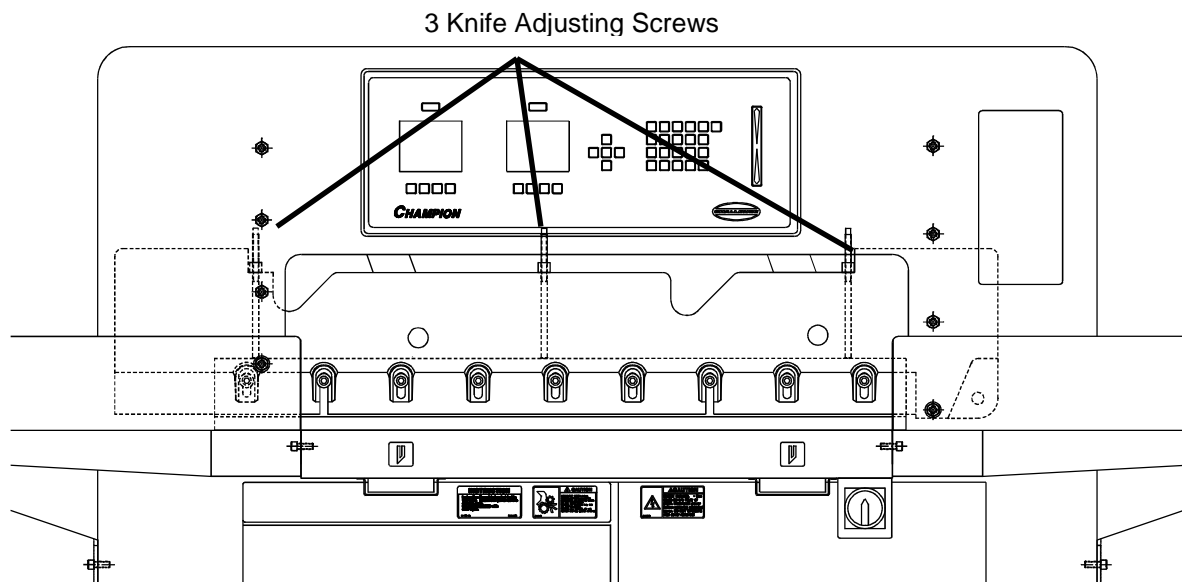


Figure 16



Figure 17 – Knife Changing Equipment

10.1.1 Knife Change

The knife changing equipment shown in Figure 17 is included in the cutter tool kit. The following instructions show how to remove and install a new or re-sharpened knife. Read through these instructions **AT LEAST ONCE** before attempting to actually change or install any blades.

10.1.1.1 Knife Removal

1. Clear the cutter table. Place chipboard directly under the knife to prevent nicking if the blade hits the table.
2. Lower the knife bar. See section 8.12.3.4 Knife Adjust on page 31 for directions on how to lower the knife bar.
3. **DISCONNECT THE POWER AND LOCK IT OUT!** (See Power Lockout procedure, page 5.)
4. Back off the three (3) knife adjusting screws on the top of the knife bar, (Figure 16 on page 40), as far as they will go (counterclockwise). A new knife will cut deeper than a knife that has been ground several times. If the adjusting screws are not backed off, damage will result to the new knife, paper deflector and/or the cutting stick.
5. Remove the right-most knife bolt. This bolt will not be accessible after the knife bar is raised.
6. Unlock and reconnect the power then raise the knife bar.
7. **DISCONNECT THE POWER AND LOCK IT OUT!** (See Power Lockout procedure, page 5.)
8. Remove the bolts in the two slotted holes of the knife bar and replace them with the knife lifter assembly. Tighten the lifters enough to hold the blade in place. Remove the remaining bolts (Figure 18 on page 42).



Figure 18

9. Clear the table and put the empty knife scabbard on the table.
10. Grasp the knife lifter assembly firmly while turning counterclockwise to release the knife from the knife bar. Slowly lower the knife down and to the right. Bring the left side out first and put the blade in the scabbard immediately.
11. Send the dull knife to the grinder.

10.1.1.2 Knife Installation

1. Lower the knife bar. See section 8.12.3.4 Knife Adjust on page 31 for directions on how to lower the knife bar.
2. Lock the paper deflector down by switching the hold down lever to the locked position (Figure 19).

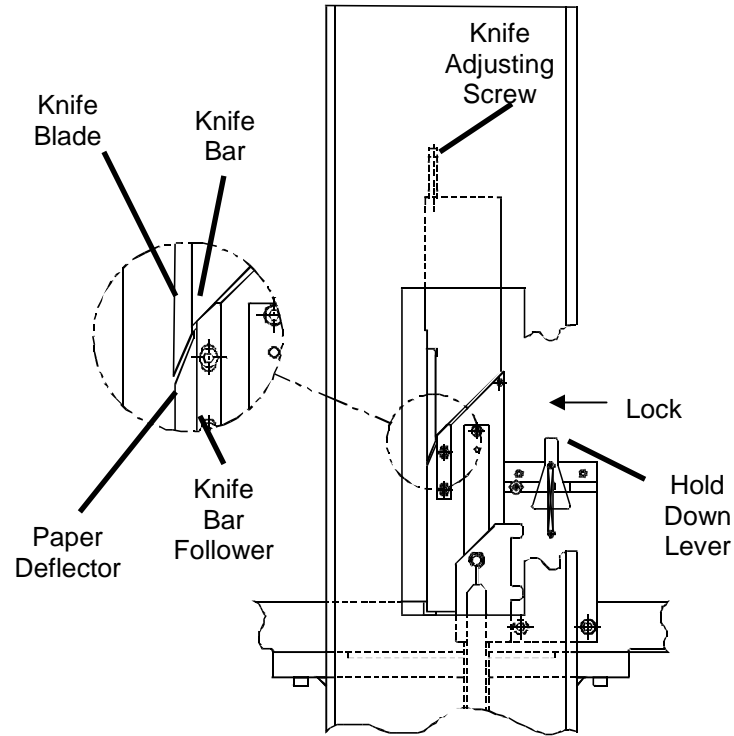


Figure 19

3. Raise the knife bar.
4. **DISCONNECT THE POWER AND LOCK IT OUT!** (See Power Lockout procedure, page 5.)
5. Use the cutting stick puller to remove the cutting stick. Turn the cutting stick to a new surface.
6. Clear the cutter table and extension tables. Place chipboard directly under the knife to prevent nicking if the blade hits the table.
7. Check to make sure that all three (3) of the knife adjusting screws have been backed out, see step 3 of Knife Removal section 10.1.1.1 on page 41.
8. Place the knife scabbard on the cutter table.
9. Remove the knife retainer screws holding the knife in the knife scabbard. Insert the knife lifters into the knife bolt holes on the knife (use the lowest holes) corresponding to the slots in the knife bar. Turn the threaded portion of knife lifters into the threaded holes in the knife until they contact the scabbard, then back off 1-1/2 turns.
10. Grasp the knife lifters, lift the blade, and insert the blade into the knife bar slot. Slowly guide the blade into the cutter right end first, then bring the left end in parallel to the knife bar. Raise the knife into the knife bar slot as high as it will go. Tighten the lifters to hold the knife.

NOTE: If the blade will not go in, either the lifters are screwed into the blade too far or the blade is not centered over the table, and the end of the blade is hitting the end stop in the knife bar.

10.0 Routine Maintenance/Adjustments

11. Insert the rest of the knife bolts and washers, snug tighten them, but don't tighten completely. Be sure all bolts have washers. The correct washers are important for proper bolt clearances!
12. Replace the knife lifters with bolts and snug tighten.
13. Place a few sheets of paper across the table to cover the cutting stick.

NOTE: Before the knife bar is run down make sure the following is checked:

- a. The (3) knife adjusting screws have been backed off completely.
 - b. The knife blade is raised as high as it can go in the knife bar over the entire length of the blade.
 - c. The paper deflector is locked down.
14. Unlock and turn the power on.
 15. Lower the knife bar. See section 8.12.3.4 Knife Adjust on page 31 for directions on how to lower the knife bar.
 16. **DISCONNECT THE POWER AND LOCK IT OUT!** (See Power Lockout procedure, page 5.)
 17. Turn the knife adjusting screws down, a little at a time, until the blade cuts through the paper evenly, over the entire length of the cut stick. Be sure the blade is parallel to the cutting stick, or one end may cut deeper than the other, causing uneven wear on the cut stick.

NOTE: When the knife is adjusted so it just cuts through the last piece of paper on the table evenly over the entire length of the cut stick, it is a good idea to turn each knife adjusting screw 1/4 turn tighter (clockwise). This can eliminate the need to readjust the knife after the very sharpest edge of the blade has worn off.

18. Tighten all the bolts.
19. Turn power on and send the knife to the "UP" position.
20. Make a test cut through a full lift of stock. Make minor adjustments by loosening the bolts and repeating steps 15 through 20.

NOTE: If the knife ends cut but the middle does not, you could have dips or uneven spots in either the knife or the cutting stick. These can be eliminated to some extent by laying 1/2" (13mm) wide strips of paper beneath the cutting stick to shim it up.

10.1.2 Cut Quality

Assuming the proper bevel angle has been chosen for the material being cut, cut quality depends upon blade sharpness and surface finish. Three cut characteristics can indicate a blade needs sharpening:

1. Burnishing appears on cut face of lift.
2. The cut does not appear straight when viewed from the top.
3. The profile of the cut (side view) does not appear to be perpendicular to the table.

Other signs that a knife needs sharpening are:

- The machine seems to strain while cutting. This strain can be heard in the hydraulic motor.
- The knife makes a “rougher” sound as it passes through stock.
- Nicks are visible on the cutting edge of the knife.

10.1.3 Bevel Angle

The most appropriate bevel angle depends upon four factors.

1. The length of time desired between sharpening
2. Physical properties of the stock being cut (hardness, impurities, density)
3. Power output of machine
4. Amount of clamp pressure applied

1. **Length of Time Between Sharpening**

Under identical cutting conditions, knives with larger bevel angles will require sharpening less frequently than knives with smaller bevel angles. There is more material supporting the cutting edge of larger bevel angles.

2. **Physical Properties of Stock**

In general a smaller bevel achieves a better quality cut. Hard, dense, and impure papers, however, will dull a small angle bevel quickly. Impurities may put nicks on the cutting edge. As a result, cut quality is lost quickly, and knives require sharpening often. Therefore, a larger angle bevel should be chosen for such materials. Soft materials can be cut with small angle bevels without adversely affecting sharpening frequency.

3. **Power Output of Machine**

As the bevel angle increases, more power is required to push the knife through stock. If a bevel angle is too large for a machine, the machine may take excessive wear-and-tear and may stall part way through the cut cycle. Although the knife will require sharpening less often, the machine may incur costly damage.

4. **Amount of Clamp Pressure Applied**

As clamp pressure increases, the pile density increases. As discussed in 2, above, more dense materials are harder to cut. This presents a dilemma. Higher clamping pressures are used to reduce draw when cutting with large angle bevels. While higher bevel angles increase the lifetime of the knife, high pressure clamping increases the material's density and detracts from knife life. As a result, a compromise must be made between knife life and cut quality.

10.1.4 Helpful Suggestions

- If your shop is large enough to purchase more than one set of knives, the following suggestions may be helpful. A set consists of 3 knives, one in the machine, one back up, and one at the grinder.
- If you cut a variety of stocks (easy and hard to cut), purchase two sets of knives. One set should be beveled at around 21° and the other around 23°.
- Use the smaller angle bevel to cut softer stocks at lower clamping pressures. Begin by cutting the most pure, easy to cut stocks. As the knife dulls, begin cutting the less pure of the softer stocks.
- Use the larger bevel to cut harder more dense stocks at higher clamping pressures. Begin by cutting the softer and most pure of the hard stocks. Then move to cutting the harder and less pure of the hard stocks.

10.0 Routine Maintenance/Adjustments

The following suggestions apply to those who can support only one set of knives. The bevel angle on the knives shipped with your machine was chosen for its versatility. It is not the ideal angle for every material, but these suggestions may improve the cut quality for those materials being cut with an inappropriate bevel:

- First, cut the softest, most pure stocks at lower clamping pressures.
- Move to the harder, more pure stocks at higher pressures. You may also need to reduce pile heights.
- Softer, impure stocks are next, followed by the hard impure stocks.

Following these guidelines will decrease the frequency of knife sharpening while maintaining a quality cut as long as possible.


Suggestions for all:

- If the machine seems to strain and cut quality is still good, reduce the pile height. You may also carefully apply glycerin to the bevel when cutting hard, coated stocks. Tie a cloth to the end of a stick; dip the stick in glycerin, and apply. Never apply by hand! In lieu of glycerin you may lightly rub white bar soap along the bevel. Lubrication will prolong the life of your machine and reduce maintenance.
- If the machine seems to strain and cut quality becomes unacceptable, the knife should be changed.
- Typical bevel angles vary from 26° to 19°. The most appropriate general-purpose bevel angle (23°) was chosen for your machine. If your most common applications warrant a different angle, careful thought should be given before making the investment.

10.1.5 Knife Tips

- To prevent corrosion you received your knife coated with light oil. It should be REMOVED WITH CARE.
- While removing or installing a knife, be careful not to allow the edge to bump against the machine. Nicks will result.
- If a knife bolt is damaged, replace it.
- Always keep knife bolts securely tightened.
- Always use the heavy-duty knife bolt washers provided by Challenge. Failure to do so could result in scratching or marring of the clamp face.
- Store knives in a dry environment to prevent corrosion.
- Never attempt to service a knife in any way.

10.2 False Clamp Plate

 **CAUTION** ALWAYS disconnect the power and LOCK IT OUT before installing or removing the false clamp plate. NEVER attempt to install or remove the false clamp plate while the machine is running. Remove all tools and stand clear when reconnecting power.

To prevent marking on pressure sensitive jobs, a false clamp plate has been included (installed) with your machine. This plate attaches to the bottom of the clamp. It is secured from the front of the cutter with three set screws that clamp against the mounting rods on the false clamp plate.

1. **DISCONNECT THE POWER AND LOCK IT OUT** (See Power Lock-Out Procedure, page 5)

2. Position the false clamp plate under the clamp. The locator pegs should be positioned to the rear of the cutter and are set into holes in the bottom of the clamp.
3. With a 1/8" Allen wrench, back off the setscrews in front of the clamp and raise the plate up to the bottom of the clamp. It may be necessary to bring the clamp down slightly with the foot pedal in order to access the far left setscrew. Raise the false clamp plate evenly or it will have a tendency to bind. When the plate has been raised into position and is flush with the bottom of the clamp, tighten the setscrews to hold the plate in position.
4. Make sure that all tools have been taken off the cutter table, reconnect the power, and turn on the power.

NOTE: The cutter cannot make cuts smaller than 2-5/8" (66.7 mm) with the false clamp plate installed.

10.3 Lubrication

A clean, lubricated machine will cut more accurately, run longer, with less downtime, and fewer repairs.

Schedule lubrication maintenance early in the day. This allows the lubricants to work into the machine. Lubrication at the end of the day allows the lubricants to run off without any benefit to the machine. Clean off old, dirty excess grease. Wipe accumulated dust off valves, hoses, and connections. Built up dust increases operating temperatures and causes premature wear of all hydraulic components.

Oil and Grease Points **WEEKLY**.

Run the knife down and **Lock Out the Power**, see Power Lockout Procedure, page 5. All moving parts require lubrication. Remove all panel covers and look for all oil locations (marked with red paint). Make sure oil holes are not plugged and lubricate with a 30 weight oil. See the photos below for critical locations (not all locations are illustrated here). Notice that some are oil locations and some are grease points. Wipe off old and excess grease. Use a National Lubricating Grease Institute No. 1 consistency, extreme pressure grease.

Make sure to inspect the counter-weight chain, both connecting links, and the c-shaped channel for wear. If excessive wear is noticed, replace parts immediately. Be sure to oil the counter weight chain.

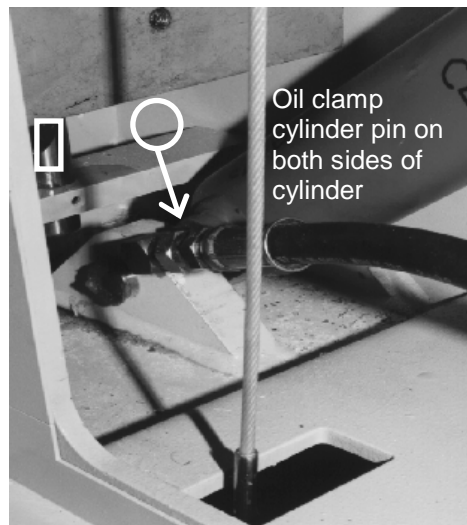
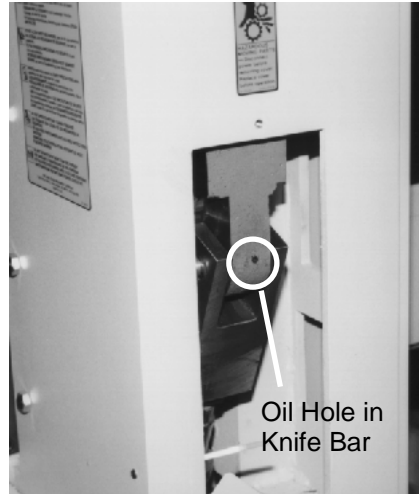


Replace all guards. Never operate cutter with any guards removed.

GREASE 

OIL 

10.0 Routine Maintenance/Adjustments





While lubricating, check pin locks to make sure they are in place and secure (Figure 20) there are a total of six. The bell crank pins do not require lubrication.

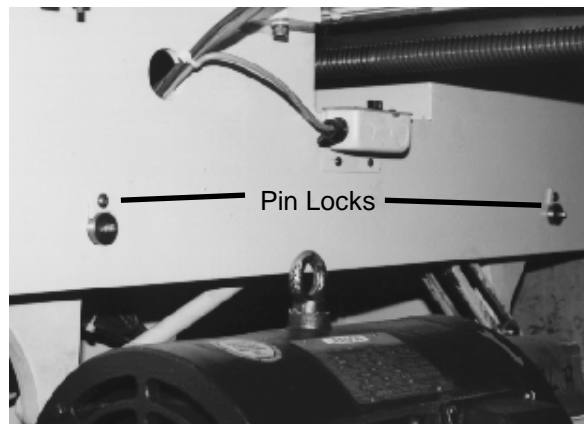


Figure 20

10.4 Hydraulic System

The Champion Series Cutters have both hydraulic cutting and hydraulic clamping operation. The cutter is powered by an electric motor coupled directly to a hydraulic pump. The pump has a fixed flow rate output of **10.5 GPM** at 1800 PSI (max. system relief setting) at 1800 RPM.

A hydraulic cylinder powers the clamp. When the cut buttons are depressed, this cylinder pushes on a bell crank and brings the clamp down (or brings the clamp up to full hydraulic pressure if the manual foot clamp is down). A hydraulic cylinder connected directly to the knife bar also powers the cut. The knife sequence valve generates 1600 PSI of backpressure throughout the system to maintain full clamp pressure during the cut. One big advantage of the hydraulic system is the immediate return of the knife when the cut buttons are released. Instead of stopping in place, the knife immediately returns to the upper position.

The hydraulic fluid should be changed **YEARLY** or EVERY 1000 HOURS of operation.

The oil filter (Challenge part H-227-1) should be changed yearly or whenever any repairs are made to the hydraulic system.

10.0 Routine Maintenance/Adjustments

NOTE: Failure to change the oil when needed can damage the seals in the clamp and knife cylinders as well as the manifold.

Refill the tank with 15 gallons of an ISO (International Standards Organization) Viscosity Grade 46, rust, oxidation, and foam inhibiting hydraulic oil. **NOTE: NEVER use Automatic Transmission Oil or Brake Fluid as a substitute for the correct hydraulic fluid.** Dangerous operation conditions could result.

Check the level of the Hydraulic Reservoir WEEKLY or whenever the machine sounds like it is laboring (this could be due to low oil level).

10.4.1 Recommended Oils

Use only one of the recommended oils or an ISO VG 46 Hydraulic Fluid equivalent. Oils other than the recommended type will cause seals, cups, and O-rings to deteriorate. See CAUTION below.

<u>Oil Name</u>	<u>Distributor</u>
Rykon No. 46	AMOCO
Energol HLP 46	BP
AW Oil 46	Chevron
Pacemaker XD 46	Citgo
Super Hydraulic 46	Conoco
Univis N46	Exxon
Security AW 46	Gulf
Kenoil R&O AW 46	Kendall
DTE 15M	Mobil
Tellus 46	Shell
Rando HDZ 46	Texaco

10.4.2 Oil Change

Before beginning, you will need (3) empty five gallon buckets, an oil pan, and a transfer pump. If oil is hot, wait until it cools.

1. DISCONNECT THE POWER AND LOCK IT OUT! (See Power Lock-out Procedure, page 5)
2. Remove the hydraulic breather cap (see Figure 21). Access the breather behind a cover plate on the hydraulic power unit cover.

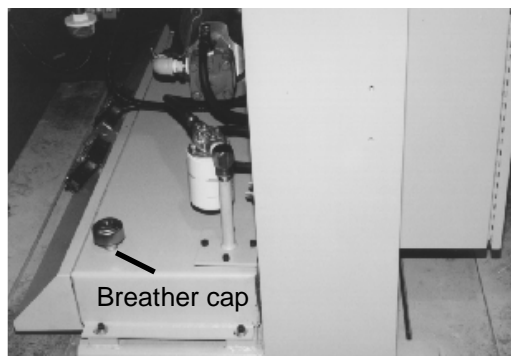


Figure 21

3. Place the suction line of the transfer pump into the breather cap hole. Place the pressure line of the transfer pump into an empty five-gallon pail.
4. Turn on the transfer pump and fill the pail. Repeat until tank is empty.
5. Replace the oil filter. Place a thin film of new hydraulic oil on the seal of the new filter to insure a proper seal. Firmly hand-tighten the filter onto the filter head.
6. Fill the tank with recommended fluid until the level is 3/4" below the top of the inside of the tank.

NOTE: DO NOT OVERFILL. Overfilling may cause leakage when the hydraulic fluid is hot.

7. Reinstall the breather cap.
8. Before turning on the machine, make sure all hydraulic hose fittings are tight. Make sure the oil filter has been firmly hand tightened to the filter head.
9. Unlock and turn on the main power to the machine. Turn on the hydraulic motor by pressing both cut buttons once. Inspect the hydraulic system for leaks. If leaks are found, turn off main power to the machine and tighten any leaking fittings.
10. Repeat step 9 as necessary.

10.5 Line Light Adjustment

The line light comes on whenever main power is turned to the ON position. The light from each of two bulbs reaches the table after passing between the knife and clamp, (Figure 22).

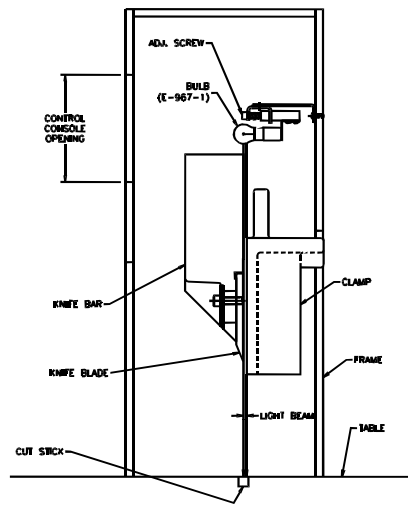


Figure 22

Each light is focused with an adjusting screw mounted on the line light bracket, behind the console.

1. Tilt the console down by removing the two screws at the top.
2. Place a wide sheet of paper on the cut stick to view the line.

3. Using a 3/16" hex wrench, turn one of the adjusting screws until you see a 1/16-1/8" beam.
4. Similarly, turn the adjustment screw of the other bulb until one, continuous beam is seen across the cut stick.

10.5.1 Line Light Bulb Replacement:

1. **DISCONNECT THE POWER AND LOCK IT OUT!** (See Power Lock-out procedure, page 5)
2. Tilt the console down.
3. Remove the old bulb by lightly pushing bulb into the socket and turning it counterclockwise.



If the bulb is still hot, allow a few minutes to cool before changing.

4. Insert the new bulb into the socket and twist clockwise until the bulb locks into place.
5. Reattach the console.
6. Unlock and turn the power ON.
7. If necessary, adjust the line as above.

10.6 Cleaning

HYDRAULICS

1. The hydraulic fans and tank should be wiped off weekly to maintain maximum cooling of the tank and hydraulic oil.
2. The hydraulic manifold and fittings should be wiped off weekly.

TABLE

1. The dust should be wiped from the air blower inlet screen on a weekly basis. This will insure unrestrained flow into the blower and maximum flow out of the air jets.
2. The front table should be cleaned periodically to remove rust and wax buildup. This should be done using cleaners provided in the optional cutter care kit. (p/n 16077) Do not clean extension tables with these cleaners. Damage to their finish will result.
3. The extension tables should be cleaned either with a dry or damp cloth or a mild water based detergent.
4. The rear table cover may be cleaned with glass cleaner or a mild, water based detergent applied to a damp cloth. Some petroleum-based solvents may damage the Plexiglas cover.

CONSOLE

- The console should be cleaned with a mild water based detergent applied to a damp cloth or paper towel. Petroleum based solvents will damage the console.

MACHINE FRAME

1. The machine frame should be cleaned with a mild, water based detergent applied to a damp cloth.

2. Always be careful when cleaning around safety warning labels. Use limited amounts of cleaners in those areas.

10.6.1 Table Conditioning

The table of a paper cutter requires periodic maintenance to remove surface oxidation. Polishing is also required to provide a smooth surface for paper to move freely. The frequency of this maintenance will be determined by a number of factors. Among these are the humidity, environmental dust, handprints, liquid spills, and type of paper stock. We recommend the use of the **Challenge Cutter Care Kit P/N 16077** for of your table care needs.

To prepare a new machine's table, follow the procedure below:

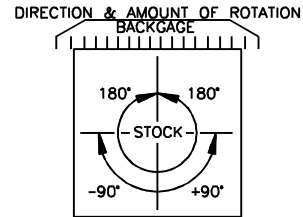
1. Remove the rust-protective coating from the table with a solvent.
2. Remove all solvent residue from the table with a dry cloth. Continue until the cloth shows no sign of residue.
3. Apply a light coating of an SAE 10-weight non-detergent motor oil or equivalent to the table and allow it to penetrate for at least one hour.
4. Remove all excess oil from the table with paper toweling (not cloth) until the paper towel you are using shows no sign of oil.
5. Apply a paste wax (Challenge P/N 16078) to the table to seal the pores of the metal.
6. Note: Do not use a wax that contains a cleaning compound on the table. The cleaner contains microscopic abrasive particles that will cause wear between the table and the bottom of the backgauge. A silicone spray (Challenge P/N 16079) will show the same type of wear as the cleaner if the excess silicone is not removed. If the excess is not removed, the silicone spray has a substance that holds the silicone to the surface it is sprayed on that causes a black, gummy build-up under the backgauge. If a silicone spray is used, paper toweling must be used to remove the excess to prevent this wear and build-up.

To clean surface oxidation from a table, follow the procedure below:

1. Spray "Rust-B-Gone" (Challenge P/N 16080) on the table and allow it to dissolve the rust. Then remove it with paper toweling. Or, pour a small quantity of SAE 10-weight motor oil onto the table. Using a Scotch-Brite Pad or a 400 grit sand paper, polish the table following the "grain" of the metal until all oxidation is removed to your satisfaction.
2. Remove all of the oil from the table until the cloth you are using shows no sign of residue.
3. Apply a light coating of an SAE 10-weight non-detergent motor oil or equivalent to the table and allow it to penetrate for at least one hour.
4. Remove all excess oil from the table with paper toweling (not cloth) until the paper towel you are using shows no sign of oil.
5. Apply a paste wax (Challenge P/N 16078) to the table to seal the pores of the metal.
6. Note: Do not use a wax that contains a cleaning compound on the table. The cleaner contains microscopic abrasive particles that will cause wear between the table and the bottom of the backgauge. A silicone spray (Challenge P/N 16079) will show the same type of wear as the cleaner if the excess silicone is not removed. If the excess is not removed, the silicone spray has a substance that holds the silicone to the surface it is sprayed on that causes a black, gummy build-up under the backgauge. If a silicone spray is used, paper toweling must be used to remove the excess to prevent this wear and build-up.

11.0 Program Log

It is always good practice to keep written records of important repeat jobs. In case a channel or the entire memory is accidentally lost. Important jobs will not have to be reprogrammed from scratch. Photocopy this page as needed to build a program log.



CHANNEL _____ JOB/DESCRIPTION _____
 PAGE _____ OF _____

STEP	CUT POSITION	ROTATE
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STEP	CUT POSITION	ROTATE
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12.0 Channel Log

It is recommended that you keep an abbreviated Channel Log and detailed Program Logs (copy this form) for important or repeat jobs. In the event memory capacity is reached, a glance at the Channel Log will tell you which channels may be cleared to make more room.

CHAN.	JOB/CUSTOMER	SAVE
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CHAN.	JOB/CUSTOMER	SAVE
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13.0 Safety System Tests

Machine manufacturer CHALLENGE Model _____

Serial Number _____

Frequency of test: **THESE TESTS SHOULD BE PERFORMED AT THE BEGINNING OF EACH WORK DAY.**

Turn on the cutter and start the hydraulic motor (see operator's manual for instructions). Enable the electric eye safety system.

Test #1: Using a 12 mm wide test piece, check the object detection capability of the electric eye system. Do this by waving the test piece throughout the electric eye beam area. The steady green and steady orange lights on the emitter side (RH) should change to steady red and flashing orange.

Test #2: Press both cut buttons to begin a cut cycle. During the downward motion of the knife or clamp, lean into the path of the electric eye beams. The downward motion of the knife and clamp should stop immediately, and the knife and clamp should return to the "up" position.

If the machine fails either test, DO NOT use machine. Repair or adjustment is necessary.

Please enter date and initials for both tests (make copies of this form if necessary).

Date _____

Test 1 _____

Test 2 _____

Date _____

Test 1 _____

Test 2 _____

Date _____

Test 1 _____

Test 2 _____

Repairs	Initials of Repairer	Date
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_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

NOTES:

