The Challenge Machinery Company provides owner's manuals on its products solely as a courtesy to its customers. See the information below before using this manual.

These manuals are for reference only. These manuals include products which are non-current, unsupported or no longer produced by The Challenge Machinery Company, and are provided solely as an accomodation to our customers. By providing these manuals, The Challenge Machinery Company makes no representation or warranty as to the products, their current condition, or their suitability or fitness for use in any particular application, which are the sole and independent responsibility of the product owner and user.

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Products may be unsupported by The Challenge Machinery Company due to age or the unavailability of parts from their original manufacturer. No parts or product support will be available to repair or maintain unsupported products. Older products may not be UL listed (if the product does not have a UL label it is not a listed product), and may not comply with applicable installation or other regulations or requirements if relocated to a new facility. Many municipalities require a product to be UL listed before an electrician will connect power to them. Often the cost of updating an older product to comply with current safety regulations is greater than the value of the product.

$10.00

SERIAL NO —

MODEL —

SAFETY ALERT

This safety alert symbol means CAUTION/WARNING-PERSONAL SAFETY INSTRUCTION. Personal injury may result if safety precautions are not carefully read before attempting to operate or repair this machine. See SAFETY PRECAUTIONS, page 2.

- This machine is designed for **ONE PERSON OPERATION ONLY!**
- Always **DISCONNECT THE POWER** before working on this machine.
- **DO NOT OPERATE WITH ANY GUARDS REMOVED!** Replace all guards before operating.
- **CRUSH HAZARD -** keep hands from under paper clamp. Use Jogging Aid and backgage controls to position and remove stock.

Instruction and Parts Manual

CHAMPION SERIES PAPER CUTTERS

MODELS MB, MBD, MBPB, MC, MCD & MCPB

This manual covers serial numbers M1001-M3653.

ALWAYS GIVE THE SERIAL NUMBER OF YOUR MACHINE WHEN WRITING.

Sold and serviced by

THE CHALLENGE MACHINERY COMPANY
1433 Fulton Street / Grand Haven, Michigan U.S.A. 49417 / Phone: 616/842-8300

F. 250-B

INTRODUCTION

WELCOME to the family of Challenge® Champion® users. Challenge has been developing and manufacturing Graphics Arts Equipment for over 100 years and is today one of the world's leading producers and distributors of Paper Cutters, Paper Drills and Bindery Equipment.

THE CHALLENGE REPUTATION is important to you as a user for the continuous, ready availability of parts and service.

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.

SAFETY ALERT! This symbol means, **CAUTION/WARNING: 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 or the Challenge Service Department. For the dealer nearest you or for service questions, call 1-800-592-0022; in Michigan, call 1-616-842-8300.

FOR PARTS OR 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 that the correct parts are sent as soon as possible.

Take a few moments right now and **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 this manual and return it **DIRECT 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 Service Department, 1433 Fulton St., Grand Haven, MI 49417. Phone (616) 842-8300.

CHALLENGE MODEL _____ SERIAL NUMBER _____
ATTN _____ COMPANY _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____
PHONE _____ DATE INSTALLED _____
DEALER'S NAME AND CITY _____

LIMITED WARRANTY

*This equipment is guaranteed to be free from defects in workmanship or material for a period of **one year** from the date of installation, except components purchased by Challenge which carry the manufacturer's warranty.*

*We will repair or replace, at our option, any equipment proving defective, not caused by accident, misuse or improper maintenance, if returned to our factory, transportation charges prepaid. This **warranty does not include the cost of labor** to replace defective components. Check the purchase agreement from your Dealer for a statement of labor warranty.*

Should you find anything wrong, contact the dealer from whom the equipment was purchased. Challenge will not be responsible for any charges incurred without its specific written authorization.

TABLE OF CONTENTS

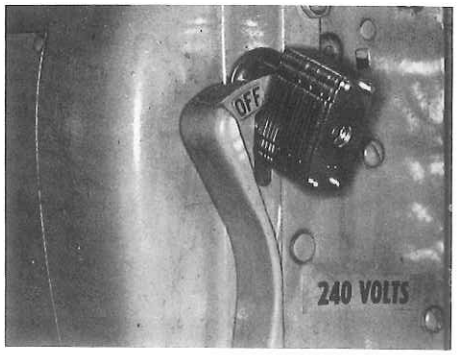
SAFETY PRECAUTIONS

This safety symbol means CAUTION/WARNING - PERSONAL SAFETY INSTRUCTION. Read the instructions because it has to do with safety. Failure to comply with the following instructions may result in personal injury.

- This machine is designed and safeguarded for ONE PERSON operation. NEVER operate the cutter with more than one person.
- Safety of this machine is the responsibility of the user and operator. Use good judgement and common sense when working with and around this machine.
- READ and understand all instructions thoroughly before using the cutter. If questions still remain, call your Authorized Challenge Dealer - Failure to understand operating instructions may result in personal injury.
- Only trained and authorized persons should operate the cutter. Turn the machine off and remove the key to prevent unauthorized use.
- DO NOT ALTER SAFETY GUARDS OR DEVICES, they are for your protection and should not be altered or removed. Severe lacerations or dismemberment could result.
- DISCONNECT POWER before cleaning, lubricating, servicing or making adjustments not requiring power. Lock the disconnect switch in the OFF position, see Power Lock-Out Procedure below.
- Have your electrician make sure the cutter is properly grounded.
- Have your electrician check for 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 procedure.
- 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 Service Chart in this manual. If the problem cannot be corrected have it checked by a qualified service person or your Authorized Challenge Dealer.
- CRUSH HAZARD, keep feet off the Clamp Pedal when handling paper under the clamp. DO NOT REST FOOT ON PEDAL at any time!
- DO NOT REACH UNDER THE KNIFE AND CLAMP AREA! Use a Jogging Aid to align and load stock and use backgage controls to remove stock.
- DO NOT RAISE CLAMP with pedal until knife has returned to up position, page 15. The knife will stop as the clamp rises, leaving the blade edge exposed.
- DO NOT OPERATE WITH ANY GUARDS REMOVED! Replace all guards after adjusting, lubricating or servicing the cutter.
- NEVER STAND ON CUTTER TABLE SURFACES or any other part of the cutter! Use a step ladder.

WARNING: POWER LOCK-OUT PROCEDURE

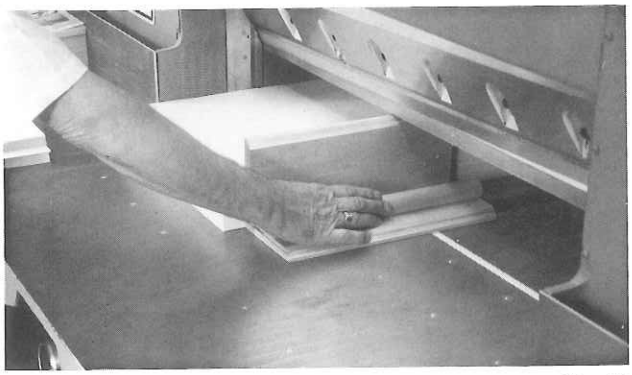
For maximum safety when making adjustments or repairs to your machine, be sure to **lock out the main power** control switch to which the machine is connected. The switch should be thrown to the OFF position and a padlock placed in the loop. The key should be held by the person servicing the machine.



(ill. 1)

JOGGING AID

Loading - Challenge offers for sale a series of jogging aids for loading stock. The use of the jogging aid allows the cutter operator to load and align stock without placing hands or arms under the clamp and knife area.



(fig. 2)

Load and align your stock against the side guide, fig. 2, then square it to the backgage for cutting.

You can make your own (drawing in back of manual) or purchase a high quality manufactured jogging aid by contacting your authorized Challenge Dealer.

Unloading

⚠ CAUTION: DO NOT REACH UNDER THE KNIFE AND CLAMP TO REMOVE CUT STOCK!

Use the handwheel or the forward and reverse backgage controls to push your stock out beyond the knife and clamp area where it can be conveniently and safely picked up.

⚠ WARNING: DO NOT ATTEMPT TO REMOVE TRIM UNTIL THE KNIFE AND CLAMP HAVE STOPPED IN THE UP POSITION! Due to static buildup, fine trim may have a tendency to stick to the clamp or knife surfaces. Fingertips might be drawn into the gap between the knife and clamp if this is attempted. Wait until the knife and clamp are BOTH up before removing stock trim.

INSTALLATION MB (SEE ADDED INSTRUCTIONS FOR M— C, CD, CPB, BD.)

⚠ WARNING: 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 2.

Cutter is shipped with Knife, Backgage, Tape and Table Extensions removed.

A separate sheet of instructions will be added if special shipping instructions were specified.

After all crating material except protecting board under Clamp has been removed and machine is thoroughly cleaned, oil all bearings and working surfaces. (See oiling instructions in maintenance section.)

To attach Tape: Insert tape holder (H) into hole in backgage and tape wheel support (J) into hole at rear end of table. Place tape wheel (K) on rear tape wheel support. Fasten slotted end of tape to tape holder with capscrew (L) and washer. Run tape around front and rear wheels and connect with tape spring (M).

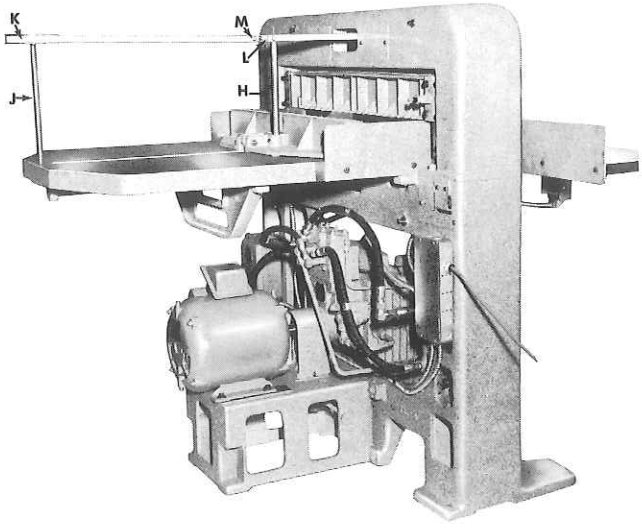
Remove oil plug from oil reservoir and replace with breather cap (F).

Check oil level in reservoir with oil gage on breather cap. Add oil if necessary.

Table extensions and extension backs: attach extension backs to extensions with polished face toward the front with 1/4-20 x 1/2" hex head cap screws.

Attach table extensions to table using 3/8-16 x 1" hex head cap screws.

Plug extension cord into 110 volt, 60 cycle, AC outlet and have motor wired to proper current and voltage



⚠ CAUTION: HAZARDOUS MOVING PARTS. Cover guards removed for illustration only. DO NOT OPERATE WITH ANY GUARDS REMOVED!

(fig. 1)

being sure that motor is turning in direction as indicated by arrow on motor and hydraulic unit.

Remove clamp protecting board.

Install knife (see maintenance section for knife installation).

SEQUENCE OF OPERATION

Operation

Push start button (D) to start motor.

Switch on fluorescent table light and tape magnifier (A).

Switch on light line (C). This light is more effective with fluorescent light off.

CLAMPING AND CUTTING CYCLE

⚠ WARNING: CRUSH HAZARD - Keep feet off the clamp pedal when handling paper under the clamp. Use a jogging aid to align stock in the cutter.

Clamp Down

Depress upper back portion of foot treadle and hold until clamp is down.

After clamp pressure is applied, foot must be removed from treadle before knife cutting action can be started.

To Raise Clamp

Depress lower front part of foot treadle and hold until clamp reaches top of stroke.

Knife Operation

To operate knife bar, press both "cut" buttons (B) and hold until knife bar reaches bottom of stroke.

Release either button and knife bar will automatically return to "up" position.

Backgage

Backgage movement: Backgage forward - turn handwheel clockwise. Backgage back - turn handwheel counterclockwise.

Backgage locking: Backgage can be locked in position by using thumbscrew (E).

Adjusting Clamp Pressure

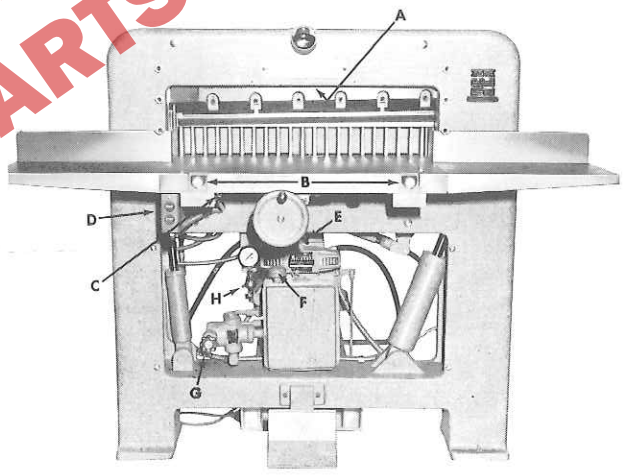
⚠ CAUTION: DO NOT set the clamp pressure below 400 psi. Pressures below this will not allow the auto cycle to operate properly and the knife will come down before the clamp. Severe lacerations and stock spoilage could result.

You may find it necessary to adjust clamp pressure due to stock variation. This can be accomplished as follows:

1. Open pressure gage valve (H) under gage.
2. Loosen locknut behind handwheel on pressure relief valve (G), depress upper back of foot treadle and hold while adjusting valve (G) to desired clamp pressure.

   Normal pressure 800 psi.

   ⚠ Caution: Do not exceed 1000 psi.
3. Tighten locknut on pressure relief valve (G) and check pressure gage reading.
4. Close pressure gage valve (H).



⚠ CAUTION: HAZARDOUS MOVING PARTS. Cover guards removed for illustration only. DO NOT OPERATE WITH ANY GUARDS REMOVED!

(fig. 2)

ADDITIONAL DIRECTION FOR INSTALLING AND OPERATING MODELS 230 - 305MBD, MCD, MCPB AND MBPB CUTTERS.

1. **Clean all machine surfaces and moving parts.**

2. **Place table in position.**

Reinstall the backgage control box under front of table. Connect the two wires from the backgage brake to the box.

Reinstall the wires to the backgage motor. This will be in conduit and lying in the cutter base.

This spacer cable #4139 or #6184, ref. #22, page 22 should now be restrung. The right cable goes around pulley assemblies and to the backgage nut #4473, ref. #51, page 24. The left cable attaches to the other end of the backgage nut; this part of the nut is located under the table. When fastened, the cables need not be extremely tight but just snug. Reference #41, page 24 pictures one of the cable ends that fit into the backgage nut.

3. **Backgage Operation**

To operate the backgage under power, the Edon Unit must be energized by the OFF and ON toggle switch. Then you may select to operate manually or automatically by the second Toggle Switch which is marked with 'A' for automatic and 'M' for manual. The only speed that can be controlled is forward on MANUAL operation. All other speeds are factory pre-set.

The top 1-1/2 amp fuse protects the backgage motor and the 1/3 amp fuse protects the Edon Unit.

CAUTION: FIRE HAZARD. Replace only with same type and rating fuse.

The green light signifies that the Edon Unit is energized and if not on, the fuse should be checked.

The Edon Unit should be turned off when cutter is not in use.

The backgage can be operated by power under manual control to any position within the cutting limits and then if desired, a very close setting may be made by pushing the handwheel #4148 and at the same time turning it to bring the tape to the desired reading. Pushing the handwheel de-energizes the backgage brake and allows the operator to operate backgage while handwheel is depressed.

Automatic Operation

After stops are set to the desired position, turn switch to automatic operation. After each cutting-clamping cycle, gage will move forward to the next stop automatically.

Using False Clamp Plate

WARNING: 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 from the front of the machine. Remove all tools and stand clear when reconnecting power.

Be sure to have the false clamp plate spacer, Ref. #41, page 22, in position on the left side of switch actuator shaft, ref. #38, as shown.

4. **Operating Instructions for Auto-Spacer**

Installing the Stop Shaft

Back off the thumbscrew, ref. #23, page 22, for clearance in the brackets at each end of the switch bracket. Insert the stop shaft, ref. #24, with the stops on it, in the square channels. Be sure to enter the stop shaft adjusting screw in its slot and screw it halfway into the stop shaft. The measuring scale should face the operator. Tighten the thumbscrews, ref. #32, that secure the stop shaft in its bracket.

Setting the Stops

Set the first stop on the left end of stop shaft to correspond with the length of the last cut and then each respective cut until all the stops are set according to the job to be cut.

Setting the Reverse Collars

Loosen the thumbscrews on the reversing collars, ref. #36, located on the reversing rod, ref. #38. The right hand collar is located about 1/2" to the right of the first stop. The left hand collar is located to the left of the last stop. This distance will vary depending on how far the operator wants the last pile of stock to be brought forward before the backgage returns to the first cut position.

Installing the Sensing Head (original installation)

Locate the sensing head, ref. #19, on the two positioning pins provided on the sensing head mounting block, ref. #18. Secure it with the socket head capscrew, ref. #20, provided.

Testing the Stop Set Up

Both the main switch and the auto-spacer switches are energized. Push the left hand reverse collar to the left. The backgage should return to its rearmost position, reverse itself and move forward to the first position. Using scrap stock, run through the entire cutting sequence and check for accuracy. Use the knurled adjusting screw on the left end of the stop shaft to make your correction on *only the last cutting position,* if that one is not correct, than work up the scale by adjusting each stop individually, if in need of correction. A setscrew stop, wrench is provided for this. To bring the backgage to any desired stop you have to actuate the clamp down and up to bring the power into operation.

Maintenance

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

Periodically, lubricate the pulleys about which the steel cable travels. The two shafts that the assembled stop guide ride on should be kept clean and lightly oiled with light machine oil. An accumulation of dust and powder will hinder proper functioning of these parts.

MAINTENANCE

Oiling Instructions

Weekly (or every forty (40) hours of operation).

Knife should be in up position, clamp should b in down position. ALWAYS pull disconnect switch before lubricating machine.

Using a No. 30 S.A.E. lubricating oil, lubricate all moving parts marked with colored paint.

Remove three (3) rear sheet metal covers and right hand side cover. You will find one oil hole behind each of these four covers.

Make certain that all oil holes are free from dust and dirt.

Lubricate both ends and sides of knife bar where bar contacts the gibs.

Lubricate back gage slide bar located under table.

Check oil level in power pack, refill if necessary. (See Hydraulic System Maintenance section.)

RECOMMENDED HYDRAULIC OILS

The MB hydraulic unit is filled with ten quarts of Rykon No. 100 oil (22 quarts MC). It should be checked every week, drained and refilled with fresh oil every 1,000 hours of operation or once each year, whichever occurs first. Add or replace with any of the following recommended oils if Rykon No. 100 is not available.

CAUTION: USE ONLY ONE OF THE RECOMMENDED OILS OR AN ISO VG 100 Hydraulic Fluid equivalent. Oils other than the recommended type will cause seals and O-rings to deteriorate. Dangerous operating conditions could result.

Oil Name	Distributor
Rykon No. 100	AMOCO
Duro AW Oil 465	Arco
AW Machine Oil 100	Chevron
Pacemaker XD No. 100	Citgo
Super Hydraulic 100	Conoco
Nuto H-100	Exxon
Harmony 100 AW	Gulf
HO 2A Hydraulic Oil	Lubriplate
DTE NO. 18	Mobil
Pennzoil AW 100	Pennzoil
Magnus A Oil 215	Phillips
Tellus 100	Shell
Energol HLP 100	Sohio
Industron 100	Std. Oil Indiana/Boron
Sunvis 851 WR	Sun Oil Co.
Rando HD 100	Texaco
Unax AW 100	Union Oil Co.

CAUTION: NEVER USE Automatic transmission oil or brake fluid as a substitute! Oils other than the recommended type will cause seals, cups and O-rings to deteriorate. Unsafe operating conditions will result.

To Adjust Knife Bar Gibs

Be sure that knife bar is directly back of screw being adjusted, i.e., knife bar should be a top position when adjusting top screws and at bottom position when adjusting bottom screws, otherwise gibs may be adjusted too tight and result in the scoring of knife bar and gibs.

To Square Backgage

When necessary to square backgage to knife, while facing the rear of cutter, loosen the right hand nut and screw and tighten the left hand screw and nut to advance left end of backgage. Vise-versa to advance the right end.

Changing Knife (see fig. 3)

CAUTION: Changing knives can be very dangerous unless safety precautions are observed and extreme care is taken when handling knives.

- **Make sure knife lifters are properly installed.**
- **Keep handling of unprotected knives to an absolute minimum.**
- **Clear off cutter table and side tables before removing knife.**
- **Have scabbard on cutter table and insert knife immediately.**
- **Warn people of any unprotected knife.**
- **Knife changing is a ONE PERSON OPERATION! Having more than one person trying to change knives invites accidents.**

Knife changing equipment is included in every cutter tool kit. The following instructions show how to remove and install a new or sharpened knife. Read completely through these instructions AT LEAST ONCE before attempting to actually change or install any blades.

Knife Removal:

1. Clear the cutter table. Turn on the power and lock the knife down. The knife is locked down by pressing the cut buttons and holding them down and pressing the power STOP button.
2. **Disconnect the power and lock it out!** See Power Lockout, page 2.
3. If equipped with the paper deflector option, lock it down by screwing the lock knob all the way in.
4. Back off the knife adjusting screws on the top of the knife bar as far as they will go (counter-clockwise). A new knife will cut deeper than an old knife that has been ground several times. If the adjusters are not backed off, damage can result to the new knife and/or the cutting stick.
5. Raise the knife by reconnecting the power and pressing the START button.

CAUTION: The knife and clamp will return to the up position when the START button is pressed. Keep tools and hands clear!

6. Disconnect the power and **lock it out,** see Power Lockout Procedure on page 2.
7. Remove the bolts in the two slotted holes of the knife bar and replace them with the knife lifters. Tighten the lifters enough to hold the blade in place, and remove the remaining four bolts.
8. Clear the tables and put the empty knife scabbard on the table.

DANGER: Knives are heavy and still very sharp. Be careful to keep the edge away from your body and keep other people out of the area while handling the blade. Severe lacerations and dismemberment could result from careless handling procedures.

(fig. 3)

9. Grasp the knife lifters firmly and at the same time, turn counterclockwise to release the knife from the knife bar. Lower the knife down and to the right. Bring the left side out first and put the blade in the scabbard immediately.

Knife Installation:

1. Use the cutting stick puller to remove the cutting stick. Turn the cutting stick to a new surface.
2. Check to make sure the paper deflector is locked down, see Knife Removal, step 3 above. Also check that the knife adjusters have been backed out ref. #15, page 10.
3. Place the new knife/scabbard on the cutter table.
4. Remove the knife retainer screws and insert the knife lifters into the knife bolt holes (use the lowest holes) corresponding to the slotted holes in the knife bar. Enter threaded portion of knife lifters into holes in knife until they contact the scabbard, then back off 1-1/2 turns.

5. Grasp the knife lifters, lift the blade and insert the blade into the knife bar slot. 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, and 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.

6. Insert the rest of the knife bolts, snug them up, but don't tighten completely. Be sure all bolts have washers. Washers are important for proper bolt clearances!

7. Replace the knife lifters with bolts and snug these also.

8. Place paper across the table to cover the cutting stick.

9. Turn the power back on, lock the knife down again and **disconnect the power** (repeat steps 1 & 2).

10. Turn the knife adjusters down, a little at a time, until the blade cuts through the paper evenly, the length of the stick. Be sure the blade is brought down parallel to the cutting stick, or one end may cut deeper than the other, causing uneven wear on the stick.

11. Tighten all the bolts and release the paper deflector.

12. Reconnect the power and press the START button to release the knife and clamp.

CAUTION: The knife and clamp will return to the up position when the START button is pressed. Keep tools and hands clear!

13. Make a test cut through a full lift of stock to check the cut, and make minor adjustments, if necessary, by turning the cutting stick to a new surface, loosening the bolts and repeating steps 9 through 11.

    NOTE: If the knife ends cut but the middle doesn't 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" strips of paper beneath the cutting stick to shim it up.

14. Send the dull knife to the grinder, and you are ready to go.

Keep Knife Sharp

Under normal operating conditions a knife should be sharpened after eight hours use, see page 33.

Outside Relief Valve (page 14, part No. 33)

CAUTION: The following test requires the machine to be operational for checking and adjusting. Be very careful that tools and other people are clear of moving parts and that the cutter is not accidentally operated while adjustments are being made. Disconnect the power and lock it out, see Safety Precautions page 2, whenever working on the machine unless the directions specifically require the machine to be powered.

The relief valve controls the system hydraulic pressure. Proper setting is 1,000 psi to 1,400 psi. To adjust, open clamp pressure gage shut off valve. Turn clamp pressure reducer valve in (G). Operate foot pedal. When clamp bottoms read pressure on gage. To adjust pressure, remove hex cap, loosen lock nut and turn in for higher, out for lower pressure. Operate cutter and recheck pressure on gage. When correct pressure is reached, tighten lock nut and replace hex cap. Readjust clamp pressure (see clamp pressure adjustment). Shut off gage valve.

If knife fails to cut through full lift of stock, dirt may have lodged in the valve. To flush, back off valve adjustment to minimum pressure and operate knife bar several times. Reset to recommended pressure.

Important

When writing, wiring or ordering repair parts or accessories, be sure to give the serial number of your cutter. This will identify your machine and insure prompt an efficient service and avoid costly delays.

OPERATING TIPS

Accuracy depends on proper care and adjustment of the machine.

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 backgage 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.

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.

Clamping pressure varies from stock to stock. The general rule is that you should have enough pressure to hold the stock securely but not so much that it marks the surface of he paper excessively. Excessive pressure causes pile distortion and inaccurate cuts.

To make stock slide as easily as possible on the cutter table, wash the table down with non-offset powder or with a silicone/rust preventive.

Mark the gripper edge and the guide edge of printed stock and make sure the first cuts are with these guide edges against the backgage.

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.

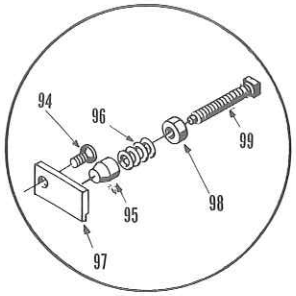
KNIFE CARE TIPS

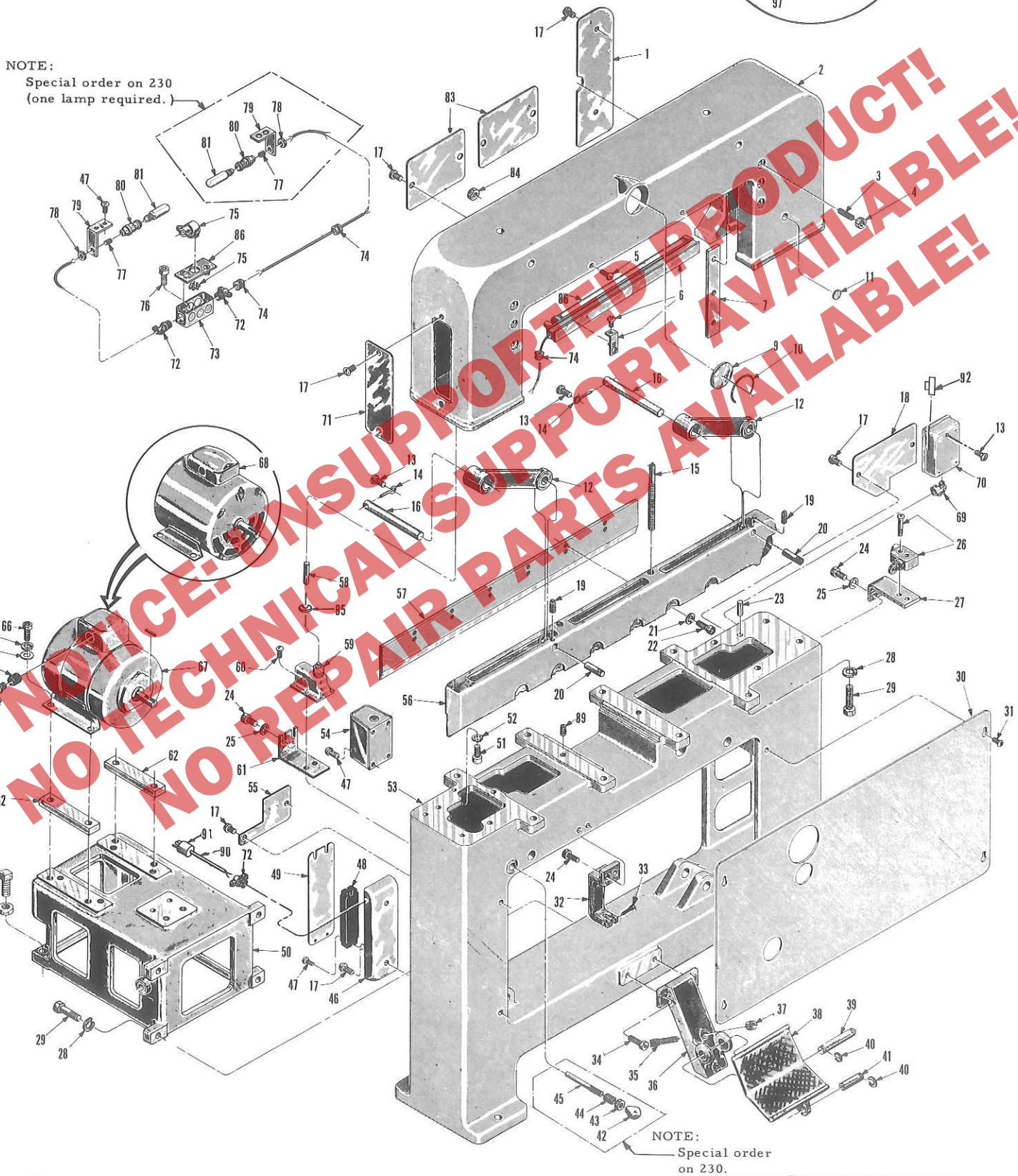
DANGER: Knives are heavy and very sharp even after use. Be careful to keep the edge away from your body and to keep people out of the area while handling the blade. ALWAYS keep knives in a knife holder scabbard when not in use to prevent damage to the knife and to prevent personal injury. Failure to follow safety procedures could result in severe lacerations or dismemberment.

- All Challenge cutters are supplied with 2 knives beveled at 21 degrees, flat ground with a minimum of #16 micro finish. This bevel is designated to be used in the average print shop with a variety of paper types. If your cutting needs are special, it may be helpful to send samples of your material to the Challenge Machinery Company for testing and recommendations.
- If is important to always have a SHARP knife, as this is the only way to minimize draw; a sharp knife is essential for accurate cutting; and a sharp knife prolongs machine life because it doesn't have to work as hard.
- Frequent light grinding of knives is recommended. This practice saves time needed to set the knife to the cutting stick, it keeps the knife in good condition, prolonging its life, and avoids trouble caused by dull knives and inaccurate cuts.
- Several signs indicate the need for a knife change; the appearance of the cut, the sound of the knife passing through the stock, draw of the stock when cutting, and the presence of a burnishing on the face of the cut.
- A busy shop should have a least 3 knives so one can be in the cutter and one spare while the other is being resharpened. It is always wise to have knives in reserve in case a blade becomes damaged or the knife sharpener gets too busy to get your blade out soon enough.
- ALWAYS keep knives in a knife holder when not in use, this prevent damage to the knife and for safety reasons.
- If possible, schedule cutting to get the most out of each blade. Start out with easy-to-cut papers like bonds, then hard coated papers followed by chipboard. If chipboard is cut first, you may find yourself changing the knife after your first cutting job since chipboard can contain metal particles and wood chips that can ruin the edge with one cut.
- To make the cutting of hard, coated papers easier, try this. Tie a rag around the end of a stick and dip it in a can of glycerine. Rub the rag on the knife bevel and it will lubricate the knife without staining the paper or messing up the printed material.
- When changing the knife, the new blade may be coated with light oil to prevent rusting. This should be wiped off CAREFULLY.
- The practice of honing new knives by the operator before installing them is usually not necessary and is very dangerous. Most knife sharpening companies will automatically hone the knife before sending it back to you, if they don't ask them to. It's better to let the professionals do it than to risk cutting yourself.

230MB & 305MB CHALLENGE CHAMPION PAPER CUTTER

⚠ WARNING: After determining which bulb(s) need replacement, turn off the key and remove it. Disconnect the power and LOCK IT OUT! See page 2, Power Lock-out Procedure. This is extremely important for YOUR safety! You will be working out of sight behind the machine. The area above the clamp and in front of the backgage is very dangerous, so the machine MUST be totally disconnected to prevent it from being accidentally started.





REF. NO.	PART NUMBER	PART NAME	QUANT. REQ'D. 230	305	REF. NO.	PART NUMBER	PART NAME	QUANT. REQ'D. 230	305
1	4468-1	Cover	1	1	53	4101	Base	1	
2	4500-1	Arch		1		4402	Base		1
	4102	Arch	1		54	E-925	Control Relay	1	1
3	1/2-13 x 3	Soc. Set Screw Oval Point	6	6	55	4463	Cover L. H.	1	1
4	S-663	1/2 - 13 Jam Nut (Plated)	6	6	56	4104	Knife Bar	1	
5	8-32 x 1 1/4	Round Hd. Mach. Screw	2	2		4501-1	Knife Bar		1
6	SS-980-1M	Fluorescent Unit	1	1	57	230-2122-3	Knife	1	
7	4505	Knife Bor Gib	2	2		2238-2	Knife		1
9	5-8-399	Lens	1	1	58	4410	Pin - Switch Trip	1	1
10	5-8-409	Lens Holder	1	1	59	E-896-1	Micro Switch	1	1
11	5-1562	3/4 Snap in Blank	3	3	60	#8-32 x 1/4	Rd. Hd. Mach. Screw	2	2
12	4503	Link Knife Bar	2	2	61	4408	Bracket-Knife Bar Switch	1	1
13	10-24 x 3/8	Rd. Hd. Mach. Screw	5	5	62	4412	Riser Block	2	2
14	S-1244	Pin Lock	2	2	63	E-696	1/2 Flex Conduct Conn. 45°	1	1
15	4449	Knife Adjusting Screw	2	2	64	E-662	Conduit Reducer	1	1
16	4507	Pin Knife Bar Link	2	2	65	3/8	Standard Washer	4	4
17	1/4-20 x 3/8	Rd. Hd. Mach. Screw	16	16	66	3/8-16 x 1 1/2	Soc. Hd. Cap Screw	4	4
18	4462	Cover R. H.	1	1	67	E-567-2	Motor 1 1/2 H. P. 3 PH.	1	1
19	1/4-20 x 1	Sw. Hd. Set Screw	2	2	68	EE-526-4	Motor 3 H. P. 1 PH.	1	1
20	4518	Pin - Knife Link	2	2	69	K-504	1/2 x 90° Angle Connector	1	1
21	S-1083-1	Special 3/8 Washer	5	6	70	E-901-3	Manual Starter-Three Phase	1	1
22	S-1326	Knife Bolt	5	6		E-901-4	Manual Starter-Single Phase	1	1
23	#6 x 1 1/2	Taper Pin	2	2	71	4469-1	Cover-End	2	2
24	1/4-20 x 3/4	Hex Hd. Cap Screw	6	6	72	E-894	Cord Grip	2	4
25	1/4	Standard Washer	4	4	73	S-1312	Junction Box	1	1
26	E-804	Micro Switch	1	1	74	K-331	Bushing	1	3
27	4446	Bracket Knife Switch	1	1	75	S-887	3/8 x 90° Angle Connector	1	1
28	3/8	Medium Lock Washer	16	16	76	#10-24 x 3/8	Soc. Hd. Cap Screw	1	2
29	3/8 x 1 3/4	Hex Hd. Cap Screw	12	12	77	E-436	Brass Nipple	1	2
30	4107	Front Panel	1		78	E-439	1/8 Pipe Nipple Nut	1	2
	4475	Front Panel		1	79	4494	Line Light Bracket	1	2
31	S-1258	3/8-16 x 1/2 Plated Rd. Hd. Mach. Screw	4	4	80	E-887	Socket	1	2
32	4454	Gage Mtg. Bracket	1	1	81	E-888	Lamp 25 Watt - 110 V. 1001-1457	1	2
33	1/4-20 x 1 1/2	Hex Hd. Cap Screw	1	1		E-933-2	M-1800 & Up	1	1
34	3/8 x 1	Hex Hd. Cap Screw	2	2	82	E-933	Lamp 40 Watt - 110 V. 1458-1799	1	2
35	1/4-20 x 2 1/2	Square Hd. Set Screw	2	2	83	4470	Cover Arch Back	2	2
36	4403	Bracket-Foot Treadle	1	1	84	#8-32	Hex Nut	2	1
37	1/4-20	Hex Jam Nut	2	2	85	S-1193-25	.250 Truarc Ret. Ring	1	1
38	4404	Treadle-Foot	1	1	86	S-845	Fluorescent Lamp 15w	1	1
39	4416	Shaft-Treadle	1	1	87	S-1313-1	Junction Box Cover		2
40	S-1193-37	.375 Truarc Ring	3	3	88	5/8 - 11	Hex Jam Nut	2	2
41	4427	Adjusting Block Retaining Pin	1	1	89	5/8 - 11 x 2	Sq. Hd. Set Screw	2	2
42	S-1466	3/8-16 Plastic Knob		1	90	1/2 - 13 x 1	(Nylok) Fl. Pt. Soc. Set Screw	2	1
43	3/8-16	Std. Hex Jam Nut		1	91	KK-299-2C	Power Cord	1	1
44	S-1407	.390 x 1/2 Spring		1	92	S-1253	Adaptor 3 Prong	1	2
45	4499	Stud (Lock)		1		E-510-N33	Heater Element 220V. -3 PH.	2	2
46	E-881	Gang Box	1	1		E-510-N26	Heater Element 440V. -3 PH.	2	1
47	#10-24 x 5/8	Rd. Hd. Mach. Screw	4	8		E-510-N41	Heater Element 220V. -1 PH.	1	
48	E-680-14	Terminal Block	1	1	94	3/8 x 16 x 3/4	Flat Head Machine Screw	1	1
49	E-882	Cover - Gang Box	1	1	95	S-1254	Clamp Plunger	1	1
50	4417	Bracket Motor Mount	1	1	96	S-1255-1	Spring	1	1
51	1/2-13 x 1 3/4	Soc. Hd. Cap Screw	8	8	97	4519	Cam Plate	1	1
52	1/2	Medium Lockwasher	8	8	98	1/2 x 13	Jam Nut	1	1
					99	4517	Clamp Plunger Screw	1	1

230MB-1001-3284 & 305MB-1001-3327.

Excessive hydraulic oil heat will be noted and 2-hand safety reset will be inoperative unless switch is actuated when the knife is in the down position.

Instructions for Setting Limit Switch

1. Remove knife.
2. Loosen switch bracket lock screws and drop the switch down as far as it will go.

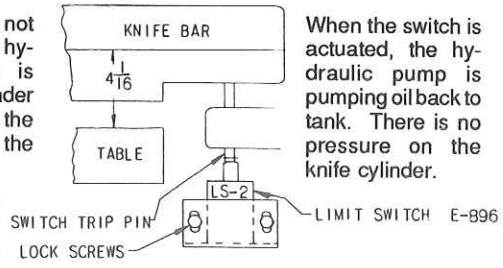
   With power on, bring the knife bar to the extreme down position and shut off the power. Check 4-1/16" dimension. If necessary, adjust knife cylinder clevis to obtain this dimension.
4. Lift the switch until the trip pin makes it click.
5. Tighten the switch bracket lock screws. Replace knife and check adjustment for proper cutting action.
6. If knife bar shows a bouncing or slamming condition at the bottom of stroke, raise switch slightly.

230MB-3285 & up, 305 MB-3328 & up ARE wired so outside relief valve dumps over when knife reaches bottom of stroke.

Knife Down Limit Switch
(230 & 305 Machines)
View from back of machine

When switch is not actuated, the hydraulic pump is pumping oil under full pressure to the "down" port of the knife cylinder.

Limit switch #2 is actuated by the switch trip pin when knife bar is in extreme down position.



When the switch is actuated, the hydraulic pump is pumping oil back to tank. There is no pressure on the knife cylinder.

TABLE PARTS 230MB, 305MB, 305MC

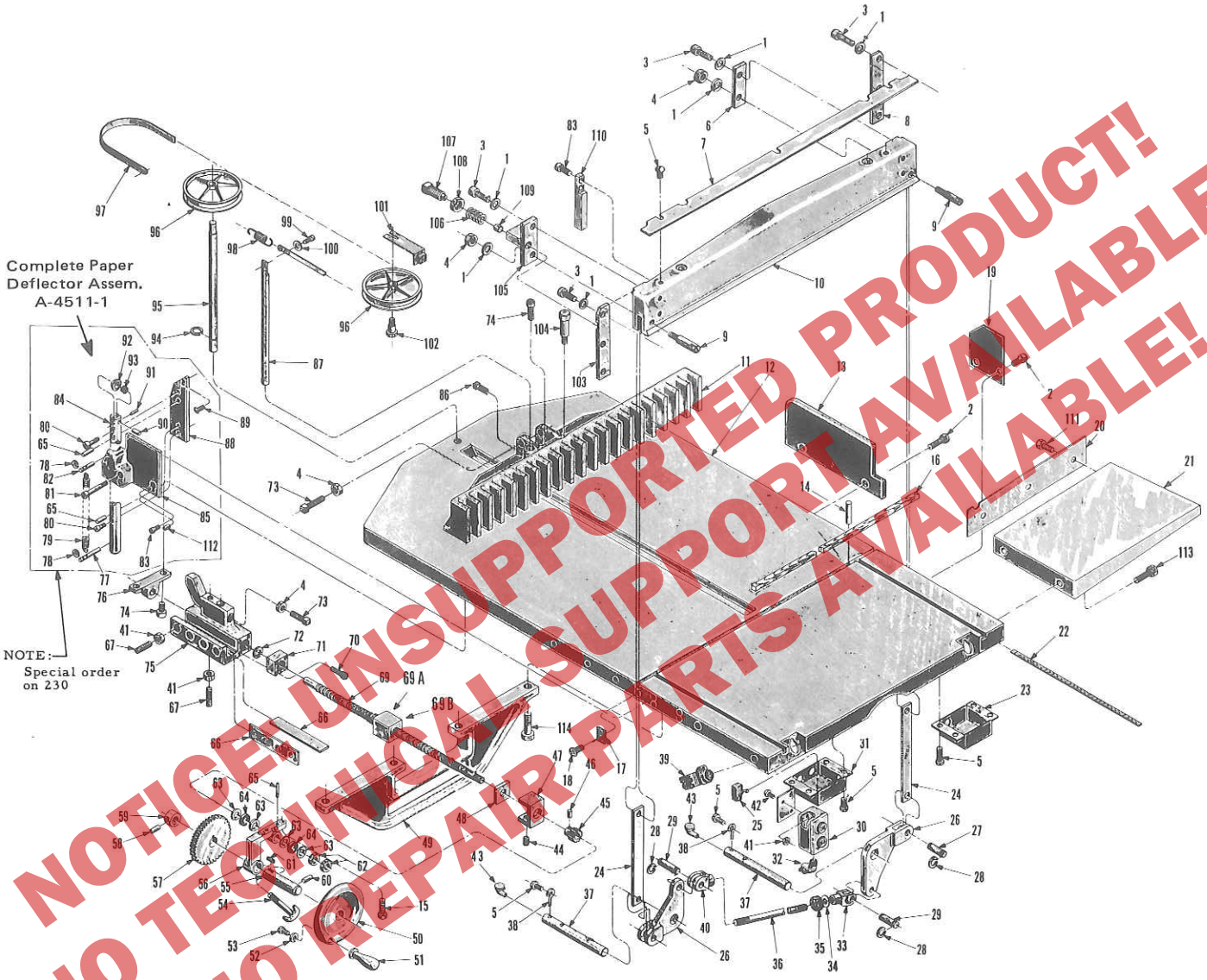
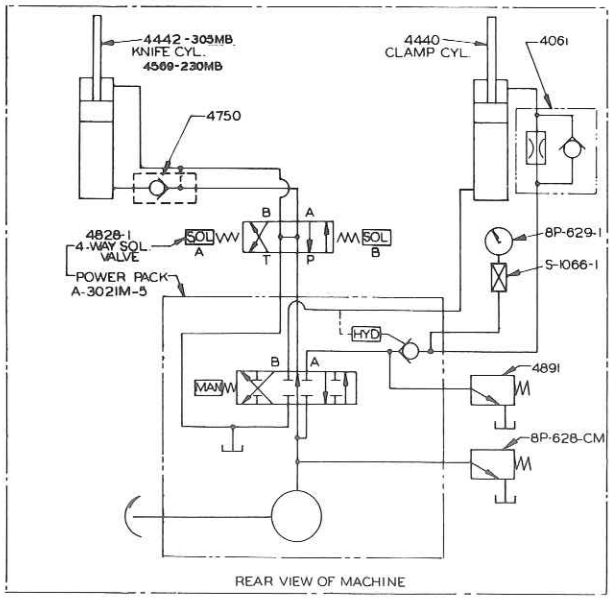


TABLE PARTS 230MB, 305MB, 305MC

REF. NO.	PART NUMBER	PART NAME	QUANT. REQ'D. 230	305
1	3/8	Medium Lock Washer	10	10
2	3/8-16 x 3/4	Hex Hd. Cap Screw	10	8
3	3/8-16 x 1 1/4	Soc. Head Cap Screws	8	8
4	3/8-16	Hex Jam Nut	5	5
5	10-24 x 3/8	Rd. Hd. Mach. Screw	10	13
6	4508	Clamp Guide Bar	1	1
7	4476	Light Line Adj. Plate		1
8	4509	Bar Clamp Guide R. H.	1	1
9	4506	Stud Clamp Pull Down	2	2
10	4502	Clamp		1
	4105	Clamp	1	
11	4108	Back Gage	1	
	4472	Back Gage		1
12	A-4488	Table Assy. & Guide		1
	A-4106	Table Assy. & Guide	1	
13	4528-1	Rear Guide R. H.	1	1
	4459	Rear Guide L. H.	1	1
14	#7 x 2 1/4	Taper Pin	2	2
15	3/8-16 x 1	Hex Hd. Cap Screw	2	2
16	5-143	Wood Cutting Stick		1
	230-312	Wood Cutting Stick	1	
17	5-6-27-B	Stop for Cutting Stick	1	1
18	#8-32 x 3/8	Fl. Hd. Screw Soc. Hd.	1	1
19	#4439	R. H. Front Side Guide	2	1
20	4529-1	R. H. Table Ext. Back	1	1
	4530-1	L. H. Table Ext. Back	1	1
21	A-4452-S	R. H. Table Ext.	1	1
	A-4453-S	L. H. Table Ext.	1	1
22	A-2236-1	Table Scale	1	2
23	A-4532	Assy. Push Button Box	1	1
24	4504	Bar-Clamp Pull Down	2	2
25	E-899	Toggle Switch		1
26	4406	Bell Crank-Clamp		2
	4115	Bell Crank-Clamp	2	
27	S-482-1	.500 x 1.539 Str. Rod End Pin	1	1
28	S-1193-50	.500 Truarc Ret. Ring	2	2
29	S-1195	.500 x 2.219 End Pin	2	2
30	E-671	Start-Stop, Pushbutton Station	1	1
31	A-4492	Cover-Pushbutton L. H.	1	1
32	S-887	3/8-90° Angle Conn.	1	1
33	4465	Clevis R. H. Clamp Conn. Rod	1	1
34	3/4	Shakeproof Lockwasher Int.	1	1
35	3/4-10	Hex Jam Nut	1	1
36	4461	Rod-Clamp Connecting		1
	4119	Rod-Clamp Connecting	1	
37	4409	Pin-Bell Crank	2	2
38	S-1244	Pin-Lock	2	2
39	E-895-4	Flush Hd. Push Button	2	2
40	4466	Clevis L. H. Clamp Conn. Rod	1	1
41	1/4 - 20	Hex Ham Nut	2	2
42	1/4 x 1/2	Screw Rd. Hd.	2	2
43	1233-6531	Oiler (Gits Bros)	2	2
44	#10-24 x 1/4	Cup Pt. Soc. Set Screw	1	1
45	4046	Gear-Back Gage Screw	1	1
46	#O-3/4	Taper Pin	1	1
47	6173	Wiper Retainer	1	1
48	6172	Wiper-Ball Brg. Screw	1	1
49	4484	Brace-Table		1
50	A-4477-1	Assem. Hand Wheel	1	1
51	S-1-1	Steel Handle	1	1
52	1/4	Std. Washer	1	1
53	1/4-20 x 1/2	Button Hd. Soc. Cap Screw	1	1
54	S-1564	3/8 x 4 Mallable Thumbscrew	1	1
55	4478	Shaft-Hand Wheel	1	1
56	4496	Hand Wheel Brkt. -Front	1	1
57	4480	Gear-Spur (non-metallic)	1	1
58	#3 x 1 1/4	Taper Pin	1	1
59	S-414	Collar	1	1
60	#3 x 1 3/4	Taper Pin	1	1
61	3/16x3/16x5/8	Square Key	1	1
62	1/2 - 20 NF	Hex Jam Nut	2	2
63	S-1295	Thrust Washer	4	4
64	S-1300	Needle Thrust Bearing	2	2
65	3/16 Dia. x 1"	Sel-Lok Pin	2	4
66	4510	Gib-Back Gage Nut	2	2
67	1/4-20 x 1"	Oval Pt. Soc. Set Screw	8	8
69A	R-4482	Cartridge Ball Bearing	1	1
69B	4051	Backgage Nut	1	1
69	A-4424	Ball Bag Screw Assem.		1
	A-4116	Ball Bag Screw Assem.	1	
	A-4424-1	Backgage Screw Assem. (305 MB-3231 & Up)		1
	A-4116-1	Backgage Screw Assem. (230 MB-3290 & Up)	1	
70	#10-24 x 1	Soc. Hd. Cap Screw	4	4
71	4474	Wiper Retainer - Rear	1	1
72	6174	Wiper Ball Brg. Scr. -Rear	1	1
73	3/8-16 x 1 3/4	Sq. Hd. Set Screw	2	2
74	3/8 x 1	Soc. Hd. Cap Screw	3	3
75	4473	Back Gage Nut	1	1
76	4419	Back Gage Scr. Brkt.	1	1
77	4521	Pin	1	1
78	S-1193-25	.250 Truarc Ring	2	2
79	H-561	Feedguide Stopspring	1	1
80	1/4-20 x 3/4	Soc. Hd. Cap Screw	2	2
81	3/8-16NCx2	Soc. Hd. Cap Screw	2	2
82	4520	Pin-upper	1	1
83	3/8-16NCx3/4	Soc. Hd. Cap Screw	2	3
84	4498	Shaft	1	1
85	4522-1	Guide Block	1	1
86	1/4 x 1/2	Sw. Hd. Set Screw	1	1
87	4451	Back Gage Tape Holder	1	1
88	4523	Deflector - Paper	1	1
89	1/4-20-5/16	Rd. Hd. Mach. Screw	1	1
90	S-433	Vib. Roller Pin	1	1
91	S-496-1	Straight Pin	1	1
92	4495-1	Roller-Paper Deflector	1	1
93	S-861-1	Bushing (Oilite)	1	1
94	S-1193-62	.625 Truarc Ret. Ring	1	1
95	4450	Rear Tape Wheel Support	1	1
96	56P-25	Tape Wheel Assembly	2	2
97	A-4448	Back Gage Tape Assembly		1
	A-4120	Back Gage Tape Asembly	1	
98	4052	Tape Spring	1	1
99	S-671	1/4 - 20 x 3/8 Plated Cap Screw	1	1
100	1/4	Polished Washer	1	1
101	A-5951	Assy. Tape Reader Sight	1	1
102	5-6-75	Tape Reel Stud	1	1
103	4512	Bar-Clamp Guide L. H.	1	1
104	1010-5254	Stripper Bolt	1	1
105	A-4514	Assy. Clamp Plunger Brkt.	1	1
106	S-1255-1	Spring	1	1
107	4513	Screw-Clamp Plunger	1	1
108	8-6424	1/2 x 13 Hex Jam Nut	1	1
109	S-1254	Clamp Plunger	1	1
110	4441	Paper Guide	1	1
111	1/4 - 20 x 1/2	Hex. Hd. Cap Screw	6	6
112	21S-250-0750	1/4 Dia. x 3/4 Sel-Lok Pin	1	1
113	3/8-16 x 1 1/2	Hex Hd. Cap Screw	4	4

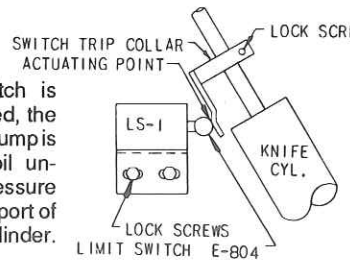
HYDRAULIC SYSTEM 230MB & MBD, 305MB



HYDRAULIC SYSTEM 230MB & MBD, 305MB

REF. NO.	PART NUMBER	NAME PART	QUANT. REQ'D. 230	305	REF. NO.	PART NUMBER	NAME PART	QUANT. REQ'D. 230	305
1	S-1193-25	.250 Truarc Ring	2	2	42	4436	Hyd. Hose Assembly	3	3
2	1/4-20 x 1/2	Soc. Hd. Cap Screw	4	4	43	1/4 Dia. x1 1/4	Sel-Lok Pin	2	2
3	4418	Actuator - Bell Crank	1	1	44	9P-652-5	Power Pack Coupling (1 PH)	1	1
4	4432	Actuator Rod Pin	3	3		8P-652-7	Power Pack Coupling (3 PH)	1	1
5	S-1193-37	.375 Truarc Ring	8	8	45	3/8-16 x 1	Hex Hd. Cap Screw	2	2
6	A-4422	Upper Clamp Actuator Rod	1	1	46	8-673	3/8 Pipe - 1/2 Tube Elbow 90°	3	3
7	#2 x 1	Taper Pin	2	2	47	4414	Pin Clamp Cylinder-Lower	1	1
8	4429	Actuator Lever	2	2	48	4061	Hyd. Flow Reg.	1	1
9	A-4421	Lower Clamp Actuating Rod	1	1	49	3/8 x 1 1/2	Pipe Nipple	2	2
10	4428	Lower Clamp Actuating Rod Block	1	1	50	S-1193-50	.500 Truarc Ring	3	3
11	S-1087-1	.750 x 2.718 Str. Rod End Pin	1	1	51	5-6-56B	.500 x 2.375 Str. Rod End Pin	1	1
12	S-1193-75	.750 Truarc Ring	2	2	52	4407	Clevis-Clamp Cylinder	1	1
13	4411	Clevis-Knife Bar Cylinder	1	1	53	3/4 - 16	NF Hex Nut	1	1
14	1"- 14	NF Hex Nut	1	1	54	4440	Hydraulic Clamp Cylinder	1	1
15	A-4443	Assembly Knife Switch Collar	1	1	55	8P-684	Assembly Breather Cap	1	1
16	1/4-20 NC x 1	Soc. Hd. Cap Screw	1	1	56	4431	Actuator Lever Supt. Rod	1	1
17	4442	Hyd Knife Cylinder		1	57	S-1362	.375 x 1.500 Str. Rod End Pin	1	1
	4569	Hyd Knife Cylinder	1		58	4420	Mounting Bracket	1	1
18	#10-24 x 3/8	Rd. Hd. Mach. Screw	2	2	59	S-515-1	.250 x 1.156 Str. Rod End Pin	1	1
19	S-1244	Pin Lock	2	2	60	3059-5	Tank Assembly	1	1
20	4413	Pin Clamp Cylinder - Lower	1	1	61	4525	Hyd. Hose Assembly	1	1
21	A-4405	Assembly-Power Pack	1	1	62	S-889	1/4 x 1 1/2 Pipe Nipple	1	1
22	S-751	1/4 Pipe Plug	4	4	63	8-678	3/8 to 1/4 Pipe Bushing	1	1
23	8P-629-3	Pressure Gage	1	1	64	S-1528	1/2T x 1/4P 90° Male Elbow	1	1
24	S-1066-1	1/4 Brass Glove Valve	1	1	65	S-1141	3/8P Forged St'l. Tee	1	1
25	S-1560	1/4 Pipe x 1/4 Tube Elbow 90°	2	2	66	S-1597	3/8P x 1/4T 90° Elbow	1	1
26	4891	Relief Valve	1	1	67	4590	Knife Cyl. Tube		1
	4891-1	2628 & Up	1			4591	Knife Cyl. Tube	1	
		2642 & Up		1	68	4750	Pilot Check Valve	1	1
27	3/8 x 2	Pipe Nipple	1	1	69	S-1136-1	Head Gasket	1	1
28	S-1522	3/4P x 1/2 Tube Elbow 90°	1	1	70	K-483	1/2 C'Sunk Pipe Plug	1	1
29	S-1064	3/8P x 1/2 Tube Male Coupling	1	1	71	S-1134	Gasket	1	1
30	4434	Tube Adj. Relief Valve	1	1	72	4828-1	Sol. Oper. 4-way Valve	1	1
31	3/8 x 2	Pipe Nipple	1	1	72	4828-2	2205 & Up		1
32	S-1063	1/2 x 3/8 Hex. Pipe Bushing	1	1			(2198 & Up)	1	
33	8P-628-C-M	Relief Valve Assembly	1	1	72A	E-1069	Coil for 4828-1 & 2	2	2
	4696	1903 & Up	1			4114-R	Rubber Insert	1	1
		(1908 & Up)		1			(1000-2885 230MB) (1001-2894 305MB)		
34	S-1419	1/2P x 1/2 Tube Elbow 90°	1	1		4114-1R	230MB-2886 & Up	1	1
35	S-1559	1/8 Pipe x 1/4 Tube Elbow 90°	1	1			305MB-2895 & Up		
36	4435	Tube Gage	1	1	73	S-1306	1" Pipe Plug-C'Sunk Hd.	2	2
37	4433	Tube Relief Valve to Tank	1	1	74	5/16 - 18x3/4	Hex Hd. Cap Screw	4	4
38	4415	Bracket Power Pack	1	1	75	8-508	Gasket	1	1
39	S-1111	Key-No. 9 Woodruff	1	1	76	A-3021M-5	Power Pack	1	1
40	S-1520	3/8P x 1/2 Tube Elbow 90°	2	2	77	4401	Manifold Plate	1	1
41	1/2-13x1 1/4	Hex. Hd. Cap Screw	4	4	78	5/16-18NC x 6	Hex Cap Screw	6	6
					79	4438	Guard-Pump Mount	1	1
					80	1/4 - 20 x 1/2	Hex Hd. Cap Screw	2	2
					81	S-1130	3/4 Pipe Plug	1	1

Knife Up Limit Switch
(230MB, MBD & 305MB machines only)
View from back of machine



When switch is not actuated, the hydraulic pump is pumping oil under full pressure to the "up" port of the knife cylinder.

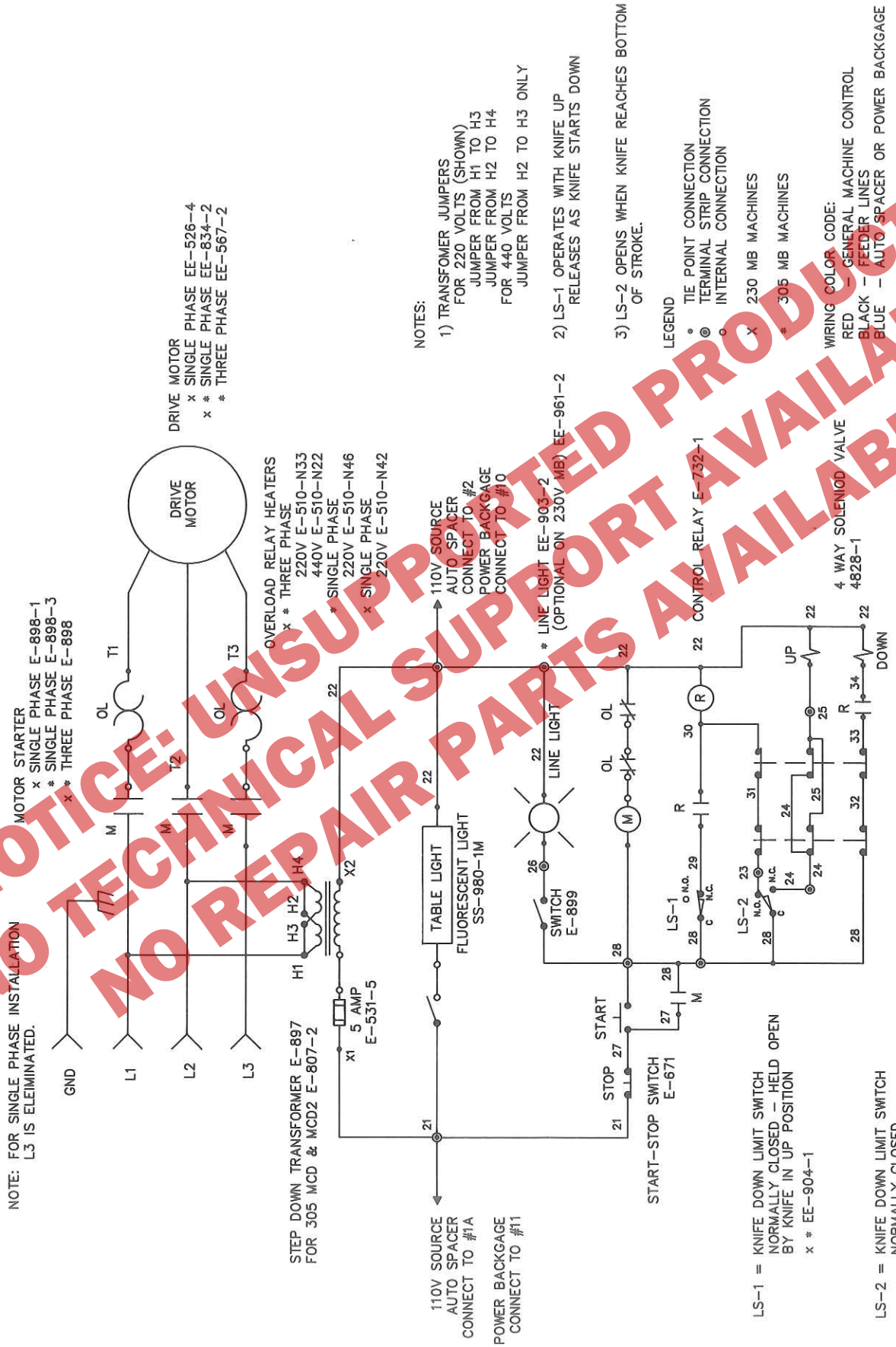
When the switch is actuated, the hydraulic pump is pumping oil back to tank. There is no pressure on the knife cylinder.

Excessive noise and hydraulic oil heat will be noted unless switch is actuated when the knife is in the up position.

Instructions for Setting Limit Switch

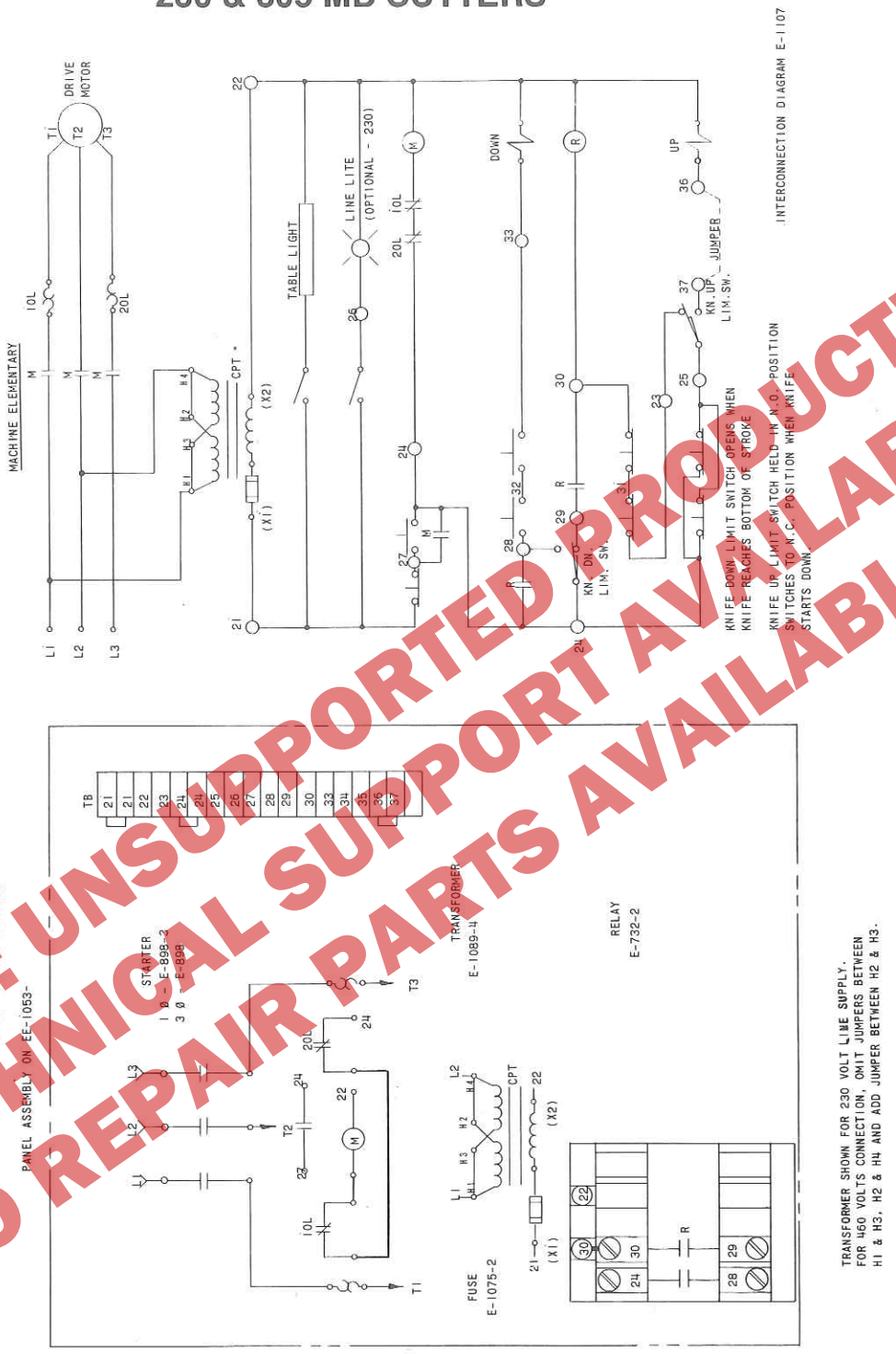
1. Knife must be in extreme up position with power on.
2. Loosen knife switch collar lock screw and adjust the trip so that it actuates the switch. (You will notice a difference in the sound as the load is taken off the motor.) It also may be necessary to loosen the switch bracket lock screws and move the switch closer to the trip.
3. Tighten lock screws and test run machine.

1 & 3 PHASE ELECTRICAL SCHEMATIC 11H2163-1
230MB, 230MBPB & 230MBD; 305MB, 305MBPB & 305MBD



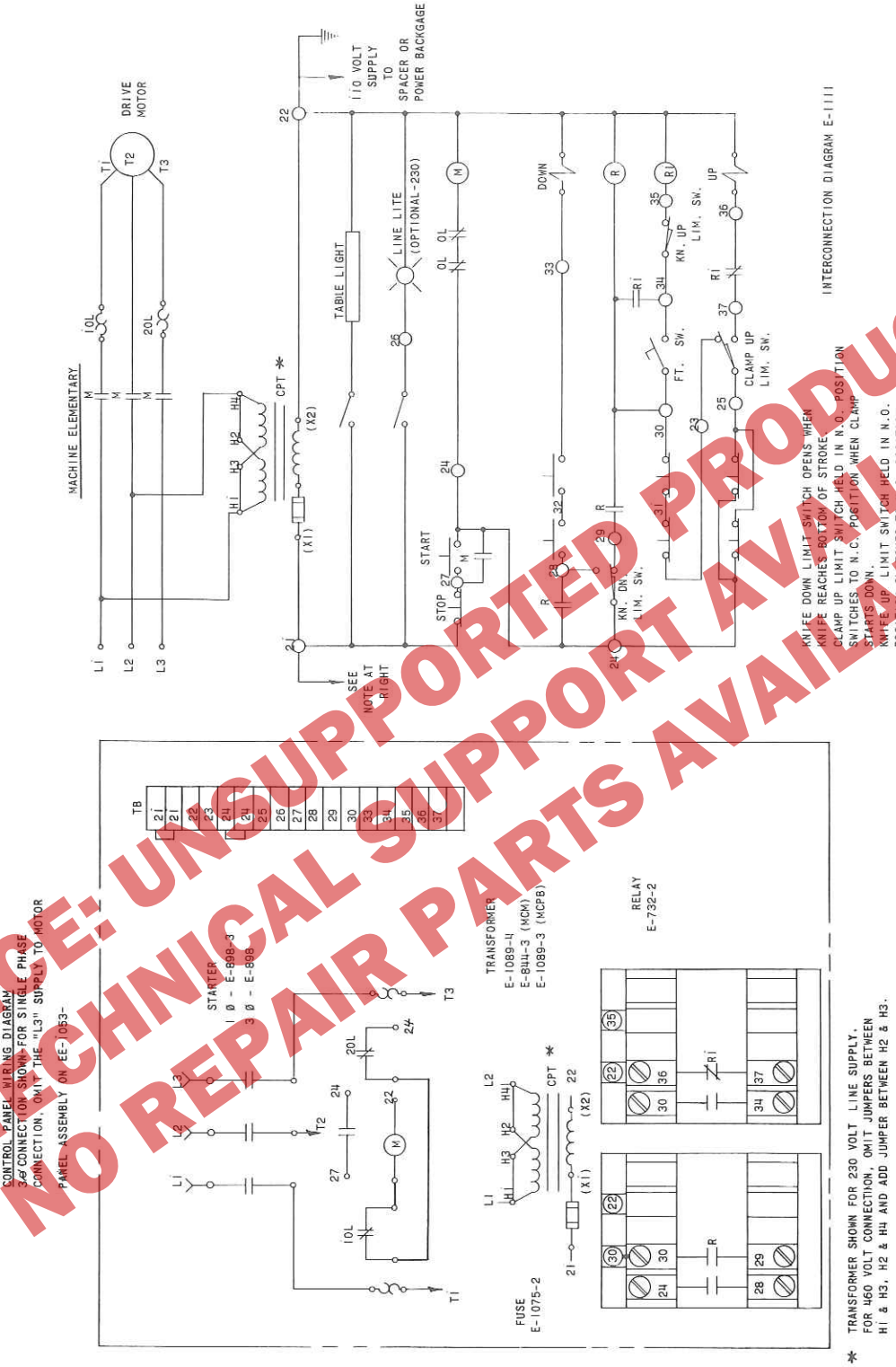
ELECTRICAL SCHEMATIC 11H2763-1
230MC, 230MCD, 230MCD2, 230MCPB;
305MC, 305MCD, 305MCD2, 305MCPB

WIRING DIAGRAM, 230/460V 1 & 3 PHASE E-1200
230 & 305 MB CUTTERS



WIRING TABLE	
WIRE	CONNECT TO
L1	M, CPT
L2	M
L3	CPT
T1	M
T2	M
T3	M
21	TB(2) CPT
22	TB
23	CPT, M, R
24	TB
25	TB(2) R, M
26	TB
27	TB, M
28	TB, R
29	TB, R
30	TB, R
33	TB
34	TB
35	TB
36	TB, 37 JUMPER
37	TB, 36 JUMPER

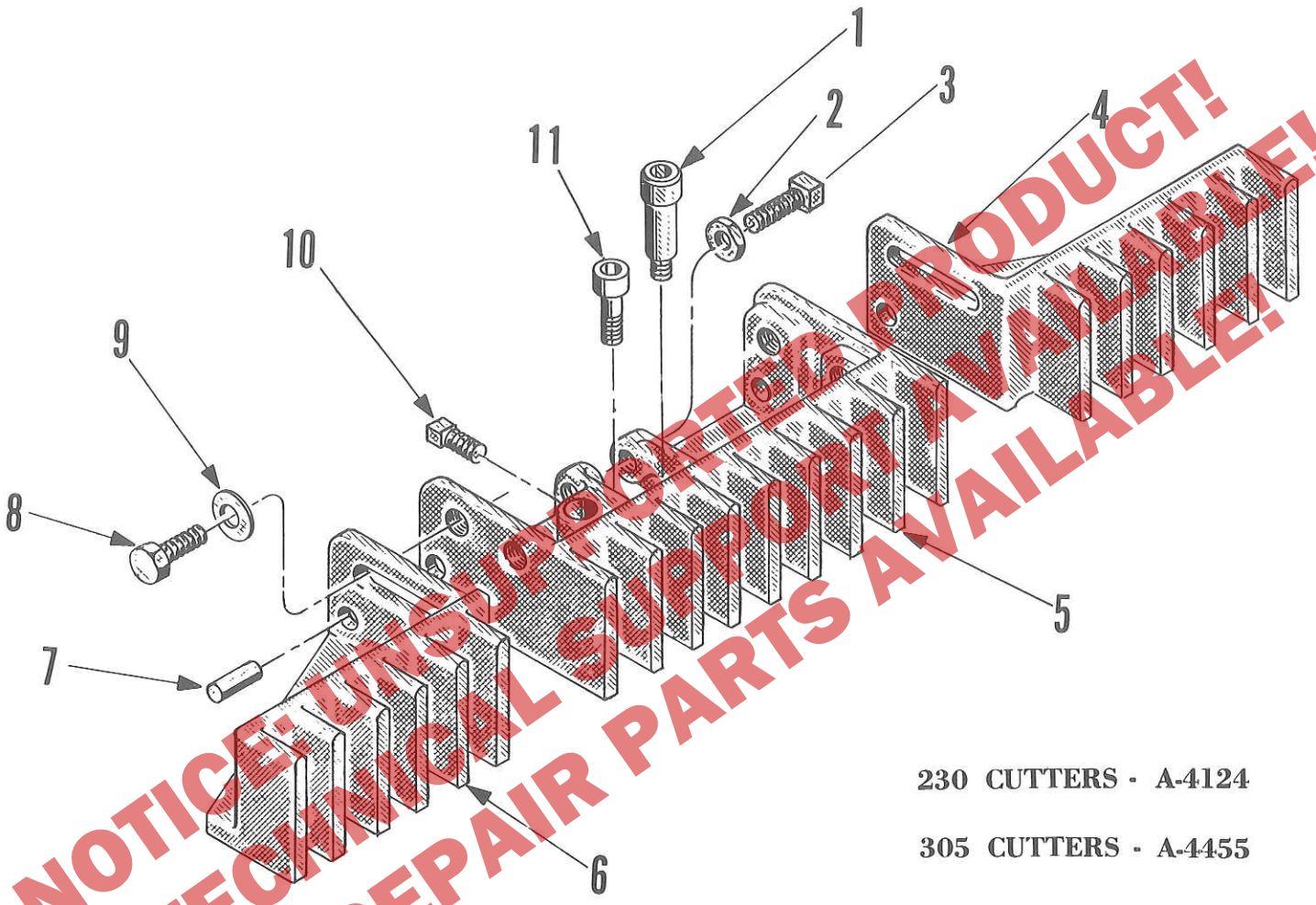
WIRING DIAGRAM, 230/460V 1 & 3 PHASE E-1201-1
230 & 305 MC & MCM CUTTERS



WIRING TABLE	
WIRE	CONNECT TO
L1	M, CPT
L2	M, CPT
L3	M
T1	M
T2	M
T3	M
21	TB(2) CPT
22	TB CPT, M, R, RI
23	TB
24	TB(2) R, M
25	TB
26	TB M
27	TB R
28	TB R
29	TB R, RI
30	TB RI
33	TB RI
34	TB RI
35	TB RI
36	TB
37	TB

SPLIT BACKGAGE

Three section gage designed primarily for book trimming. Three piles of stock can be cut at one time by splitting this gage and adjusting each section to fit the job. A time-saver when trimming quantity lots of books or pamphlets.



230 CUTTERS - A-4124

305 CUTTERS - A-4455

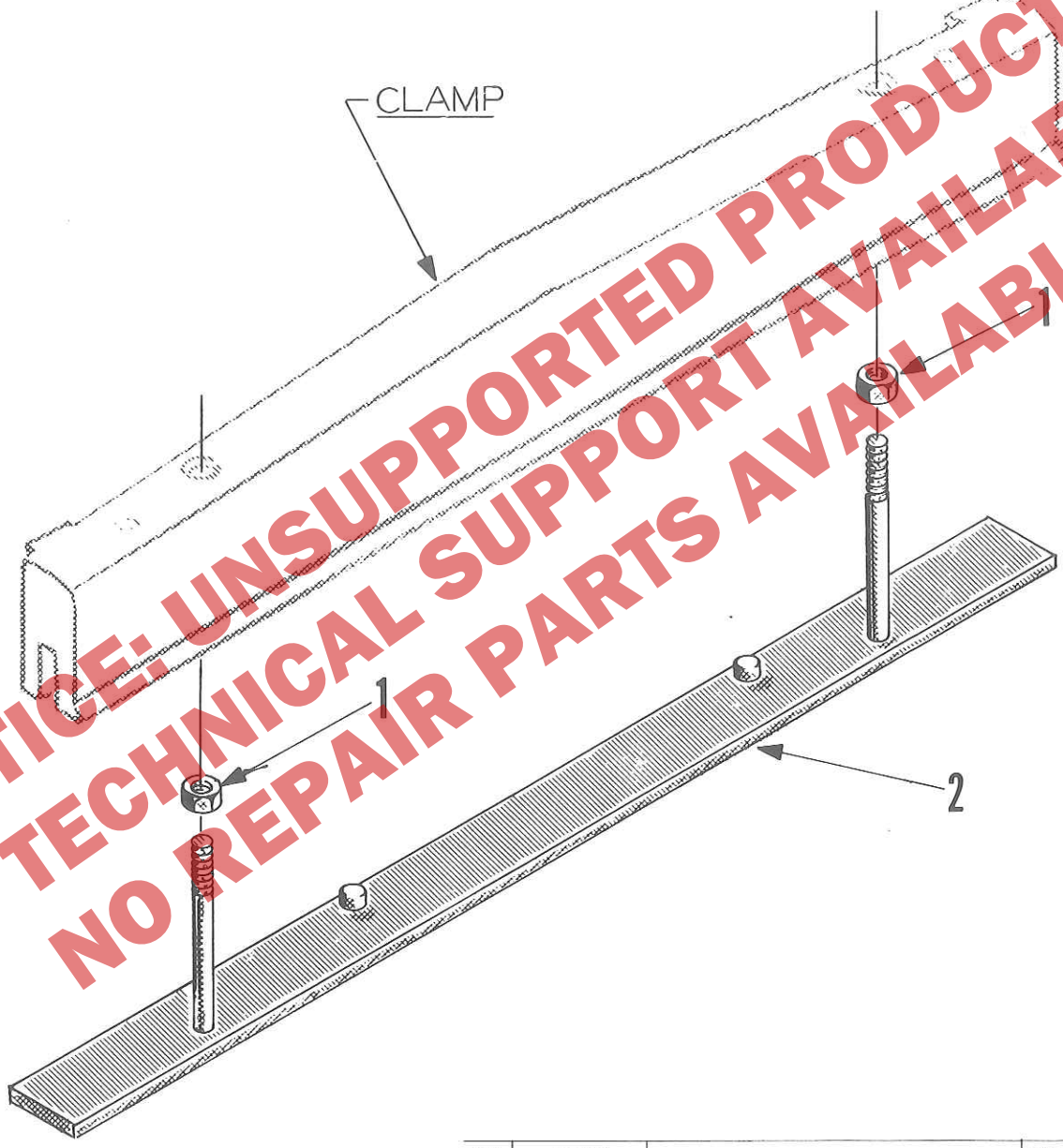
REF. NO.	PART NUMBER	PART NAME	QUANT. REQ'D. 230	305
1	5/8 x 1 1/4"	Bolt Shoulder	1	1
2	3/8 - 16	Jam Nut Hex	2	2
3	3/8-16 x 1 1/2	Set Screw - Sq. Head	2	2
4	4456	Back Gage (R. H.)		1
	4125	Back Gage (R. H.)	1	
5	4457	Back Gage (Center)		1
	4127	Back Gage (Center)	1	
6	4458	Back Gage (L. H.)		1
	4126	Back Gage (L. H.)	1	
7	#8 x 1 3/4"	Taper Pin	2	2
8	1/2-13 x 1 1/2"	Cap Screw-Hex Head	4	4
9	1/2	Washer		4
	S-1083-O	17/32 Spec. Washer	4	
10	1/4-20 x 1/2	Set Screw - Sq. Head	1	1
11	3/8 x 1	Cap Screw - Allen Head	1	1

FALSE CLAMP PLATE ATTACHMENT

A smooth flat plate that attaches to the bottom of the clamp to prevent the clamp from marking stock when cutting. Especially designed for use when cutting soft stock such as mimeograph, blotter, cover, etc., and to reduce offsetting when trimming carbonized forms.

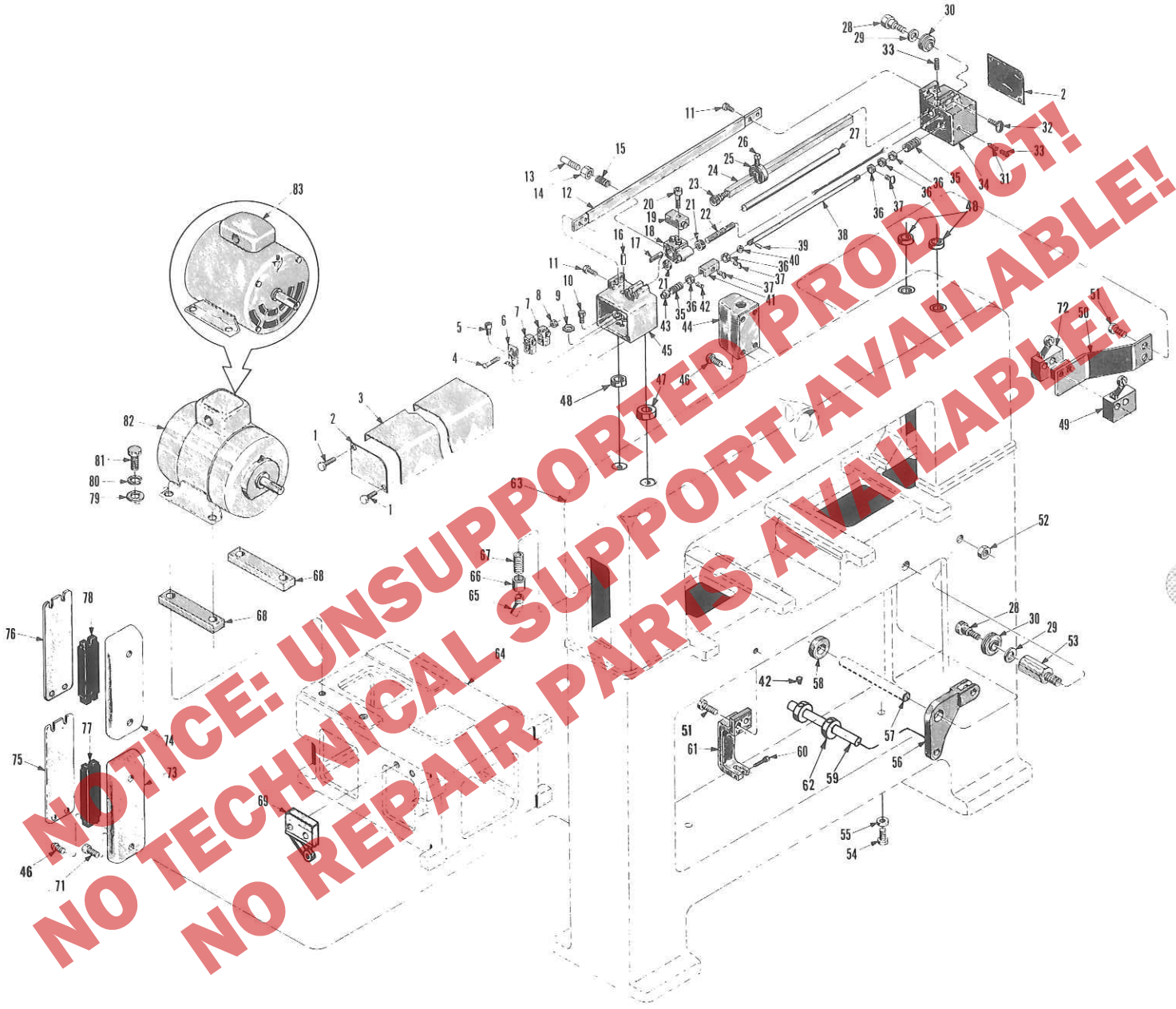
False plate is easily removed when necessary to gage to less than two inches.

WARNING: 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 from the front of the machine. Remove all tools and stand clear when reconnecting power.



REF. NO.	PART NUMBER	PART NAME	QUANT. REQ'D. 230	305
1	4-6425	Nut-(Wing)	2	2
2	A-4490	Clamp Plate Assembly		1
2	A-4123	Clamp Plate Assembly	1	

AUTO-CLAMP & AUTO SPACER ASSEMBLY
CHALLENGE 230 AND 305MBD AND MCD



AUTO-CLAMP & AUTO SPACER ASSEMBLY
CHALLENGE 230 AND 305MBD AND MCD

REF. NO.	PART NUMBER	PART NAME	QUANT. 230 MBD	REQ'D. 305 MCD
1	102406-6923	#10-24NC x 3/8 Rd. Hd. Mach. Screw	4	4
2	6199	Cover Housing	2	2
3	A-4137	Assembly-Spacer Unit Cover-Welded	1	
	A-6197	Assembly-Spacer Unit Cover-Welded		1
4	63228-6923	#6-32NC x 1 3/4 Rd. Hd. Mach. Screw	2	2
5	102403-6918	#10-24NC x 3/8 Soc. Hd. Cap Screw	2	2
6	4586	Support-Switch	1	1
7	E-859	Micro Switch	2	2
8	632-6423	#6-32NC Hex Nut	2	2
9	E-519	1/2 Conduit Lock Nut	1	1
10	507-6913	5/16-18NC x 7/8 Hex Hd. Cap Screw	3	3
11	102406-6918	#10-24NC x 3/4 Soc. Hd. Cap Screw	4	4
12	A-4145	Assembly-Circuit Plate	1	
	A-6185	Assembly-Circuit Plate		1
13	102410-6938	#10-24NC x 5/8 Cup Pt. Soc. Set Screw	2	2
14	1024-6423	#10-24NC Hex Nut	3	3
15	S-1595	.151 O. D. x .375 LG. Spring	2	2
16	S-873	Fibre Grommet	1	1
17	4309	Stop Guide Key	1	1
18	A-4587	Assembly-Stop Guide	1	1
19	A-4961	Sensing Head Assembly	1	1
20	102408-6918	#10-24NC x 1 Soc. Hd. Cap Screw	1	1
21	5-6424	5/16 - 18NC Hex Jam Nut	2	2
22	4139	Spacer Cable	1	
	6184	Spacer Cable		1
23	4632	Pressure Foot Adj. Screw	1	1
24	4135	Shaft-Stop	1	
	6192	Shaft-Stop		1
25	4963	Collar Stop	5	6
26	S-765	1/4 x 3/8 Flat Pt. Set Screw	5	6
27	4140	Shaft-Stop Guide	1	
	6190	Shaft-Stop Guide		1
28	S-1410	Screw Hex Shoulder	4	4
29	S-1416	Bushing	4	4
30	4224	Pulley Assembly	4	4
31	402-6949	1/4-20NC x 1/4 Half Dog Pt. Soc. Set Scr.	1	1
32	S-763	1/4-20NC x 1/2 Thumb Screw	2	2
33	406-6938	1/4-20NC x 3/8 Cup Pt. Soc. Set Screw	3	3
34	6208	Housing R. H.	1	1
35	S-1411	Spring . 341 I. D. x 1. 25 LG.		2
	S-1533	Spring . 341 I. D. x 1. 25 LG.	2	
36	S-1402	Collar 25/64 I. D. x 3/4 O. D. x 3/8	4	6
37	102404-6955	10-24NC x 1/2 Thumbscrew	3	3
38	4141	Shaft-Switch	1	
	6182	Shaft-Switch		1
39	21S-125-0375	Pin	1	1
40	6183	Roller	1	1
41	4149	Spacer-False Clamp Correcting	1	
	4381	Spacer-False Clamp Correcting		1

REF. NO.	PART NUMBER	PART NAME	QUANT. 230 MBD	REQ'D. 305 MCD
42	102404-6938	#10-24NC x 1/4 Cup Pt. Soc. Set Screw	3	6
43	6191	Bushing L. H. Housing	1	1
44	E-919	Control Relay		1
45	6209	Housing-L. H.	1	1
46	102410-6923	#10-24 x 5/8 Rd. Hd. Mach. Screw	4	6
47	6189	Bushing-Spacer	1	1
48	6188	Bushing-Spacer	3	3
49	E-866-1	Limit Switch (Auto Index)	1	1
50	A-4573	Assy. -LS Bracket (Clamp)	1	1
51	406-6913	1/4-20NC x 3/4 Hex Hd. Cap Screw	4	4
52	6-6424	3/8-16NC Hex Jam Nut	2	2
53	6180	Post Pulley	2	2
54	408-6937	1/4-20NC x 1 Sq. Hd. Set Screw	2	
55	4-6424	1/4-20NC Hex Jam Nut	2	
56	4406-D	Bell Crank		1
	4115-D	Bell Crank	1	
57	4409	Bell Crank Pin	2	2
58	S-798	Collar	2	2
59	K-512	1/2 x 4 1/2 Straight Pin	1	1
60	412-6913	1/4-20NC x 1 1/2 Hex Hd. Cap Screw	1	1
61	4454-D	Gauge Mounting Bracket		1
62	4571	Collar-Eccentric	1	2
63	4500-1-D	Arch		1
	4102-D	Arch	1	
64	4417	Bracket Motor Mount	1	1
65	E-696	1/2 Flex Steel Conduit Connector 145°	1	1
66	8-5350	1/2 Pipe Coupling	1	1
67	812-6405	1/2 x 1 1/2 Pipe Nipple	1	1
68	4412	Riser Block	2	
69	E-854	Limit Switch		1
71	406-6923	1/4-20NC x 3/8 Rd. Hd. Mach. Screw	4	4
72	E-866-1	Limit Switch (Clamp Up)		1
73	E-881	Steel City Gang Box	2	1
74	E-881-1	Steel City Gang Box		1
75	E-882-1	Cover Plates		1
76	E-882	Cover Plate	2	1
77	E-680-17	Terminal Blocks		1
	E-680-15	Terminal Blocks	1	1
78	E-680-14	Terminal Blocks	1	
79	12-7327	3/8 Medium Lock Washer	4	4
80	6-7321	3/8 Standard Washer	4	4
81	612-6918	3/8-16NC x 1 1/2 Soc. Hd. Cap Screw	4	4
82	E-567-2	Electrical Motor 1 1/2 H. P. 3 PH.	1	
	EE-567-2	Electrical Motor 2 H. P. 3 PH.		1
83	EE-526-4	Electrical Motor 3 H. P. 1 PH.	1	
	E-834-2	Electrical Motor 4 H. P. 1 PH.		1

CAUTION: These tests require the machine to be operational for checking and adjusting. Be very careful that tools and other people are clear of moving parts and that the cutter is not accidentally operated while adjustments are being made.

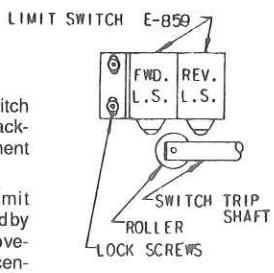
Backgage Forward & Reverse Limit Switches
(MBD & MCD machines only)
View from top of machine

Manual

Fwd. Sw. - When switch is actuated, the backgage forward movement stops.

Rev. Sw. - When switch is actuated, the backgage reverse movement stops.

Fwd. & rev. limit switches are actuated by the right and left movement of the spring centered switch trip shaft.



Automatic

Fwd. sw. - When switch is actuated, the backgage forward movement is automatically reversed.

Rev. Sw. - When switch is actuated, the backgage movement is automatically reversed.

If switches are not properly adjusted, the backgage motor will stall out at extreme forward and reverse positions and blow a fuse.

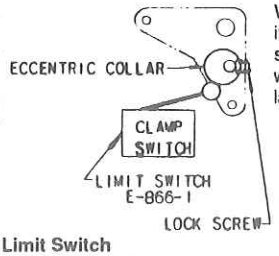
Instructions for Adjusting Limit Switches.

1. Adjust spring centered switch trip shaft collars so that the folder is between the two switch plungers.
2. Loosen lock screws and move the switches toward the roller so that about 1/8 movement of the switch trip shaft will actuate a switch.
3. Tighten lock screws and test run machine.

Clamp Switch (Auto-Index)
(MBD & MCD machines only)
View from back of machine

When switch is not actuated, the automatic spacing unit will not index forward.

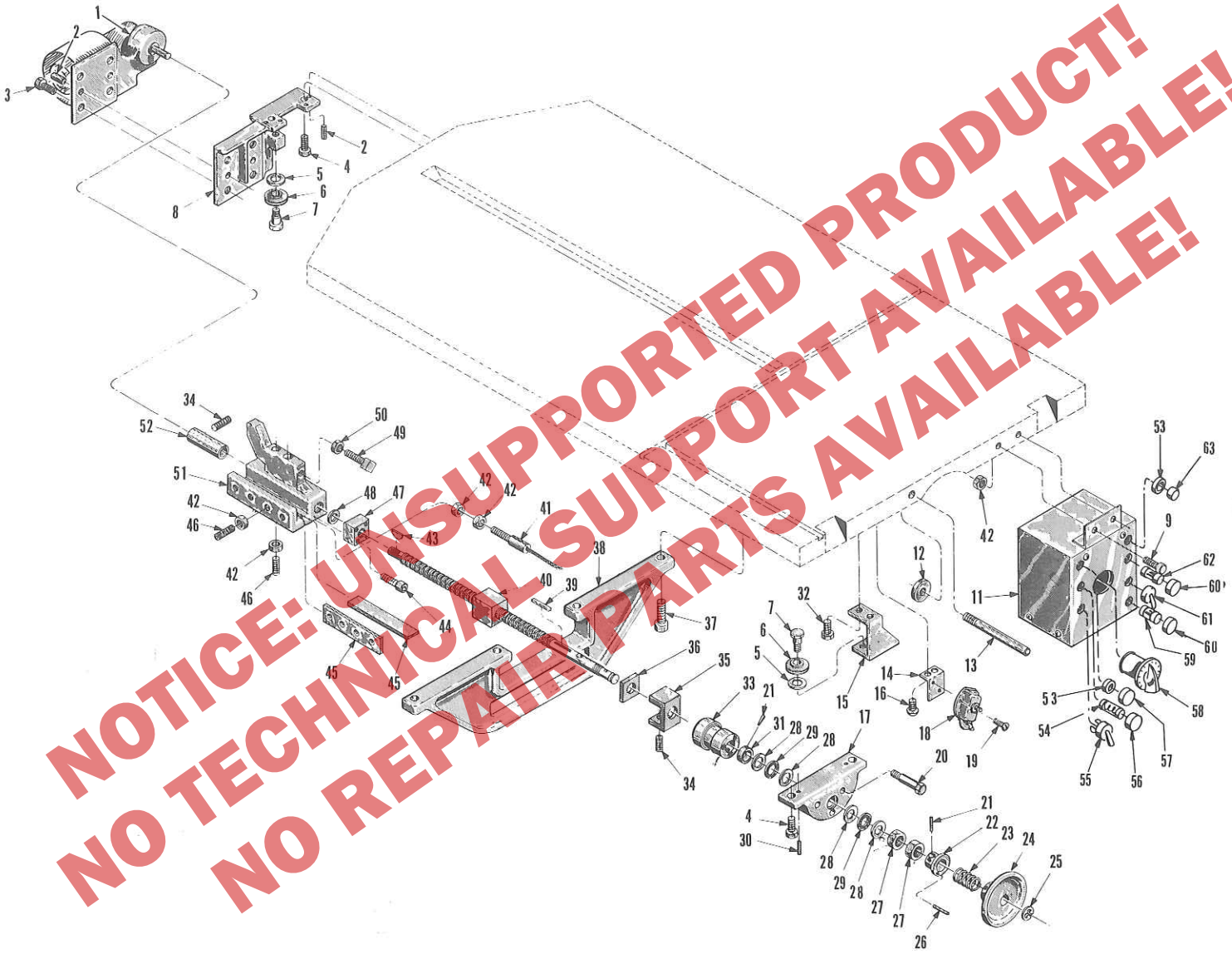
Clamp switch is actuated by the eccentric collar when clamp is in the extreme up position.



When switch is actuated, it allows the automatic spacing unit to index forward to the next stop collar.

Instructions for Setting Limit Switch

1. Clamp must be in extreme up position.
2. Loosen lock screw in eccentric collar.
3. Rotate eccentric collar until switch clicks.
4. Tighten lock screw.
5. Turn on auto-spacer control and select the auto position. Backgage should index forward until the sensing head makes contact with a stop collar.
6. Bring clamp down then up again for auto indexing to the next stop collar.

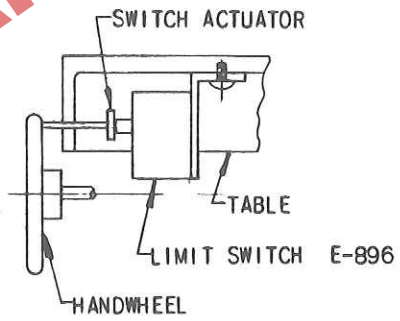


REF. NO.	PART NUMBER	PART NAME	QUANT. REQ'D. 230 MBD	QUANT. REQ'D. 305 MCD	REF. NO.	PART NUMBER	PART NAME	QUANT. REQ'D. 230 MBD	QUANT. REQ'D. 305 MCD
1	EE-872	Gear Reducer Motor	1	1	34	102404-6938	#10, 24 NC x 1/4 Cup Pt. Soc. Set Screw	2	2
2	21S-187-0500	3/16 Dia. x 1/2 Sel-Lok Pin	4	4	35	6173	Wiper Retainer	1	1
3	102406-6918	#1024 NC x 3/4 Soc. Hd. Cap Screw	4	4	36	6172	Wiper	1	1
4	608-6918	3/8 - 16 NC x 1" Soc. Hd. Cap Screw	4	4	37	610-6913	3/8-16 NC x 1 1/4 Hex Hd. Cap Screw		4
5	4-7321	1/4" Std. Washer	3	3	38	4484	Brace-Table		1
6	A-4267	Pulley Assembly	3	3	39	20206-6123	1/8 x 1/8 x 3/4 Key	1	1
7	S-1410	Screw-Hex Shoulder	3	3	40	A-6200	Assembly Ball Screw		1
8	6175	Bracket-Gear Motor	1	1		A-4146	Assembly Ball Screw	1	
9	408-6910	1/4-20 NC x 1" Button Hd. Soc. Cap Screw	2	2	41	4139	Spacer Cable	1	
11	EE-871-B	Control Unit	1	1		6184	Spacer Cable		1
12	6196	Rod End-Switch Actuator	1	1	42	4-6424	1/4-20 NC Hex Jam Nut	14	12
13	6195	Rod-Switch Actuator	1	1	43	803-6121	1/2 x 3/32 Woodruff Key	1	1
14	6193	Bracket-Switch	1	1	44	102408-6918	#10-24 x 1 Soc. Hd. Cap Screw	4	4
15	6206	Bracket-Pulley Support	1	1	45	4510	Gib-Back Gage Nut	2	2
16	102406-6923	#1024 NC x 3/8 Rd. Hd. Mach. Screw	2	2	46	416-6953	1/4 - 20 NC x 1 Oval Pt. Soc. Set Screw	8	8
17	6207	Bracket-Front	1	1	47	4474	Wiper Retainer-Rear	1	1
18	E-896	Limit Switch-Brake	1	1	48	6174	Wiper-Rear	1	1
19	63206-6923	#6-32 NC x 3/8 Rd. Hd. Mach. Screw	2	2	49	614-6937	3/8-16 NC x 1 3/4 Sq. Hd. Set Screw	1	1
20	414-6918	1/4-20 NC x 1 3/4 Soc. Hd. Cap Screw	3	3	50	6-6424	3/8-16 NC Hex Jam Nut	1	1
21	006-6633	#O x 3/4 Taper Pin	2	2	51	4473	Back Gage Nut	1	1
22	6204	Adapter-Lock Nut	1	1	52	6176	Motor & Screw Coupling	1	1
23	S-1408	Spring-. 52 I. D. x . 62 O. D. x 56	1	1	53	E-1006	Pushbutton Shield	2	2
24	4881	Hand Wheel	1	1	54	E-998	Pilot Light	1	1
25	S-1193-50	.500 Truarc "E" Retaining Ring	1	1	55	E-994	Toggle Switch	1	1
26	305-5246	3/16 Dia. x 5/8 Dowel Pin	1	1	56	E-999	Pilot Light Holder	1	1
27	12-6528	3/4 - 16 NF Light Hex Jam Nut	2	2	57	E-1004	Forward Pushbutton	1	1
28	S-1295-1	Thrust Washer	4	4	58	E-1007	Variable Transformer	1	1
29	S-1300	Needle Thrust Bearing	2	2	59	E-891	1/2 A. Fuse	1	1
30	21S-187-0750	3/16 Dia. x 3/4 Sel-Lok Pin	2	2	60	E-991	Fuse Holder	2	2
31	6203	Collar	1	1	61	E-995	Toggle Switch	1	1
32	406-6918	1/4-20 NC x 3/4 Soc. Hd. Cap Screw	2	2	62	E-889	1 1/2 A. Fuse	1	1
33	E-883	Friction Brake	1	1	63	E-1005	Reverse Pushbutton	1	1

Brake Release Switch
(MBD & MCD machines only)
View from right side of machine

When switch is not actuated the brake is on.

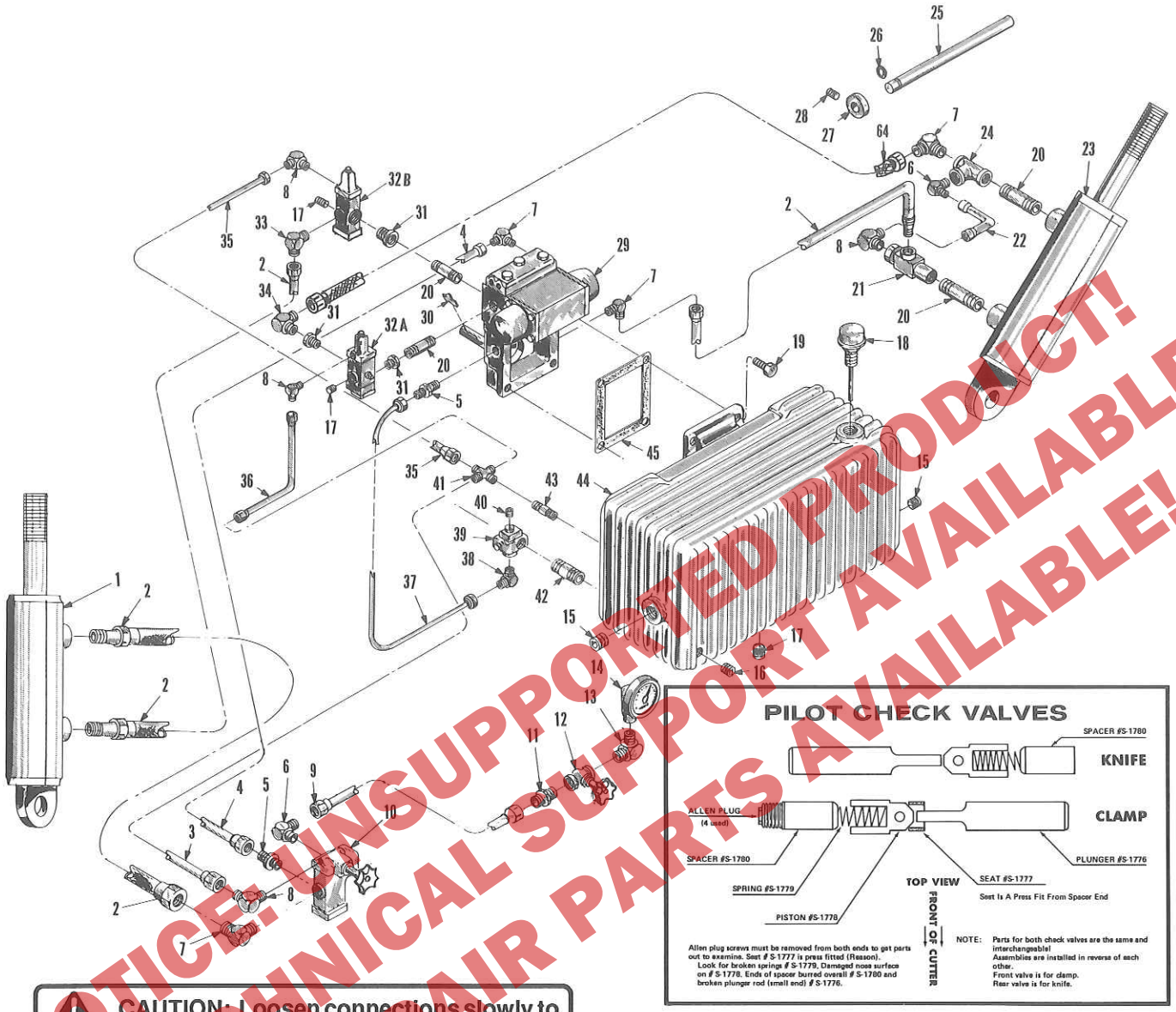
When switch is actuated the brake is off.



Switch Operation

Push handwheel in until switch actuator trips the switch which releases the brake and allows the handwheel to be turned by hand for fine adjustment.

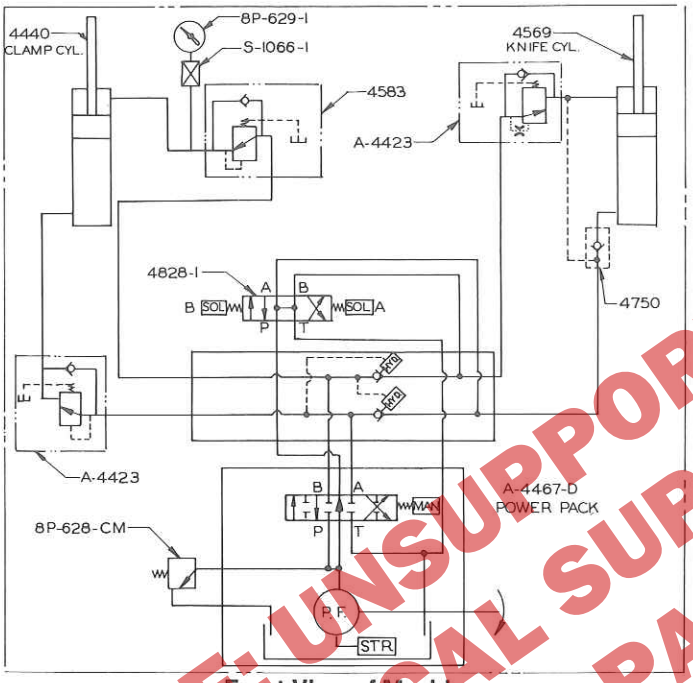
HYDRAULIC ASSEMBLY 305MC, 305MCD



CAUTION: Loosen connections slowly to bleed off any trapped pressure!

REF. NO.	PART NUMBER	PART NAME	QUANT. REQ'D.	REF. NO.	PART NUMBER	PART NAME	QUANT. REQ'D.
1	4440	Hydraulic Clamp Cylinder	1	26	S-1193-50	.500 Truarc "E" Retaining Ring	1
2	4436	Hydraulic Hose Assembly	3	27	4572	Cam - Switch Actuator	1
3	4580	Tube - Pressure Reducer Drain	1	28	404-6938	1/4 - 20 NC x 1/4 Cup Pt. Soc. Set Screw	1
4	4577	Tube - Pressure Reducer	1	29	A-3021M-5	Power Pack	1
5	S-1064	3/8P - 1/2 Tube Male Coupling	2	30	S-1111	#9 Woodruff Shoulder Key	1
6	S-1597	3/8P - 1/4T 90° Male Elbow	2	31	S-1059-1	3/4 to 3/8 St'l. Reducer Bushing	3
7	8-673	3/8 - 1/2 Tube Elbow 90°	4	32	A-4423	Pressure Control Valve	2
8	S-1560	1/4 Pipe - 1/4 Tube 90° Elbow	4		4536	Sequence Valve 230MC-2303 & Up	2
9	4579	Tube - Gauge	1		4536	Sequence Valve 305MC-2226 & Up	2
10	4583	Pressure Reducer Valve	1	33	S-1522	3/4P - 1/2T 90° Elbow	1
11	S-1593	1/4P x 1/4T Straight Connecter	1	34	S-1520	Elbow - 1/2T x 3/8P 90° Extra Long	1
12	S-1066-1	1/4 Brass Globe Valve	1	35	4581	Tube Clamp Sequence Drain	1
13	4-5511	1/4P 90° Street Elbow	1	36	4582	Tube - Knife Sequence Drain	1
14	8P-629-3	Pressure Gauge	1	37	4578	Tube Relief Valve	1
15	S-1306	1" C'Sunk Hd. Pipe Plug	2	38	S-1419	1/2P - 1/2T 90° Elbow	1
16	S-751	1/4 Solid Pipe Plug	1	39	8P-628-CM	Relief Valve Assembly	1
17	12-6671	3/4 C'Sunk Hd. Pipe Plug	3		4696	Relief Valve 230MC-2303 & Up	1
18	8P-684	Assembled Breather Cap	1		4696	Relief Valve 305MC-1922 & Up	1
19	506-6913	5/16 - 18 NC x 3/4 Hex Hd. Cap Screw	4	40	K-483	1/2 C'Sunk Pipe Plug	1
20	612-6405	3/8 x 1 1/2 Pipe Nipple	4	41	S-1594	Cross 1/4T x 1/4T x 1/4T x 1/8F Pipe	1
21	4750	Pilot Check Valve 3/8 Pipe	1	42	816-6405	1/2 x 2 Pipe Nipple	1
22	4591	Tube Knife Cylinder	1	43	216-6405	1/8 x 2 Pipe Nipple	1
23	4569	Hydraulic Knife Cylinder	1	44	A-4568	Reservoir - Power Pack	1
24	S-1141	3/8P Forged Steel Tee	1	45	8-508	Gasket	1
25	4431-D	Actuator Lever Support Rod	1	46	4525	Hydraulic Hose Assembly	1

CAUTION: Several of the following tests require the machine to be operational for checking and adjusting. Be very careful that tools and other people are clear of moving parts and that the cutter is not accidentally operated while adjustments are being made. Disconnect the power and lock it out, see Safety Precautions page 2, whenever working on the machine unless the directions specifically require the machine to be powered.



Front View of Machine

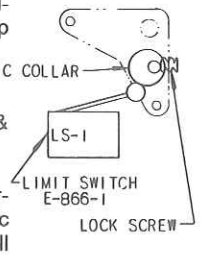
CLAMP DOWN, KNIFE DOWN SEQUENCE VALVE (32A)

Open clamp gage valve, loosen lock knob on clamp valve. Turn adjusting knob in until 1200-1400 psi is obtained when clamp is at bottom of stroke.

On knife down cycle, gage should read 800-900 psi, this indicates sequence valve pressure.

Clamp Switch
(305MC & MCD machines only)
View from back of machine

When switch is not actuated, the hydraulic pump is pumping oil under full pressure to the "up" ports on knife & clamp cylinders.



Limit switch #1 is operated by the eccentric collar on the clamp bell crank when clamp is in extreme up position.

When the switch is actuated, the hydraulic pump is pumping oil back to tank. There is no pressure going to the cylinders.

Note: LS-1 & LS-2 are tied in together. The last switch to be actuated relieves the pressure.

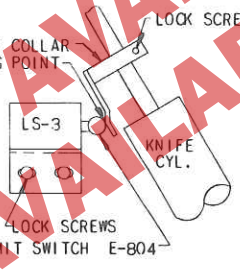
Excessive noise and hydraulic oil heat will be noted unless switch is actuated when the clamp is in the up position.

Instructions for Setting Limit Switch

1. Clamp must be in extreme up position with power on.
2. Loosen eccentric collar lock screw and turn collar until it trips the switch. (You will notice a difference in the sound as the load is taken off the motor.)
3. Tighten lock screw and test run machine.

Knife Switch
(305 MC & MCD machines only)
View from rear of machine

When switch is not actuated, the hydraulic pump is pumping oil under full pressure to the "up" ports of the cylinders.



When the switch is actuated, the hydraulic pump is pumping oil back to tank. There is no pressure on the cylinders.

Limit switch #3 is actuated by the knife switch collar when the knife is in the extreme up position.

Note: LS-1 & LS-3 are tied in together. The last switch to be actuated relieves the pressure.

Excessive noise and hydraulic oil heat will be noted unless switch is actuated when knife is in the up position.

Instructions for Setting Limit Switch

1. Knife must be in extreme up position with power on.
2. Loosen knife switch collar lock screw and adjust the trip so that it actuates the switch. (You will notice a difference in the sound as the load is taken off the motor.)

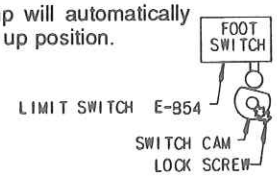
   It may be necessary to loosen the switch bracket lock screws and move the switch closer to the trip.
3. Tighten lock screws and test run machine.

KNIFE UP, CLAMP UP SEQUENCE VALVE (32B)

Valve must be set so the knife goes up before the clamp starts, but before the clamp lags or a hydraulic whine is heard on the clamp up stroke. To adjust, remove hex cap and loosen lock nut. Turn adjusting screw in for more clamp lag on up stroke. Operate cutter through an automatic cycle and visually check knife and clamp up sequence. Continue to adjust to proper setting. Tighten lock nut and replace hex cap.

Manual Clamp Treadle Switch (305MC & MCD machines only) View from l.h. side of machine

When switch is not actuated the clamp will automatically return to up position.



Foot switch is actuated by the cam when stepping on the "upper" portion of the foot treadle.

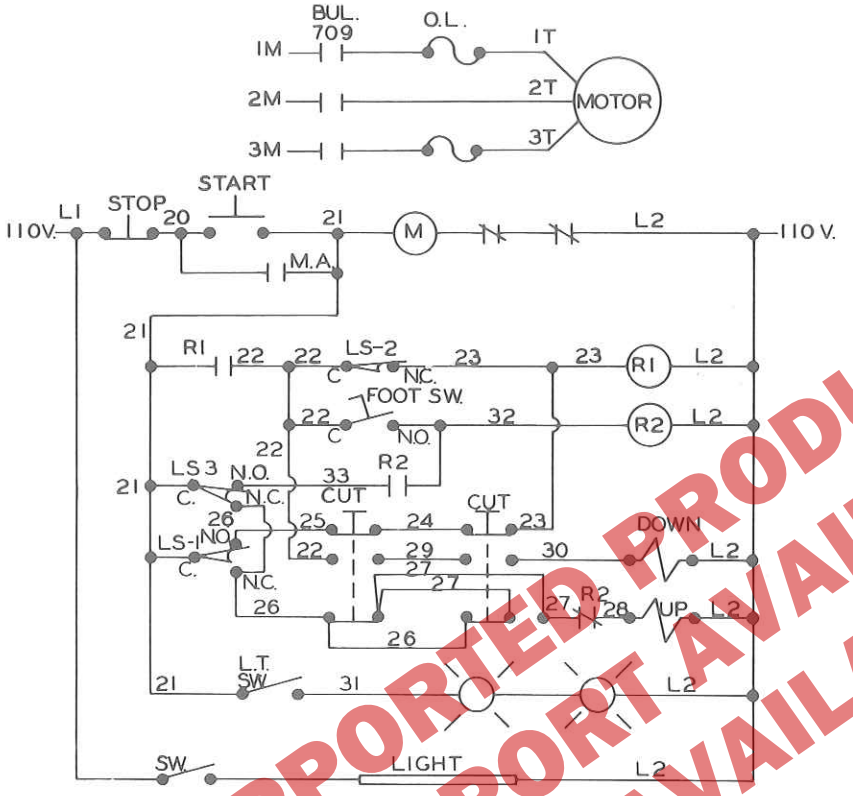
When switch is actuated, it energizes "R2" relay which isolates the clamp up circuit and the clamp will remain down. The clamp can be returned to the up position again by operating "lower" portion of the treadle, or it will return automat ically after a cut cycle.

If the cam does not trip the switch it is possible to burn out the "up" solenoid in the hydraulic valve.

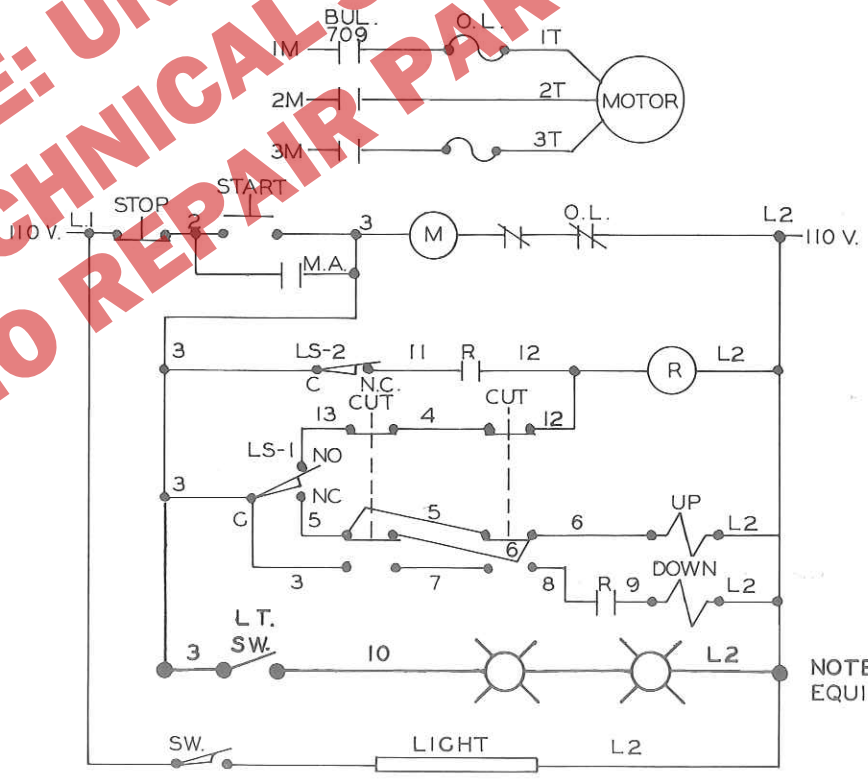
Instructions for Setting Limit Switch

1. Foot treadle should be in its spring loaded neutral position. (Switch should not be actuated at this time.)
2. Loosen lock screw and turn cam so that the rear portion of the flat just clears the switch roller.
3. Tighten lock screw and test the foot treadle operation.

ELECTRICAL DIAGRAM MC AND MCD (MACH.)

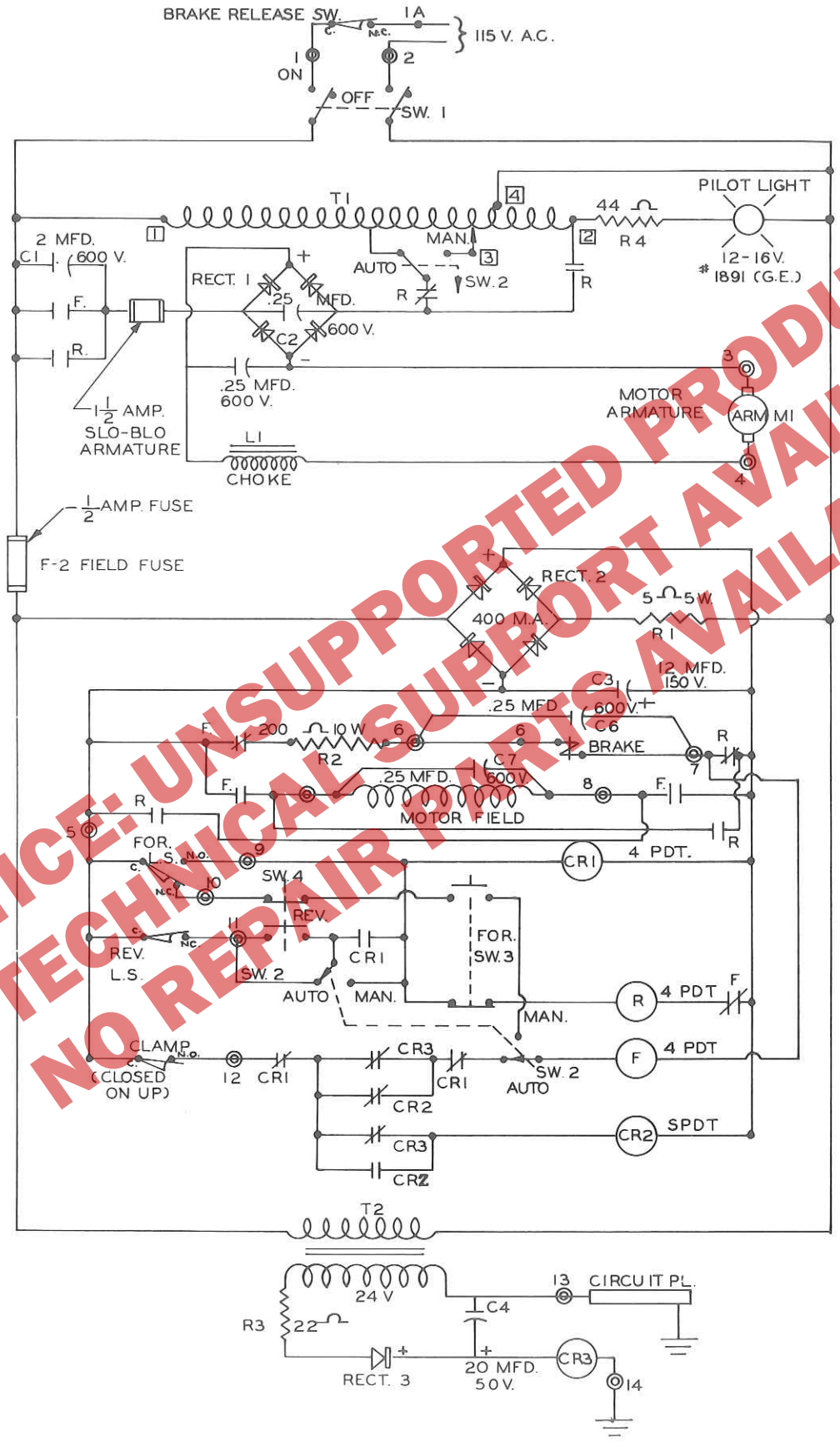


ELECTRICAL DIAGRAM MB AND MBD (MACH.)



NOTE: LIGHT LINE ACCESSORY EQUIPMENT ON 230MB

AUTOMATIC SPACER MBD AND MCD CONTROLS



SERVICE CHART

CAUTION: Never work on this machine with the power on unless the instructions say the machine must be on. Lock the power off at the wall disconnect switch.

CAUTION: Loosen hydraulic connections slowly to bleed off any trapped pressure!

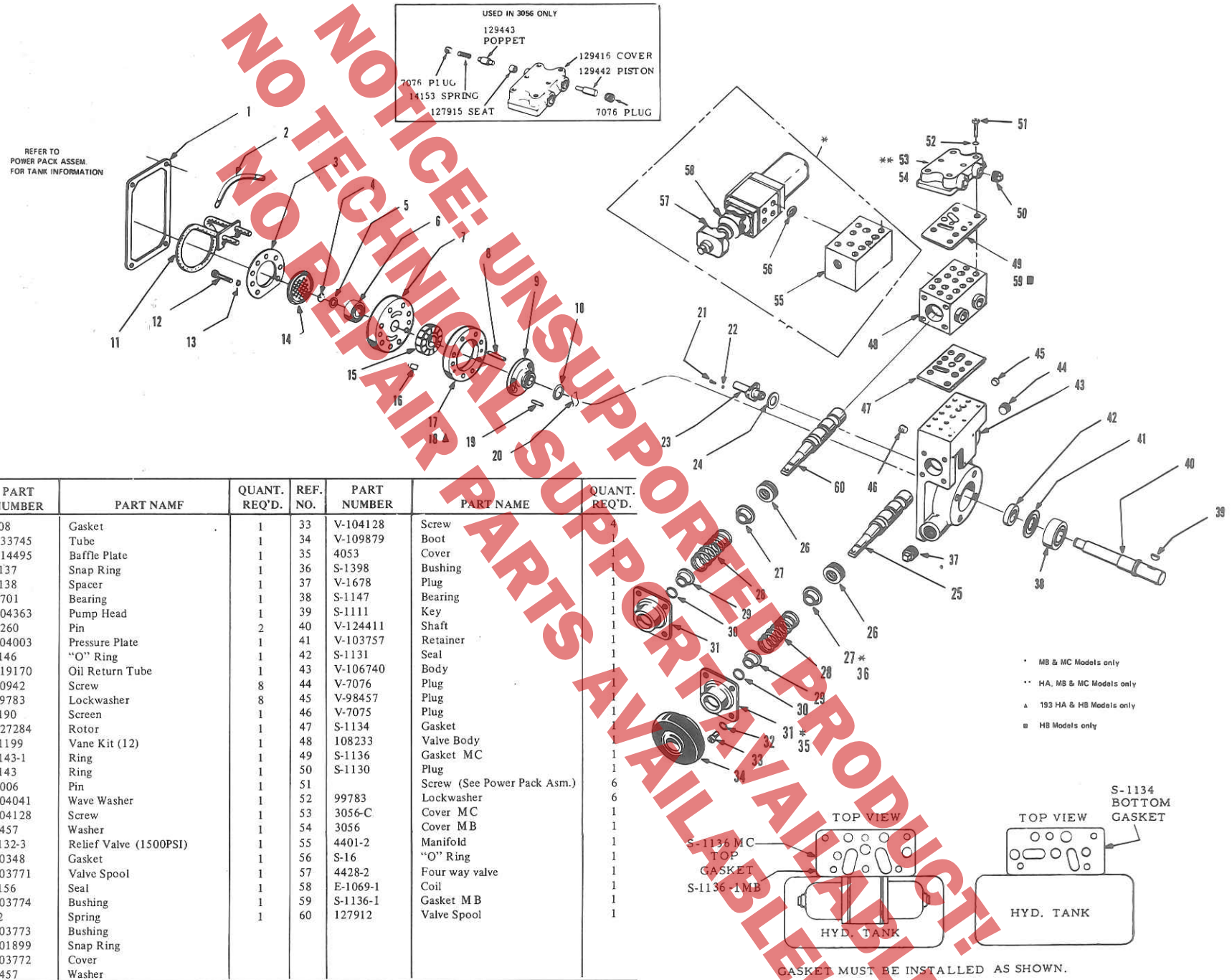
If there is a problem with your cutter that you or your service department cannot fix, contact the dealer from whom you purchased your machine.

TROUBLE	PROBABLE CAUSE	REMEDY
Pump not delivering oil	Unit not driven in direction indicated by arrow.	Must be reversed immediately to prevent seizure of pump due to lack of oil.
Pump not delivering sufficient power	Not enough oil in tank.	Add oil as necessary.
Clamp fails to hold pressure	Defective Check Valve.	Replace Head of Hydraulic Unit.
Knife stops in stock	Knife too dull.	Change knives.
	Outside relief valve defective.	Change Relief Valve Assembly ref. #33, page 14
	On MC, MCD and MCPB Cutters the Pressure Control Valve may be clogged or defective. This valve is in the knife cylinder top line (on end of oil line).	Open adjustment and flush by operating knife. May have to replace valve if re-setting does not restore power.
Pump noisy and sluggish	Partially clogged filter.	Remove and clean filter thoroughly. If screen fills with residue again, the cups in the cylinder are going bad and should be replaced.
Inaccurate Cutting	Too much side play in Knife-Bar.	Adjust Knife-Bar Gibs. See Maintenance Section, Page 6
Drawing of stock	Dull knife.	Use sharp knife.
	Clamp pressure may have dropped.	Check pressure setting.
	Oil may be low in tank.	Add oil to "full" level.
Concave Cutting— Wide ends, narrow in center	Excess moisture around edge of paper.	Store paper properly in dry location.
Concave Cutting— Variation from top to bottom of lift	Mostly on soft stock — not firmly clamped. Knife dull or incorrectly ground.	Adjust clamp pressure, use knife that is properly ground and sharpened.

How often do you change blades? This decision is affected by many things: Chiefly, the kind of stock being cut, but also by the quality and temper of steel in the knife blade.

Whenever possible, stocks such as gummed, antique, blotter and cover paper should be cut with a sharp knife and defer cutting of chipboard, etc., until the knife becomes dull or just prior to changing knives.

Under normal cutting operations, blade should be resharpened after eight hours use.



REF. NO.	PART NUMBER	PART NAME	QUANT. REQ'D.	REF. NO.	PART NUMBER	PART NAME	QUANT. REQ'D.
1	8-508	Gasket	1	33	V-104128	Screw	4
2	V-133745	Tube	1	34	V-109879	Boot	1
3	V-114495	Baffle Plate	1	35	4053	Cover	1
4	S-1137	Snap Ring	1	36	S-1398	Bushing	1
5	S-1138	Spacer	1	37	V-1678	Plug	1
6	V-1701	Bearing	1	38	S-1147	Bearing	1
7	V-104363	Pump Head	1	39	S-1111	Key	1
8	V-8260	Pin	2	40	V-124411	Shaft	1
9	V-104003	Pressure Plate	1	41	V-103757	Retainer	1
10	S-1146	"O" Ring	1	42	S-1131	Seal	1
11	V-119170	Oil Return Tube	1	43	V-106740	Body	1
12	V-10942	Screw	8	44	V-7076	Plug	1
13	V-99783	Lockwasher	8	45	V-98457	Plug	1
14	S-1190	Screen	1	46	V-7075	Plug	1
15	V-127284	Rotor	1	47	S-1134	Gasket	1
16	SS-1199	Vane Kit (12)	1	48	108233	Valve Body	1
17	S-1143-1	Ring	1	49	S-1136	Gasket MC	1
18	S-1143	Ring	1	50	S-1130	Plug	1
19	V-9006	Pin	1	51		Screw (See Power Pack Asm.)	6
20	V-104041	Wave Washer	1	52	99783	Lockwasher	6
21	V-104128	Screw	1	53	3056-C	Cover MC	1
22	V-6457	Washer	1	54	3056	Cover MB	1
23	S-1132-3	Relief Valve (1500PSI)	1	55	4401-2	Manifold	1
24	V-10348	Gasket	1	56	S-16	"O" Ring	1
25	V-103771	Valve Spool	1	57	4428-2	Four way valve	1
26	S-1156	Seal	1	58	E-1069-1	Coil	1
27	V-103774	Bushing	1	59	S-1136-1	Gasket MB	1
28	S-12	Spring	1	60	127912	Valve Spool	1
29	V-103773	Bushing					
30	V-101899	Snap Ring					
31	V-103772	Cover					
32	V-6457	Washer					

JOGGING AID A-12608-( )

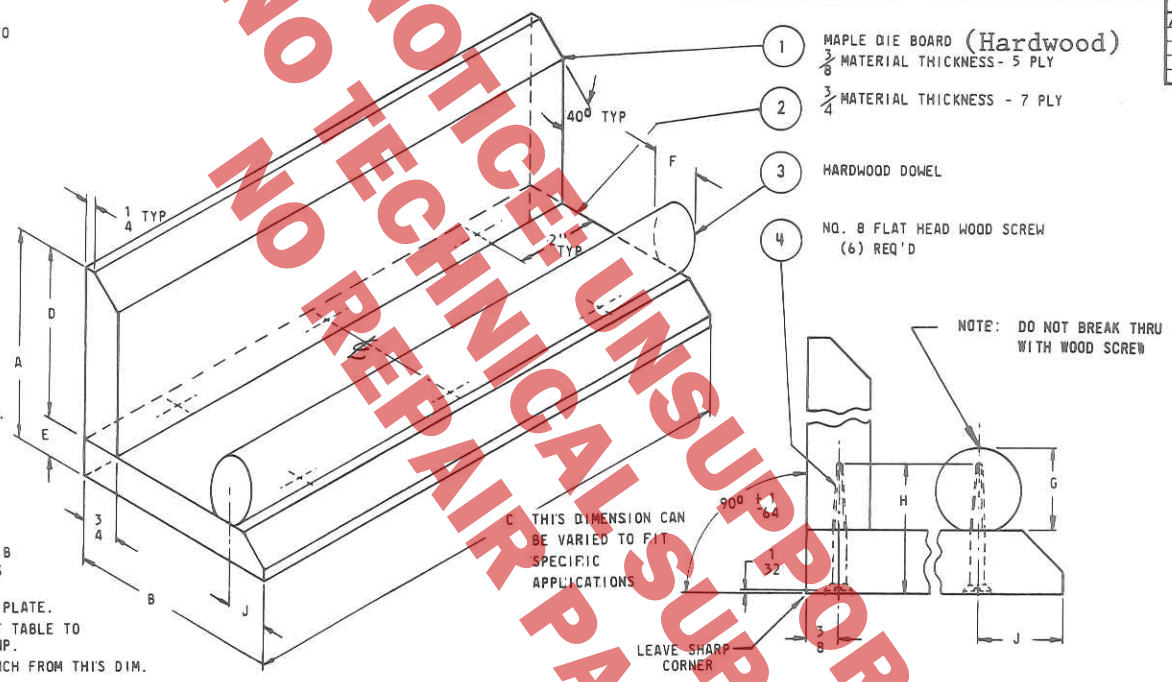
INSTRUCTIONS

1. CUT WOODEN PARTS TO DESIRED LENGTH.
   SAND SURFACE.
   REMOVE SHARP EDGE EXCEPT AS NOTED.
2. SCREW ALL PARTS TOGETHER SECURELY USING WOOD GLUE BETWEEN MATING SURFACES
3. TO AVOID WARPING APPLY PROTECTIVE COATING.
   2 COATS SANDING SEALER
   2 COATS CLEAR LACQUER OR EQUIVALENT
   SAND LIGHTLY BETWEEN COATS.
4. STORE IN DRY PLACE.

NOTE!

FOR CLAMP OPENINGS NOT LISTED, DIMENSIONS A & B ARE TO BE DETERMINED AS FOLLOWS:

1. REMOVE FALSE CLAMP PLATE.
2. MEASURE FROM TOP OF TABLE TO BOTTOM FACE OF CLAMP.
3. SUBTRACT $\frac{3}{8}$ OF AN INCH FROM THIS DIM.



DATE	STK	REVISION RECORD	REGSTD	APPD	DR
12-11-84	—	RELEASED FOR PROD. (NO ECN)		D	W

PART NUMBER	CLAMP OPENING (REF.)	A	B	C	D	E	F	G	H	J	K
A-12608-1	2-1/2	$2\frac{1}{8}$	$2\frac{1}{8}$	12	$1\frac{3}{4}$	$\frac{3}{8}$	1	$\frac{15}{16}$	$1\frac{1}{4}$	$\frac{1}{2}$	
A-12608-2	3-1/4	$2\frac{7}{8}$	$2\frac{7}{8}$	12	$2\frac{1}{2}$	$\frac{3}{8}$	1	$\frac{15}{16}$	$1\frac{1}{4}$	$\frac{1}{2}$	
A-12608-3	3-1/2	$3\frac{1}{8}$	$3\frac{1}{8}$	12	$2\frac{3}{4}$	$\frac{3}{8}$	1	$\frac{15}{16}$	$1\frac{1}{4}$	$\frac{1}{2}$	
A-12608-4	4	$3\frac{5}{8}$	$3\frac{5}{8}$	12	$3\frac{1}{4}$	$\frac{3}{8}$	1	$\frac{15}{16}$	$1\frac{1}{4}$	$\frac{1}{2}$	
A-12608-5	4-1/2	$4\frac{1}{8}$	$4\frac{1}{8}$	14	$3\frac{3}{8}$	$\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{3}{16}$	$1\frac{3}{4}$	2	
A-12608-6	5	$4\frac{5}{8}$	$4\frac{5}{8}$	14	$3\frac{7}{8}$	$\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{3}{16}$	$1\frac{3}{4}$	2	
A-12608-7	5-1/2	$5\frac{1}{8}$	$5\frac{1}{8}$	14	$4\frac{3}{8}$	$\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{3}{16}$	$1\frac{3}{4}$	2	
A-12608-8	6	$5\frac{5}{8}$	$5\frac{5}{8}$	14	$4\frac{7}{8}$	$\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{3}{16}$	$1\frac{3}{4}$	2	
A-12608-9											
A-12608-10											

PART NUMBER	CLAMP OPENING (REF.)	A	B	C	D	E	F	G	H	J	K
A-12608-11											
A-12608-12											
A-12608-13											
A-12608-14											
A-12608-15											
A-12608-16											
A-12608-17											
A-12608-18											
A-12608-19											
A-12608-20											

NOTICE

WHEN SELECTING A JOGGING AID FOR A PARTICULAR SIZE CUTTER BE SURE DIMENSIONS A & B ARE $\frac{3}{8}$" LESS THAN THE CLAMP OPENING. (MINUS FALSE CLAMP PLATE) DO NOT DEVIATE.

USED IN

DO NOT SCALE DRAWING.

DE-BURR SHARP EDGES UNLESS OTHERWISE SPECIFIED

TOLERANCE ON DIMENSIONS NOT OTHERWISE SPECIFIED
TWO DIGIT DECIMAL EQUALS PLUS OR MINUS .010
THREE DIGIT DECIMAL EQUALS PLUS OR MINUS .005
FRACTION 1/64

ANGULAR LIMITS ± 1°

NO.	PART NO.	DESCRIPTION OF ACCESSORIES	NO. USED
MATERIAL	ASSEMBLY - PURCHASE	NO. USED	1

NAME OF PART: JOGGING AID
CHALLENGE PAPER CUTTER

DRAWN
TRACED
CHECKED BWW 12-11-84
SCALE NONE
DATE 10-15-84

THE CHALLENGE MACHINERY COMPANY
GRAND HAVEN, MICHIGAN

SUPERSEDES DRAWING NO.
SUPERSEDED BY DRAWING NO.

A-12608-( )

DE-16