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.

Older products may not comply with current safety procedures, guidelines or regulations, and it is the product owner's and user's responsibility to evaluate the suitability and fitness of the products in their current use and application. The Challenge Machinery Company makes no representation, warranty or recommendation regarding any modifications which may be required on non-current or unsupported products. The Challenge Machinery Company assumes no liability for any modification or alteration to any Challenge product, and any such modification or alteration to any Challenge product is not authorized by The Challenge Machinery Company. The availability of these manuals is solely for the purpose of providing reference information for the products.

This manual may not be complete in all aspects of product maintenance and repair. **All products should be used only by qualified and properly trained personnel, following proper safety procedures.** All products should be regularly inspected and maintained, and their condition, application and use should be periodically evaluated by qualified personnel. Only qualified and properly trained technicians should perform maintenance, repair and replacement procedures. Attempting these procedures without proper training may cause machine damage or operator injury!

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.

SERIAL NO —

MODEL —

SAFETY ALERT

This safety alert symbol means CAUTION or 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 4.

- 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 backage controls to position and remove stock.

Instruction and Parts Manual

CHALLENGE®

CHAMPION SERIES PAPER CUTTERS

MODELS MC, MPX, MPC & CRT*

***Use in conjunction with CRT Programming manual, F.701-B**

This manual covers serial numbers 92145D† and up.

†(Machine serial numbers without a letter suffix designation use manual F.254-B)

ALWAYS GIVE THE SERIAL NUMBER OF YOUR MACHINE WHEN WRITING.

Sold and serviced by

Note: Additional supplement at end of manual

THE CHALLENGE MACHINERY COMPANY

1433 Fulton / Grand Haven, Michigan 49417 U.S.A./ Phone: 616-842-8300/ Fax: 616-842-6511

INTRODUCTION

WELCOME to the family of Challenge® Champion® users. Challenge has been developing and manufacturing Graphics Arts Equipment for over 125 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 OR 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 (800) 866-7800; in Michigan, call (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 Ave., 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

PLEASE SEE SEPARATE FLYER INCLUDED WITH THIS MANUAL FOR WARRANTY DETAILS.

It is ***VERY IMPORTANT*** that you read and understand the conditions of the warranty.

The Warranty Information Sheet must be filled in correctly, completely, and ***must be on file at The Challenge Machinery Company*** for warranty claims to be honored for this machine.

WARNING: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. As temporarily permitted by regulation, it has not been tested for compliance with the limits for Class A computing devices pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

SPECIFICATIONS

Cutting Width	30-1/2"/77cm
Clamp Opening	3-1/2"/90mm
Minimum Cut - Standard	3/4"/19mm
- Special	1/2"/13mm
With False Clamp Plate	2-1/4"/57mm
Table Front of Knife	18-1/2"/47cm
Space Behind Knife	30-1/2"/77cm
Table Height	36"/91cm
Overall Height	57-3/4"/147cm
Overall Width	
With Side Tables	78-1/2"/200cm
Without Side Tables	49-1/8"/125cm
Overall Length	57-1/2"/146cm
Net Weight (approx.)	1855 lbs/841kg
Shipping Weight (approx.)	2350 lbs/1066kg
Will pass through door:	
Assembled	49"/124cm
With table/treadle out	33-1/2"/85cm
Table/treadle/motor out	20"/51cm

SPACER

MPX Spacer has 50 cuts on 2 Channels.
MPC Spacer has 3800 cuts on 99 Channels.
CRT Spacer has 4000 cuts on 99 Channels.

Minimum Space between cut positions is .005" or .1mm.
Repeat Positioning Accuracy is .003" or .05mm

ELECTRICAL

STANDARD:
5 H.P. Motor
Three Phase, 60 Hz, AC
Available in 3 Voltages -
208/230 Volts at 25 Amps
460 Volts at 11.5 Amps

OPTIONAL:
5 H.P. Motor
Single Phase, 60 Hz, AC
Available in 2 Voltages -
208 Volts at 44 Amps /
230 Volts at 44 Amps

PACKING LIST

Extension Side Tables

2 - 18 x 24 Steel Side Table	(47166)
2 - Side Table Back Plate	(47164-1)
8 - Side Table Bolts	(H-6913-606)
8 - Side Table Hex Nuts	(H-6424-6)
4 - Leveling Screws	(H-6939-616)
2 - Plastic Plug	(E-2196-5)
2 - End Cover Decal	(S-1781-34)
4 - Side Table Mounting Bolts (shipped installed in table)	(H-6913-608)
4 - Side Table Mounting Washers (shipped installed in table)	(8815)
1 - False Clamp Plate (installed)	(47006-2)
2 - Knives	(2238-2)
6 - Knife Bolts	(H-6918-608)
6 - Knife Washers, Special	(8815)
4 - Cutting Sticks (one installed)	(4171)
1 - Jogging Aid	(A-12698-3)
1 - Tool Kit (containing):	
2 - Knife Lifters	(S-1245-5)
1 - Cutting Stick Puller	(5064)
1 - Hex 'T' Wrench	(W-164)
1 - 5/16 Open End Wrench	(W-158)
Hex Wrench Set (one of each):	
1/8"(W-141)	
5/32"(W-137)	

Warning: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. As temporarily permitted by regulation, it has not been tested for compliance with the limits for Class A computing devices pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

TABLE OF CONTENTS

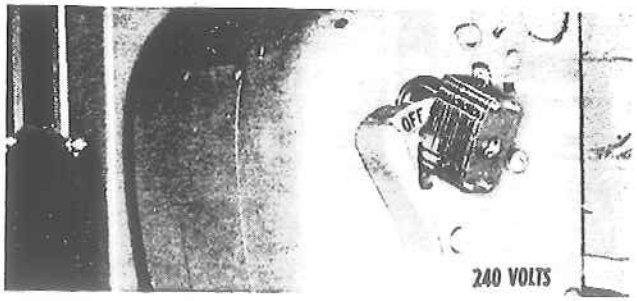
SAFETY PRECAUTIONS

This safety symbol means CAUTION OR 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.
- When not in use, push stop button in and remove the key to lock the cutter, see Key Lock, page 16.
- Have your electrician make sure the cutter is properly grounded, Power Hookup, page 9.
- Have your electrician check for sufficient power to operate the cutter properly, page 9.
- OBSERVE ALL CAUTION PLATES mounted on this cutter, p. 17.
- 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, see page 10.
- 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, page 45.
- If the cutter sounds or operates unusually, turn it off and consult the Trouble-Shooting section of this manual, page 30. 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, page 18, when handling paper under the clamp.
- 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 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.

CAUTION: 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.



(fig. 1)

PRECAUCIONES DE SEGURIDAD

Este simbolo de alerta de seguridad significa ¡OJO! - INSTRUCCIONES DE SEGURIDAD PERSONAL. Lea las instrucciones porque se refieren a su seguridad personal. Falla 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 qsa esta maquina.
- LEA y enrienda bien a fondo todas las instrucciones antes de poner a funcionar la guillotina. Si todavia tuviese alguna pregunta, favor de llamar al distrubuidor autorizado de las maquinas Challenger - dedos y manos son demasiado valiosos como para arriesgarlos en experimentos.
- El manejo de la guillotina debe estar exclusivamente a cargo de personal entrenado y autorizado para ello.
- NO MODIFIQUE LOS MECHANISMOS DE SEGURIDAD, estan ahi pare su proteccion no deben ni modificarse ni quitarse.
- DESCONECTE LA CORRIENTE ELECTRICA antes de proceder a hacerle servicio de limpieza, engrasar, o de hacer adjustes que no requieren corriente. Trabe el interruptor en la posicion OFF (apagado); vea "Procedimiento para cortar la cirriente electrica" al pie de esta pagina.
- Eche llave a la guillotina y quite la llave cuando la maquina no esta en operadion; vea Corriente electrica" en la pagina 9.
- Asegurese de que la guillotina este debidamente a tierra.
- Verifique el voltaje y asegurese de que esta sea suficiente para el debido funcionamiento de la guillotina.
- Preste atencion a todas las placas con advertendias instaladas en seta guillotina.
- No permita que objetos extranos 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 la 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, desconecte la y consulte la seccion "Reparador" de este manual, pagina 30. Si no es posible corregir el problema, llame a su servicio autorizado para que le examinen la maquina.
- 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 deve 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.

INSTALLATION & SETUP

SHIPPING DAMAGE

Your cutter has been carefully packed to prevent damage during shipment. However, claims for damage or loss are the resposibility of the recipient so inspect all shipments as soon as they are received. If there should be any noticable damage make a notation on the freight bill. Visual and/or hidden damage must be reported to the claims department of the carrier within 15 days. If you need any asssistance contact your dealer. Check the contents of the crate against the packing list on the first page of this manual to make sure there are no missing items.

UNCRATING

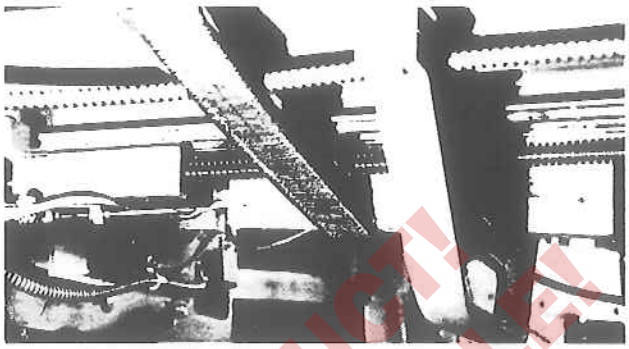
This machine is shipped lag bolted to a wooden skid and covered with a triple-walled corrugated container. Loosen the flaps of the carton where they are attached to the skid. When loose, the carton can be lifted straight up over the cutter. Remove the side tables and accessory box which are also attached to the skid. Place the cutter/skid about where the machine will be positioned and remove the lag bolts securing the cutter. Proceed to Lifting Instructions.

LIFTING INSTRUCTIONS

Unpacking, handling and positioning should be done by professional handlers. If handling or unpacking is a problem, your dealer or a local trucking facility should be able to supply or recommend a qualified rigger. These people are experienced and have the proper equipment (this machine weighs approx. 1855 lbs/835 kg). DO NOT RISK personal injury or damage by attempting to move machinery with makeshift equipment or inadequate manpower.

(fig. 2)

Champion cutters are equipped with an eyebolt for lifting the machine. Remove the protective cover from the rear of the arch, fig. 2. Unbolt the lifting block, turn it over so the hole is up and replace the bolts. Use hook & chain or lifting straps rated for lifting 2,000 lbs./908 kg.



(fig. 3)

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, blocking must be placed alongside the leadscrew to prevent damage, fig. 3. A bent leadscrew will cause the backgage to bind.

The backgage 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 position the cutter.

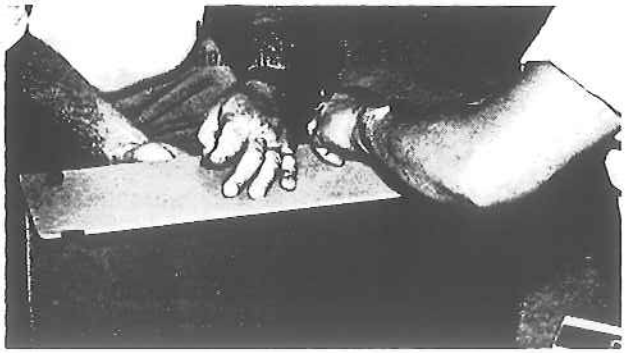
CLEANING

The table surfaces have been coated with a Rust Preventive before shipping. This is NOT a lubricant and should be removed. Wipe down the table and bare metal surfaces with a non-flammable solvent such as CRC or blanket wash. Coat table surfaces with a wax/rust preventive. Table surfaces are cast iron and steel and will rust if not protected.

ASSEMBLY: Standard

Unless otherwise specified, the only items that have been disassembled for shipping are the knife and extension side tables. Knife installation will be covered later, side table attachment is as follows:

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



(fig. 4)

(fig. 5)

1. Assemble the side table backs to the table surfaces. Make sure that backs are assembled opposite each other so you have a right and left extension table. The extension table bolts and hex nuts are packed inside the tool kit box. Tables are installed with the clearance hole for the knife gibs towards the middle of the cutter, fig. 4.
2. Have one person hold the table in position while the other aligns the holes and starts threading the mounting bolts, fig. 6. (Mounting bolts are shipped, installed in the side of the table – remove them to install tables.)

(fig. 6)

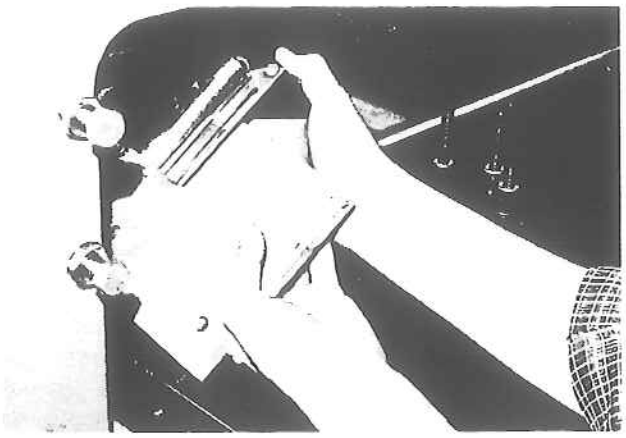
3. Use a 9/16" socket and extension to snug up the mounting bolts, then tap the extension table up or down with your hand or a rubber mallet until it is flush with the cutter table. Run a straight edge or sheet of paper over the seam to check the fit and make sure your stock won't get caught on the seam, fig. 6.
4. Locate the leveling screws. They are found in the tool kit also. Insert them in the threaded holes next to the mounting bolts and use them to level the tables. 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.
5. Install plastic plugs to cover the extra mounting holes at the inside front of the side table which extends beyond the front of the main cutter table. the long self adhesive labels are used to cover the extra mounting holes on the outside of the side tables. Labels are shipped inside the electrical panel.
6. Clean the tables as instructed in the Cleaning instructions, if not already done. Apply a silicone/rust preventive/wax to protect the table surface.

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.

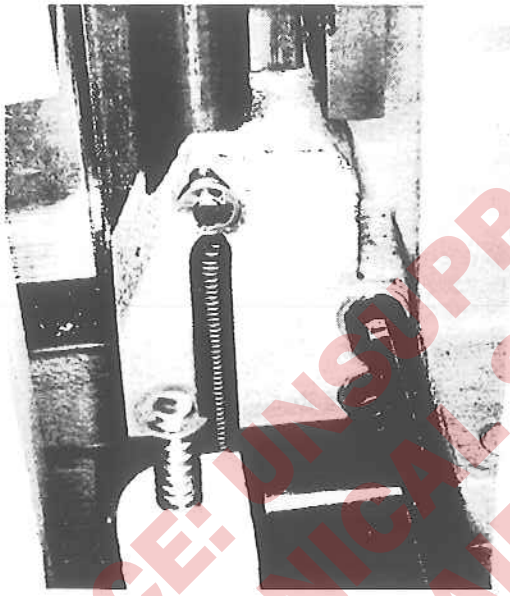
Your cutter will arrive in two crates. One, containing the arch-base assembly and the second, a "Dutch Box" containing the parts and accessories with the table upside down on the bottom. Reassemble as follows:

1. Uncrate the arch-base assembly.
2. Remove the accessories from the dutch box.
3. Lift the table out of the dutch box and turn it right side up. **NOTE:** Be careful not to damage or bend the leadscrew or backgage drive motor assembly. Use blocking alongside the screw if straps are used (see fig. 3).
4. Remove the rear arch cover asembly.
5. Insert table from the rear of the machine through the arch. The table is located by means of two taper pins beneath the cutting stick.
6. After locating the table, install the eight (8) table bolts. Seat the taper pins and tighten the bolts.
7. Attach the table side guides to the left rear, right rear and the right front of the table. Install the rear table plexiglass cover to the rear table side guides.
9. Install the Paper Deflector Option if ordered. Position the deflector into position from the inside of the left arch post.



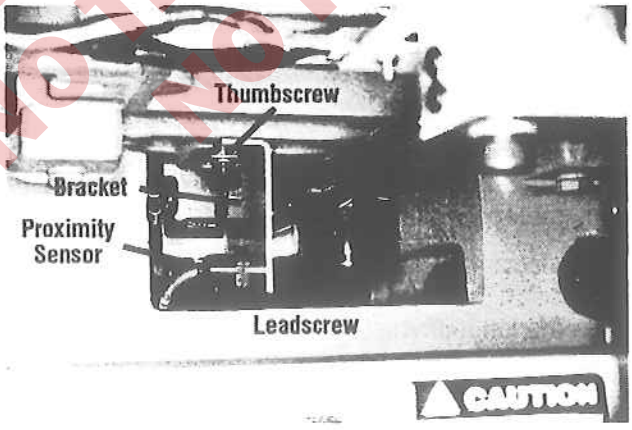
(fig. 7)

Depress the deflector with your thumb while installing the assembly to clear the knife bar, fig. 7. Attach with one 3/8 - 16 x 3/4" and two 3/8 - 16 x 2" socket head capscrews.



(fig. 8)

The two 2" socket screws must be installed from inside the arch, fig.8; remove the side guard plate for access. All three bolts should have shakeproof lockwashers.



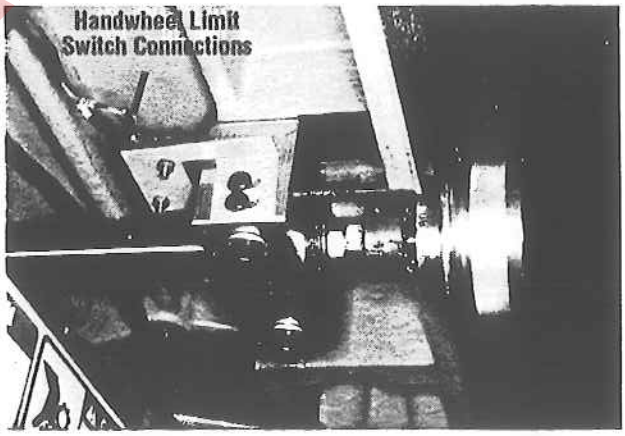
(fig. 9)

10. Attach the forward limit switch proximity sensor to its bracket at this time. The bracket is located in the backgage clearance channel in the base casting, fig. 9. Install the sensor so it protrudes past the bracket a minimal amount. When electrical connections have been completed, the sensor will have to be re-adjusted.

11. Reconnect the cut button cable assembly. This connection is simply made by inserting the quick-connect plug into the socket on top of the electrical box, fig. 10, and securing the locking ring.

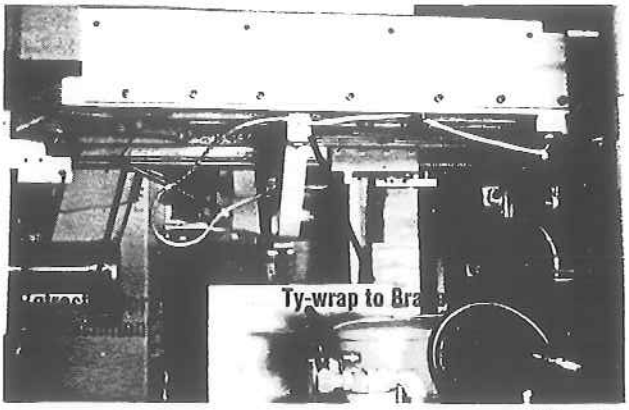
(fig. 10)

11. Attach the wire connectors to the handwheel actuator limit switch, fig. 11. The wire connectors attach to the two rear tabs — one tab from the back of the switch and the other to the rear most side tab. It does not matter which wire is connected to which tab as long as they are connected to the NO, normally open, tab connectors. (Not on MC Model.)



(fig. 11)

12. Route the encoder cable underneath the table to the encoder. Start by threading the cable from the back of the arch to the table brace. Secure it to the brace with an electrical ty-wrap and connect it to the table bottom with the plastic cable clamp, fig. 12. Attach the retractor spring to the table bottom with the button head cap screw as shown. Next, attach circuit board to the side of the backgage nut, fig. 13. Make sure the plastic encoder cover is on

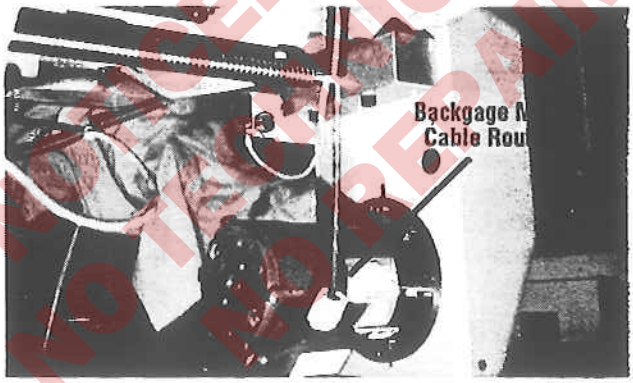


(fig. 12)

the cable and then attach the wire connector to the bottom of the encoder as shown in fig. 13. Press the plastic cover over the encoder and the wire connection.

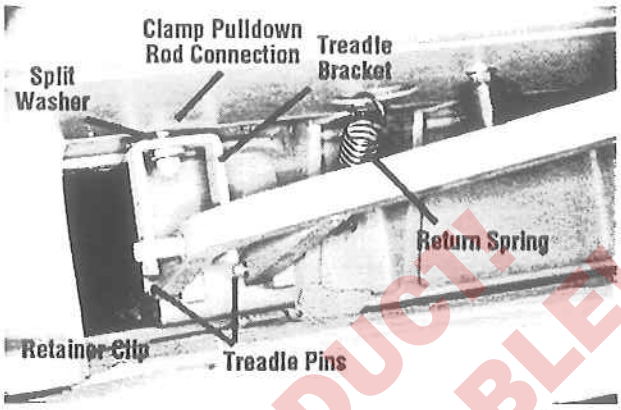
(fig. 13)

13. Reconnect the backgage motor cable (MC model has no backgage motor). From the table the cable runs through the strain relief bushing into the motor housing, fig. 14. Attach the wires according to the wiring schematic in the back of this manual for the machine model which you have.



(fig. 14)

14. Re-attach the clamp foot treadle assembly. Locate the treadle mounting pins, fig. 15. The treadle slides onto the pins and is secured with a retainer clip on the outer pin. Place one end of the return spring on the machine bolt on the side of the treadle arm. From inside the front power panel box, lift the other end of the spring up through the access hole



(fig. 15)

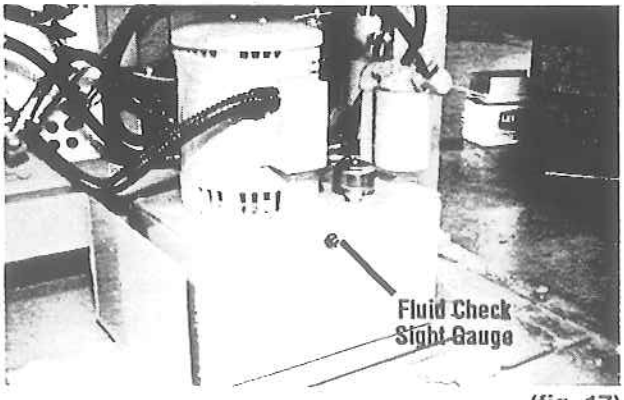
and place the end into the locator hole next to it, fig. 16. Use the cutting stick puller from the tool kit to make this connection. Now connect the treadle to the clamp pull down rod. Insert the rod through the treadle bracket, install the split washer (two matching parts), and secure with the shake proof lock nut, fig. 15.

(fig. 16)

15. If your cutter has the air table option, connect the tube from the blower to the bottom of the table.

HYDRAULIC CHECK

The Hydraulic Reservoir, fig. 17, on the Champion Cutters are filled with 5 gallons of "Rykon No. 100" hydraulic oil at the factory. The fluid level should be checked before operation, and then at least once a week during normal operation.



(fig. 17)

The reservoir is located behind the cutter, beneath the table, fig. 17,. The hydraulic tank has a sight gauge in the back for checking the oil level. The reservoir should be kept full at all times.

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

POWER HOOKUP

⚠ 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 4

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 motor itself. Check the motor specs 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 is a major source of problems. Too many machines on the same circuit will reduce the power to each machine. At peak operating demand, 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 amp rating on the machine nameplate. If a wire run is over 75 feet (23m), the next size wire should be used (check local electrical codes).

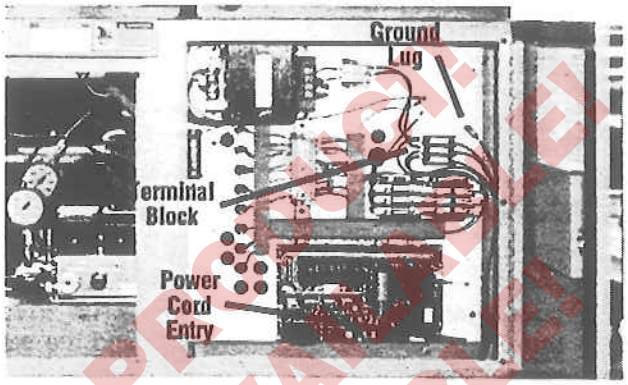
Electrical Specifications for Champion Cutters

	Voltage	Amps	Circuit Size	Wire Size
Three Phase:	460	11.5	20 amps	#12 AWG
	230	25	35 amps	#8 AWG
	208	25	35 amps	#8 AWG
Single Phase:	230	37	44 amps	#6 AWG
	208	38.7	44 amps	#6 AWG

THREE PHASE HOOKUP

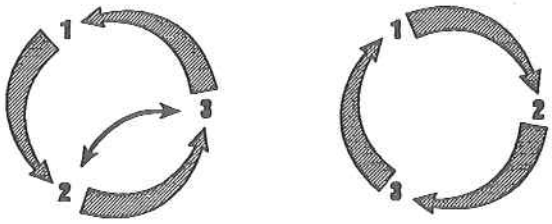
The power source is connected to the cutter through the bottom of the power panel (right hand side when viewed from rear).

1. ***DISCONNECT AND LOCK OUT THE POWER*** at the main power panel to prevent accidental power-up. See Power Lockout, page 4.
2. Thread the power cord through a conduit connector into the power panel and secure.



(fig. 18)

3. Fasten the ground lead to the ground terminal lug, fig. 18.
4. Now, fasten the three power leads to the three terminals of the main power terminal block.
5. Close the electrical panel doors and latch them. Unlock the main panel and turn on the power. Turn on the control panel key.
6. Press **both** cut buttons to activate the motor and check to make sure it is turning the same direction as the arrow on the motor casing.



(ill. 1)

If it isn't, disconnect the power and simply exchange any two leads of the power cord. The motor will now turn the correct direction. Double check to make sure.

SINGLE PHASE HOOKUP

The power source is connected to the cutter through the bottom of the power panel (right hand side when viewed from rear).

1. ***DISCONNECT THE POWER AND LOCK IT OUT*** at the main power panel to prevent accidental power-up. See Power Lockout, page 4.

2. Thread the power cord through a conduit connector into the power panel and secure.
3. Fasten the ground lead to the ground terminal lug, fig. 18.
4. Now, fasten the two power leads to the L1 and L2 terminals of the main terminal block.
5. Close the electrical panel doors and latch them. Unlock the main panel and turn on the power. Turn on the control panel key and press **both** cut buttons to start the hydraulic motor.

KNIFE CHANGING AND INSTALLATION

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

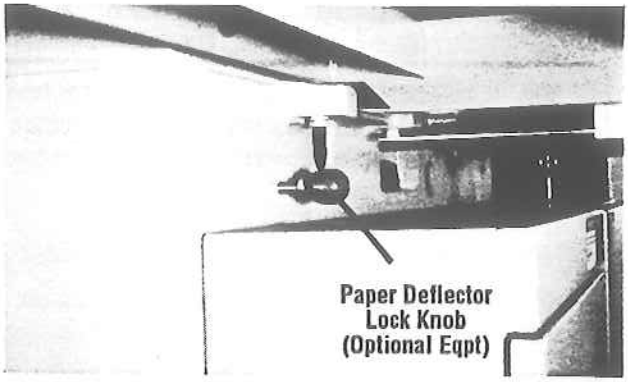
- **Make sure knife lifters are properly installed.**
- **Keep handling of unprotected knives to an absolute minimum.**
- **Clear off cutter table and side tables before removing knife.**
- **Have scabbard on cutter table and insert knife immediately.**
- **Warn people of any unprotected knife.**
- **Knife changing is a ONE PERSON OPERATION! Having more than one person trying to change knives invites accidents and is NEVER recommended.**

(fig. 19)

The knife changing equipment shown in fig. 19, 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 for 4-5 seconds. The knife will lock down and automatically shut off the power.
2. Press the stop button and **remove the key!**



(fig. 20)

3. If equipped with the paper deflector option, lock it down by screwing the lock knob all the way in fig. 20.

(fig. 21)

4. Back off the knife adjusting screws on the top of the knife bar, fig. 21, as far as they will go (counterclockwise). 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 replacing the key and turning it on. When the power is back on, press both cut buttons to raise the knife and clamp.
6. ***DISCONNECT THE POWER AND LOCK IT OUT,*** see Power Lockout Procedure on page 4.

(fig. 22)

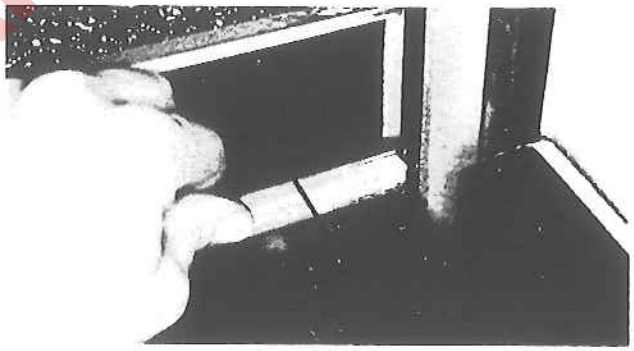
7. Remove the bolts in the two slotted holes of the knife bar and replace them with the knife lifters. Tighten the lifters enough to hold the blade in place, and remove the remaining four bolts.
8. Clear the tables and put the empty knife scabbard on the table.

DANGER: Dull 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. 23)

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, fig. 23. Bring the left side out first and put the blade in the scabbard immediately.

Knife Installation:



(fig. 24)

1. Use the cutting stick puller, fig. 24, 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, fig. 21.
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.

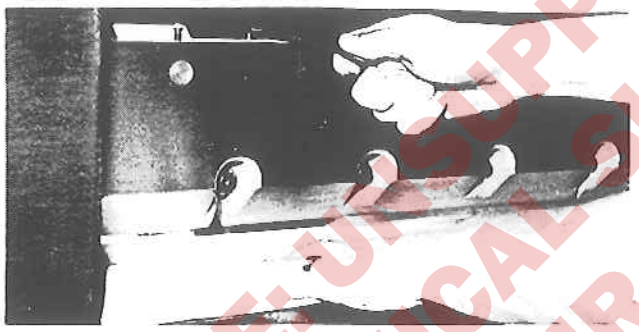
   NOTE: If the blade will not go in, either the lifters are screwed into the blade too far, or the blade is not centered over the table, and the end of the blade is hitting the end stop in the knife bar.

6. Insert the rest of the knife bolts, snug them up, but don't tighten completely. Be sure all bolts have washers. The correct 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 (repeat step 1) and then turn the power off.



(fig. 25)

10. Turn the knife adjusters down, a little at a time fig. 25, 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. Replace the key, turn the power back on and press the cut buttons to release the knife and clamp. The knife and clamp will return to the UP position.

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.

FALSE CLAMP PLATE

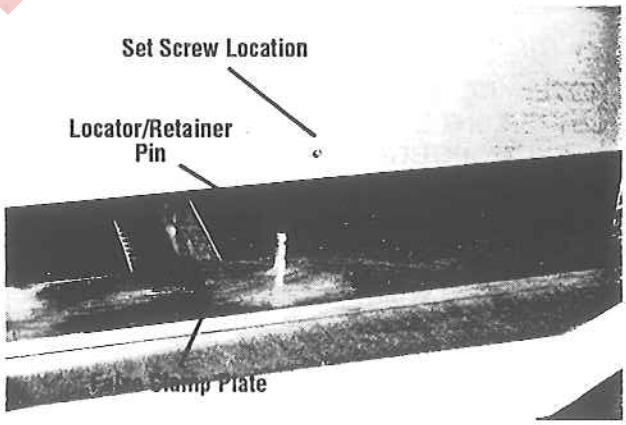
To prevent marking on pressure sensitive jobs, a false clamp plate has been included (installed) with your machine. This plate attaches to the bottom of the clamp. It is secured from the front of the cutter with three set screws which hold connector rods that pass up into the clamp.

NOTE: On MPC/MPX/CRT model cutters, ***the forward limit switch value must be changed any time the false clamp plate is installed or removed AND the forward proximity sensor bracket must be adjusted!*** See Service Mode Section, page 27.

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 Install:

1. ***DISCONNECT THE POWER AND LOCK IT OUT!*** See Power Lockout, page 4.



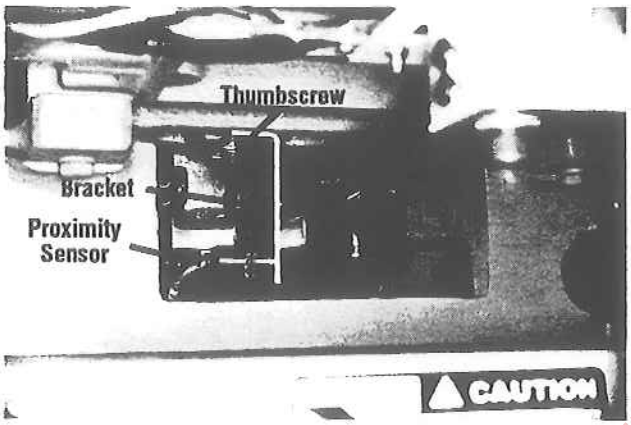
(fig. 26)

2. Position the false clamp plate under the clamp, fig. 26. The locator pegs are positioned to the rear of the cutter and are set into holes in the bottom of the clamp.

3. With a ⅛" Allen wrench, back off the set screws in front of the clamp and raise the plate up to the bottom of the clamp. Make sure to raise the 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 set screws to hold the plate in position.

4. Make sure that all tools have been taken off the cutter table, reconnect the power, and turn the key on.



(fig. 27)

5. The forward proximity sensor, fig. 27, must be adjusted to stop the backgage before it contacts the false clamp plate. Loosen the thumb knob on the proximity sensor bracket and slide the bracket back as far as it will go. Retighten the thumbscrew.

   NOTE: On MPC/MPX/CRT models, change the forward limit switch value to 2". See Service Mode Section, page 27.

NOTE: The cutter cannot be operated closer than 2" (50.8mm) with the false clamp plate installed.

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

PRESETTING/BACKGAGE POSITION READOUT
MC MODEL CUTTERS

The backgage positioning system on the Champion MC Model Cutters consists of three interacting units which together provide accuracy to 1/100th of an inch (0.01"/0.1mm).

The heart of the system is a circuit board mounted behind the control panel which also contains an L.E.D. position readout display. Feeding information to this board are two units, the encoder and the presetter, both suppling information from the backgage movement.

The encoder is mounted on a bracket at the end of the table and connected to the leadscrew with a flex coupling. Pulses from the encoder unit give the direction and amount of movement, which is then displayed.

The presetter coordinates the encoder with the readout to give the actual position of the backgage. It is activated by a wand attached to the backgage.

With this system, the backgage position display will always remain lit. It will only go out if the power to the machine is disconnected, after which it will have to be reset before the cutter is used.

The following instructions tell how to reset the presetter and re-zero the backgage/readout to give accurate cuts.

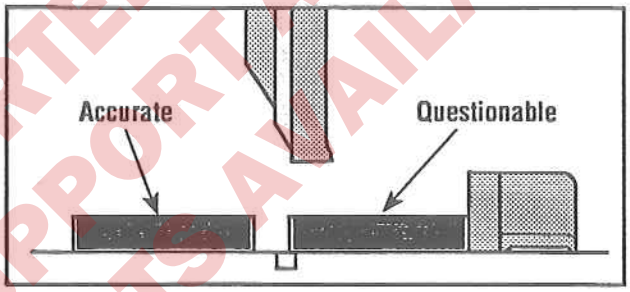
RESET - Whenever the power to the cutter has been off, the backgage position readout will need to be reset. To reset the readout, bring the backgage forward through the presetter (5 inches). The presetter coordinates the backgage and the backgage position encoder every time it passes forward through the five inch presetter position. The cutter is now ready for operation.

RE-ZERO - If the backgage position readout does not match the actual measurement between the knife and the backgage, the cutter must be re-zeroed. This inaccuracy usually occurs due to rough handling during shipment.

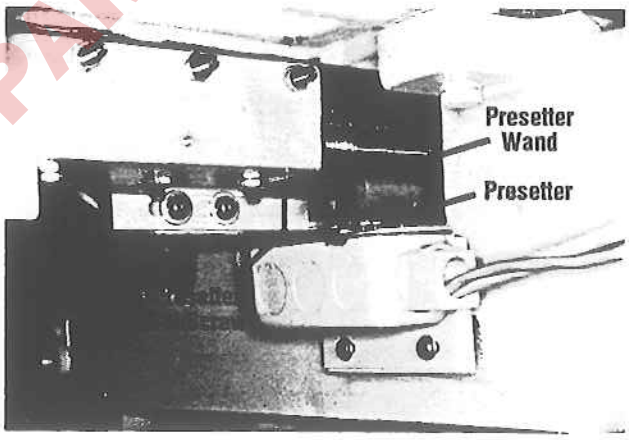
The accuracy can be checked by comparing cut sheets of paper.

NOTE: The backgage gibs should be adjusted and the backgage squared before attempting to re-zero, see Adjustments.

1. Place a 1/4 to 1/2 inch lift of 8-1/2 x 11" paper against the center of the backgage.
2. Using the backgage position readout, bring the lift up to the 10" position and make a cut. Move the backgage up to 5" and make another cut.
3. Take a sheet from the center of each lift and compare them to each other. The encoder system on your cutter will space accurately between cuts, ill. 2, your 10" and 5" cuts, whether the overall accuracy is correct or not. The stack of paper between the 10" and 5" cuts will be a true 5", but the paper left against the backgage will not if the backgage position read-out is off, ill. 2.



Ill. 2



(fig. 28)

4. If the backgage position readout is off, you will have to adjust the Presetter Wand attached to the bottom of the backgage, fig. 28.
5. The leading edge of the presetter wand is what activates the presetter sensors as the backgage is moving forward through them. A set screw behind the wand allows for adjustment. If your test showed the backgage measurement to be short, move the

wand back by turning the set screw out. If tests show the measurement to be long, turn the set screw in to move the wand forward.

6. Run the backgage back, then bring it forward through the 5" presetter again and make another test. Continue to adjust and preset until your test sheets match.

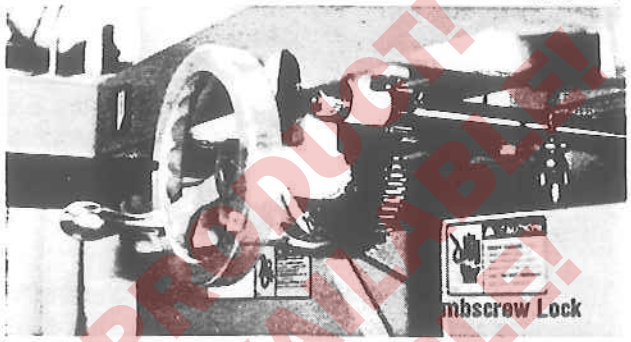
BACKGAGE POSITION (FIG. 29)

After your cutter has been re-zeroed and preset, the backgage position is shown on the lighted readout in the center of the control panel.

Positioning - The backgage is moved by using the handwheel at the front of the cutter (manual control).

Backlash Indicator - A small red light in the upper right hand corner of the display warns of backwards backgage motion, fig. 29. To insure accurate cuts, the backgage must be brought up to the cut position from the rear of the table. Moving back past the cut position and then up to your mark compensates for any slack in the backgage leadscrew.

(fig. 29)



(fig. 30)

Backgage Lock - Tightening the backgage lock prevents the backgage from moving while positioning paper against it. The MC model has a thumbscrew lock beneath the handwheel, fig. 30.

MPX/MPC SETUP PROCEDURE

When the power to the machine is initially connected, or whenever the power to the cutter has been turned off, the top L.E.D. display line will show a small letter 'c' and 55 inches (c55.000). The smaller two position display will show random figures.

To initially setup the computer follow these procedures:

NOTE: This procedure is for initial setup only as it wipes out the entire computer memory. ***For power interruptions follow PRESET procedures.*** Battery backup will maintain stored programs for up to one month.

1. Turn the MEMORY LOCK key to the open (unlocked) position.
2. Press the following command keys: CHANNEL 0 & ENT.
3. Next, type in: 9 1 9. **This clears and initializes the memory** (removes all data and sets up the memory to receive new information). It also sets all the default values for various service functions listed under the Service Mode of the OPERATION section of this manual.
4. Press the CHANNEL key, select any channel number (press the number keys of the desired channel) and press the ENT button. Your computer is ready to operate.
5. You should now PRESET your cutter.

PRESET

Whenever the power has been off, the computer will need to be preset. Presetting coordinates the computer with the actual backgage position. When the power is turned on, the display will show, c55.000. The computer will be in the English Measurement (may be in metric depending on what mode it was in when last powered) and the Manual Mode of operation. The Presetter switch (under table) is located at 5" (127mm) and the cutter presets every time the backgage moves **forward** through this position. To reset the display, send the backgage to 4" by pressing the 4 and the SEND keys. (If the backgage is closer than 5", it must be moved back beyond this point and then sent forward. Use the manual backgage control buttons if this is the case.) The backgage will go to the 4" position, presetting as it passes through 5" (127mm).

Note: The MPX/MPC has a special alert feature to notify the operator if the presetter has lost more than 0.010" accuracy. A continuous beeping will sound until cancelled by pressing the clear button. Usually this would indicate a mechanical or electrical malfunction. The alert may also sound if the backgage is closer than the 5" preset position upon initial power-up. In this instance, the computer has actually preset going in the reverse direction. Simply clear the alert and proceed.

RE-ZERO

If the backgage position readout does not match the actual measurement between the knife and the backgage, the cutter must be re-zeroed. This inaccuracy usually occurs due to rough handling in shipment.

The accuracy can be checked by comparing cut sheets of paper (see ill. 2, page 15).

1. Place a 1/4" to 1/2" lift of paper against the center of the backgage (the backgage should be squared first but using the center of the backgage will minimize the effects of squareness).
2. Cut this lift, then, using the spacer readout, cut the lift exactly in half. The cutter will space accurately **BETWEEN** cuts whether the overall dimension is correct or not.
3. Take two sheets from the middle of each lift and compare them, ill. 2. The piece pushed out and cut off is accurate, the piece left against the backgage is of questionable accuracy. If they do not match up evenly, an adjustment must be made.
4. Having been tested and found inaccurate, the backgage can be adjusted ± 0.25"(6.3mm) by using the 914 code in the Service Mode (press CHANNEL 0 ENT & 9 1 4). Enter the amount of adjustment and press + or - to increase or decrease the adjustment. To exit without changing the number press, Enter. (**NOTE:** You must preset machine after doing this.) Inaccuracies greater than 1/4" are done by adjusting the presetter wand attached to the front of the backgage, fig. 28, page 15. A set screw directly behind the wand provides for adjustment.
5. If your test showed the backgage to be short, turn the set screw adjuster out to move the presetter wand back.
6. If your test showed the backgage measurement to be too long, turn the set screw adjuster in to move the presetter wand forward.
7. Run the backgage through the 5" (127mm) presetter position and make another test. Continue to adjust and preset until the two sheets of paper come out exactly even.

OPERATING CONTROLS

(See fig. 32)

1) CONTROL PANEL

START/STOP KEYLOCK - The hydraulic power can be locked out by pushing the stop button and removing the key, thus preventing unauthorized use. The key must be turned on to activate clamping and cutting power. Turning the key to the ON position automatically turns on the light line and the table light.

PANIC STOP - Pressing the STOP button immediately shuts off all power to the knife and clamp.

Note: If the machine sits idle, the motor will automatically shut off after two (2) minutes.

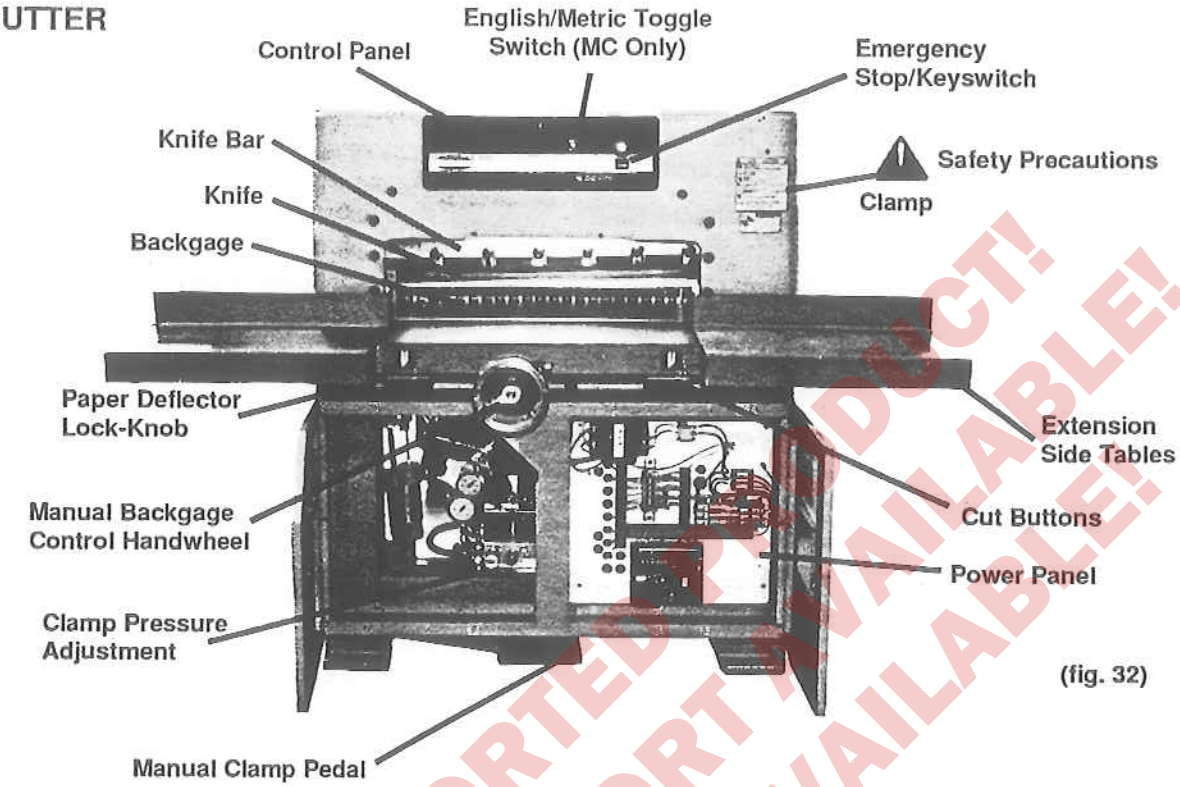
2) CUT BUTTONS - Pressing the cut buttons once will start the hydraulic motor, pressing them a second time will activate the cut sequence. BOTH cut buttons must be pressed at the same time (within 1/2 second of each other). If either one or both buttons are released during a cut, the knife and clamp will immediately return to the up position. You must release both buttons and press them again to make another cut. Holding the cut buttons 4-5 seconds after the knife is down will lock the knife in the down position and shut off the power for knife changing purposes (see Knife Changing, pg. 11)

NOTE: When running a program or using the send function on the MPX/MPC model, an audible signal (beep) will indicate the backgage is in position. Wait until the computer beeps before making a cut.

(fig. 31)

3) BACKGAGE CONTROLS - The backgage of the MC model is positioned with the handwheel in the center of the cutter table. On the MPX/MPC models, the backgage is controlled with the FWD & REV keys on the keypad or by entering a dimension and pressing the SEND key. Fine adjustment is made with the Micro-Adjust Handwheel at the center of the table, fig. 31. Turn clockwise to move the backgage forward, counterclockwise to move the backgage back. On the MPX/MPC, push the knob in to engage the leadscrew and then turn. Pressing the handwheel in will automatically bring the current backgage position up onto the top line of the MPX/MPC display.

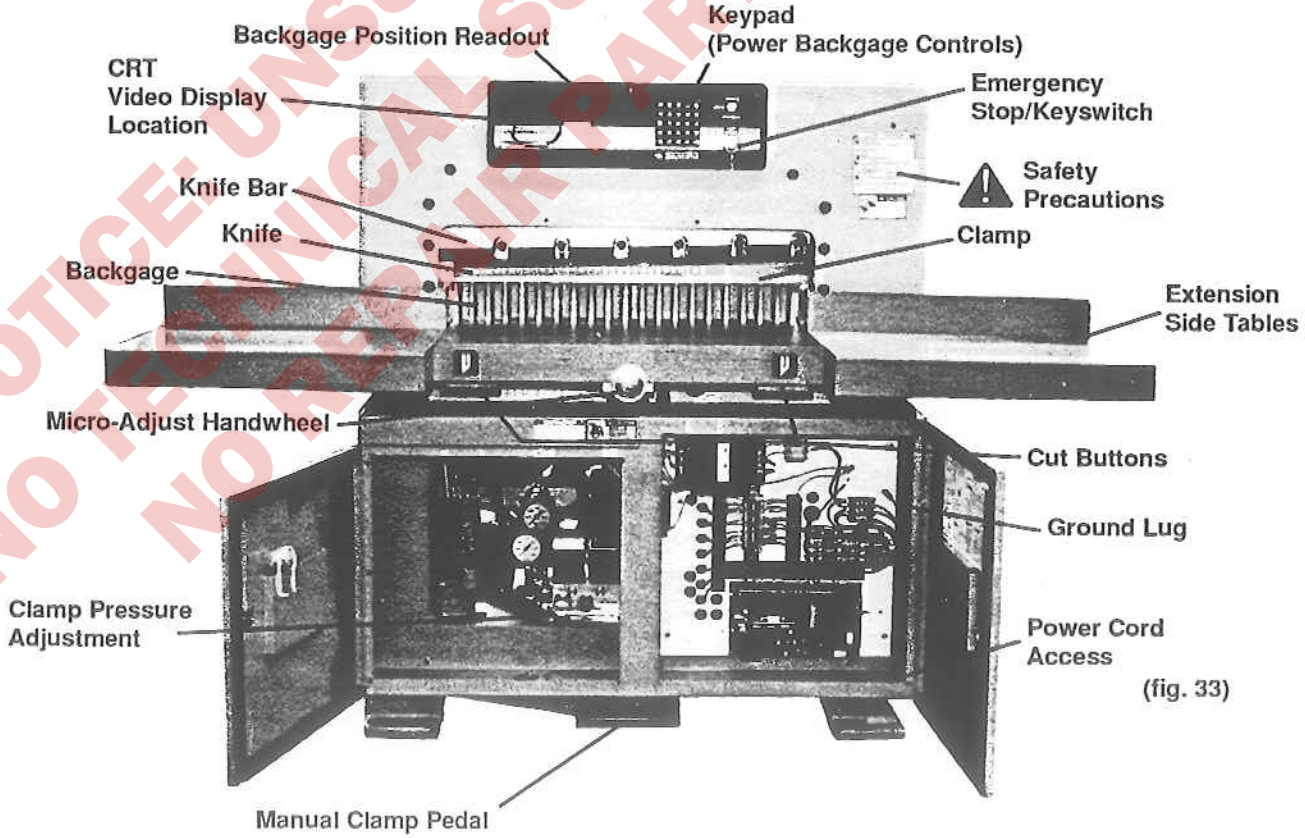
MC CUTTER



(fig. 32)

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

CRT / MPC(shown) / MPX CUTTERS



(fig. 33)

4) MANUAL FOOT CLAMP - The foot pedal controls the up and down movement of the clamp. Spring tension will return the clamp to the up position whenever the clamp is released. An air dampener underneath the cover on the rear of the arch slows the clamp down as it reaches the mechanical stops on the up and down travel of the fot pedal. See the ADJUSTMENTS section of this manual for setup procedures on the air dampener.

⚠ CAUTION: PINCH POINT - Keep feet off the clamp pedal when handling paper under the clamp. Use a jogging aid to align stock in the cutter.

5) CLAMP PRESSURE ADJUSTMENT - A pressure reducer valve and gauge for adjusting the auto cycle clamp pressure are located inside the left door housing on the front of the cutter below the table. Adjusting the pressure reducer valve, clamping pressure can be set (see Adjustments section) to a maximum of 1000 psi for heavy stock or large reams to a minimum of 400 psi for pressure sensitive jobs like carbon or NCR sets. For pressure sensitive stock use of a false clamp plate is also recommended.

⚠ 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.

6) MICRO-ADJUST HANDWHEEL - On the power backgage and computer models, the knob in the center of the table front is used to make final hairline adjustments.

7) TABLE LIGHT - With the key turned on, the work surface table light will come on.

8) PAPER DEFLECTOR - An exclusive, optional Challenge feature that prevents loose trim from catching in the knife slot. A paper deflector lockdown knob below the table allows the paper deflector to be locked out of the way for knife changing purposes (see Knife Installation).

9) LINE LIGHT INDICATOR - This thin beam of light is projected on the stock to show you where the knife will cut. It is easily focused from the rear of the arch with a single knurled knob. The line light comes on whenever the main power key is on.

10) JOGGING AID

Loading - Challenge includes with each cutter a jogging aid 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 unprotected.

(fig. 34)

Load and align your stock against the side guide, fig. 34, then square it to the backgage for cutting.

You can purchase additional jogging aids by contacting your authorized Challenge Dealer.

Unloading

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

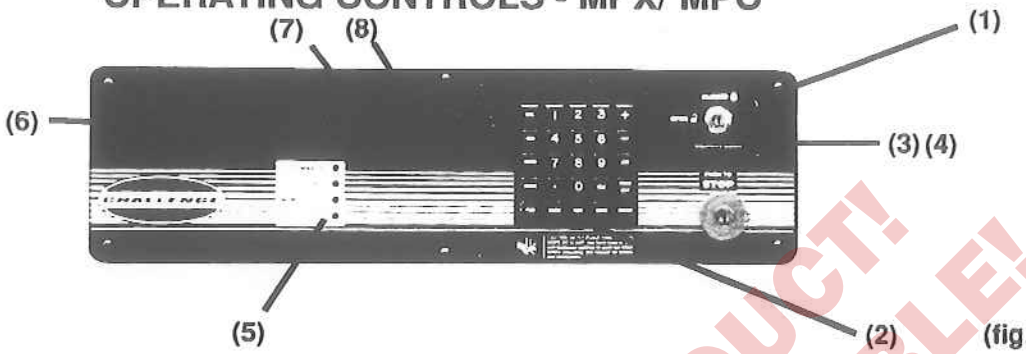
Use the backgage controls to push your stock out beyond the knife and clamp area where it can be conveniently and safely picked up.

⚠ CAUTION: DO NOT ATTEMPT TO REMOVE TRIM UNTIL THE KNIFE AND CLAMP HAVE STOPPED IN THE UP POSITION! Due to static build-up, 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.

11) AIR TABLE OPTION - For machines equipped with the air table option, there is a valve which routes the air to or away from the table. Press the AIR button on the keypad once to turn air on, press again to turn air off. The air blower is on whenever the hydraulic motor is on.

On MC models equipped with air table option, press and hold the right cut button for one (1) second to turn the air on or off.

OPERATING CONTROLS - MPX/ MPC



(fig. 35)

1) MEMORY LOCK - If the Memory Lock switch is closed (locked), the command keys, DELETE, ENTER and INSERT will not work for channels 1 - 89. Programs stored in channels 1 - 89 may be run but no changes may be made to them. On MPX models, Memory Lock protects both channels.

The memory initialization function (see Service Mode) is also disabled when the switch is locked. Channels 90 - 99 are always open (unlocked).

2) BACKGAGE CONTROLS - These three buttons, FWD, SLOW & REV control the manual backgage operation. Holding the FWD button in moves the backgage forward in high speed. Holding the REV button in moves the backgage in the reverse direction in high speed. Holding the SLOW button down along with either the FWD or REV buttons moves the backgage forward or reverse in slow speed.

For manual control, approach your cut position in high speed, use the SLOW button as you near it and make final hairline adjustments with the micro-adjust handwheel.

3) NUMBER ENTRY - Calculator style keyboard for number entry. Pressing any key on the keyboard will stop backgage motion.

4) COMMAND KEYS - Keys which are used to activate the various functions of the MPC computer spacer.

ENTER - Enter key. Used in combination to activate other Command functions. Used to add cut dimensions to build up new programs. In old programs, used to change the dimension displayed.

SEND* - Send key can be used at any time to make the backgage go to whatever position is currently displayed on the top LED display. Simply enter the number you want the backgage to go to and hit SEND. In Auto mode SEND can be used to reposition the backgage without making a cut and will automatically advance to the next step for you.

NOTE: Whenever the backgage is under computer control (as in the SEND function), the computer will do a pushout (moves ahead 5") when changing from a small dimension to a larger dimension. This is a safety feature which eliminates the need for the operator to reach under the knife and clamp to remove stock.

CLR - Clear key. Erases any numbers from the top LED display.

SCAN* - the Scan key shifts the computer into the Auto mode of operation and allows the operator to review a program step-by-step, or by holding the key down, to rapidly scroll through the entire program. After the last step it will return you to the first (01) cut position

CHANNEL - The Channel key is used to access channel positions 01 - 99 in the computer's memory (channel 1 & 2 on MPX). It can be used to access a specific channel or used to search for an empty channel (see Channel Selection, under Programming).

INSERT - The Insert key is used to add onto the end of a new or old channel and to insert cuts between steps of an existing channel. Inserts cut position shown on display **after** the step position shown on the lower LED display.

DELETE - In an existing channel program, the Delete key is used to erase a single step, the rest of a channel, or an entire channel (see Building a Program, under Programming).

PUSHOUT* - Whenever this key is pressed the backgage will advance 5" and then return to the position it started from. Used in conjunction with the Jogging Aid, it eliminates the need to reach under the knife and clamp to load or remove stock.

AIR - For machines equipped with the air table option, press the AIR button once to turn air on, press again to turn air off. The AIR button controls a valve which routes the air to or away from the table.

* SEND, SCAN & PUSHOUT keys are the only commands allowed in the Auto mode of operation. Pressing any other key exits Auto and goes into Manual mode. SEND & SCAN are not used in the service function.

5) STATUS LIGHTS - These lights tell the operator which mode the computer is operating in.

MANUAL - This light will be on whenever the computer is not in Auto mode and when there are no errors.

ERROR - This light will be on whenever the cutter isn't being used to indicate that the power to the machine is on. During operation, the error light comes on to indicate an incorrect entry has been made. To exit Error, press CLR or type any number.

(Example: Attempting to enter a number smaller than the forward limit or larger than the reverse limit.)

MEMORY FULL - This light will come on whenever the operator attempts to add more than 3800 cuts. The computer will enter steps through the 3800th position, then steps/channels will have to be deleted to make additional entries. Touch any key to get back to manual mode.

AUTO - Press SCAN to shift into the Auto mode. The Auto mode is used to run programmed channels. When this light is on, the computer will automatically advance to the next step in the channel after making a cut, pressing SCAN or SEND. SCAN and SEND are the only command keys allowed in the Auto mode.

6) CHANNEL/STEP DISPLAY - This lower, two position, LED display will show the operator what the current step or channel is. The symbol digit code tells which of these is currently being displayed.

7) SYMBOL DIGIT - The first position of the top display is used for symbol codes which tell the operator what is being displayed in the lower channel/step display. An underlined 'c' ( ) indicates channel, a single lowercase 'c' indicates step or cut position. No symbol indicates you are in the Service function, and a modified 'L' ( ) indicates you are in the Label Cut function (Label Cutting is on MPC model only).

8) NUMERAL DISPLAY - This display shows the numbers being entered from the keyboard or calculated by the computer. It can also show the backgage position or cut positions in a program.

(fig. 36)

9) ENGLISH/METRIC TOGGLE SWITCH (MC Only) - This switch, fig. 36, changes the MC readout from one measurement mode to the other. There is no need to preset, simply flip the switch.

MPX/MPC OPERATING PROCEDURES - OUTLINE

The following is an abbreviated outline of the Operating Procedures for running the MPC computer spacer. Familiarize yourself with the operation of this machine by reading the in-depth descriptions and examples which follow. Then use this outline to refresh your memory as needed.

A. PRESET - Bring the backgage FORWARD through the 5" preset position. Coordinates backgage and computer.

B. NUMBER ENTRY

1) **Keyboard Entry** - Press number keys and ENTER

2) **Relative (±) Entry** - Press + or - to add or subtract relative to position shown on display. May be entered (ENTER), inserted (INSERT) or sent (SEND).

3) **Fraction Entry** - Fraction $XX^{YY}/_{ZZ}$ entered as XX.YY.ZZ

4) **Backgage Position** - Press handwheel to bring current backgage position onto display.

C. PROGRAMMING

1) **Introduction** - ENTER key enters numbers into memory & executes commands.
INSERT key adds cut positions to existing programs.
DELETE key:
(1)Single Entry: press DELETE
(2)Remainder: press CLEAR + DELETE
(3)Channel: press CLEAR + DELETE at step 01.

2) **Channel** - Select: CHANNEL + # + ENTER
(99 channels on CRT & MPC; 2 on MPX)
*Search: CHANNEL + * + ENTER

3) **Create Program** - Select channel, enter #, press ENTER or INSERT.
SCAN - Press SCAN key to review steps, press and hold to scroll through steps.

4) **Run Program** - Select channel, press SCAN, press SEND, start cutting.

5) **Program Changes** - DELETE: Press DELETE key or CLEAR + DELETE.

6) **Label Cut** - Press 55 + ENTER (Metric; Press 1397 + ENTER)
Enter: 01 Width,
02 Trim &
03 (Qty - 1).

D. METRIC

1) **Metric** - Enter Service function (CHANNEL + 0 + ENTER), press entry key (6), press CLEAR + ENTER.

2) **English** - (CHANNEL + 0 + ENTER), (6), press any nonzero number + ENTER.

E. SERVICE MODE - See page 27.

* MPC & CRT Models only.

OPERATION

A. PRESET

The computer initially powers up in the English mode showing 55.000" on the top display. This should remind the operator that the machine should be preset.

The presetter is located five inches (5"/127mm) behind the knife. The presetter coordinates the computer to the actual backgage position. To preset the computer, the backgage must pass FORWARD through the five inch preset position.

Send the backgage forward to 4"/102mm by typing in 4" on the keyboard and pressing the SEND key. If the backgage is currently at a position less than five inches, use the manual backgage control buttons to move the backgage beyond five inches, then use the SEND key.

B. NUMBER ENTRY

Numbers are used together with the computer's command keys to control the backgage position either directly, or indirectly as when building a program.

A simple rule of operation is, first enter the number and then tell (command) the computer what to do with that number.

There are several ways that numbers can be entered into the computer. The best way to learn them is by actually standing in front of your machine and trying them. They are as follows:

1) Keyboard Entry

Type in the number you want and press ENTER, INSERT or SEND. It is **not** necessary to enter leading or ending zeroes. If you want to enter 04.000, press "4". The number 05.250 could be entered as "5.25" - no zeroes necessary.

If you enter more than two digits before entering a decimal point, the computer will take the last two as valid.

Example:
If you enter 123.45, the computer will ignore the one (1) and take it as 23.450.

2) Relative (±) Entry

If you would like a position relative to the current position on the display, press + or - depending on which direction you would like the backgage to go, type in the relative amount and press either ENTER, INSERT, or SEND, the computer will then perform the math and use that number in the function you pressed.

Example:
If the display shows 12.888 and you would like to move the backgage 2.535" forward from that, press, 2.535, and hit SEND. The computer will subtract 2.535 from 12.888 and send the backgage to that position. The number could also be stored in a program or used to change a position in an existing program.

3) Fractional Entry

The fraction; $XX^{YY}/_{ZZ}$ would be entered as, XX.YY.ZZ

XX is a one or two digit number between 0 - 99*
YY is a two digit number between 00 - 98
ZZ is a two digit number between 01 - 99
YY must be less than ZZ

*** NOTE:** The whole number must be within the range of the reverse limit switch or the computer will error out.

Examples:
If you would like to enter 5-1/4 inches, press 5.01.04, then hit ENTER, SEND, or INSERT and the computer will figure out the fraction and perform the operation.

If the display shows 8.000 and you would like to make a cut at 3/8 of an inch before that, press "-" 0.03.08 and hit SEND. The leading zero before the left decimal is not mandatory but is allowed.

You could have entered the cut or added it to memory by pressing ENTER, or INSERT, instead of SEND.

4) Backgage Position

The backgage position can be used to enter cut positions directly to the computer display by simply pressing the handwheel. Once the backgage position appears on the display, the previous operations Relative Entry, Fractional Entry, ENTER, INSERT, and SEND, can all be used to program or reprogram a step or to reposition the backgage.

Example:
You don't know the rough size of your stock, but do know the label sizes. Manually get the backgage to the

point for the first trim. Select a new channel and press the handwheel to bring the backgage position onto the display, and press ENTER. If you know the labels are 2-3/8 inches wide, press "-" 2.03.08 ENTER. Repeat the sequence, "-" 2.03.08 ENTER, as many times as there are rows of labels. You may now hit SCAN twice, hit SEND and your job is ready to run.

Backgage position entry could be used to do "First Lift Programming". Select a new channel, then use manual controls or the SEND key to position your stock. When in position, press the handwheel (brings backgage position to the display) and press either INSERT or ENTER to store the position.

Notes In General:

On a new channel, the enter key, ENT, will automatically add to the program for you, but once you have changed channels or scanned the channel, ENT will only change the current step.

Another way to add a series of numbers to build up a channel is with the Label Cutting Mode. This mode of number entry is covered in its own section later in these instructions.

The above examples are only a small sample of how the system can be used, there are many different ways to use the various features of the MPC. The only way to really learn it is to actually use the machine.

C. PROGRAMMING

1) Introduction

Programming the computer is quite simple if you remember the following generalization. The procedure of operation and command of the computer is to give or enter a number, and then tell (command) the computer what to do with the number.

There are three command keys used in programming channels. What follows is a description of these keys and how to use them.

ENTER (ENT) key - On a new channel, pressing this key will store the number on the display in memory. The cut position (lower display) will advance as each cut is entered. Once you have finished programming a new channel and you either hit SCAN to look at it, or select another channel and come back to it, your new channel becomes an old channel.

With an old channel, ENTER will only change the current step. No step advance will take place.

INSERT (INS) key - On a new channel, this key functions just like the ENTER key to add on to a new program.

In an existing (old) channel, Insert must be used to add onto the end of the program or it can be used to insert new numbers between steps of the program. It will insert **after** the current step shown on the display. Whatever is shown on the display is what will be added/inserted in Memory.

DELETE key - There are three ways to use the Delete function;

(1) Delete Step

If you wish to delete a single step, simply get to that step and press the DELETE key. Only the current step will be deleted.

(2) Delete Rest

If you enter zero (or press CLEAR key) at the current step and press DELETE, the current step and the remaining steps of the channel will be deleted.

(3) Delete Channel

If you press zero (or CLR) and DELETE at the beginning of a channel (step 01), the entire channel will be deleted.

2) Channel Selection (CHANNEL + # + ENTER/ CHANNEL + · + ENTER)

After your computer has been preset, you must tell the computer which channel you want to put your program on.

To select a channel, press CHANNEL followed by the desired channel number, then ENTER.

After pressing CHANNEL, the top display will show a '⁝' symbol at the left of the display. When this "channel symbol" is displayed, the lower, two digit display shows the current channel (01-99 on MPC & CRT; 01-02 on the MPX).

Once the display shows the channel you want to go to, press ENTER, and the computer will go to that channel and display the first cut position (01) in that channel. After pressing the ENTER key, the symbol in the upper display will change to '⁝', the bottom display now shows the current cut position number (01 - 99; steps 101, 201, etc. would display as 01 also). If the channel is empty the first position, "00" will show in the bottom

display and the top display will show the cut symbol and a single zero.

NOTE: This procedure (CHANNEL + ENTER) may be used any time you wish to return to the first position of a channel.

To use the **SEARCH*** function, press CHANNEL, the channel symbol '⁞' will show, then press the decimal point. The computer will automatically advance to the next empty channel. Once an acceptable channel is shown in the two digit display, press ENTER to go to that channel.

NOTE: MEMORY LOCK switch will prevent channels 01 - 89 from being programmed if it is closed (locked position).

*Search function is not available on MPX models with only two channels.

3) Building a Program

To build (or write) a program is simply a matter of entering the desired number (according to the previous directions for Number Entry), and pressing the ENTER, or INSERT keys to store them in memory.

(1) Select a channel that is empty.

(2) Enter cut positions; type in the number and press INSERT or ENTER.

"First Lift Programming" If you don't know the cut positions, you can program your channel as you cut the first lift.

(1) Load your stock.

(2) Select an empty channel.

(3) Use the manual backgage controls or the SEND function to position the stock for your first cut.

(4) You may now make your cut then store the position, or store it first then make your cut. Either way, press the handwheel to bring the backgage position onto the display and press either INSERT or ENTER.

It may be more helpful to make the cut first, then if minor corrections are necessary, these can be made before storing the position.

(5) Move to the next cut position and repeat the storage procedure in step 4 above.

(6) Continue until you are finished cutting.

(7) Press SCAN once to enter the Auto mode of operation, and again to return you to the first cut position. Press SEND to bring the backgage to that position and you are ready to load another lift for cutting. In Auto mode, the computer will automatically advance to the next cut position after each knife cycle.

PROGRAM REVIEW (SCAN key)

To review the list you have just programmed, press the SCAN key. Press once to enter Auto mode and then press it again to review the program step by step. If you want to step through the program fast, once you have entered Auto mode, press the SCAN key and hold it down. The display will then continuously step through all the program positions.

4) Running a Program

To run a program that has already been programmed, you need only:

(1) Select the channel your program is on.

(2) Press SCAN to enter the Auto mode of operation.

(3) Press SEND to bring the backgage to the first cut position.

(4) Load your stock.

(5) Start cutting. The computer will automatically advance the backgage to the next cut position and at the end of the lift will return you to the starting cut position (01).

Pressing any key other than SCAN or SEND will exit the Auto mode and place you into the Manual mode of operation.

NOTE: You will notice that during a SEND or when in the Auto mode, whenever the backgage moves from a small dimension to a larger one, the backgage will do a pushout (move ahead 5.000") before going to the larger dimension. This is a safety feature that eliminates the need to place your hands under the clamp/knife danger zone. This dimension is automatically set when the computer is set up (initialized), but may be changed by following the instructions under SERVICE MODE.

PROGRAM INTERRUPT

If while running a program, someone brings in a rush job, or you need to make a stray cut, simply do a pushout and set your job aside,

(1) Enter the dimension of the stray cut. Computer exits Auto mode and enters Manual mode.

(2) Press SEND to move the backgage to the cut position.

(3) Make your cut(s).

(4) When done, press SCAN to re-enter the Auto mode.

(5) Then press SEND and you will return the backgage to the step in your program where you left off.

5) Program Changes

As covered above in the Introduction to Programming, there are several ways to change an existing program.

DELETE - Using the DELETE key, you can delete a single entry (press DELETE); an entry and the remainder of the channel (press 0 CLEAR and DELETE); or the entire channel (press 0 CLEAR + DELETE at step 01 of the channel).

CHANGE - Any single cut position can be changed by entering the new dimension on the display and press the ENTER key. This places the new dimension in the memory at the cut position shown on the lower display. It does not advance the step position.

INSERT - The Insert key is used to expand an existing program. Either to add onto the end of an existing program or to insert steps between existing cut positions. You must remember that the dimension that is currently displayed will be inserted **after** the step shown on the lower two position display. To add to a program, use the SCAN key to position the display at the last cut in the program. Enter the dimension onto the display that you want added and press the INSERT key. Your dimension will be added and the step advanced if you wish to add another dimension.

To insert a number between steps in a program, again use the SCAN key to position the lower display to the step **after** which you want the dimension added. Enter the dimension onto the display and press the INSERT key. The dimension will be inserted and all existing cut positions will be moved back one step.

---

6) Label Cutting (Not available on MPX Model cutters)

The label cutting mode is simply an automatic inserting (INSERT) function. It can be used to build up a channel, or to insert increments (a block of sequential cuts) between steps of an existing channel.

To enter the Label Cutting mode, begin by selecting a channel, entering the necessary pre-trims, then type, 55 & ENTER. At this point, the display will show 0.000.

NOTE: To enter Label Cutting from the Metric mode enter '1397' instead of '55'.

The computer is now waiting for you to enter:

(01) Label width;

(02) Trim between labels; and

(03) (Qty-1), the number of times to repeat the steps.

Notice that the bottom display increments (01 - 02 - 03) to help you keep track of which one you are on. Once you have entered the number of times, the computer will leave label mode and perform the insertions for you.

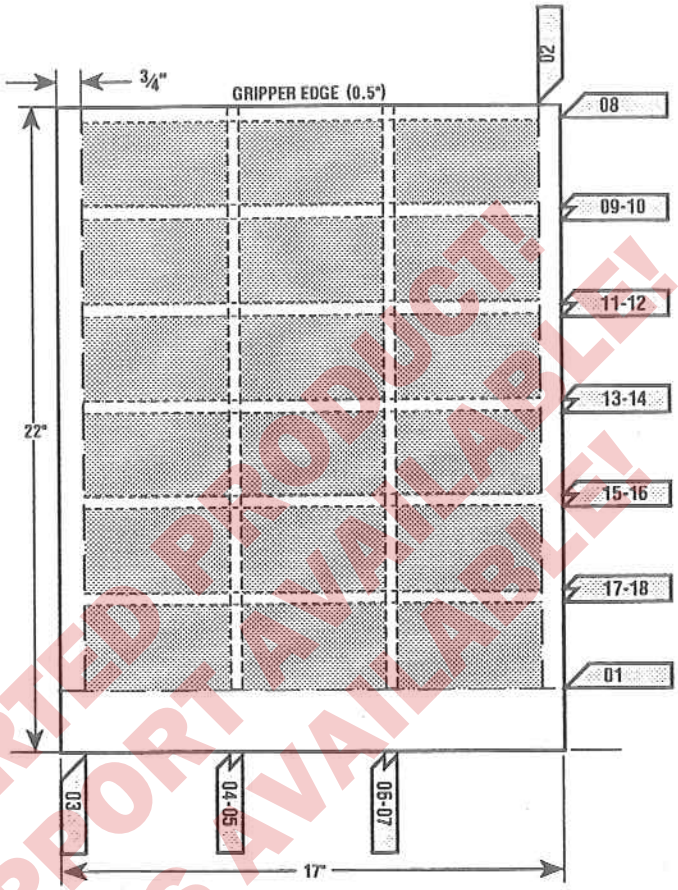
If a mistake is made while in label mode, press any function key, other than ENTER, and CLEAR. The computer will error out of label mode, then you may re-enter 55 to get back to label mode.

NOTE: Because Label Cut is an INSERT function, it will build up steps in an old or new channel without advancing the backgage through each step. If you are cutting as you program, you will have to use the SCAN key to return to the first cut position at which the Label Cut Routine was started. Any additional trims after this point will need to be inserted using the INSERT key rather than the ENTER key as the computer now views your channel as an OLD channel. It is least confusing if you create your program using Label Cut first and *after* the program is written, do the actual cutting.

Example:
Stock size is 17 x 22".
Gripper edge is 1/2".
Side Guide edges are 3/4" each.
Label size is 3 x 5".
Trim between labels is 1/4".
(See illustration 4)

STEP DESCRIPTION

Place stock with gripper edge against backgage.
01 ENTER trim of 19-3/4" (19.03.04).
Rotate stock 90°, cut edge against cutter side guide.
02 ENTER trim of 16-1/4" (16.01.04).
Rotate stock 180°.
03 ENTER trim of 15-1/2" (15.01.02)
04-07* Press 55 & ENTER (Enters Label Cut routine).
01 Label Size = 5"
02 Trim Between = 1/4" (0.25")
03 (Quantity - 1) = (3 - 1) = 2
You will now have three strips of labels with the gripper edge still on them.
08* ENTER trim of 19-1/2" (19.01.02).
09-18* Press 55 & ENTER (Label Cut routine).
01 Label Size = 3"
02 Trim Between = 1/4" (0.25")
03 (Quantity - 1) = (6 - 1) = 5
You may stack all three strips on top of each other for the final cuts (08 - 18) or you may wish to repeat these steps for each strip.



ill. 3

NOTES: *See NOTE preceding example.
** The number of times to repeat (Qty - 1) must be less than 66. The routine may be run twice to exceed the 66 limitation.

C. METRIC

If the Metric entry is clear as described in Service mode, the display will show all numbers in "MM", and the keyboard entries will be taken in "MM". Fractional entry is disabled in this mode, but the other functions operate the same way as in English.

To tell at a glance which mode you are in, check the position of the decimal point. (Only one position, 0.1mm, shown behind decimal in metric.)

D. SERVICE MODE (CHANNEL + 0 + ENT)

1) Introduction

There are certain parameters (Stop Compensation and Slow Down) which the computer needs to position the backgage correctly. These numbers will change depending on backgage motor speed settings and the "tightness" of the backgage system. There are other parameters (forward limit, reverse limit, push out, metric and knife count) which are designed to make things easier for the operator.

The following is a list of the parameters mentioned above and the entry keys needed to check each.

ENTRY KEY	FUNCTION	DEFAULT (MPC,MPX)	LIMITS
1	Stop Compensation	0.006"	0.020"
2	Slow Down Point	0.450"	1.000"
3	Forward Limit	2.000"	≤3.00"
4	Reverse Limit	30.000"	≥30.00"
5	Push Out	5.000"	
6	Metric On/Off Status		
7	Display Accuracy	± 0.005"	+ 0.010"
8	Knife Count		
930	Default Setup		

*** * * Special Functions * * ***

910 Security Code - Default Change
911 Diagnostics
912 Segment Test
913 Program Revision
914 Preset Compensation
915 Diagnostics History
919 Initialize Memory & Ram Test - WIPES OUT MEMORY!

To get into Service mode, press CHANNEL, then 0 (zero), followed by ENTER. One single decimal point and four zeroes should show in the upper six digit portion of the display.

To check any of the first eight parameters, type in the parameter's entry key. The current value for that parameter will show on the upper display and its entry key will show in the bottom display.

If you want to change the number, you will have to use the Special Function - 9 1 0. This special Security Code prevents operators from accidentally changing the parameters while viewing the settings. After entering the service mode, press 9 1 0 and the entry key of the parameter you want to change. You may now enter any number within the limits shown in the chart above. If a value outside of the limits is entered, the system will re-enter the default value.

2) Definition of Terms

(1) Stop Compensation - Press: CHANNEL, 0, ENTER, 1. The amount of space needed to account for backgage momentum. The computer will shut the backgage motor off at the new cut position, plus the stop compensation. System Default set at 0.004". This setting may be customized up to 0.020".

(2) Slow Down Point - Press: CHANNEL, 0, ENTER, 2. The amount of space before the final destination where the computer should shift from fast to slow speed. Typically about 0.550". Custom limit of 1.000".

(3) Forward Limit - Press: CHANNEL, 0, ENTER, 3. The most forward point that the backgage can get to. This parameter makes sure that the operator won't send the backgage to a number smaller than the backgage can get to. Typically 2.000". Can only be set to a value of 3.000" or less.

(4) Reverse Limit - Press: CHANNEL, 0, ENTER, 4. The farthest point the backgage can get to. This parameter keeps the operator from trying to send or program the backgage to a number larger than the backgage can get to. Can be customized to value of 30.000" or greater. Typically 30.000".

(5) Push Out - Press: CHANNEL, 0, ENTER, 5. Whenever the computer moves the backgage to a larger dimension it does a push out. This parameter tells the computer how far to push out, default automatically sets to 05.000". If no push out is desired, enter zero. The use of a push out eliminates the need to reach under the clamp/knife area to remove stock - A DANGEROUS PRACTICE!

(6) Metric On/Off Status - Press: CHANNEL, 0, ENTER, 6. If this parameter is zero, the computer displays data in metric. The computer powers up in English mode. Enter zero ('0'), if metric is desired. To get back to English, enter any nonzero number.

(7) Display Accuracy - Press: CHANNEL, 0, ENTER, 7. If the actual backgage position stops ± this amount, the display will show the programmed position. If you want the display to always show the actual backgage position, enter zero (0). Must be less than or equal to, (±), 0.010".

(8) Knife Count - Press: CHANNEL, 0, ENTER, 8. This value increments (increases) when a cut is made. Operator may only clear this setting. Pressing any other key will exit knife count.

(930) Default Setup - Press: CHANNEL, 0, ENTER, 9, 3, 0. Pressing this number will reset all the service parameters back to the default values. It will not affect any programs stored in the memory.

3) Special Functions

(910) Security Code - Press: CHANNEL, 0, ENTER, 9, 1, 0. As explained in the paragraph above, this code allows the operator to customize (change) the system defaults to suit their special cutting needs.

(911) Diagnostics - Press: CHANNEL, 0, ENTER, 9, 1, 1. This is a service function only. Entering 9 1 1 will cause the top display to alternately flash between the backgage position and the diagnostic code. Diagnostic codes and their meanings are listed in the MICROPROCESSOR TROUBLE SHOOTING SECTION later in this manual (page 34). This feature may be disabled by re-entering the service mode (CHANNEL+0+ENTER) and pressing 9 1 1 again.

(912) Segment Test - Press: CHANNEL, 0, ENTER, 9, 1, 2. Pressing this code number in the service mode will light all the segments of the L.E.D. display including decimal points. They all should be lit.

(913) Revision Level - Press: CHANNEL, 0, ENTER, 9, 1, 2. Entering this code number will display the Program Revision Level of the computer.

(914) Preset Adjustment - Press: CHANNEL, 0, ENTER, 9, 1, 4. Allows the operator to adjust the preset accuracy ± 0.25"(6.3mm) without resetting the presetter wand adjustment.

(915) Diagnostic Memory - Press: CHANNEL, 0, ENTER, 9, 1, 5. This function accesses the diagnostic memory. After entering 9 1 5 the top display will show the current diagnostic Error Code in the first two segments of the upper display. The second two segments will show the last ten (00-09) Warning Codes and the last two segments will show the last ten (00-09) Error Codes. The lower, two digit display shows which of the last ten (00, 01, ...,08, 09) Warning or Error codes are being displayed in the last four segments of the top display. Press the plus (+) or minus (-) keys to scroll up or down through the last ten codes in the diagnostic memory.

(919) Memory Initialization & Ram Test - **This code WILL ERASE ALL CUTS STORED IN MEMORY!** Press: CHANNEL, 0, ENTER, 9, 1, 2. The MEMORY LOCK key must be off (unlocked) and the display will go blank during this process. If the memory protect key is on, the computer will do nothing when the last number is pressed. The 9 1 9 code will also reset all the service parameters back to the default values.

Pressing this code number also causes the computer to do a test of the memory chip which stores your cutting programs. If the memory chip is bad the display will show the following characters:

Once the nine service operations are set, battery backup will maintain them. Except in extreme situations (such as strong power surges) battery backup will maintain stored program memory for up to one month. It is a good idea however, to check the first eight whenever the power has been interrupted. If for some reason, battery backup fails, the above procedure must be repeated.

To exit Service mode, select a non-zero channel.

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 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 the 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 a #16 micro finish. This bevel is designed 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.

- It 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 at least 3 knives. One 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, to prevent damage to the knife and for safety.

- 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.

- When changing the knife, the new blade may be coated with light oil to prevent rusting. This should be REMOVED WITH CARE.

- 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 injury to yourself.

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

TROUBLESHOOTING

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.

WON'T START

1. Fuse blown
2. Starter defective
3. Loose plug or wire
4. Cut button defective
5. Key lock defective

CUT BUTTONS PUSHED - MACHINE DIES

1. Knife and clamp are out of sequence. Turn off power and turn key back on.
2. Check clamp and knife up limit switches.
3. When cutting a full pile, the clamp up limit switch does not break contact, either adjust limit switch or cut down on pile height.

CUT BUTTONS ACTIVATED - WON'T CUT

1. Cut button defective
2. Motor wired wrong, going in direction opposite arrow
3. Pilot check on knife cylinder defective
4. Sequence valve pressure set too high
5. Knife down solenoid in knife directional valve inoperative
6. Knife up limit switch not in adjustment

ERRATIC OPERATION - POWER LOSS

1. Clogged filter
2. Low hydraulic oil level
3. Dirt in relief valve
4. Worn out pump
5. Oil bypassing clamp cylinder piston

CLAMP WON'T OPERATE

1. Clamp Up Limit switch out of adjustment
2. Clamp pressure reducer valve set too low
3. Clamp down solenoid defective
4. Relief valve defective
5. Check adjustment on knife up limit switch

CLAMP WON'T HOLD PRESSURE

1. Clamp cylinder seals worn
2. Pressure valve setting too low

CLAMP WON'T BOTTOM

1. Clamp cylinder out of adjustment
2. Clamp return spring broken or out of adjustment

CLAMP NOT PARALLEL TO TABLE

1. Clamp connecting rod out of adjustment

CONCAVE CUTTING - ENDS WIDE, CENTER NARROW

1. Excessive moisture at edges of paper.

CONCAVE CUTTING - VARIATION OF TOP AND BOTTOM

1. Soft stock not firmly clamped
2. Knife dull or ground incorrectly
3. Knife bar gibs loose
4. Air in stock when clamped, pulls away from back-gage

INCONSISTENT STOPPING OF KNIFE IN UP POSITION

1. Bind in knife linkage or gibs

HESITATION OF KNIFE

1. Dull knife
2. Seals worn in knife or clamp cylinder
3. Pilot check on knife cylinder defective

KNIFE WON'T RETURN

1. Knife up solenoid in directional valve defective

CLAMP WON'T RETURN

1. Knife up limit switch not engaging or defective
2. Clamp up solenoid in clamp directional valve defective

KNIFE DRIFTS DOWN

1. Knife bar snubber spring out of adjustment
2. Knife bar gibs out of adjustment
3. Defective pilot check on knife cylinder
4. Defective seals in knife cylinder

KNIFE STOPS IN STOCK

1. Knife too dull
2. Relief valve defective
3. Pressure control valve clogged or defective
4. Knife cylinder seals worn
5. Clamp cylinder seals worn
6. Motor stalling due to low voltage or too small wire to the machine

NOISY AND SLUGGISH HYDRAULIC SYSTEM

1. Oil filter partially clogged
2. Cylinder seals worn on clamp or knife
3. Low on oil

INACCURATE CUTTING

1. Backgage not square
2. Knife bar has play - tighten gibs
3. BAckgage gibs loose

BACKGAGE SPEED ERRATIC

1. Oil on belt
2. Belt/pulley loose

BACKGAGE MOVEMENT ERRATIC

1. Backgage gibs loose or binding on table way
2. Backgage nut binding on leadscrew, screw bent or dirty
3. Problem with electrical dirve component (see below)

DRAWING OF STOCK

1. Dull knife
2. Low clamp pressure
3. Hydraulic oil low
4. Air in lift – reduce pile height

MPX/MPC MICROPROCESSOR TROUBLESHOOTING

The following is a brief guide to aid service-people in troubleshooting the microprocessor computer. Before using this guide the service-person should first attempt to run the self diagnostic tests listed under the Service Mode in the Computer Operation section of this manual, pg. 27, codes for the diagnostics can be found on the next page, pg 34. See the companion manual, F.701-B, for Troubleshooting information specific for CRT Model cutters.

PROBLEM - AREA TO CHECK*

Segment test fails - EE-2243-1(MPX); EE-2540(MPC).

Keys of keyboard enter incorrect digits - Keyboard connector either disconnected or off by one pin. EE-2243-1(MPX); EE-2540(MPC).

Computer display stops at the correct position, but the backgage is off - EE-2243-1(MPX); EE-2540(MPC), encoder, preset board or wand improperly positioned.

Backgage moves but display does not count, display dims - EE-2243-1(MPX); EE-2540(MPC) or encoder.

Speed of backgage is not stable in slow speeds - EE-2240.

Backgage and display consistently miss the mark by the same amount - Check Stop Compensation and Slowdown Settings in Service Mode of Computer Operation section.

Manual buttons move backgage but display does not update, display does not dim - EE-2243-1(MPX); EE-2540(MPC).

Handwheel moves backgage but display does not update, display does not dim - Check handwheel switch and its connections, or EE-2243-1(MPX); EE-2540(MPC).

Computer locks up and will not accept commands - Memory is not initialized or Memory Lock key is closed. Key is stuck in on keyboard.

Checksum and/or Ram Test fail - EE-2243-1(MPX); EE-2540(MPC).

Loss of automatic or manual control of backgage - EE-2240, EE-2243-1(MPX), EE-2540(MPC), clamp or knife up limit switch not engaged,or key on keyboard stuck.

Machine does not preset - Make sure wand is passing deep enough through presetter sensors. Also check EE-1574-5 or EE-2243-1(MPX); EE-2540(MPC).

Backgage moves in one direction only - EE-2240, EE-2243-1(MPX), EE-2540(MPC), or forward or reverse limit switch is stuck.

Backgage motor doesn't run but voltage is present at terminals #39 & 40 of the Power Panel - Check backgage motor.

Memory does not advance after each cut or advances by itself - Check EE-2243-1(MPX); EE-2540(MPC) or EE-2240.

*NOTE: Circuit boards designated by "EE" numbers can be found in the electrical diagrams at the back of this manual.

MC/MPX/MPC DIAGNOSTICS
WARNING & ERROR CODE REFERENCE CHART

NOTE: If the display shows an unused number or one designated as Normal or Normal Condition there is no problem. these indicate proper operation. To display and/or review (MPX &MPC) error codes use the Service Mode & 9 1 1 code. On the CRT press the DIAG softkey. MC machines will stop operating and display the error codes on the LED display until the error or warning is corrected or the machine is restarted. For further instructions see part D. Service Mode, under MPX/MPC OPERATION section.

WARNING CODES

Communication (01-19)

00 RESERVED
01
} Unused
14
15 Power Panel Reset (Normal Condition)
16 Comm Link Shut down (Normal)
17 Up Link error recovery (Normal)
18 Unused
19 Unused

Console (20-29)

20
} Unused
22
23 Handwheel in – No backgage movement allowed
24 Backgage will not move
25 Backgage moves in wrong direction
26
} Unused
29

Backgage (30-39)

30
31 Knife down – No backgage movement allowed
32 Clamp down – No backgage movement allowed
33 Clamp & Knife down – No backgage movement
34
} Unused
37
38 Bind or no encoder pulse present during movement

Power Panel (40-44)

40 Cut button and/or footswitch stuck in – power up
41
} Unused
43
44 Guard muted during cut cycle

ERROR CODES

Power Panel (45-69)

45 Dynamic brake and SCRs were on at same time
46
} Unused
49

50 Execution out of bounds (MC–N/A)
51 Outputs on, outside of hydraulic routine
52 Starter dropped out while energized
53 Contactor de-energized but failed to drop out in time
54 Contactor de-energized but was stuck in
55 Contactor energized but should not have been (MC–N/A)
56 Hydraulics routine improperly called (MC–N/A)
57 Hydraulic motor contactor failed to pull in
58 Over heating (MC only)
59 Safety system shut down (if equipped with this option)

60 Unused
61 Outputs on, without cut button depression (MC only)
62
} Unused
69

Hydraulics (70-79)

70 Unused
71 Clamp cylinder failed to come up normally
72 Unused
73 Clamp cylinder failed to come down normally
74 Knife failed to leave the up limit
75 Knife failed to come up
76 Knife change
77 Sequence error
78 Unused
79 Unused

LUBRICATION

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

Schedule lubrication maintenance both early in the day and early in the week. This allows the lubricants to work into the machine. Lubrication at the end of the day or week allows the lubricants to run off without any benefit to the machine.

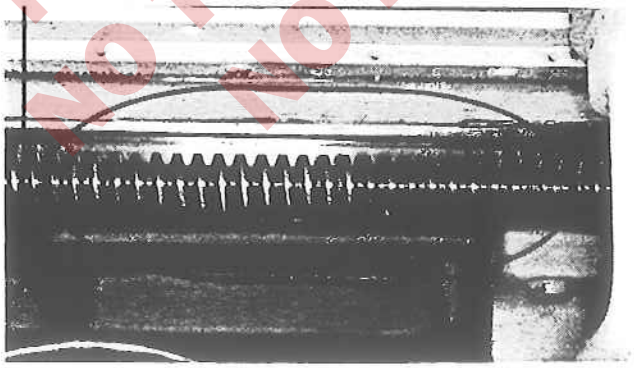
Clean off old, dirty excess grease. Clean accumulated dust off valves, hoses, and connections. Built up dust increases operating temperatures and causes premature wear of all hydraulic components.

Oil and Grease Points - WEEKLY

Run the knife down and **Lock Out the Power,** see Power Lockout Procedure, page 4. 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.

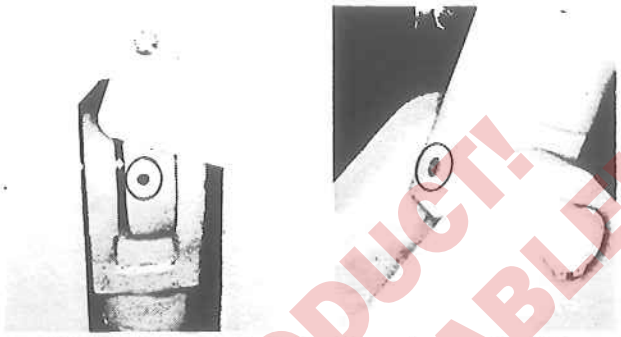
CAUTION: Replace all guards. Never operate cutter with any guards removed.

GREASE ☐ OIL ⬭



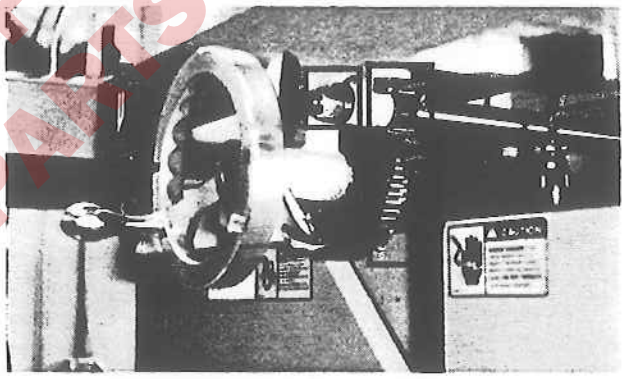
Use Existing (fig. 28) Photo

Backgage Leadscrew - Light Oil (fig. 37)

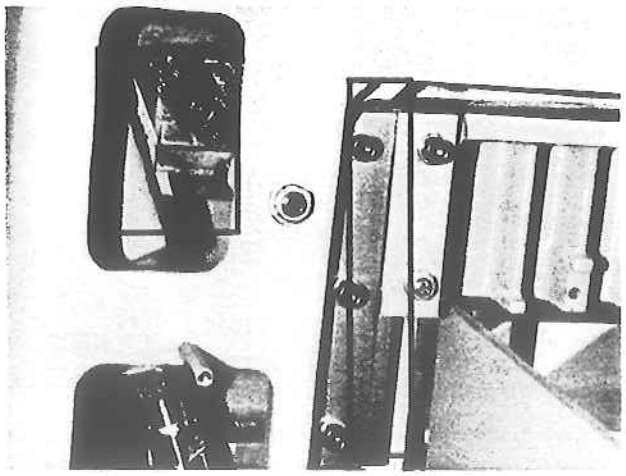


(fig. 38) Upper - Cylinder Pins - Lower (fig. 39)

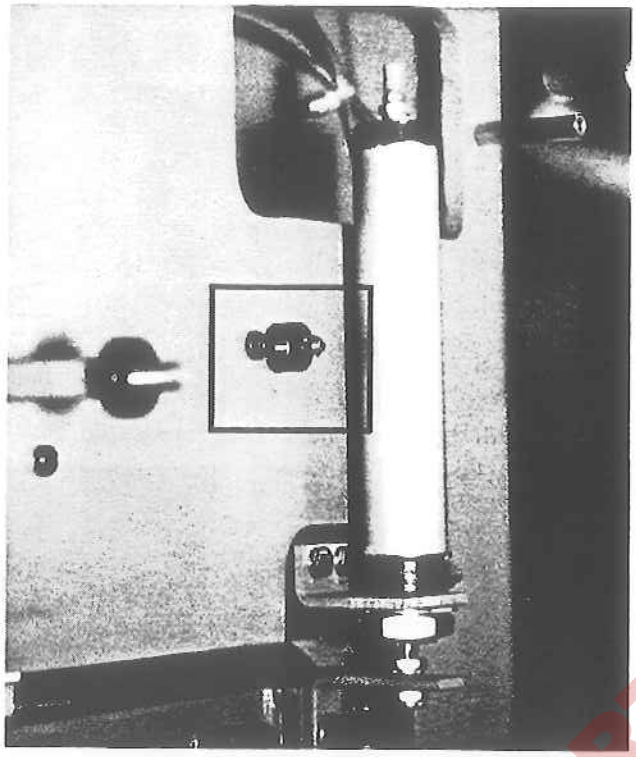
Leadscrew Bearings & Handwheel Actuator (fig. 40)



Leadscrew Bearings & Handwheel Gears (fig. 41)



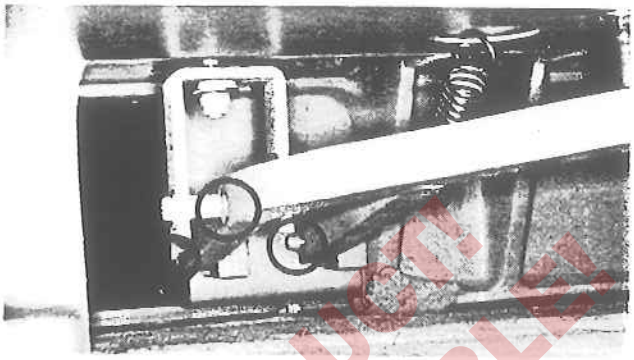
Knife Snubber & Clamp Guide - Grease (fig. 42)



Knife Bar Link Pins - Grease (fig. 43)

IMPORTANT!!! Upper and Lower Knife Bar Link Pin lubrication (grease fittings, behind upper arch cover and below table, and oil holes) are the most critical lubrication points on the entire machine. Grease and oil WEEKLY to prevent build-up of hardened grease, or more often, if cutter is to be operated continuously for extended periods.

Knife Bar Gibs - Grease (fig. 44)



Foot Pedal Pivot Pins - Oil (fig. 45)

HYDRAULIC SYSTEM

The Champion Series Cutters have both hydraulic cutting and clamping operations. The cutter is powered by an electric motor coupled directly to a hydraulic pump. The pump is a gear type with a fixed gallon-per-minute output of 7.5 at 1800 psi (max. system relief setting) at 1800 RPM.

The clamp action is powered by a hydraulic cylinder. When the cut buttons are depressed, this cylinder pulls on the clamp bell crank, and brings the clamp down (or brings the clamp up to full hydraulic pressure if the manual foot clamp is down). The cutting action is also powered by a hydraulic cylinder connected directly to the knife bar. The knife sequence valve generates 1200 psi of back pressure 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.

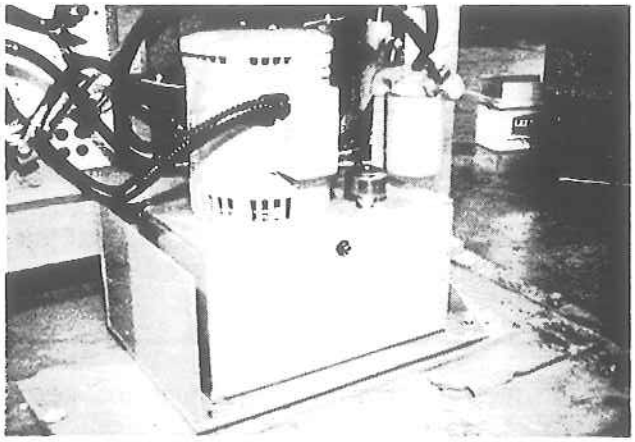
The hydraulic fluid should be changed YEARLY or EVERY 1000 HOURS of operation.

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

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

Refill the tank with 5 gallons of an ISO (International Standards Organization) Viscosity Grade 100, 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 operating conditions could result.

A table of various manufacturers and their equivalents is listed below.



(fig. 46)

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). The tank has a sight gauge on the back so you can check the oil level.

RECOMMENDED OILS

Use only one of the recommended oils or an ISO VG 100 Hydraulic Fluid equivalent. **Oils other than the recommended type will cause seals, cups and O-rings to deteriorate. See CAUTION below.**

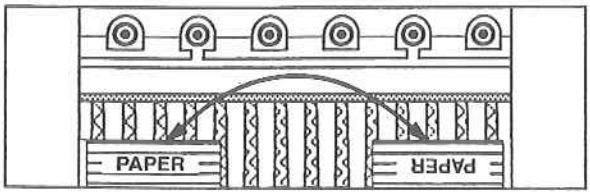
OIL NAME	DISTRIBUTOR
Rykon No. 100	AMOCO
Duro AW Oil 465	Arco
AW Machine Oil100	Chevron
Pacemaker XD No. 100	Citgo
Super Hydaulic100	Conoco
Nuto H-100	Exxon
Harmony 100 AW	Gulf
HO 2A Hydraulic Oil	Lubriplate
DTE No. 18	Mobil
Pennzoil AW 100	Pennzoil
Magnus A Oil 215	Phillips
Tellus 100	Shell
Energol HLP 100	Sohio
Industron 100	Std. Oil Indiana/Boron
Sunvis 851 WR	SUNOCO.
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.

ADJUSTMENTS

SQUARING THE BACKGAGE

To test the backgage for square, place a small lift of paper against the left side of the backgage (but not against the side guide) and make a cut.



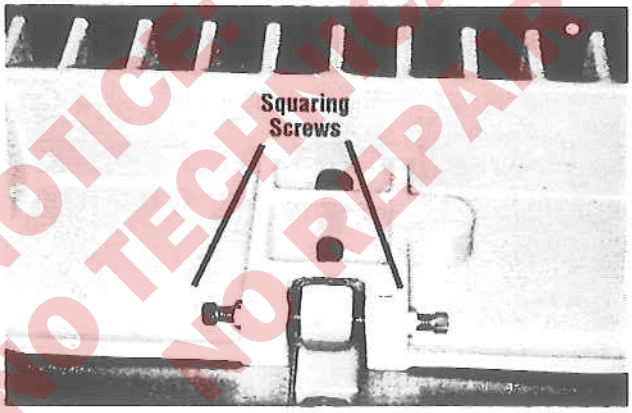
(ill. 4)

Now, leave the backgage in the same position, flip the lift over and against the right side of the backgage (but not aginst the side guide). Make another cut to see if any of the stock will trim off. Run two checks, one starting on the left and moving to the right, the other, moving from the right to the left. Trim in either sequence indicates the backgage is out of square.

1. As machine wears, make sure the backgage gibs are set properly first (see Backgage Gibs, page 44), then follow steps 2 through 5.

   NOTE: Gib adjustment is not necessary on initial machine setup as gibs have been adjusted at the factory.

2. Loosen the jam nuts on the backgage squaring screws.



(fig. 47)

3. Back off the squaring screw on the side that the trim occurred and tighten the other.
4. With the squaring screws tight, make another test. Continue to adjust and test until no trim occurs when testing in either sequence.
5. Set the jam nuts.

LIMIT SWITCHES

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.

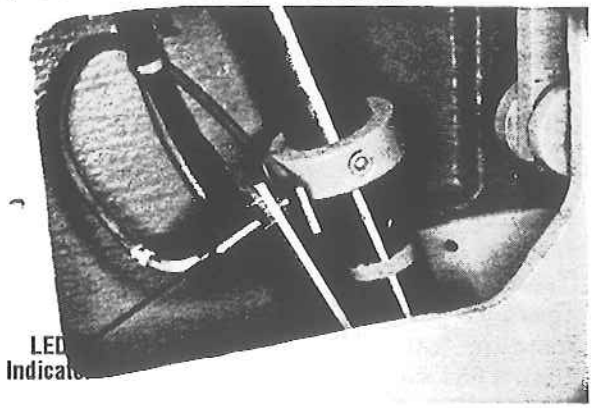
The Challenge Champion cutters now incorporate proximity switches to detect machine operation. These types of limit switches have no moving parts and are more reliable than the old style of contact switches.

Note: Adjust the switches in the following order:

1) **Knife Up Proximity Switch**
2) **Hydraulic Up Proximity Switch**
3) **Clamp Up Proximity Switch**
4) **Backgage Forward Proximity Switch**
5) **Backgage Reverse Proximity Switch**

1) Knife Up Limit Switch

This switch tells the machine electronics that the knife and clamp are sequencing properly. If not actuated, it prevents the clamp from coming up until the knife has returned to the up position. It is located inside the base casting and actuates from the bracket on the knife cylinder shaft, fig. 48. An indicator light on the switch body is on when the switch is actuated.



(fig. 48)

1. With the power off and the key removed, loosen and lower the knife up actuator.
2. Turn on the power.

CAUTION: CRUSH HAZARD! When the limit switch is actuated, the clamp will return to the up position. Keep hands and tools clear.

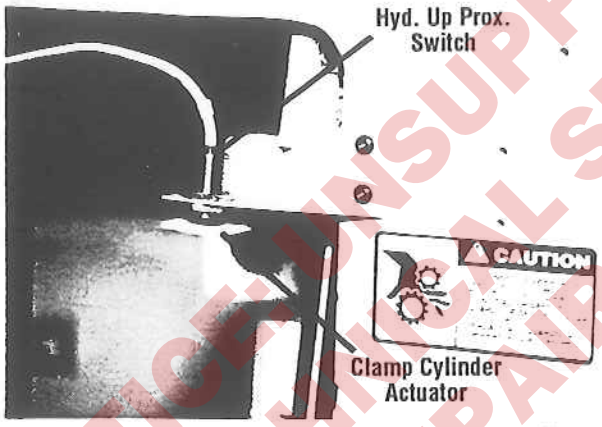
3. Turn on the key and press the cut buttons twice to make a cut. Release the cut buttons and the knife

will return to the up position and a load will remain on the hydraulic system for a few seconds.

4. After the hydraulics shut off, move the actuator up the cylinder shaft until the switch trips (indicator light will come on), then continue to move it an additional 1/16"/1.6mm. If the indicator on the switch does not come on, the jam nuts of the actuator may need to be loosened and the switch repositioned in its bracket (proximity switches must be within 1/16"/1.6mm to actuate).
5. Turn off the power and lock it out.
6. Tighten the actuator and the jam nuts of the proximity switch.

2) Hydraulic Up Proximity Switch"'

This switch is mounted on the left, rear leg of the base casting. An indicator light on the switch body comes on when the switch is actuated (proximity switches must be within 1/16"/1.6mm to actuate). The switch senses the extension of the clamp cylinder at the top of its stroke. This stops hydraulic power to the clamp and knife. If the switch is not properly set, the knife and clamp cylinders will be under constant load (indicated by excessive heat and noise).



Hydraulic Up Proximity Switch **(fig. 49)**

To adjust:

1. Loosen the bottom locknut and turn the top locknut down to raise the switch.
2. Turn on the key and press the cut buttons once to start the hydraulic motor.
3. The knife and clamp will move to the extreme up position and a load will remain on the hydraulics.
4. When the cylinder has stopped moving, pass a metal object in front of the switch to actuate it and take the load off the hydraulics. Keeping pressure on the switch to hold it against its mounting bracket, turn the locknut up to lower the switch until the indicator light in the switch comes on. Tighten the lower jam nut.
5. Press the cut buttons to cycle the clamp and check for clamp positioning.

3) Clamp Up Proximity Switch

This switch is mounted inside the rear of the arch casting, fig. 50. It is tripped by the clamp when the clamp is in its up position. This switch prevents backgage movement if the clamp is not up. On

Photo shows rear table & arch covers removed—do not operate machine without covers or guards in place!

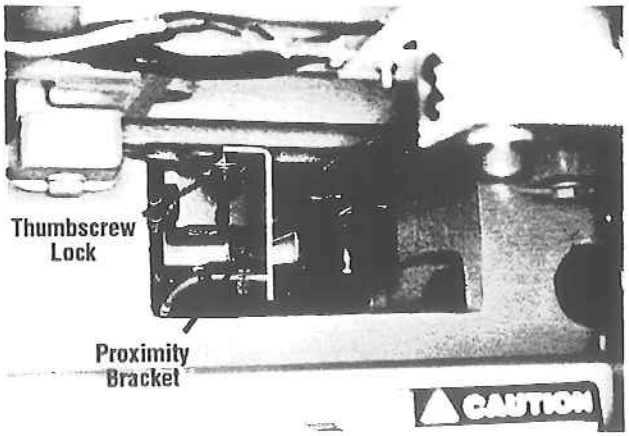
(fig. 50)

machines equipped with the air table option, it diverts the air from the table when the clamp is down to prevent the stock from moving during a cut.

This switch is tripped by a spring loaded actuator on the top of the clamp and requires no adjustment.

4) Backgage Forward Proximity Switch

This switch stops the forward motion of the backgage before it hits the mechanical stop or the false clamp plate (if installed). It is tripped by the forward actuator mounted on the bottom of the backgage nut.

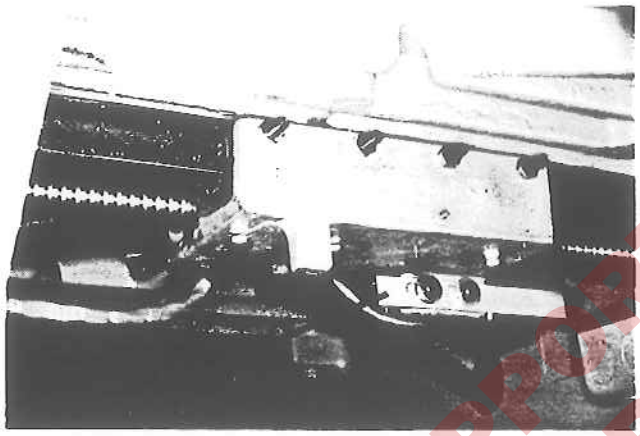


(fig. 51)

If the false clamp plate is installed the proximity switch bracket, fig. 51, must be moved to its rear most position to prevent the backgage from running into the false clamp plate. Simply loosen the thumbscrew and slide

the bracket back. If the false clamp plate is removed, the bracket must be returned to its forward position to obtain cuts smaller then 2".

Adjustments:
The proximity switch must be positioned in its bracket to be approximately 1/16"(1.6mm) away from the actuator mounted on the bottom of the backgage nut, fig. 51. Adjustments are made by loosening the two jam nuts and positioning the proximity switch in the bracket until the switch is tripped by the actuator. Make sure the switch is not extended too far as it may contact the actuator and damage the switch. Lock the jam nuts after the switch position has been set.

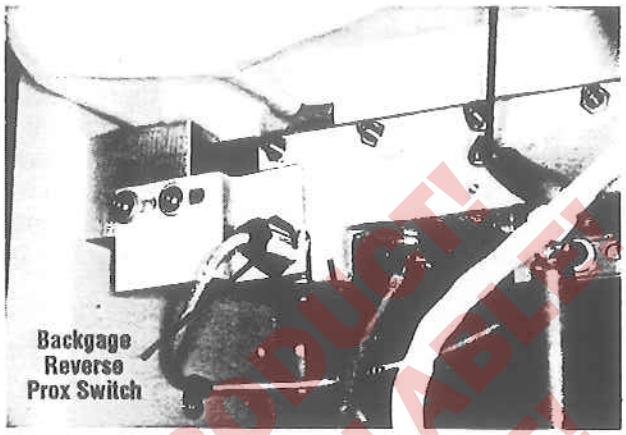


(fig. 52)

Once the proximity switch is properly positioned, the actuator can be adjusted, fig. 52. The actuator is adjusted by loosening the two socket screws and sliding the actuator forward or back. It should be set so that the backgage stops at 00.735" (0018.7mm). On the MPX/MPC models, use the SEND key to test. Make sure to tighten the socket screws once proper adjustments have been made.

NOTICE: Whenever changing the false clamp plate, the proximity sensor bracket must be changed appropriately ***and*** the forward limit value must be changed in the service mode so the computer knows what the false clamp plate status is.

5) Backgage Reverse Proximity Switch



(fig. 53)

The backgage reverse proximity switch is located underneath the rear of the table above the backgage motor, fig. 53. This switch stops the backgage at the maximum rear position. It is actuated by the backgage nut casting and adjustments are made by positioning the switch in the bracket and then adjusting the position of the bracket itself. If not properly adjusted, the backgage may hit in the rear position and blow a fuse or bend the leadscrew.

Position the switch in the bracket by loosening the jam nuts on the actuator. With the backgage already in the rear position set the switch so it is tripped by the backgage, approximately 1/16"(1.6mm). Now adjust the bracket position so the switch stops the backgage from hitting the rear stop. Loosen the socket screws and adjust the position of the bracket forward or back as needed. Run the backgage all the way back with the backgage reverse key to check your adjustments.

HYDRAULIC VALVE ADJUSTMENTS

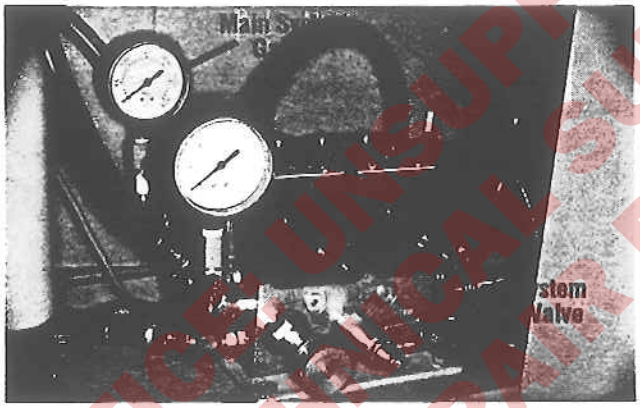
CAUTION: Several of the following tests require the machine to be operational for checking and adjusting. Be very careful that tools and other people are clear of moving parts and that the cutter is not accidentally operated while adjustments are being made. Disconnect the power and lock it out, see Safety Precautions page 4, whenever working on the machine unless the directions specifically require the machine to be powered.

For initial setup, adjust the valves in the following order:

1) **Main System Relief Valve - 1800 psi**
2) **Sequence Valve - 1200 psi**
3) **Pressure Reducer - 1000 max/400 min psi**

NOTICE: Pressure settings fluctuate with oil temperature. **Set pressures when the oil is hot.**

1) Main System Relief Valve (fig. 54)



(fig. 54)

This valve maintains the overall hydraulic pressure for the entire system. Factory Setting: 1800 psi.

Check Procedure:

1. Open the left access door on front of the cutter.
2. Turn the power on and make a cut to hold the knife down on the cutting stick. Read the pressure off the main system pressure gauge (rear gauge) while the knife is down. If the gauge does not read 1800 psi, an adjustment is needed.

To Adjust:

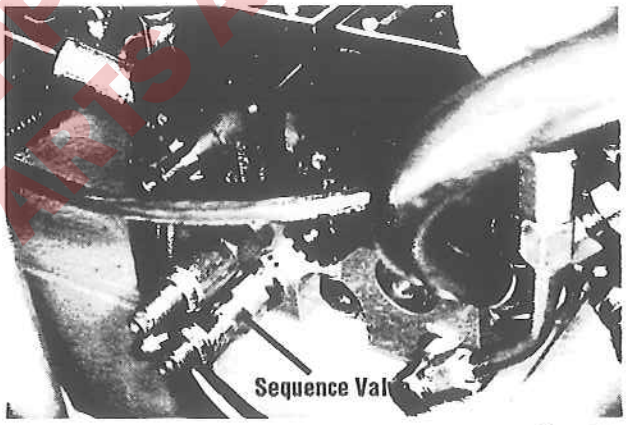
1. Loosen the lock nut on the relief valve. Use an Allen wrench to turn the adjusting screw. Turn IN to increase pressure, OUT to decrease pressure.

CAUTION: PINCH POINT - You will require two people to perform the following adjustment. One to hold the cut buttons in and the other to adjust the valve screw. Be extremely careful to keep hands and tools away from moving parts. The only thing that has to be handled is the adjusting wrench! A possible pinch point exists between the clamp parallel rod and the top of the valve solenoids. Do not place hands or tools in this area if the machine is to be cycled.

2. Make a cut and hold the buttons in. While reading the main system gauge, adjust the valve screw until you have the correct pressure.
3. Tighten the lock nut while holding the hex wrench in place.
4. Proceed to readjust the other valves.

2) Sequence Valve (fig. 55)

This valve controls the clamp and knife sequence. It keeps the knife up until after the clamp had made contact. It is the lower valve on rear of the manifold. Factory Setting: 1200 psi.



(fig. 55)

NOTE: Main System Pressure must be set at 1800 psi before making this adjustment.

Check Procedure:

1. Open the left access door on front of the cutter.
2. Press the cut buttons while reading the pressure on the main system pressure gauge (rear gauge). The gauge should read approximately 1200 psi as the knife is coming down (when bottomed, the gauge will jump to 1800 psi showing the Main System Relief Pressure previously set).
3. If correct, proceed to check the Pressure Reducer.

To Adjust:

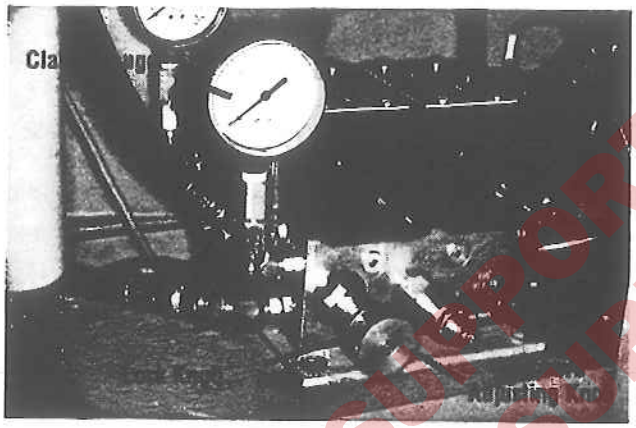
1. Loosen the lock nut.
2. Make a cut and hold the buttons in. While reading

the main system gauge, adjust the valve -- screw until you have the correct pressure.
3. Tighten the lock nut while holding the hex wrench in place.
4. Proceed to readjust the other valves.

3) Pressure Reducer (fig. 57)

This valve limits the amount of pressure to the clamp system. Factory setting: 1000 psi (1000 max/400 min).

To Check:
1. With the hydraulic access door open, activate the cut buttons and read the pressure off the clamp gauge (front gauge). It should read 750 psi for average cutting purposes.



(fig. 57)

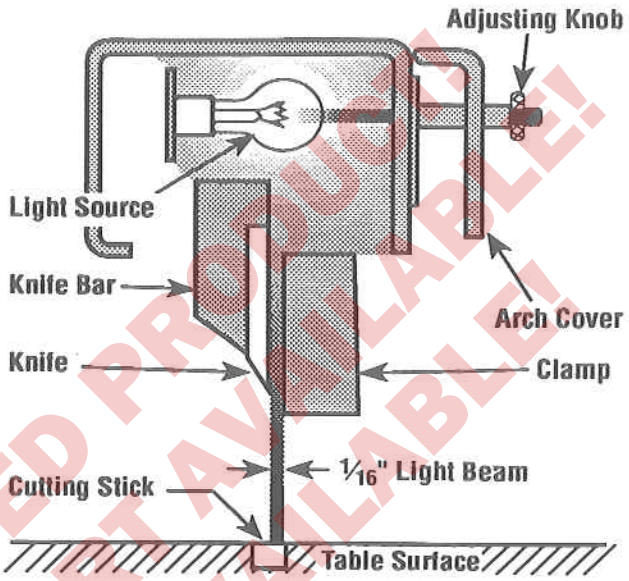
To Adjust:
1. Loosen the lock knob. There are two knobs, one behind the other, fig. 57. The outer is the adjusting knob, the inner is the lock knob.
2. Push the cut buttons and check the reading on the clamp gauge when the clamp is on the table and the knife is coming down.
3. Turn the pressure adjusting knob clockwise for MORE pressure, counterclockwise for LESS.

CAUTION: DO NOT set the clamp pressure below 400 psi. Severe lacerations or dismemberment could result! The Knife and Clamp System loses sequence at settings below 400 psi and the knife could come down before the clamp.

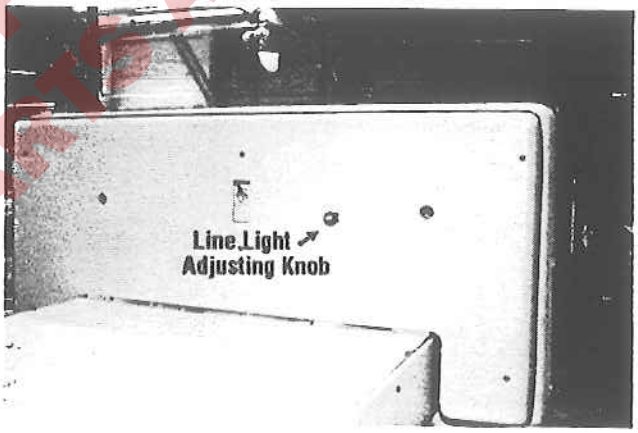
4. Make another cut and check the pressure gauge. Adjust the pressure to your cutting needs (see OPERATING TIPS).
5. Tighten the locking knob.

LINE LIGHT

The Line Light comes on whenever the key is turned on. The light from one 75 watt bulb passes through the clamp and knife clearance, and falls on the table, ill. 5.



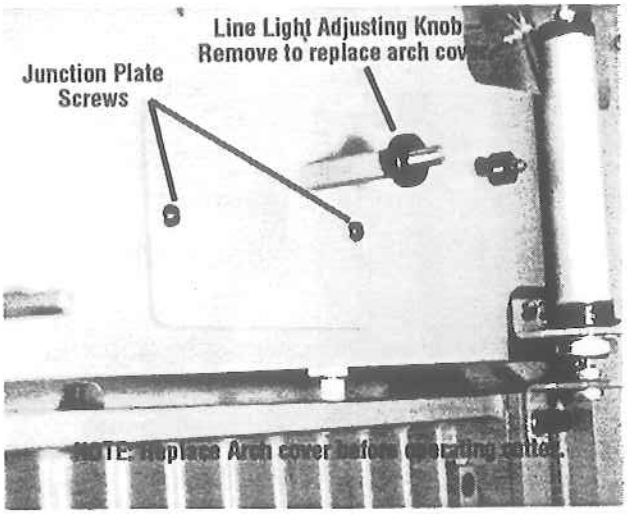
(ill. 5)



(fig. 58)

The light is focused with a knurled nut from the rear of the arch fig. 58. Place a small lift of paper over the cutting stick and adjust this nut until you get a 1/8"—3/16" beam. **NOTE:** The line light adjusting knob must be removed to remove the rear arch cover. The line light will need to be readjusted any time the cover is removed.

Bulb replacement:
1. Make sure the power is off and remove the key. ***DISCONNECT THE POWER AND LOCK IT OUT!*** (See page 4, Power Lockout Procedure).
2. Remove the knurled line light adjusting knob and take off the rear arch cover.

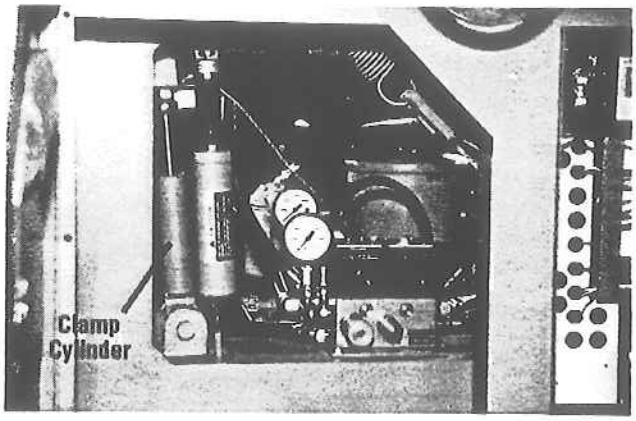


(fig. 59)

3. Loosen the two screws on the rear of the arch holding the line light junction plate, figl. 59. The screws are held to the plate with retainer washers so they won't come all the way out.
4. Reach into the arch and unscrew the old bulb.
5. Replace with another standard, clear, 75 watt bulb. Bulbs must have a horizontal filament when viewed upright while holding the socket end in your hand.
6. Reattach the line light junction plate to the arch.
7. Replace the rear arch cover.
8. Replace the knurled knob onto the threaded shaft.
9. Reconnect the power, replace the key and turn it on.
10. Refocus the line light.
11. Unless the cutter will be operated immediately, turn off the key.

CLAMP CYLINDER

If the clamp piston bottoms in the cylinder before clamp makes contact with the table, or if the clamp does not make full travel on the up stroke, the clamp cylinder may need adjustment.



(fig. 60)

The clamp cylinder is located inside the left base casting leg behind the hydraulic panel door, fig. 60.

To adjust:

1. ***DISCONNECT THE POWER AND LOCK IT OUT!*** See power lockout procedure, page 4.
2. Loosen the lock nut.
3. Use the flats on the clamp cylinder shaft to turn the shaft into or out of the clevis as required, fig. 61.
4. Retighten the jam nut securely.

(fig. 61)

CLAMP PARALLEL ROD

(fig. 62)

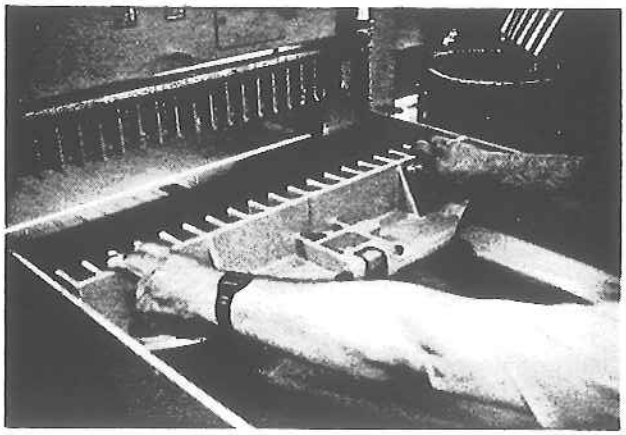
(fig. 63)

If the clamp is not parallel with the table;

1. ***DISCONNECT THE POWER AND LOCK IT OUT!*** See power lockout procedure, page 4.
2. Loosen the jam nuts on each end of the clamp connecting rod, fig. 62 & 63.
3. Using the flats on the end exposed below the base casting, fig. 63, turn the connecting rod and align the clamp with the table.
3. Retighten the jam nuts.

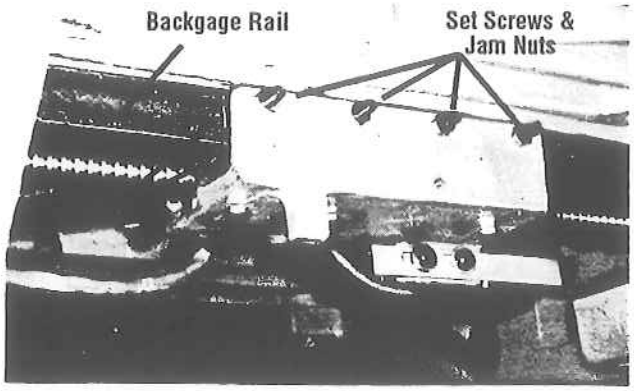
BACKGAGE GIBS

If you are having trouble keeping the backgage square, check for backgage side play. Position the backgage approximately two inches (50-55mm) from the rear of the table and turn off the power.



(fig. 64)

Remove the rear table cover. From the back, grab each end of the backgage and try to rock it back and forth. If there is noticeable play in the backgage, the gibs may need adjusting. Check for play at various positions on the table, fig. 64.



(fig. 65)

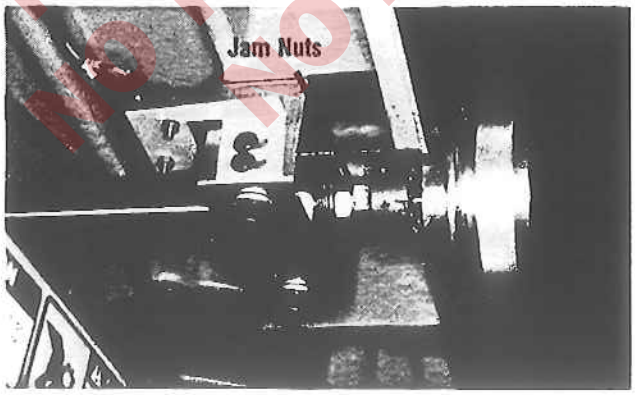
The backgage has two gibs which ride on a steel rail underneath the table, fig. 65. These are adjusted by set screws which are held in position by jam nuts.

To adjust:

1. Run the backgage back to 23" (600mm) and disconnect the power.
2. Always adjust the side gib first. Loosen all the adjusting screws then tighten the front and rear screws.
3. Grab hold of each end of the backgage and try to rock it back and forth to check for play.
4. Continue to adjust these two screws until there is no play.
5. Lock the screws in place with the jam nuts.
6. Now, snug up the middle two screws and lock these in place also.
7. Next, snug up the bottom gib adjusting screws, then back them off ⅛ turn and lock in place with the jam nuts.
8. Run the backgage back and forth to make sure it does not bind. Readjust if necessary.
9. Replace the rear table cover.
10. Check the backgage squareness (see Installation and Setup).

LEADSCREW ADJUSTMENT NUTS

If play is noted in the forward pillow block and thrust bearings, take up the play in the adjustment nuts by:



(fig. 66)

1. Loosen the leadscrew jam nuts behind the handwheel, fig 66.
2. Snug up the inner nut to eliminate any play.
3. Tighten the nuts against each other.
4. Check the socket head bolts in the pillow block to make sure they are tight also.

BACKGAGE DRIVE BELT ADJUSTMENT

If the backgage motor runs but the backgage doesn't move, or slips, the problem could be the belt adjustment, fig. 67.

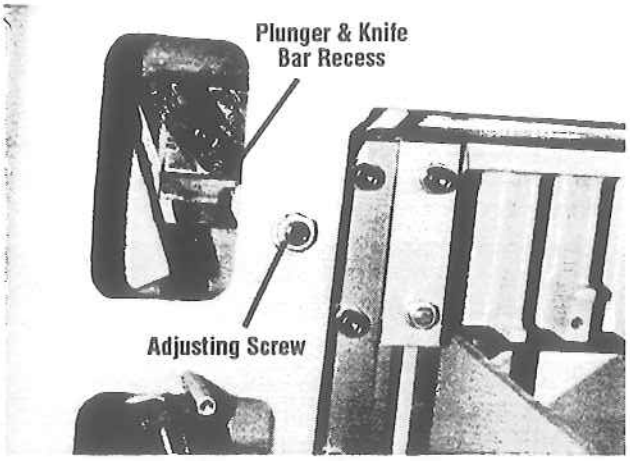
(fig. 67)

To adjust the belt:

1. Turn off the key, ***DISCONNECT THE POWER, AND LOCK IT OUT!*** See Power Lockout Procedure, page 4.
2. Remove the drive belt cover guard at the back of the table.
3. Loosen the two socket head screws holding the motor mounting plate.
4. Slide the plate down to put more tension on the belt, or lift it up to reduce tension for removing belt.
5. If belt cannot be tightened, replace with a new belt. The Champions take a standard **3L270,** Challenge part no. 13939.
6. Adjust the tension of the belt so that there is a ½" (10mm) flex remaining and tighten the mounting plate socket screws.
7. Replace the belt guard cover.
8. Reconnect the power to the machine.

KNIFE BAR SNUBBER

The knife bar snubber holds the knife in the up position while the cutter is left idle, or if the cylinder becomes worn. If the knife drifts down an adjustment is necessary.



Cover Guard Removed for Clarity (fig. 68)

The snubber consists of a steel plunger under spring tension controlled by an adjusting screw. The plunger catches a recess in the knife bar to help hold it in the up position. The snubber is located on the back right hand side of the arch.

To adjust:

1. Eliminate all side play by making sure the knife bar gibs are properly adjusted. This may solve the problem, if the knife still drifts down, continue to adjust the knife snubbers as follows.
2. Lock the knife and clamp down by lowering the clamp with the foot treadle, pressing and holding the cut buttons until the cutter shuts off (4-5 seconds).
3. Turn off the key and ***DISCONNECT THE POWER AND LOCK IT OUT!*** (see Power Lockout Procedure, page 4).
4. Loosen the jam nut with a ¾" wrench.
5. Turn the knife adjusting screw in until the spring bottoms out.
6. Back off the adjusting screw ½ to ¾ turn and tighten the lock nut.
7. Reconnect the power and turn the key on.
8. Raise the knife and clamp by pressing the cut buttons.
9. If the cutter will not be used immediately, turn off the key.

KNIFE BAR GIBS

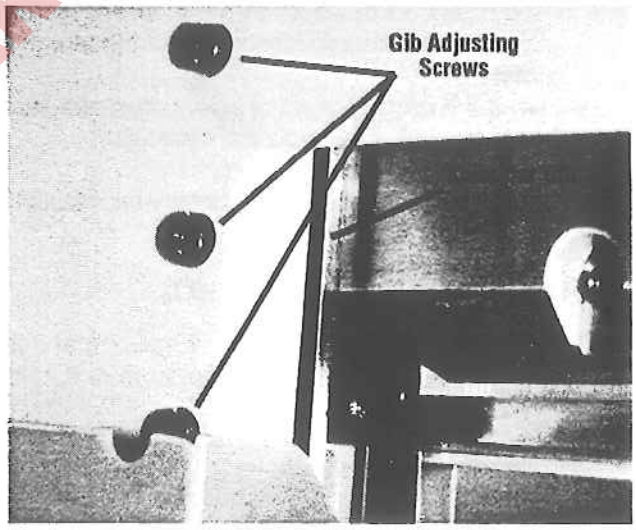
The knife bar gibs are two metal plates on either side of the arch that guide and hold the knife as it cuts. If adjusted too tight the knife may not come down, or the gibs and knife bar could be damaged by scoring. If too loose, you could get uneven or inaccurate cuts.

There are three, socket set screws with jam nuts on either side of the arch that adjust the gibs, fig. 69. These should be adjusted only with the knife bar directly behind the bolts being tightened.

⚠ WARNING: Knives are heavy and very sharp (even after use). Severe lacerations could result. Follow all safety precautions and knife changing instructions from page 11 of this manual!

To adjust:

1. ⚠ ***REMOVE THE KNIFE.*** Follow the instructions on page 11.
2. With the power off and the knife in the up position, loosen the top jam nuts on either side of the arch.
3. With an Allen wrench, back off the set screw, then turn it back in until it is just snug. Tighten the jam nuts.
4. Turn the power on and lock the knife bar down by pressing the cut buttons and holding them in until the machine shuts off (4–5 seconds). Remove the key and disconnect the power.



⚠ ***CAUTION: REMOVE THE KNIFE BEFORE ADJUSTING GIBS!***

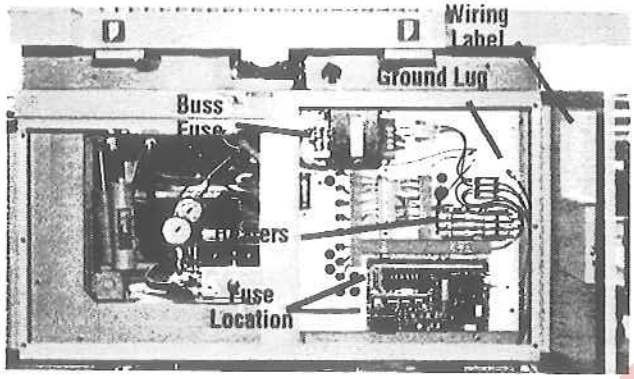
(fig. 69)

5. Turn off the power and loosen the jam nuts on the bottom two set screws on either side of the arch.

6. Back the set screws off slightly and then turn them back in until they are snug.
7. Lock the set screws in place by tightening the jam nuts.
8. Turn the power back on and cycle the knife several times Recheck the gibs (repeat steps 1 - 6).
9. Don't overtighten the gib adjusters as this will scrape off the lubricants and result in scoring.
10. If your knife bar and gibs do get scored, simply remove only the burrs by scraping and then sanding smooth. Reset the gibs. Deep scores need not be removed - they will help retain lubricants.

FUSES

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



(fig. 70)

The Champions each have a set of fuses and one set of heaters. The fuses are located inside the main power box, fig. 70. The MC and MCPB have three fuses here and the MPC has four. Check the label inside the cover for correct ratings for these fuses. Labels are reproduced with the drawings at the back of this manual in case those on the cover tat may be damaged or illegible.

(fig. 71)

Aside from the main power panel set, the MPC has another fuse (250V AGC ½ amp fast acting) located behind the left end of the console control panel, fig. 71. This protects the logic power supply of the computer. The control panel must be removed from the main console to gain access to this fuse.

HEATERS

The heaters are located on the power panel starter, fig. 70. They protect the motor from overloading and causing damage. These heaters are rated according to the size of your motor and should be changed if a different voltage motor is installed. Check the electrical Power Box Assembly drawing for correct values.

The heaters are of an automatic reset type. If the pump is left under load for too long, they will kick out. Simply allow to cool and your cutter can be restarted.

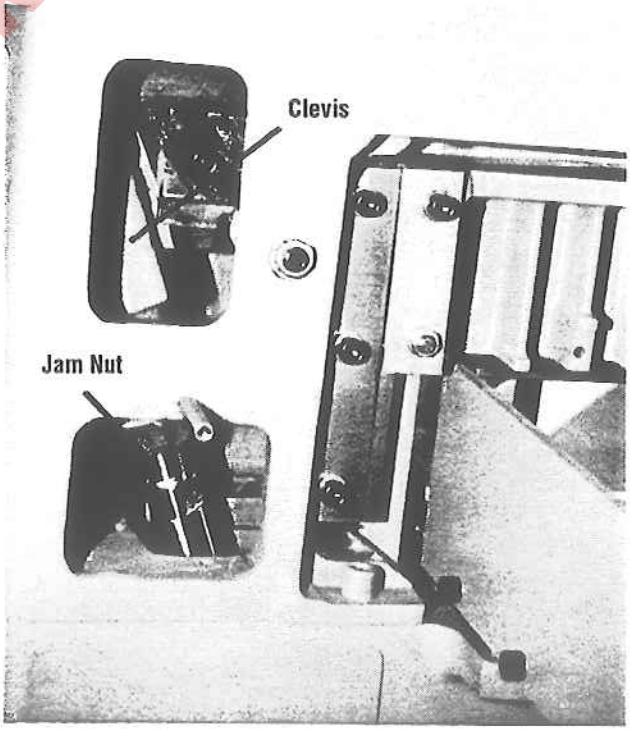
KNIFE BAR CYLINDER

Replacing Knife Bar Cylinder:

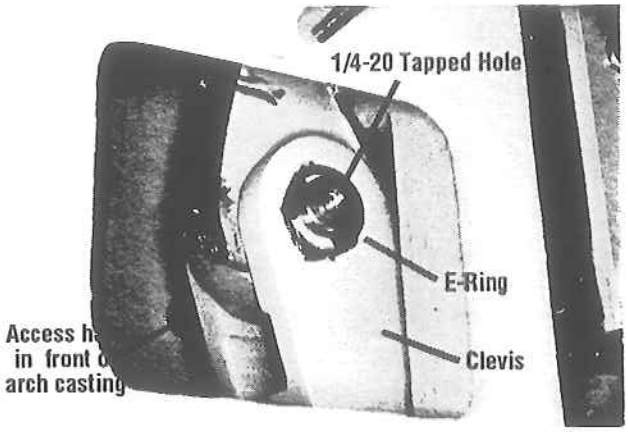
1. Remove the knife from the cutter (see Knife, Installation and Set Up).
2. Place a 3" lift of paper under the clamp only to hold it up and out of the way of the knife bar. Then place a 3' long 2x4 board flat side down under the right end of the knife bar. This will be used for leverage of the knife bar when removing and reinstalling the knife bar pin.
3. Lock the clamp and knife down by pressing the cut buttons and holding the buttons in until the machine shuts off (4-5 seconds).
4. Turn the key off and disconnect the power.

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

5. Place a pan underneath the cylinder and gradually loosen and remove the hydraulic connections. Loosen the connections **slowly** to bleed off any trapped pressure.



(fig. 72)



View from rear of arch with cover off and knife locked down.

(fig. 73)

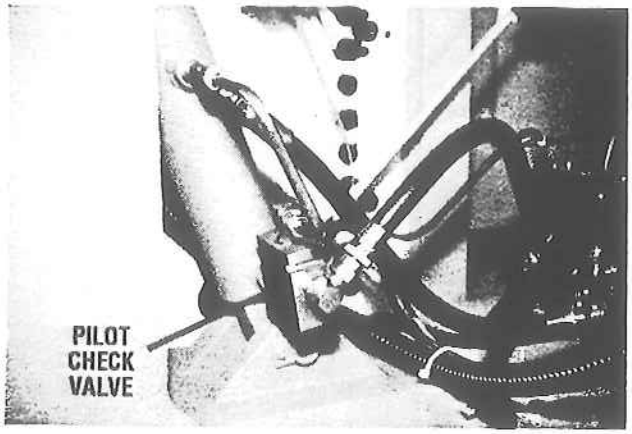
6. Remove the clevis pin. E-style retaining rings on either side of the pin can be removed through the access panel in the side of the arch casting. The pin has a 1/4-20 tapped hole in it to aid removal and a clearance hole in the front of the arch provides access to knock the pin out of the knife bar, fig. 73. Use the board blocking up the knife bar to release pressure on the pin to make it easier to remove.
7. Now, remove the pin retainer and the Truarc retainer ring from the lower mounting pin holding the cylinder to the base.
8. Remove the old cylinder. With the shaft of the old cylinder bottomed out, note the dimension between the top of the cylinder body and the bottom of the cylinder clevis. Also note the approximate position of the proximity switch actuator. Transfer the proximity switch actuator, the clevis lock nut, and the clevis onto the new cylinder and insert it into position on the cutter.
9. Reinstall the base pin, Truarc retainers, and the pin retainer.
10. Install the upper pin to connect the cylinder to the knife bar and replace the retaining rings.
11. The cylinder shaft can be threaded into the clevis to adjust the position of the knife bar. When properly adjusted, the distance from the top of the knife bar recess to the table with the knife in the down position should measure 4⅛" (105mm), fig. 74.
12. Lock the jam nut securely in place.
13. Reconnect the hydraulic hoses.
14. Reconnect the power to the cutter and turn the key on.

⚠ CAUTION; CRUSH HAZARD! Knife and clamp will return to the up position when the key is turned on and the cut buttons are pressed for the first time. Keep hands and tools away.

15. Adjust the Knife up proximity switch actuator (see page 38). Press the cut buttons once to turn on the hydraulic motor and raise the knife and clamp. Allow machine to run for a few minutes to work the air out of the system.
16. See Knife Installation and Setup for reinstalling the knife.

(fig. 74)

PILOT CHECK VALVE



(fig. 75)

The Pilot Check Valve on the knife cylinder, fig. 75, helps to hold the knife in the up position. If it becomes stuck or plugged, the clamp will come down but the knife will remain in the up position.

To check:

1. Follow knife changing procedures to remove the knife blade and then block the knife bar in the up position.
2. Press the stop button in, remove the key, ***DISCONNECT THE POWER AND LOCK IT OUT!*** See Power Lockout Procedure, page 4.
3. Place a pan underneath the valve and **slowly** loosen the pilot valve connections to bleed off any pressure.
4. Remove the check valve and connect the hydraulic hose directly to the cylinder. Plug the free line going to the tee on the upper cylinder with a ⅜" NPT pipe plug.
5. Reconnect the power and run the machine.
6. If the knife cycles without the valve in line, replace with a new check valve.

CAUTION: LACERATION HAZARD. This is a test procedure only. Do not operate cutter without a functional check valve installed. Possible knife drift could occur exposing the blade edge below the clamp.

MPC GLOSSARY OF TERMS

TERM - DEFINITION

ADD (+) - Key pressed in conjunction with 'ENT', 'INSERT' or 'SEND'. Moves backgage, changes dimension or inserts a cut position relative to one displayed by adding the value entered.

AUTO - A STATUS LIGHT indicator showing the computer is in the Auto Mode of operation (running a program). Shift into Auto by pressing 'SCAN' key once, press 'SCAN' again to access program(s). Exit by pressing any key other than 'SCAN ' or 'SEND'.

AUTO SEARCH - See CHANNEL SEARCH.

BACKGAGE STOP - See STEP.

CHANNEL - Location in the computer memory where a series of cut positions are stored.

CHANNEL LOCK - See MEMORY LOCK.

CHANNEL PROGRAM - See CHANNEL.

CHANNEL SEARCH - Used to find an unused (empty) channel. Press 'CHANNEL', the decimal '.' key & 'ENT' to go to the first open channel.

CHANNEL SELECT - Press 'CHANNEL', a Channel Number & 'ENT' to access a channel location in the memory. See also, CHANNEL SELECT & CHANNEL SEARCH.

CHANNEL SYMBOL - The Symbol, , shows in the first position of the top line of the display to indicate the second line is showing the CHANNEL number. See also, CHANNEL SELECT & CHANNEL SEARCH.

CLEAR - Zeroes out display. Zeroes out values displayed when in SERVICE mode.

CLR - See CLEAR.

CUT POSITION - See STEP.

DECIMAL POINT - Indicates decimal location for numbers. English/METRIC indicator. FRACTION separator. Symbol used for CHANNEL SEARCH.

DELETE - Key used to delete a STEP, portion of a CHANNEL, or an entire CHANNEL.

ENTER - 'ENT' key writes the display dimension shown into the CHANNEL PROGRAM. In a new program, pressing 'ENT' adds the dimension to the end; in an existing (old) program, it writes over the existing dimension.

ERROR - A STATUS LIGHT indicator showing an incorrect entry has been made. Review mode of operation you were attempting to operate.

FRACTIONS - Entered as linear amount separated by decimals. The fractional expression $XX^{YY}/_{ZZ}$ (where XX = whole number; YY = numerator; ZZ = denominator) would be typed as XX.YY.ZZ.

HANDWHEEL - Manually makes micro-adjustments to the backgage position. Also may be used to enter the backgage position to the display for entering as a step in a program.

INSERT - Key used to add a cut position (STEP) into an existing PROGRAM. Dimension on display will be entered AFTER the cut position shown on the lower, two place line of the display.

INTERRUPT - 'SEND' key may be used for a stray cut during a PROGRAM. Type dimension and press 'SEND', make the cut and press 'SCAN' and 'SEND' again to return to PROGRAM POSITION.

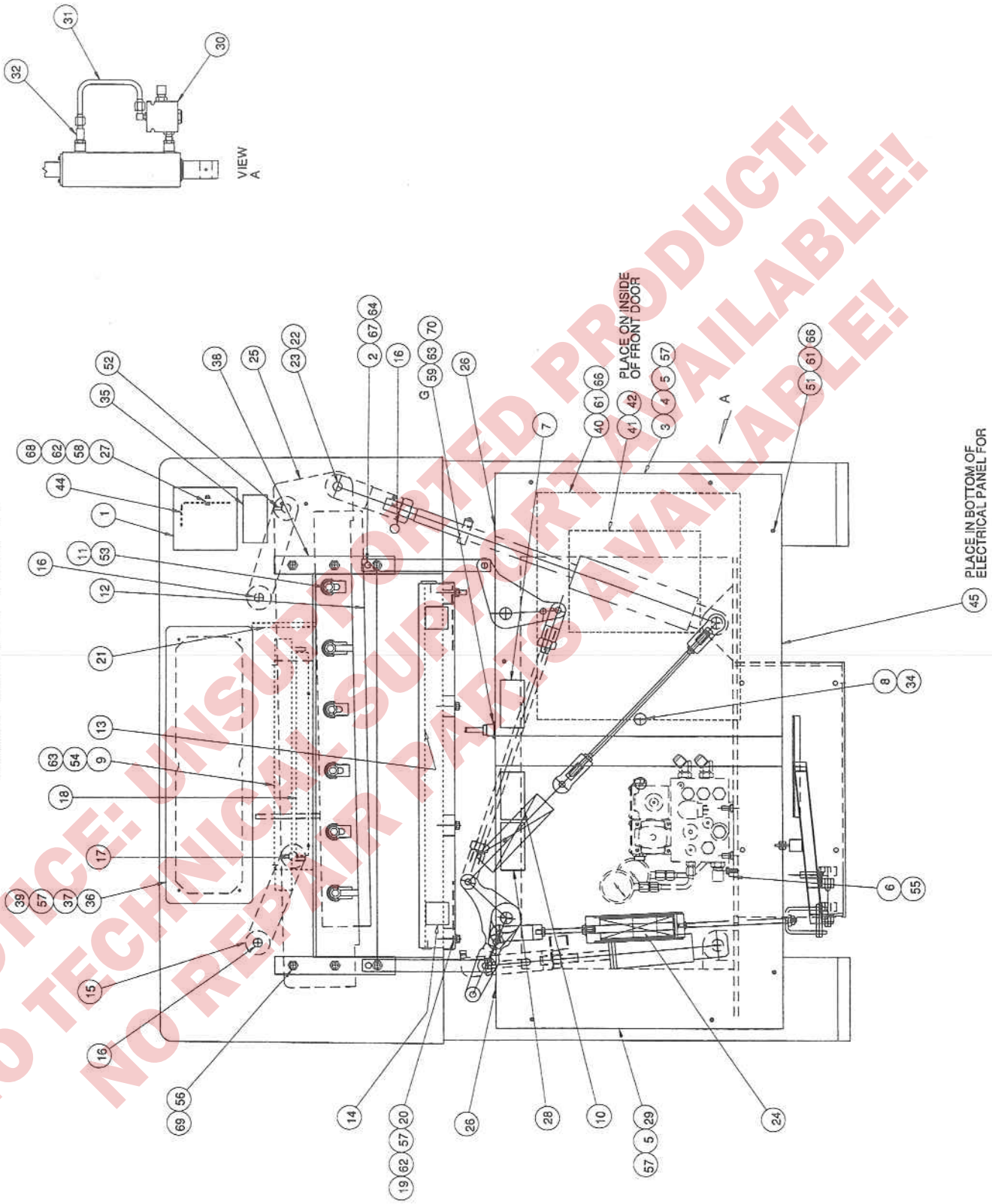
TERM - DEFINITION

LABEL CUTTING - Symbol, l . Routine entered by pressing '55' (1397 in metric) & 'ENT' and giving values for: Step 1 - Label Size; Step 2 - Trim Size; Step 3 - Quantity (less 1).

MANUAL - A STATUS LIGHT indicator which shows operations other than AUTO or when no ERROR has occurred.

MANUAL KEYS - Set of three keys, FWD (forward), REV (reverse) and SLOW which are used to move the backgage manually.

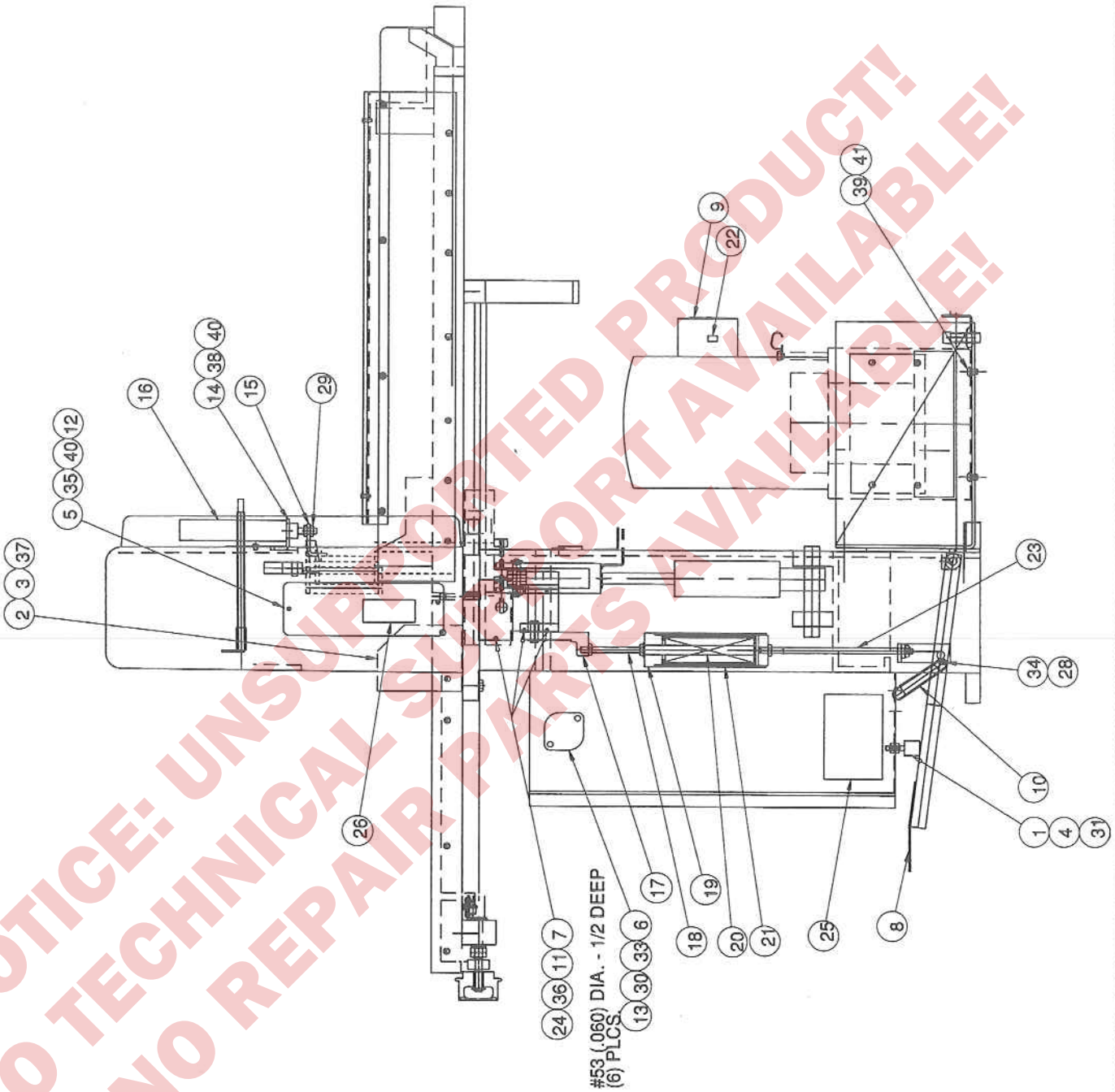
MAIN ASSEMBLY - FRONT VIEW
47000 SHEET 1 OF 11



MAIN ASSEMBLY – FRONT VIEW
47000 Sheet 1 of 11

Ref. No.	Part No.	Part Name	Qty.
1.	S-1781-8	Label	1
2.	4506	Stud – Clamp	2
3.	47097	Door Asm. – R.H. Front	1
4.	47033	Enclosure – Front	1
5.	47163	Gasket	6
6.	See Chart, Sht. 2	Manifold Assembly	REF.
7.	S-1781-11	Label	1
8.	47101	Latch – Front Enclosure	2
9.	EE-2149-1	Table Light Assembly (60 HZ.)	1
10.	S-1781-16	Label – Caution	1
11.	8815	Washer – Knife Screws	6
12.	2238-2	Knife	1
13.	4171	Cut Stick	1
14.	A-9121	Cut Plate	2
15.	4503-2	Link – Knife Bar	2
16.	E-2196	Plug – Hole	3
17.	4518	Pin – Knife Link	2
18.	S-845	Light – Table	1
19.	S-1781-11A	Label	2
20.	EE-2512	Cut Button Asm.	1
21.	4449	Screw – Knife Adjusting	2
22.	S-1193-75	"E" Ring – ¾"	2
23.	S-1087-1	Pin – Rod End	1
24.	S-1781-20	Label – Spring Caution	1
25.	4501-1	Knife Bar	1
26.	E-2196-11	Plug - Hole	2
27.	S-1694-2	Tyrap – #10	2
28.	S-1781-25	Label – Instruction	1
29.	47173	Door Asm. – L.H. Front	1
30.	H-437	Check Valve Assembly	Ref.
31.	H-433	Tube Assembly – Knife Cyl. Pilot	Ref.
32.	H-435	Tee – Male Run	1
33.			
34.	11145-1	Rivet – 3/16"	4
35.	S-1781-14	Label	1
36.	EE-2514	Assembly – Control Console (MC)	1
37.	E-1152-28	Spacer	4
38.	4505	Gib – Knife Bar	2
39.	S-1864-3	Captive Retaining Device	4
40.	See Chart, Sht. 2	Electrical Panel	1
41.	S-1781-32	Label - Power Connection (MPC 60 Hz.)	1
42.	S-1781-33	Label - Power Connection (MC 60 Hz.)	1
44.	E-2482-1	Cable - Fiber Optic (MC Only)	1
51.	H-6910-404	Screw – ¼ - 20 X ½" Butt. Hd.	8
52.	H-6938-408	Screw – ¼-20 X ½" Cup Pt. Soc. Set	2
53.	H-6918-608	Screw – ⅜-16 X 1" Soc. Hd.	6
54.	H-6910-83206	Screw – #8-32 X ¾" Butt. Hd.	2
55.	H-6913-606	Screw – ⅜-16 X ¾" Hex	2
56.	H-6953-852	Screw – ½ - 13 X 3 - ½ Oval Pt. Soc. Set	6
57.	H-6910-102404	Screw – #10 - 24 X ½ Butt. Hd.	14
58.	H-6910-102408	Screw – #10 - 24 X 1" Butt. Hd.	2
61.	H-7324-8	Washer – ¼ Int. Tooth	12
62.	H-7324-#10	Washer – #10 Int. Tooth	6
63.	H-7324-#8	Washer – #8 Int. Tooth	2
64.	H-7327-12	Washer – ⅜ Med. Lock	2
66.	H-6424-4	Nut – ¼ - 20 Hex	4
67.	H-6424-6	Nut – ⅜ - 16 Hex Jam	2
68.	H-6423-#10	Nut – #10 - 24 Hex	2
69.	H-7002-8	Nut – ½ - 13 Hex Jam (Black)	6

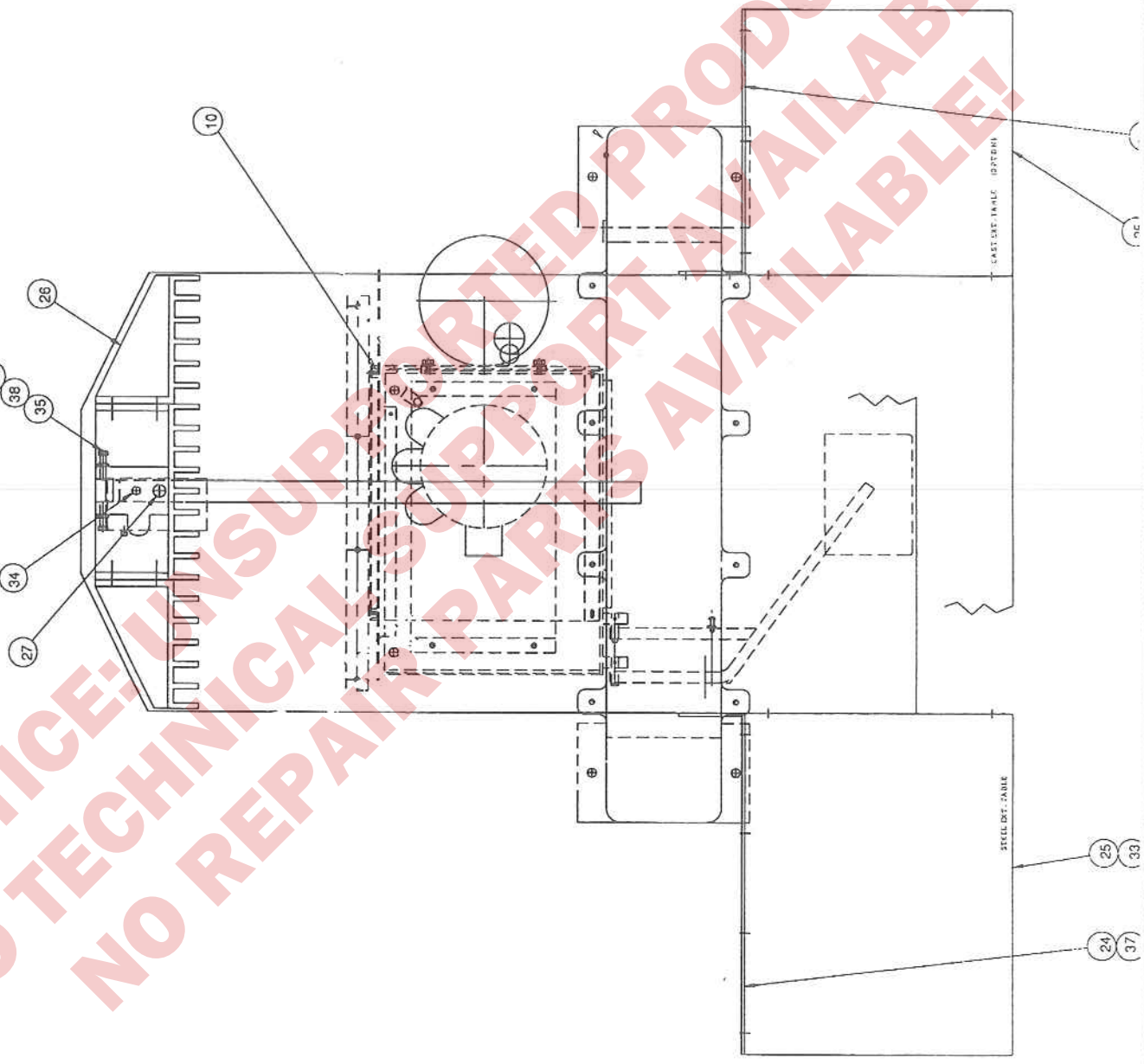
MAIN ASSEMBLY – SIDE VIEW
47000 Sheet 2 of 11



MAIN ASSEMBLY – SIDE VIEW
47000 Sheet 2 of 11

Ref. No.	Part No.	Part Name	Qty.
1.	40016-3	Mount - Vibration	1
2.	47116	Guide – R.H. Front Table	1
3.	47115	Guide – L.H. Front Table	1
4.	47185	Rod - Pedal Stop	1
5.	4469-1	Cover – Arch End	2
6.	47139	Cover	1
7.	E-1504-M-1	Electrical Specification Plate	1
8.	47153	Safety Tread – Foot Pedal	1
9.	S-1781-11A	Label	1
10.	47136-1	Spring – Extension	1
11.	S-1236-5	Plate – Serial	1
12.	S-1864-3	Captive Retaining Device	4
13.	S-1864-1	Captive Retaining Device (60 HZ. Only)	2
14.	47137	Bracket – Air Cylinder (Arch)	1
15.	47138	Bracket – Air Cylinder (Clamp)	1
16.	P-284	Cylinder – Air	1
17.	47099	Clevis – Foot Pedal	Ref.
18.	47117	Rod – Pedal Linkage	Ref.
19.	47118	Top Cap – Pedal Linkage	Ref.
20.	47048	Rod Assembly – Pedal Linkage	Ref.
21.	47120	Tube Assembly – Pedal Linkage	Ref.
22.	E-1237-2	Wire Nut – Red	4
23.	47089	Tie Rod – Pedal Linkage	Ref.
24.	E-1501-M	Plate – Lamp Rating	1
25.	S-1781-24	Label - FCC	1
26.	S-1781-15	Label	2
27.			
28.	H-642-4	Nut – ¼-20 Hex	1
29.	H-6443-6	Nut – ⅜-24 Nyloc Jam	2
30.	H-6423-#8	Nut – #8-32 Hex	2
31.	H-6423-5	Nut – 5/16-18 Hex	2
32.			
33.	H-6910-83204	Screw – #8-32 X ½" Butt. Hd.	2
34.	H-6910-406	Screw – ¼-20 X ¾" Butt. Hd.	1
35.	H-6910-404	Screw – ¼ - 20 X ½" Butt. Hd.	4
36.	H-6924-004	Screw – #0 X ¼" R.H. Hd. Dr.	6
37.	H-6918-606	Screw – ⅜ - 16 X ¾" Soc. Hd.	4
38.	H-6913-404	Screw – ¼ - 20 X ½" Hex	2
39.	H-6910-604	Screw – ⅜ -16 X ½" Butt. Hd	4
40.	H-7324-8	Washer – ¼" Int. Tooth	6
41.	H-7327-12	Washer – ⅜" Lock	4

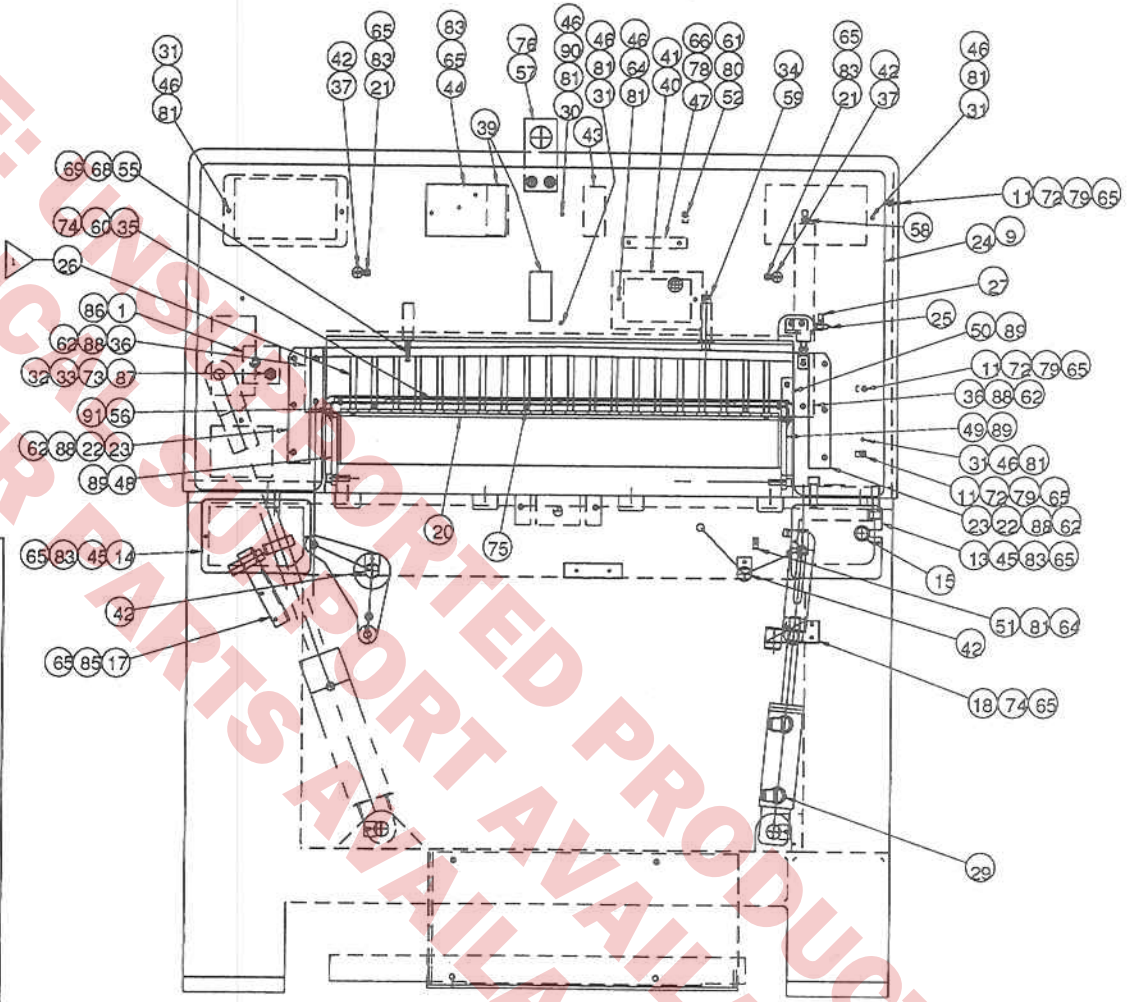
MAIN ASSEMBLY – TOP VIEW
47000 Sheet 3 of 11



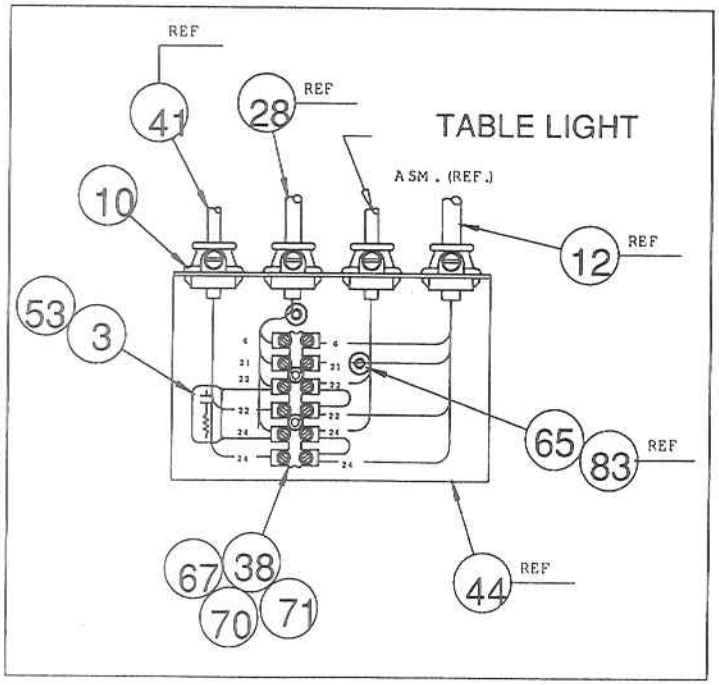
MAIN ASSEMBLY – TOP VIEW
47000 Sheet 3 of 11

Ref. No.	Part No.	Part Name	Qty.
1- 23		Unused ref. nos.	
23.	S-1781-16	Label	2
24.	47164-1	Plate – Extension Table (Steel Tables)	2
	47164	Plate – Extension Table (Cast Tables)	2
25.	47165	Table – Extension (Cast Iron)	2
	47166	Table – Extension (Steel)	2
26.	4472-1	Backgage (MPC)	1
	A-4455-2	Backgage – Split (MC)	1
27.	H-5254-1010	Screw – 5/8-11 X 1-1/4 Shoulder	1
28.	H-6913-606	Screw – 3/8-16 X 3/4" Hex (Cast Tables)	6
	H-6913-606	Screw – 3/8-16 X 3/4" Hex (Steel Tables)	8
29.			
30.			
31.			
32.			
33.	H-6913-608	Screw – 3/8-16 X 1" Hex (Ext. Table)	REF
34.	H-6918-608	Screw – 3/8-16 X 1" Soc.	1
35.	H-6931-614	Screw – 3/8-16 X 1-3/4" Sq. Hd. Set	2
36.			
37.	H-6424-6	Nut – 3/8-16 Hex Jam (For Steel Table)	8
38.	H-6424-6	Nut – 3/8-16 Hex Jam	2
39.			
40.	S-1149-1	Nut – 1/2-13 Long (MC)	2

MAIN ASSEMBLY – REAR VIEW
47000 Sheet 4 0f 11



JUNCTION BRACKET ASM. DETAIL

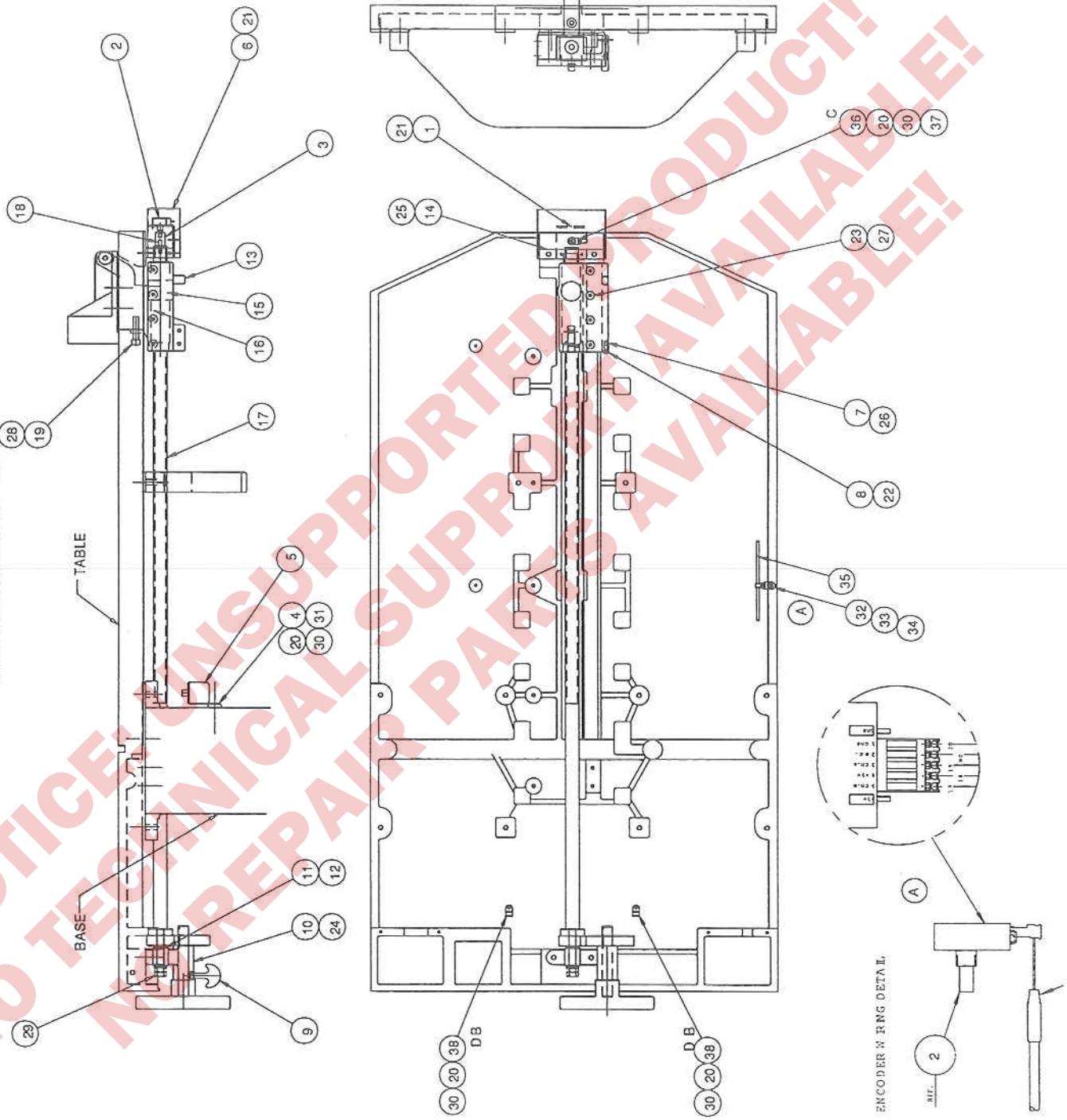


NOTES:
FOR 1/2 MINIMUM CUTS USE CLAMP #47004 AND PROX. BRACKET 47046-2.

MAIN ASSEMBLY – REAR VIEW
47000 Sheet 4 0f 11

Ref. No.	Part No.	Part Name	Qty.
1.	4519-1	Cam Plate	1
2.			
3.	E-1736	Quencharc	1
4.			
5.			
6.			
7.			
8.			
9.	E-1453-3	Shrink Tubing – 1" Long	2
10.	S-1350-16	Bushing	4
11.	S-1694-2	Tyrap – #10	3
12.	EE-2530	Cable Assembly – Console Power	Ref.
13.	47051	Cover – Base L.H. Rear	1
14.	47050	Cover – Base R.H. Rear	1
15.	E-1172-18	Bushing – Snap-In	1
16.			
17.	47131-1	Bracket – Knife Prox. SW.	1
18.	47171	Bracket – Clamp Prox. SW.	1
19.	S-1781-11A	Label – Caution	1
20.	47006-2	Plate Asm. – False Clamp	1
21.	S-1244	Pin – Lock	2
22.	S-1861	Shim	2
23.	4509	Bar – Clamp Guide	2
24.	47001	Cover – Rear Arch	1
25.	P-283-1	Valve – Flow Control	2
26.	47012-1	Clamp	1
27.	P-285-1	Muffler – Air	2
28.	EE-2495	Cable Assembly – Console Signal	Ref.
29.	H-272-1	Elbow – 45° "0" Ring To Tube	2
30.	E-1152-35	Spacer	1
31.	E-1152-36	Spacer	4
32.	S-1254	Plunger – Clamp	1
33.	S- 1255-1	Spring	1
34.	47184	Nut ¾ -16 Jam	1
35.	47002	Shield – Backgage	1
36.	4508	Clamp – Guide Bar	2
37.	4507-1	Pin – Knife Bar Link	2
38.	E-1237-3	Wire Nut	2
39.	S-1781-15	Label – Caution	2
40.	E-933-2	Lamp – 75 Watt	1
41.	47017	Line Light Asm.	1
42.	S-1725	Fitting – Grease	4
43.	S-1781-12	Label – Caution	1
44.	E-1369-5	Cover – Junction Box	1
45.	S-1864-2	Captive Retaining Device	4
46.	S-1864-3	Captive Retaining Device	7
47.	13941	Reflector – Line Light (MC,MPC,MPX Only)	1
48.	47019	Guide – Rear R.H.	1
49.	47020	Guide – Rear L.H.	1
50.	4441	Paper Guide	1
51.	S-1694-3	Tie – Cable	2
52.	E-2186-3	Clamp–Wire Harness (MC,MPC,MPX Only)	1
53.	E-1237-6	Wire Nut	2
54.	E-1370-5	Box – Junction	1
55.			
56.	47003	Bracket – Backgage Shield	2
57.	47169	Plate – Lift	1
58.	P-288	Reducer	1
59.	H-438	Shock Absorber	1
60.	47180	Support - Backgage Shield	2
61.	H-7324-#10	Washer –#10Int.Tooth(MC,MPC,MPX Only)	1
62.	H-7327-12	Washer – ⅜ Lock	8
63.			
64.	H-7324-8	Washer – ¼ Int. Tooth	4
65.	H-7324-#10	Washer – #10 Int. Tooth	15
66.	H-7324-8	Washer – ¼Int.Tooth(MC,MPC,MPX Only)	2
67.			
68.			
69.			
70.			
71.	H-6424-4	Nut – ¼-20 Hex Jam	2
72.	H-6423-#10	Nut – #10-24 Hex	2
73.	H-6424-8	Nut – ½-13 Hex Jam	1
74.	H-6910-102403	Screw - #10-24 X ⅜ Butt. Hd.	12
75.	H-6951-406	Screw - ¼-20 X ⅜ S. S. Nyloc	3
76.	H-6918-812	Screw – ½-13 X 1- ½ Soc.	2
77.			
78.	H-6910-404	Screw -¼-20X½Butt. Hd.(MC,MPC,MPX)	2
79.	H06910-102408	Screw – #10-24 X 1" Butt. Hd.	3
80.	H-6910-102404	Screw–#10-24X½" Butt.Hd.(MC,MPC,MPX)	1
81.	H-6910-404	Screw – ¼-20 X ½" Butt. Hd.	16
82.			
83.	H-6910-102404	Screw – #10 - 24 X ½ Butt. Hd.	13
84.	H-6918-610	Screw – ⅜- 16 X 1-¼" Soc. Hd.	6
85.	H-6910-102406	Screw – #10 - 24 X ¾" Butt Hd.	4
86.	H-6910-606	Screw – ⅜ - 16 X ¾ Butt. Hd.	1
87.	H-6953-836	Screw – ½ - 13 X 2 - ¼ Oval Set	1
88.	H-6918-608	Screw – ⅜ - 16 X 1" Soc. Hd.	2
89.	H-69188-606	Screw – ⅜ - 16 X ¾ Soc. Hd.	14
90.	H-6910-408	Screw – ¼ - 20 X 1" Butt. Hd.	2
91.	H-6913-408	Screw – ¼ - 20 X 1" Hex	1

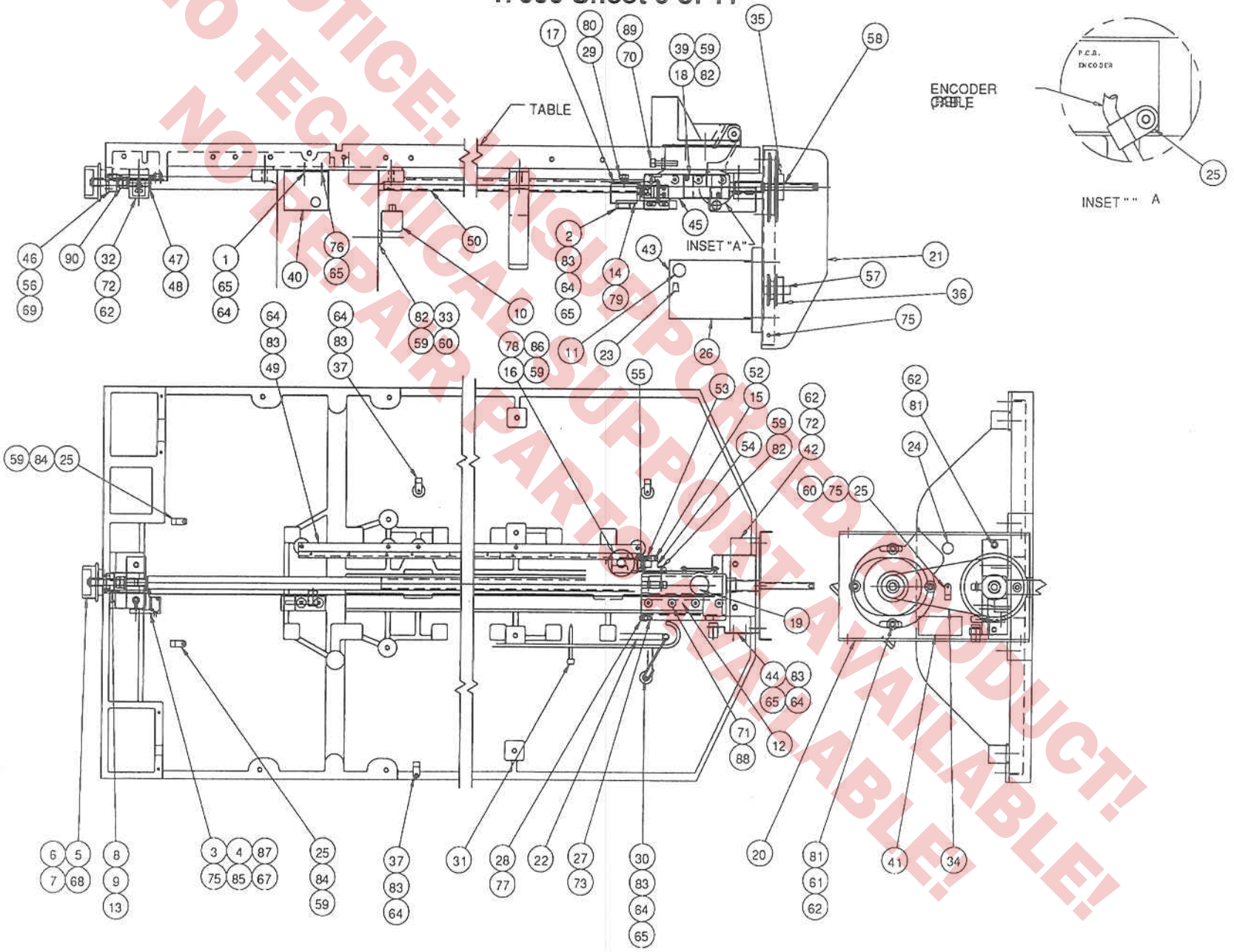
MAIN ASSEMBLY – MC TABLE
47000 Sheet 5 of 11



MAIN ASSEMBLY – MC TABLE
47000 Sheet 5 of 11

Ref. No.	Part No.	Part Name	Qty.
1.	47154	Bracket – Encoder	1
2.	E-2467	Encoder	1
3.	47053	Coupling – Encoder Drive	1
4.	8391	Spacer	1
5.	EE-1630-8	Preset Control Asm.	1
6.	47045	Cover – Encoder	1
7.	S-1867	Pin – Pusher	1
8.	8641-1	Actuator – `all Switch	1
9.	S-653-1	Thumbscrew	1
10.	47059	Handwheel Assembly	1
11.	S-1295-5	Thrust Washer	4
12.	S-1300	Bearing - NeedleThrust	2
13.	47135	Nut - Backgage	1
14.	47043	Pillow Block - Rear	1
15.	47029	Nut - Backgage Screw	1
16.	4510	Gib - Backgage Nut	2
17.	47031	Leadscrew Assembly - Backgage	1
18.	H-21S-250-1000	Pin – ¼ X 1" Roll	1
19.	H-6931-514	Screw - ⅜ - 16 X 1¾ Sq. Hd. Set	1
20.	H-6910-102404	Screw – #10 - 24 X ½ Butt.	2
21.	H-6910-102403	Screw – #10 - 24 X ⅜ Butt. Hd.	6
22.	H-6910-83202	Screw – #8 - 32 X ¼ Butt.	2
23.	H-6940-420	Screw - ¼ - 20 X 1¼ Flat Pt. Set	8
24.	H-6918-608	Screw - ⅜ 19 X 1" Soc.	2
25.	H-6918-620	Screw - ⅜ - 16 X 2½ Soc.	2
26.	H-6966-406	Screw - ¼ - 28 X ⅜ Cone Pt. Set	1
27.	H-6424-4	Nut - ¼ - 20 Hex	8
28.	H-6424-6	Nut - ⅜ - 16 Hex	1
29.	H-6428-8	Nut - ½ - 20 Hex	2
30.	H-7324-#10	Washer - #10 Int. Tooth	2
31.	H-7321-#10	Washer - #10 Plain	2
32.	H-6910-404	Screw - ¼ - 20 X ½ Butt. Hd.	1
33.	H-7324-8	Washer -¼ Int. Tooth	1
34.	EE-2534	Cable Assembly - Encoder - MC	1

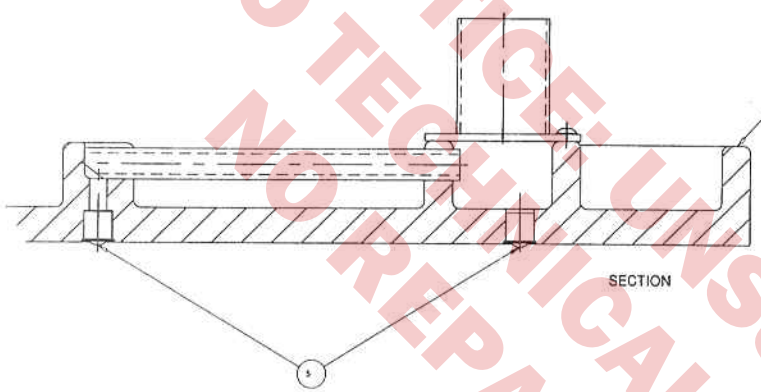
MAIN ASSEMBLY - MPX, MPC, CRT TABLE
47000 Sheet 6 of 11

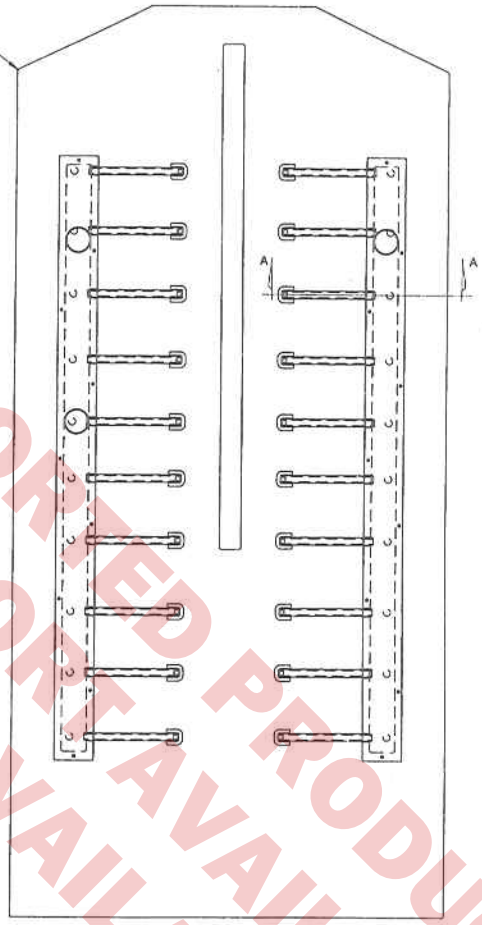


MAIN ASSEMBLY - MPX, MPC, CRT TABLE
47000 Sheet 6 of 11

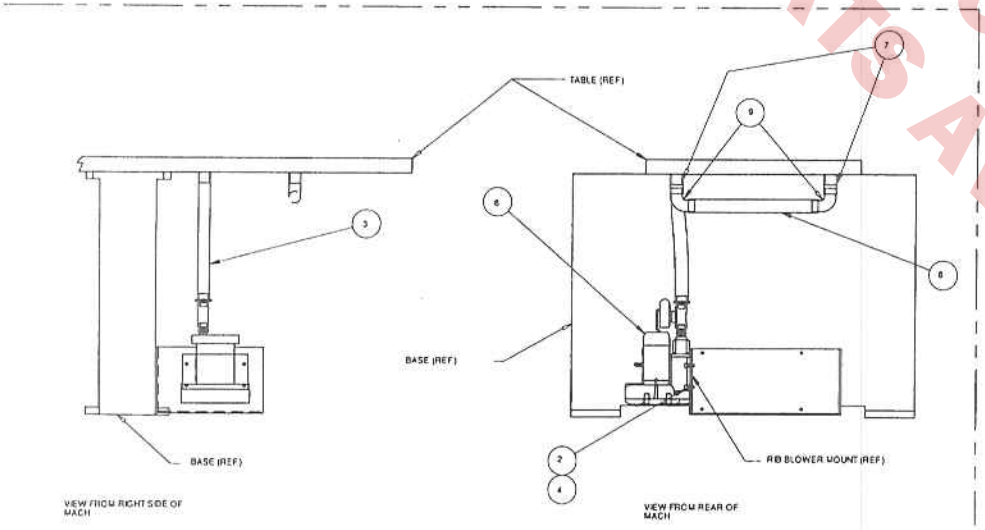
Ref. No.	Part No.	Part Name	Qty.
1.	7957-6	Knob - Adjustment	1
2.	47041	Actuator - Forward Limit	1
3.	47042	Bracket - Switch	1
4.	E-866-4	Switch - Micro	1
5.	A-8633	Handwheel Asm.	1
6.	S-1193-43	'E' Ring - 7/16"	1
7.	8577	Plug - Handwheel	1
8.	8635	Plunger - Handwheel Limit Switch	1
9.	S-1193-25	'E' Ring - 1/4"	1
10.	EE-1630-6	Preset Control Asm.	1
11.	E-2180-2	Connector	1
12.	4510	Gib - Backgage Nut	2
13.	8636	Spring	1
14.	E-2468	Encoder - MPC	1
15.	47176	Spring - Encoder	1
16.	47175	Bracket - Encoder	1
17.	47177	Shield - Encoder	Ref.
18.	EE-2533	P.C.B. Asm. - Encoder	1
19.	47028	Nut - Backgage Screw	1
20.	47054	Bracket - Motor	1
21.	47055	Cover - Backgage Drive	1
22.	8657	Spring - Encoder Cable	2
23.	E-1237-1	Wire Nut - Yellow	2
24.	E-2196-11	Plug - Hole	1
25.	E-968-2	Clip - Wire	1
26.	E-1600-154	Motor	1
27.	S-1867	Pin - Pusher	1
28.	8641-1	Actuator - Hall Switch	1
29.	8230	Pinion - Encoder	1
30.	8658	Retainer - Spring	1
31.	S-1694-1	Tyrap	3
32.	47037	Pillow Block Assembly - Front	1
33.	8391	Spacer	2
34.	13939	Belt	1
35.	A-12616	Pulley	1
36.	13927	Pulley - Drive	1
37.	S-1694-3	Tyrap	3
38.	E-968-4	Clip - Wire	1
39.	E-1152-11	Spacer/Standoff	2
40.	47046-1	Bracket - Forward Proximity Switch	1
41.	S-1781-15	Label - Caution	1
42.	47039	Pillow Block Assembly - Rear	1
43.	S-1781-11A	Label	1
44.	47040	Bracket - Reverse Limit	1
45.	47135	Nut - Backgage	1
46.	47142	Collar - Handwheel	1
47.	S-1295-5	Thrust Washer	4
48.	S-1300	Bearing - Needle Thrust	2
49.	AA-8226-1	Rack Assembly	1
50.	47024	Leadscrew - Long	1
	47025	Leadscrew - Short	1
51.	H-6121-604	Key - 1/8 X 3/8 Woodruff	1
52.	H-6123-30305	Key - 3/16 X 3/16 X 5/8	REF.
53.	H- 6123-20206	Key - 1/8 X 1/8 X 3/4 Straight	1
54.	H-7324-#10	Washer - #10 Int. Tooth	8
55.	H-7321-#10	Washer - #10 Plain	3
56.	H-7321-6	Washer 3/8 Plain	2
57.	H-7327-12	Washer - 3/8 Lock	8
58.	H-7325-8	Washer - 1/4 Lock	7
59.	H-7324-8	Washer - 1/4 Int. Tooth	7
60.	H-7321-4	Washer - 1/4 Plain	5
61.	H-7321-#8	Wahser - #8 Plain	1
62.	H-7324-#4	Washer - #4 Int. Tooth	2
63.	H-7322-7	Washer - 7/16 Polish	1
64.	H-6938-102406	Screw - #10 - 24 X 3/8 Soc. Set	1
65.	H-6931-614	Screw - 3/8 - 16 X 1 3/4 Sq. Hd. Set	1
66.	H-6940-420	Screw - 1/4 - 20 X 1 1/4 Flat Pt. Set	8
67.	H-6918-620	Screw - 3/8 - 16 X 2 1/2 Soc.	4
68.	H-6966-406	Screw - 1/4 - 28 X 3/8 Cone Pt. Set	1
69.	H-6910-83203	Screw - #8 - 32 X 3/8 Butt. Hd.	1
70.	H-6910-102403	Screw - #10 - 24 X 3/8 Butt. Hd.	7
71.	H-6903-404	Screw - 1/4 - 20 X 1/2 Nyloc Butt. Hd.	1
72.	H-6910-83202	Screw - #8 - 32 X 1/4 Butt. Hd.	2
73.	H-6910-102402	Screw - #10 - 24 X 1/4 Butt Hd.	4
74.	H-6921-44004	Screw - #4 - 40 X 1/4 Fill Hd.	4
75.	H-6964-63202	Screw - #6 - 32 X 1/8 Brass Tip Set	1
76.	H-6918-606	Screw - 3/8 - 16 X 3/4 Soc.	4
77.	H-6910-102406	Screw - #10 - 24 X 3/4 Butt. Hd.	2
78.	H-6910-404	Screw - 1/4 - 20 X 1/2 Butt. Hd.	13
79.			
80.	H-6923-44012	Screw - #4 - 40 X 3/4 Rd. Hd.	2
81.	H-6423-#10	Nut - #10 - 24 Hex	2
82.	H-6423-#4	Nut - #4 -40 Hex	2
83.	H-6424-4	Nut - 1/4 - 20 Hex	8
84.	H-6424-6	Nut - 3/8 - 16 Hex	1
85.	H-6428-8	Nut - 1/2 - 20 Hex	2

AIR TABLE ASSEMBLY
47000, Sheet 7 of 11





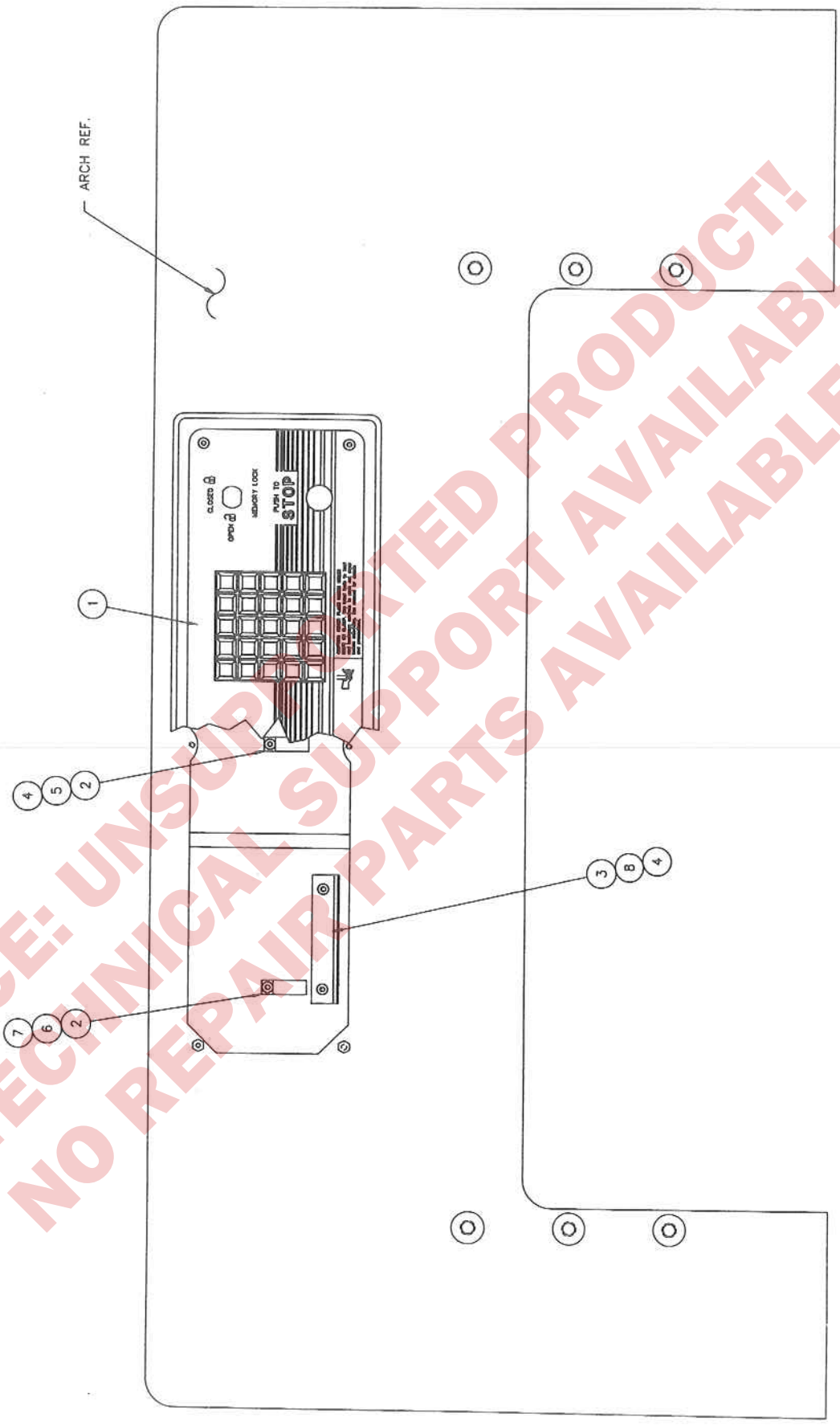
NOTE:
FOR ELECTRICAL HOOKUP SEE:
EE-2587 FOR MC MODEL
OR
EE-2585 FOR SPACER MODEL



AIR TABLE ASSEMBLY
47000, SHEET 7 OF 11

Ref. No.	Part No.	Part Name	Qty.
1.	47062	Table Assembly - Air Tubes	1
2.	H-6913-606	⅜ - 16 X ¾ Hex Bolt	4
3.	H-7321-6	Washer - ⅜ Flat	4
4.	H-7329-6	Washer - ⅜ Lock	4
5.	P-207-1	Jet - Air (Short Table)	36
6.	47132	Blower Asm. - Single Phase	1
	47141	Blower Asm. - Three Phase	1
7.	P-240	Hose - 1½ X 3	2
8.	P-240	Hose - 1½ X 19"	1
9.	P-235-2	Elbow - Hose	2
10.	P-240	Hose - 1½ X 8"	1

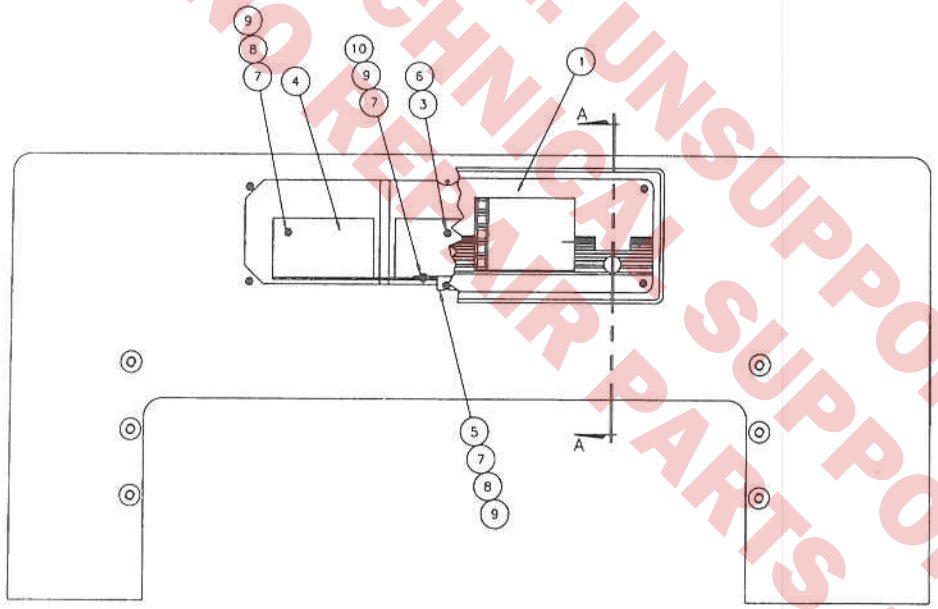
MAIN ASSEMBLY – MPX, MPC ARCH
47000 Sheet 8 of 11

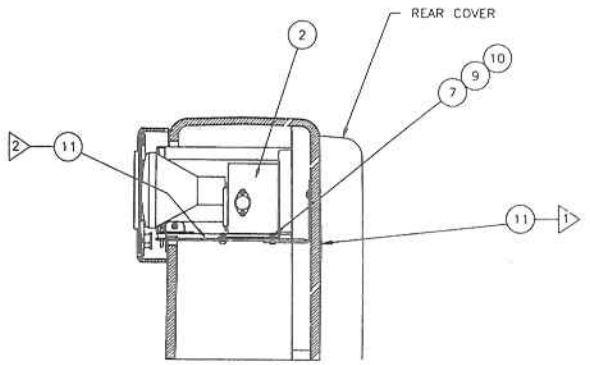


MAIN ASSEMBLY – MPX, MPC ARCH
47000 Sheet 8 of 11

Ref. No.	Part No.	Part Name	Qty.
1.	EE-2529	Assembly – Control Console – MPC	1
2.	E-2193	Clamp - Wire Harness	2
3.	13941	Reflector – Line Light	1
4.	H-7324-8	Lockwasher – ¼ - 20 Int. Tooth	3
5.	H-6910-408	Screw – ¼ - 20 X 1" But. Hd. Soc. Cap	1
6.	H-6910-102404	Screw – #10 - 24 X ½ But. Hd. Soc. Cap	1
7.	H-7324-#10	Lockwasher – #10 Int. Tooth	1
8.	H-6910-404	Screw – ¼ - 20 X ½ But. Hd. Soc. Cap	2

MAIN ASSEMBLY – CRT ARCH
47000 Sheet 9 of 11





SECTION "A–A"

SCALE: 1/3X

NOTES:

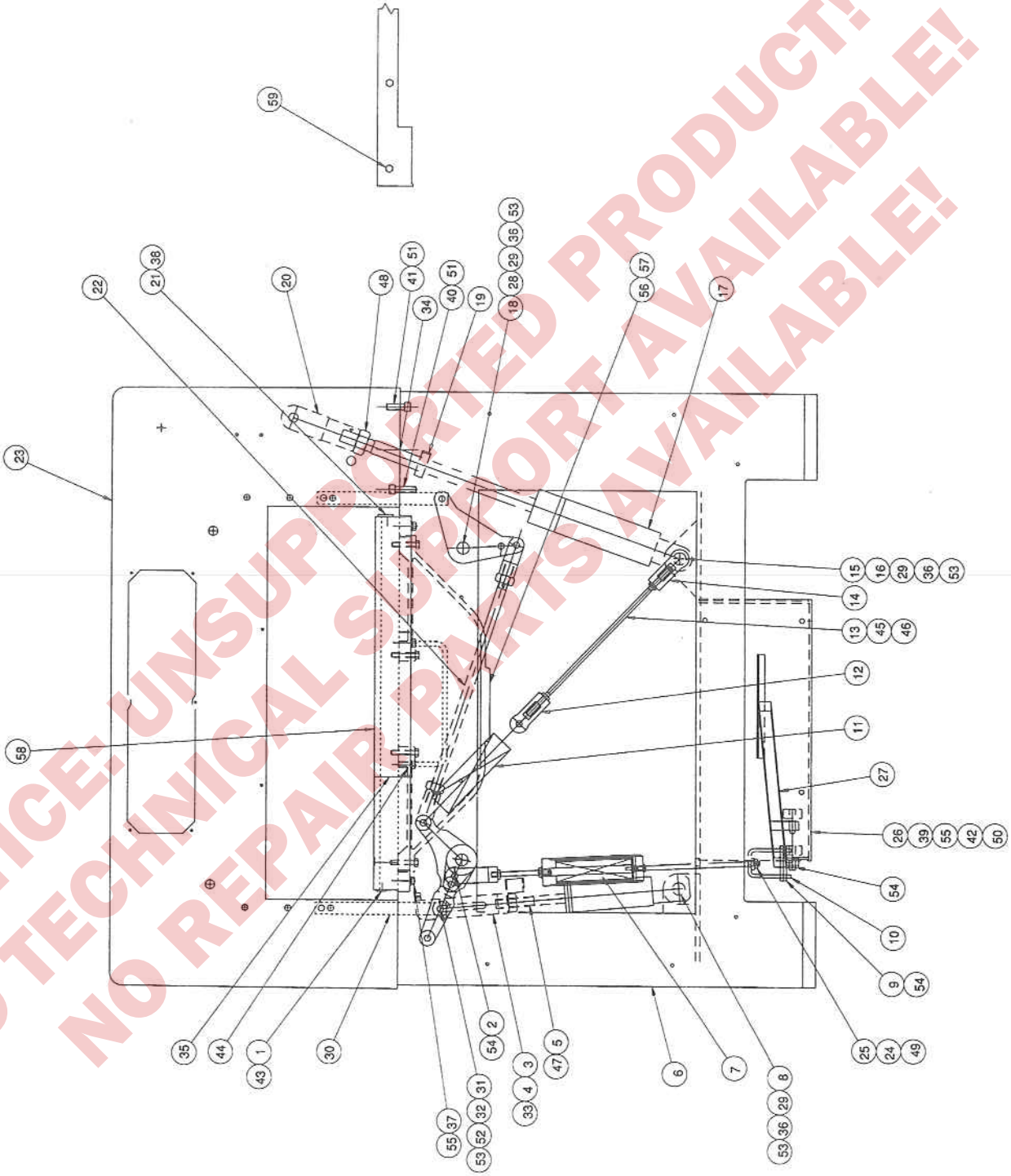
1. INSTALL ITEM #11 WARNING LABEL LEFT OF THE RIGHT UPPER ARCH OPENING , AS VIEWED FROM THE REAR.

2. INSTALL ITEM #11 WARNING LABEL ONTO THE TOP OF THE CRT COVER ASSEMBLY – NEXT TO THE CRT. THE LABEL SHOULD BE READABLE WHEN THE CRT CONSOLE (ITEM #1) IS REMOVED.

MAIN ASSEMBLY – CRT ARCH
47000 Sheet 9 of 11

Ref. No.	Part No.	Part Name	Qty.
1.	EE-2516	Control Console Asm. – CRT(Eng.)	1
	EE-2516-1	Control Console Asm. – CRT(Span.)	1
2.	EE-2389	CRT Cover Asm.	1
3.	H-7324-8	Washer – ¼-20 Int. Tooth	1
4.	139991	Bracket – CRT, Arch	1
5.	139991	Bracket – CRT, Cover Hold-Down	1
6.	H-6910-408	Screw – ¼ - 20 X 1" But. Hd. Soc. Cap	1
7.	H-6910-102404	Screw – #10-24 X ½" But. Hd. Soc. Cap	5
8.	H-7324-#10	Lockwasher – #10 Int. Tooth	2
9.	H-7321-#10	Lockwasher – #10 Standard	5
10.	H-7319-4	Washer – ¼" Standard	3
11.	S-1781-23	Label – Warning	2

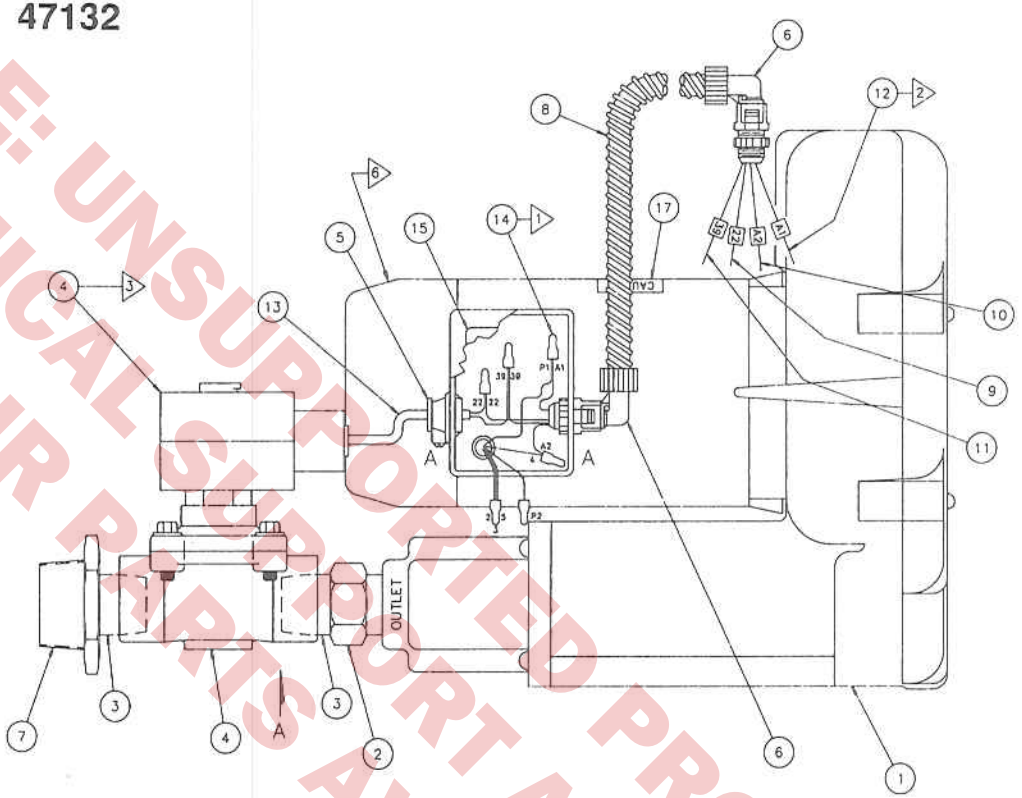
MAIN ASSEMBLY - FRONT VIEW (BASE ASSEMBLY)
47000 Sheet 11 of 11

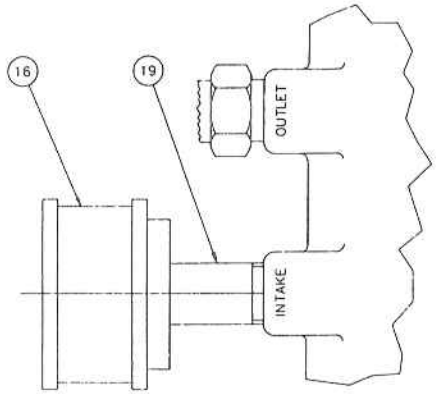


MAIN ASSEMBLY – FRONT VIEW (BASE ASSEMBLY)
47000 Sheet 11 of 11

Ref. No.	Part No.	Part Name	Qty.
1.	5-6-27B	Stop – Cut Stick L.H.	1
2.	47088	Pin – Clamp Return Clevis	1
3.	47093	Clevis – Clamp Cylinder	1
4.	47112	Actuator – Clamp Prox.	1
5.	H-431	Cylinder Asm. – Clamp	1
6.	47032	Base	1
7.	47170	Spring Assembly – Pedal Return	1
8.	47111	Pin – Clamp Cylinder	1
9.	47098	Pin – Pedal Bracket	1
10.	47102	Bracket – Pedal	1
11.	47136	Spring – Extension	1
12.	47095	Cevis – L.H.	1
13.	47057	Tie Rod – Clamp Return	1
14.	47094	Clevis – R.H.	1
15.	47087	Pin – Knife Cylinder	1
16.	S-1073-100	Retaining Ring 1"	1
17.	H-342	Cylinder Assembly – Knife	1
18.	47110	Pin – Bellcrank	2
19.	47125	Cam Assembly – Knife Cylinder	1
20.	4411	Clevis – Knife Cylinder	1
21.	4542	Stop – Cut Stick R.H.	1
22.	47005	Bellcrank Assembly – Clamp	1
23.	47168	Arch	1
24.	47084-1	Washer – Spherical – Top	1
25.	47084	Washer – Spherical – Bottom	1
26.	47143	Bracket Assembly – Hydraulic Power Unit	1
27.	47149	Pedal Assembly – Foot	1
28.	SS-798	Collar	1
29.	8835	Pin – Keeper	4
30.	4504	Bar – Clamp Pull Down	1
31.	47063	Pin – Clamp Cylinder Clevis	1
32.	H-6903-404	Screw - ¼ 20 X ½ Nyloc Butt. Hd.	2
33.	H-215-125-0500	Pin – ⅛ Dia. X ½ Roll	1
34.	H-6633-612	Pin – #6 X 1 - ½ Taper	2
35.	H-6633-718	Pin – #7 X 2 - ¼ Taper	2
36.	H-6910-404	Screw – ¼ - 20 X ½ Butt. Hd.	6
37.	H-2913-614	Screw – ⅜ - 16 X 1 - ¾ Hex	8
38.	H-6913-606	Screw – ⅜ - 16 X ¾ Hex	1
39.	H-6918-608	Screw – ⅜ - 16 X 1" Soc.	4
40.	H-6918-812	Screw – ½ - 13 X 1 - ½ Soc.	2
41.	H-6918-814	Screw – ½ - 13 X 1 - ¾ Soc.	6]
42.	H-6931-1016	Screw – ⅝ - 11 X 2" Sq. Hd.	2
43.	H-6909-83203	Screw – #8 - 32 X ⅜ Flat Hd.	1
44.	H-6951-824	Screw – ½ - 13 X ½" Flat Pt. S.S. Nyloc	2
45.	H-6423-6	Nut – ⅜ - 16 Hex	1
46.	H-6433-6	Nut – ⅜ - 16 L.H. Hex	1
47.	H-6427-12	Nut – ¾ - 16 Hex	1
48.	H-6427-16	Nut – 1" - 14 Hex	1
49.	H-5247-6	Nut – ⅜ - 16 Flex Lock	1
50.	H-6424-10	Nut - ⅝ - 11 hex	2
51.	H-7329-8	Washer – ½ HI Collar	8
52.	H-7321-4	Washer – ¼ USS	2
53.	H-7324-8	Washer – ¼ Int. Tooth	6
54.	S-1193-50	"E" Ring – ½	7
55.	H-7327-12	Washer - ⅜ Lock	12
56.	4484	Brace - Table	1
57.	H-6913-616	Screw - ⅜ - 16 X 2" Hex Hd.	4
58.	47023	Table	1
	47062	Table Assembly - Air Tubes	1
59.	H-6913-608	Screw - ⅜ - 16 X 1" Hex	4

AIR TABLE BLOWER ASSEMBLY - SINGLE PHASE
47132





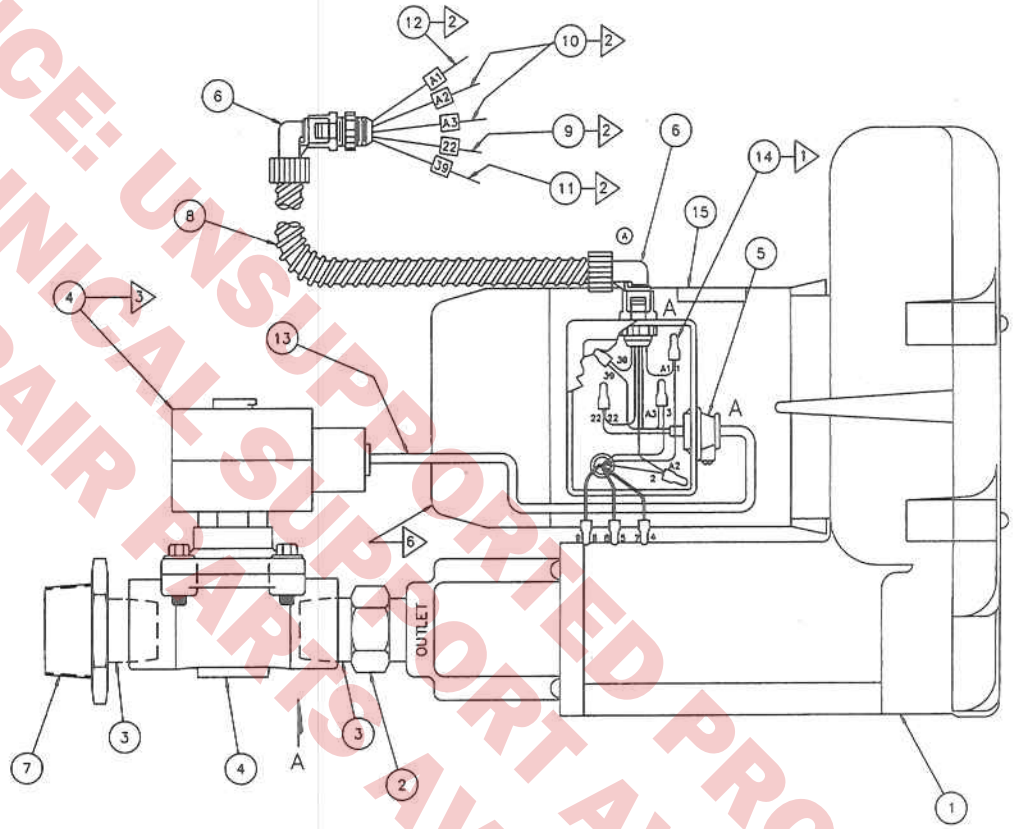
VIEW A
SCALE: NONE

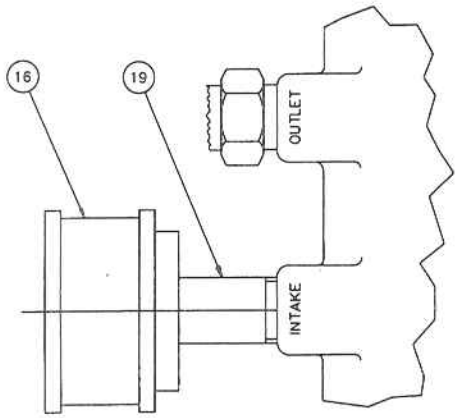
WIRING CHART		
HIGH VOLTAGE	WIRE NO.	CONNECT TO BLOWER NO.
208/230V 60Hz 220V 50Hz	A1	P1
	A2	4
	–	P2
	–	2,3 & 5
LOW VOLTAGE	WIRE NO.	CONNECT TO BLOWER NO.
115V 60Hz 110V 50Hz	A1	P1
	A2	2 & 4
	–	P2,3 & 5

AIR TABLE BLOWER ASSEMBLY - SINGLE PHASE
47132

Ref. No.	Part No.	Part Name	Qty.
1.	E-1223-1	Blower	1
2.	P-204	Reducer - PVC	1
3.	P-212	Nipple - PVC	2
4.	P-202	Valve - Solenoid	1
5.	S-1350-16	Strain Relief	1
6.	E-2190-1	Connector - 90-degree Elbow	2
7.	P-204-1	Reducer	1
8.	E-2189-1	Tubing 28" Long	1
9.	E-709-R	Wire 18 GA MTW 47" Long	1
10.	E-709-R	Wire 18 GA MTW 49" Long	1
11.	E-709-R	Wire 18 GA MTW 50" Long	1
12.	E-709-R	Wire 18 GA MTW 51" Long	1
13.	E-1453-1	Shrink Tubing – 5" Long	1
14.	E-1237-6	Nut - Wire - Blue	6
15.	S-1781-11A	Label, Caution	1
16.	H-238-4	Strainer	1
17.	13950	Label, Caution	1
18.	E-1214-4	Connector - #8 Ins. Fork (Not Shown)	1
19.	H-6405-1624	Nipple - 1" X 3" Pipe	1

AIR TABLE BLOWER ASSEMBLY - THREE PHASE
47141





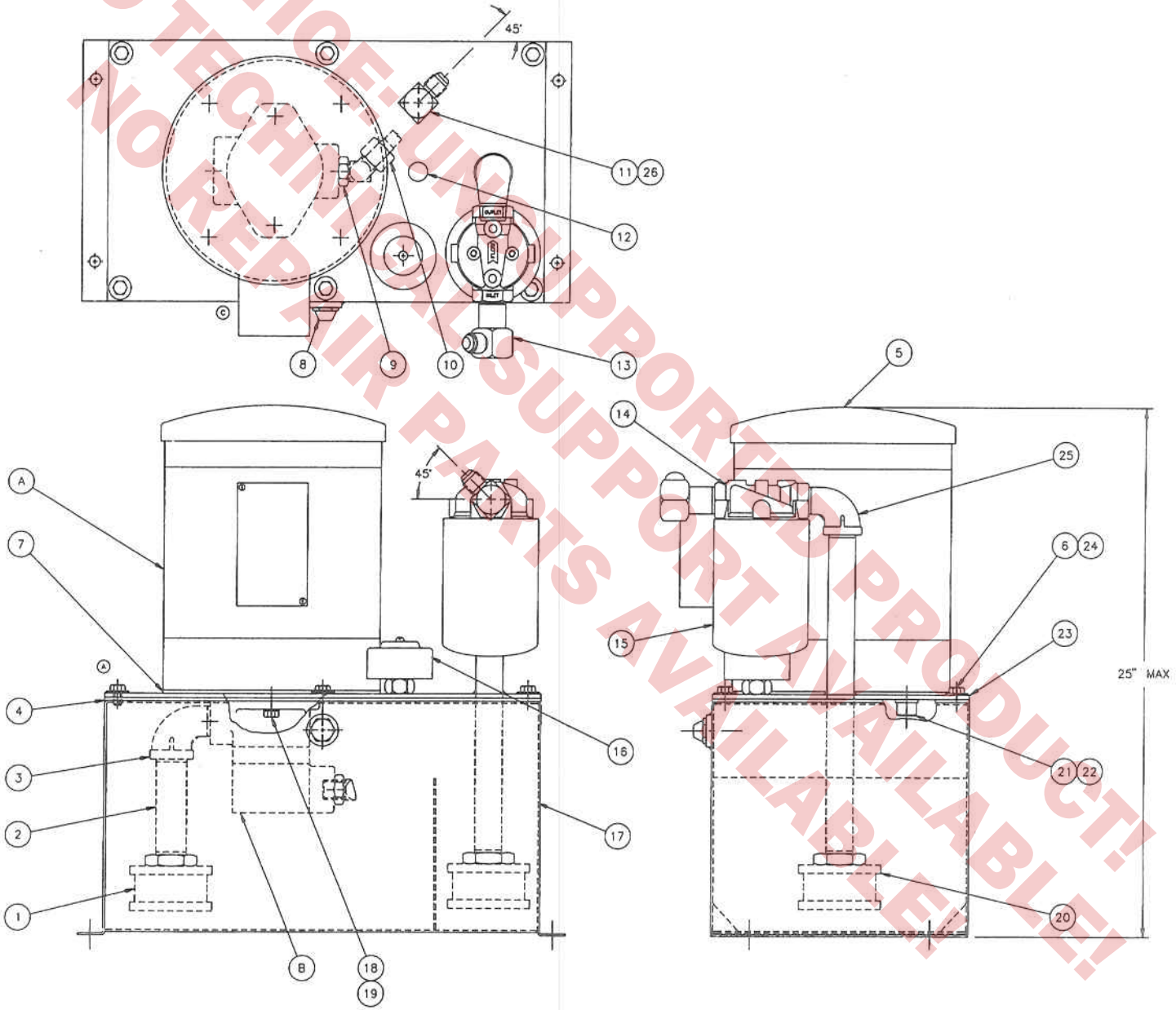
VIEW A
SCALE: NONE

WIRING CHART		
HIGH VOLTAGE	WIRE NO.	CONNECT TO BLOWER NO.
460V 60Hz 380–415V 50Hz	A1	1
	A2	2
	A3	3
	–	7 & 4
	–	8 & 5
	–	9 & 6
LOW VOLTAGE	WIRE NO.	CONNECT TO BLOWER NO.
208–230V 60Hz 190–220V 50Hz	A1	1 & 7
	A2	2 & 8
	A3	3 & 9
	–	4, 5 & 6

AIR TABLE BLOWER ASSEMBLY - THREE PHASE
47141

Ref. No.	Part No.	Part Name	Qty.
1.	E-1223-1	Blower	1
2.	P-204	Reducer - PVC	1
3.	P-212	Nipple - PVC	2
4.	P-202	Valve - Solenoid	1
5.	S-1350-16	Strain Relief	1
6.	E-2190-1	Connector - 90-degree Elbow	2
7.	P-204-1	Reducer	1
8.	E-2189-1	Tubing 28" Long	1
9.	E-709-R	Wire 18 GA MTW 47" Long	1
10.	E-709-R	Wire 18 GA MTW 49" Long	1
11.	E-709-R	Wire 18 GA MTW 50" Long	1
12.	E-709-R	Wire 18 GA MTW 51" Long	1
13.	E-1453-1	Shrink Tubing – 10" Long	1
14.	E-1237-6	Nut - Wire - Blue	6
15.	S-1781-11A	Label	1
16.	H-238-4	Strainer	1
17.			
18.	E-1214-4	Connector - #8 Ins. Fork (Not Shown)	1
19.	H-6405-1624	Nipple - 1" X 3" Pipe	1

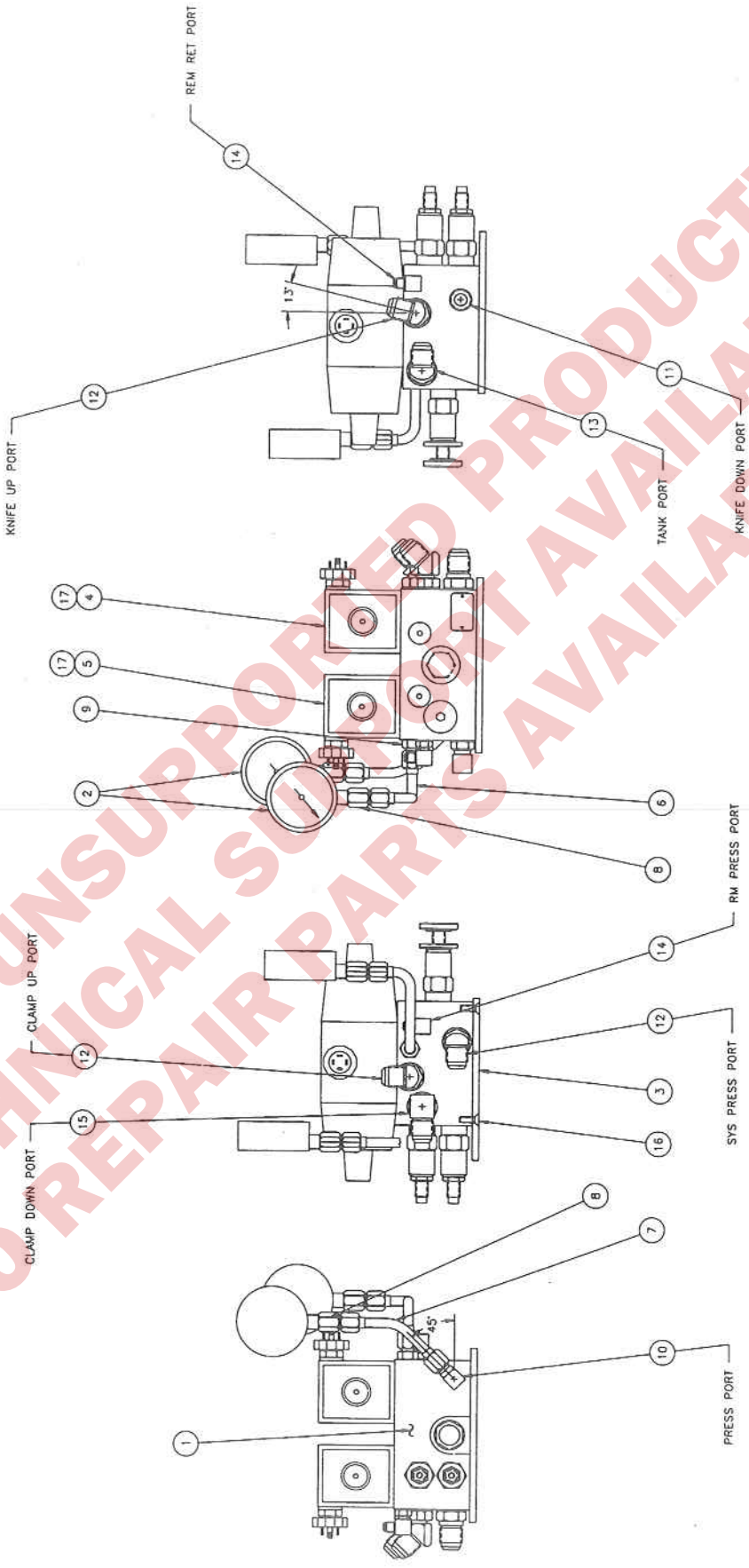
HYDRAULIC POWER UNIT ASSEMBLY
H-416-( )



HYDRAULIC POWER UNIT ASSEMBLY
H-416-( )

Ref. No.	Part No.	Part Name	Qty.
1.	H-238-4	Strainer – Oil	1
2.	H-6405-1-1640	Nipple – 1" x 5" Pipe	1
3.	H-248-2	Elbow – 1" x 90° Street	1
4.	3947	Gasket – Tank Cover	1
5.	E-2283	Cover – Grip	REF
6.	H-7321-5	5/16 Flat Washer	6
7.	13946	Gasket – Motor	1
8.	H-281-2	Sight Gage	REF
9.	H-272-3	Elbow – 45° SAE "0" Ring to Tube	1
10.	H-389	Tube – Pump	1
11.	H-442	Elbow – 90° Swivel	1
12.	H-6671-8	Plug – ½ NPT	1
13.	H-237-17	Elbow – 90° ¾ T. x ¾ P.	1
14.	H-226-1	Head – Filter	1
15.	H-227-1	Filter	1
16.	H-287-2	Breather	1
17.	47140	Tank	1
18.	H-7327-12	⅜ Med. Lockwasher	2
19.	H-6913-608	⅜ - 16 x 1" HEX HD. CAP Screw	2
20.	H-338	Diffuser	1
21.	H-6918-808	½ - 13 x 1" SOC HD. CAP Screw	4
22.	H-7327-16	½ Med. Lockwasher	4
23.	47155	Cover Assembly	1
24.	H-6913-506	5/16 - 18 x ¾ HEX HD. CAP Screw	6
25.	H-248-1	Elbow - ¾ Street	1
26.	H-441	Bulkhead Tube Union	1

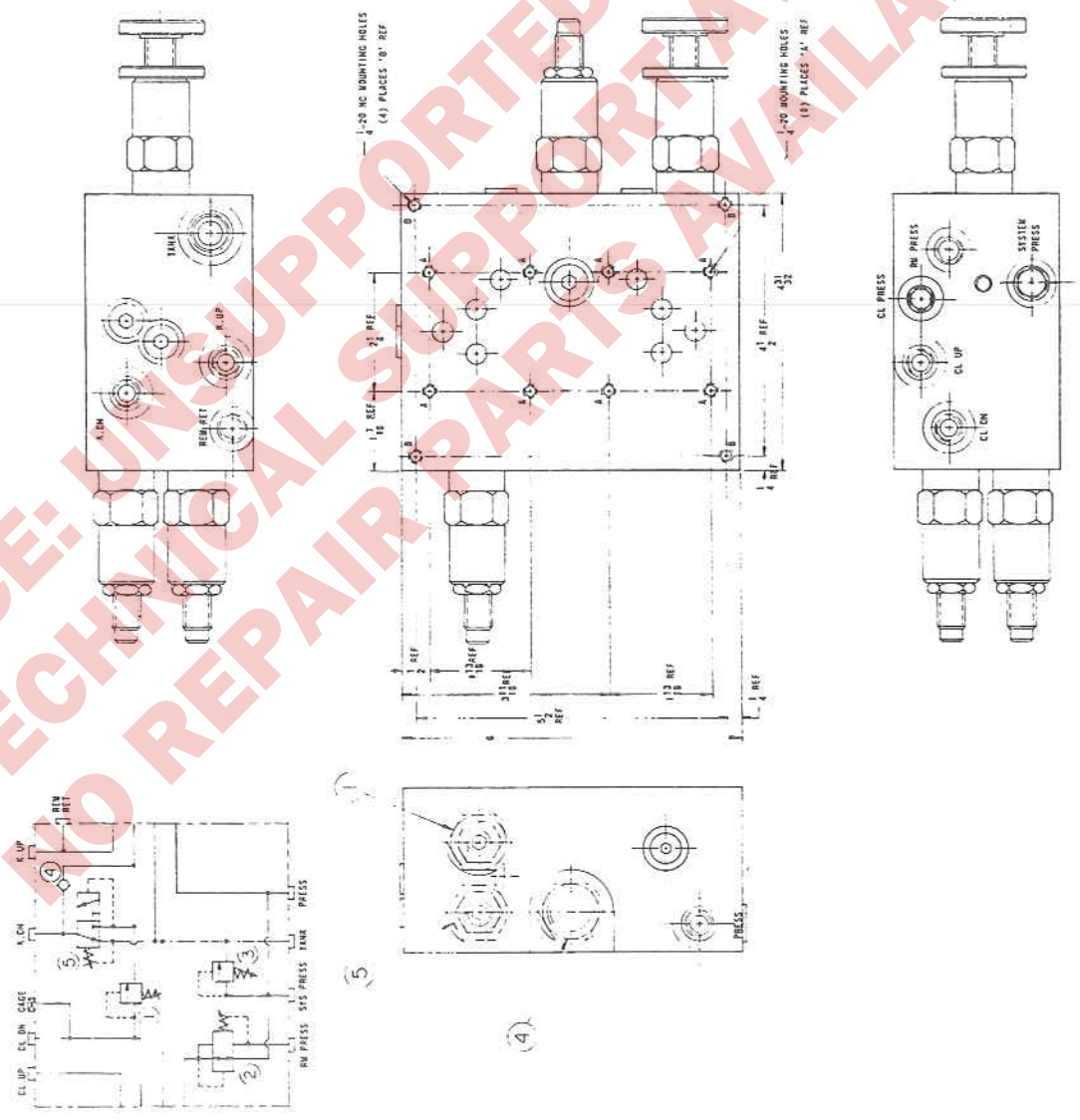
MANIFOLD ASSEMBLY
H-443



MANIFOLD ASSEMBLY
H-443

Ref. No.	Part No.	Part Name	Qty.
1.	H-285	Manifold Assembly	1
2.	8P-629-3	Gage	2
3.	13921-1	Bracket – Hydraulic Manifold	1
4.	H-310	4-Way Valve Assembly (Knife)	1
5.	H-311	4-Way Valve Assembly (Clamp)	1
6.	H-328	Tube Assembly – Clamp Pressure	1
7.	H-425	Tube Assembly – System Pressure	1
8.	H 253-2	Adapter – Pipe(INT) To Tube	2
9.	H-236-5	Adapter – SAE "O" Ring To Tube	1
10.	H-230-3	Elbow – 90° SAE "O" Ring To Tube	1
11.	H-236-6	Adapter – SAE "O" Ring To Tube	1
12.	H-272-1	Elbow 45° SAE "O" Ring To Tube	3
13.	H-272-3	Elbow 45° SAE "O" Ring To Tube	1
14.	H-230-5	Elbow 90° SAE "O" Ring To Tube	2
15.	H-229-1	Elbow 90° SAE "O" Ring To Tube (Long)	1
16.	H-6922-412	Screw – ¼- 20 x ¾ Flat Head	4
17.	H-6918- ( )	See Chart Valve MTG> Hardware	-

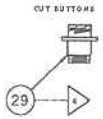
MANIFOLD ASSEMBLY
H-285

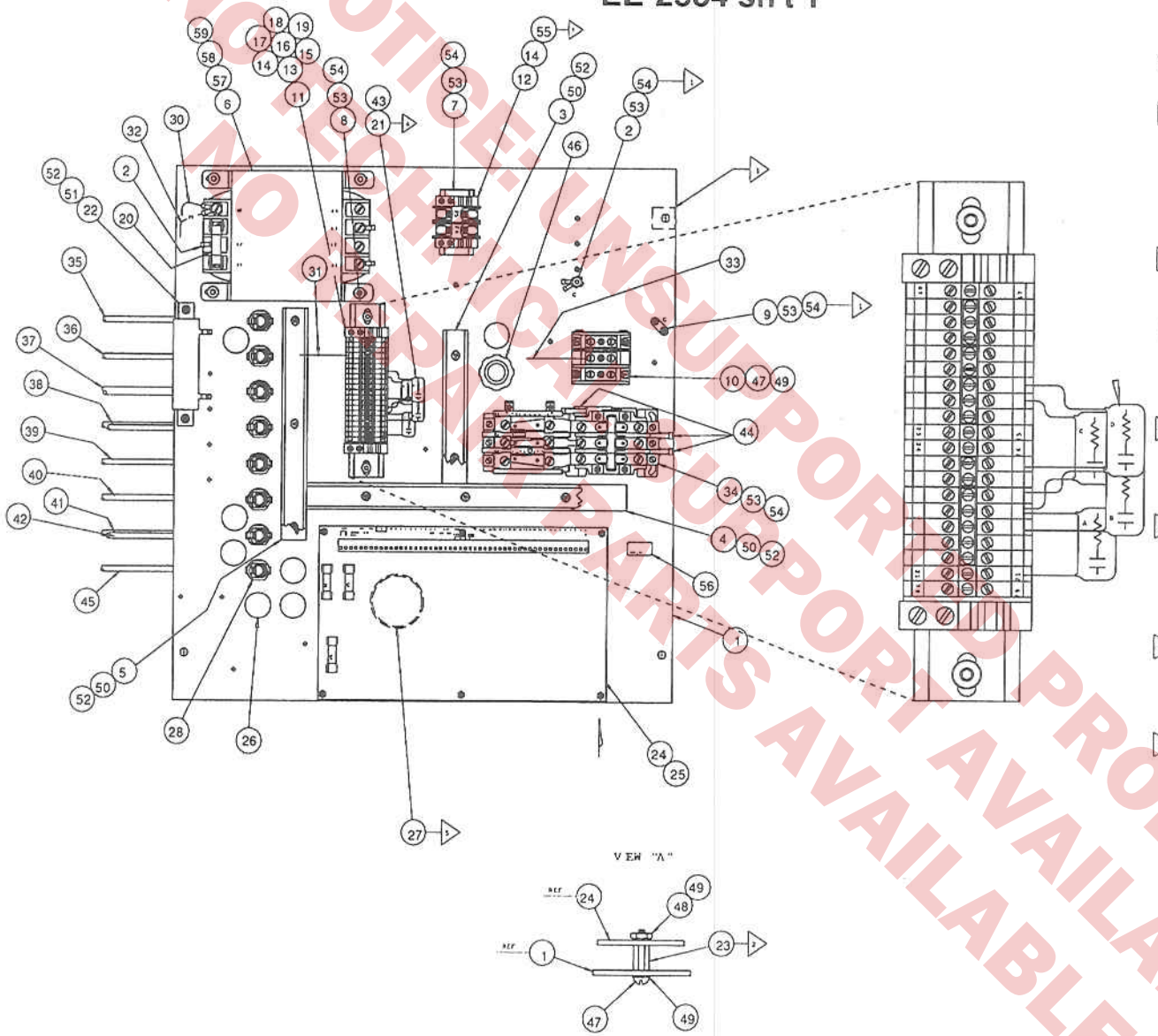


MANIFOLD - ASSEMBLY
H-285

Ref. No.	Part No.	Part Name	Qty.
1.	H-203-7	Relief Valve Cartridge Low Press	1
2.	5136	Pressure Reducing Valve	1
3.	8031-1	Main System Relief Valve	1
4.	H-203-8	Check Valve Cartridge	1
5.	H-203-9	Sequence Valve Cartridge	1
6.	H-328	Tube Assembly – Clamp Pressure	1
–	HH-292-1	Seal Kit (Not Shown)	-

POWER PANEL ASSEMBLY - MPX, MPC, CRT 60 HZ.
EE-2584 sh't 1





NOTES:

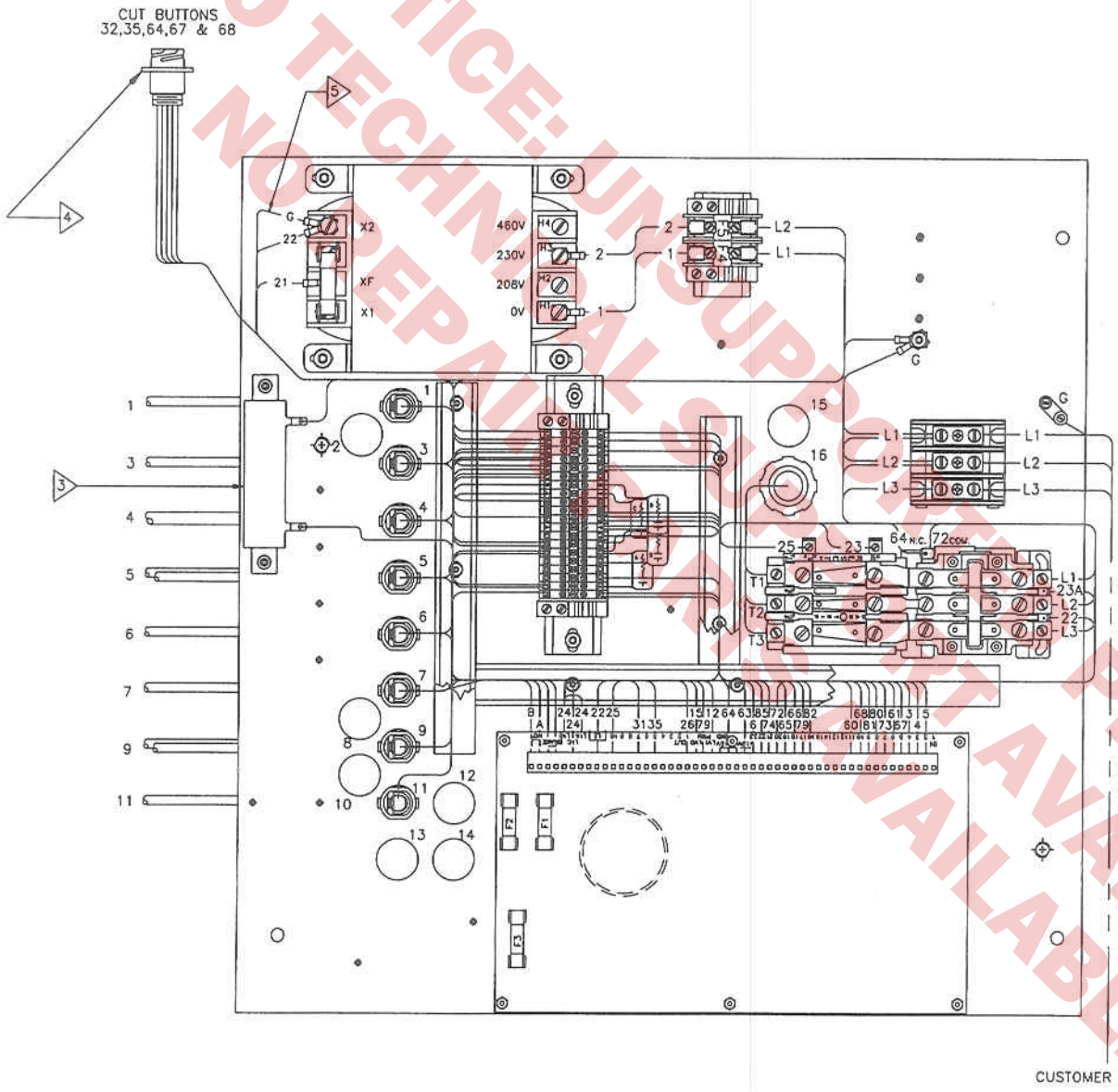
1. IF NECESSARY, GRIND OFF PAINT UNDER THE GROUND LUG, GROUND SCREW AND THE UPPER RIGHT CORNER MOUNTING HOLE TO ASSURE PROPER GROUND.
2. USE #SV-22-105 LOCTITE TO RETAIN STUD (ITEM #23) TO SCREW (ITEM #47).
3) USE #18 GA MTW WIRE (ITEM #31) FOR ALL PANEL WIRING UNLESS OTHERWISE SPECIFIED.
4. THIS ITEM IS TO BE WIRED AND TIED BACK NEATLY FOR SHIPPING (SEE SHEET 2).
5. BEFORE ATTACHING THE CIRCUIT BOARD INSERT ITEM #27 INTO THE HOLE ON THE PANEL UNDERNEATH WHERE THE PC BOARD WILL MOUNT.
6. ADD SHRINK TUBING (ITEM #43) TO THE LEADS OF THE QUENCHARCS FOR INSULATION.
7. ITEM #55 FUSE PULLER SHOULD BE TIED TOGETHER AND ATTACHED TO ASSEMBLY TO KEEP FORM BEING LOST. THESE PARTS TO BE USED IN FINAL ASSEMBLY.

POWER PANEL ASSEMBLY - MPX, MPC, CRT 60 HZ.

EE-2584 sheet 1

Ref. No.	Part No.	Part Name	Qty.
1.	47156	Panel - Power	1
2.	E-1214-1	Connector - Ins. Locking Fork	7
3.	E-1429-6	Wire Duct & Cover - 6" Long	1
4.	E-1429-7	Wire Duct & Cover - 12¾" Long	1
5.	E-1429-8	Wire Duct & Cover - 9" Long	1
6.	E-1089-24	Transformer -208/230/460V 750VA	1
7.	E-1977-9	Rail - Terminal - 2½" Long	1
8.	E-1977-11	Rail - Terminal - 6¾" Long	1
9.	E-640-2	Ground Lug - 4GA Max.	1
10.	E-2591	Power Terminal Block, 3 Pole	1
11.	E-2068-4	Terminal Block - Through, 12 AWG.	20
12.	E-1974-6	Terminal Block - Fuse	2
13.	E-2069-3	End Plate	1
14.	E-2070-1	End Bracket	4
15.	E-2071-2	Fixed Bridge - 2 Pole	2
16.	E-2071-3	Fixed Bridge - 3 Pole	2
17.	E-2071-5	Fixed Bridge - 5 Pole	1
18.	E-1356-95	Marking Strip	1
19.	E-1356-94	Marking Strip	1
20.	E-1075-6.25SB	Fuse - 6¼A SLO-BLO	1
21.	E-1736	Quencharc	4
22.	E-1198-1	Power Resister, 2 OHM 55 Watt	1
23.	E-1152-24	Stand-Off - ½" Long	6
24.	EE-2592	P.C.B. Asm. - Motor Controller	1
25.	E-2066-10	Plug Connector - P.C.B. 10 Pin	5
26.	E-2196-11	Hole Plug - ⅞ Dia.	7
27.	E-2196-21	Hole Plug - 2" Dia Mounting Hole	1
28.	S-1350-16	Strain Relief-Cable	8
29.	EE-2506	Receptacle Asm. - 14 Pin Rev.	1
30.	E-709-G	Wire, #18 Ga. Green MTW	As Needed
31.	E-709-R	Wire, #18 Ga. Red MTW	As Needed
32.	E-849-R	Wire, #16 Ga. Red MTW	As Needed
33.	E-1213-B	Wire, #10 Ga. Blacke MTW	As Needed
34.	E-2194	Motor Starter	1
35.	EE-2492	Prox. Assembly - Clamp up Limit	1
36.	EE-2530	Cable Assembly - Console Power	1
37.	EE-2495	Cable Asm. - Console Signal	1
38.	EE-2593	Conduit Asm. - Rev. Limit & Motor	1
39.	EE-2508	Prox. Asm. - Forward Limit	1
40.	EE-2496	Prox. Asm. - Knife Up	1
41.	EE-2589	Cable Assembly - Knife up/dwn Solenoid	1
42.	EE-2590	Cable Asm. - Clamp up.dwn Solenoid	1
43.	E1453-3	Shrink Tubing - 1" Long (Not Shown)	8
44.	E-1214-49	Connector - ¼" Fully Ins. Quick Disc.	4
45.	EE-2502	Prox. Assembly - Hydraulic Up.	1
46.	EE-2510	Conduit Assembly - Hydraulic Motor	1
47.	H-6910-63203	Screw, #6032NC X ⅜" But Hd Cap.	10
48.	H-6423-#6	Nut, #6 -32NC Hex	6
49.	H-7324-#6	Washer, #6 Int. Tooth	16
50.	H-6910-83203	Screw, #8-32NC X ⅜" But. Hd. Cap	8
51.	H-6910-83205	Screw, #8-32NC X ⅝" But. Hd. Cap	2
52.	H-7324-#8	Washer, #8 Int. Tooth	10
53.	H-6910-102403	Screw, #10-24NC X ⅜" But. Hd. Cap	9
54.	H-7324-#10	Washer, #10 Int. Tooth	9
55.	E-2594	Fuse Puller	2
56.	E-1584-()	Label -Asm. Number	1
57.	H-6910-403	Screw, ¼-20NC X ⅜" But. Hd. Cap.	4
58.	H-7324-8	Washer, ¼ Int. Tooth	4
59.	H-7319-4	Washer, ¼ Flat	4

POWER PANEL ASSEMBLY (Wiring Connections) - MPX, MPC, CRT 60 HZ.
EE-2584 sh't 2 0f 2



NOTES:

1) WIRE TAG ALL WIRES BOTH ENDS-AS SHOWN.

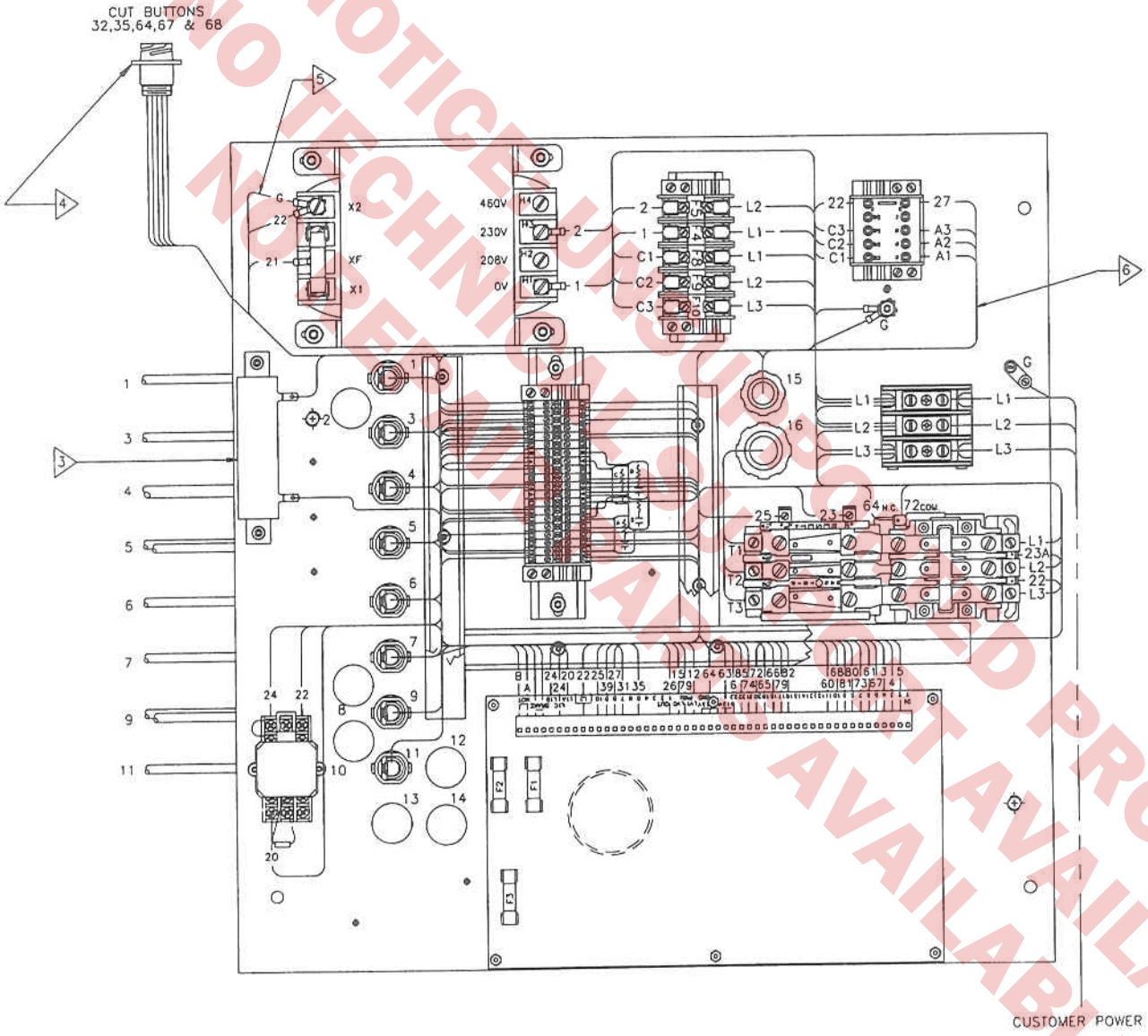
2) #10 GA. WIRE TO BE RUN TO ALL TERMINALS BEFORE THE FUSES, #16 GA. WIRE TO BE RUN FOR THE SECONDARY SIDE OF THE FUSES THROUGH THE TRANSFORMER TO THE TERMINAL BLOCKS. ALL WIRING TO BE #18 GA. UNLESS OTHERWISE SPECIFIED.

3 WIRES TO THE RESISTOR TO BE SOLDERED TO RESISTOR TERMINALS AS SHOWN.

4 WIRE AND TIE BACK NEATLY FOR SHIPPING.

5 USE #18 GA. GREEN MTW BETWEEN TRANSFORMER (#22 TERMINAL) & GROUND SCREW.

POWER PANEL ASSEMBLY - MPX, MPC, CRT (Air Table Option)
EE-2585 sh't 2 0f 2



NOTES:

1) WIRE TAG ALL WIRES BOTH ENDS-AS SHOWN.

2) #10 GA. WIRE TO BE RUN TO ALL TERMINALS BEFORE THE FUSES, #16 GA. WIRE TO BE RUN FOR THE SECONDARY SIDE OF THE FUSES THROUGH THE TRANSFORMER TO THE TERMINAL BLOCKS. ALL WIRING TO BE #18 GA. UNLESS OTHERWISE SPECIFIED.

3 WIRES TO THE RESISTOR TO BE SOLDERED TO RESISTOR TERMINALS AS SHOWN.

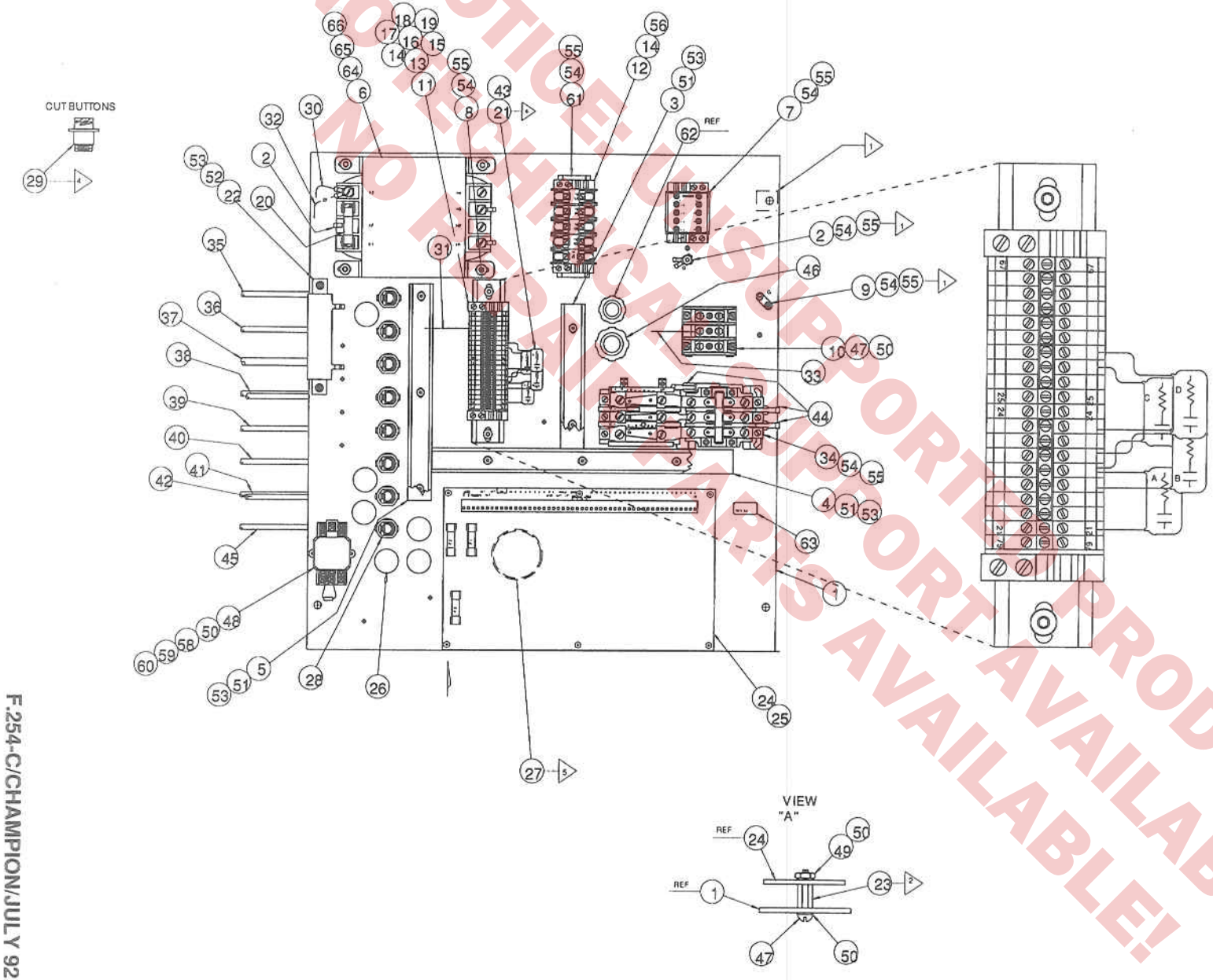
4 WIRE AND TIE BACK NEATLY FOR SHIPPING.

5 USE #18 GA. GREEN MTW BETWEEN TRANSFORMER (#22 TERMINAL) & GROUND SCREW.

6 ATTACH THE WIRES FROM THE BLOWER ASSEMBLY (KNOCKOUT #15) AS FOLLOWS:
- A1, A2 & A3 TO GO TO BLOWER STARTER
- 22 TO GO TO TERMINAL BLOCK #22
- 39 TO GO TO CIRCUIT BOARD TERMINAL NO. OUT 9

SINGLE PHASE MACHINES
- A1,A1 & A3 TO GO TO BLOWER STARTER
- 22 TO GO TO TERMINAL BLOCK #22
- 39 TO GO TO CIRCUIT BOARD TERMINAL NO. OUT 9

POWER PANEL ASSEMBLY - MPX, MPC, CRT (Air Table Option)
EE-2585 SHEET 1 0f 2



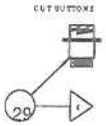
NOTES:

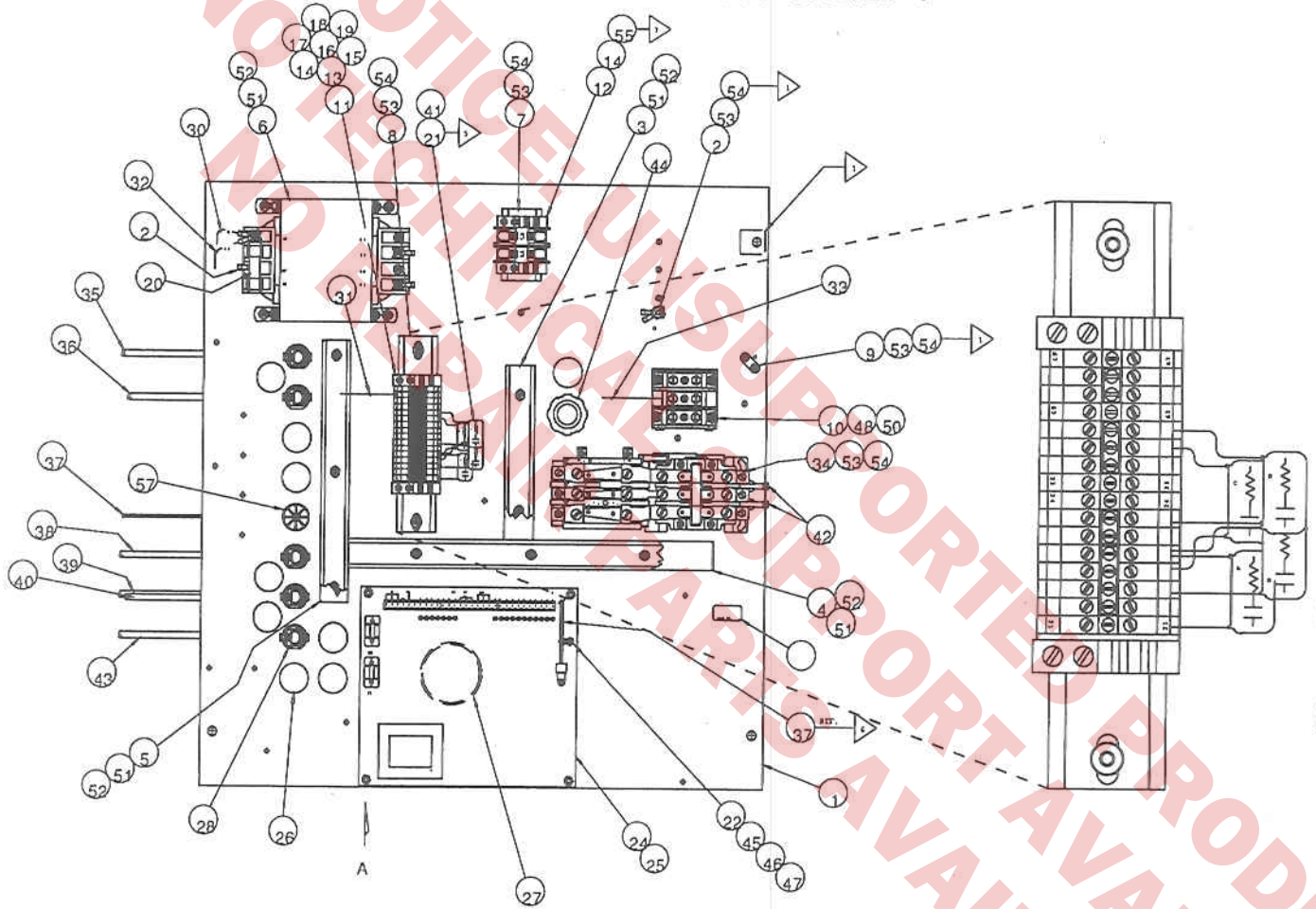
1. IF NECESSARY, GRIND OFF PAINT UNDER THE GROUND LUG, GROUND SCREW AND THE UPPER RIGHT CORNER MOUNTING HOLE TO ASSURE PROPER GROUND.
2. USE #SV-22-105 LOCTITE TO RETAIN STUD (ITEM #23) TO SCREW (ITEM #47).
3. USE #18 GA MTW WIRE (ITEM #31) FOR ALL PANEL WIRING UNLESS OTHERWISE SPECIFIED.
4. THIS ITEM IS TO BE WIRED AND TIED BACK NEATLY FOR SHIPPING (SEE SHEET 2).
5. BEFORE ATTACHING THE CIRCUIT BOARD INSERT ITEM #27 INTO THE HOLE ON THE PANEL UNDERNEATH WHERE THE PC BOARD WILL MOUNT.
6. ADD SHRINK TUBING (ITEM#43) TO THE LEADS OF THE QUENCHARCS FOR INSULATION.
7. ITEM #56 FUSE PULLER SHOULD BE TIED TOGETHER AND ATTACHED TO ASSEMBLY TO KEEP FROM BEING LOST. THESE PARTS TO BE USED IN FINAL ASSEMBLY.

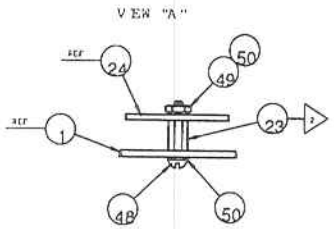
POWER PANEL ASSEMBLY - MPX, MPC, CRT (Air Table Option)
EE-2585 SHEET 1 0f 2

Ref. No.	Part No.	Part Name	Qty.
1.	47156	Panel - Power	1
2.	E-1241-1	Connector - Ins. Locking Fork	7
3.	E-1429-6	Wire Duct & Cover - 6" Long	1
4.	E-1429-7	Wire Duct & Cover - 12¾" Long	1
5.	E-1429-8	Wire Duct & Cover - 9" Long	1
6.	E-1089-24	Transformer - 208/230/460V 750VA	1
7.	E-1977-9	Rail - Terminal - 2½" Long	1
8.	E-1977-11	Rail - Terminal - 6¾" Long	1
9.	E-640-2	Ground Lug - 4Ga. Max.	1
10.	E-2591	Power Terminal Block, 3 Pole	1
11.	E-2068-4	Terminal Block - Through, 12 Awg.	20
12.	E-1974-6	Terminal Block - Fuse	5
13.	E-2069-3	End Plate	1
14.	E-2070-1	End Bracket	6
15.	E-2071-2	Fixed Bridge - 2 Pole	2
16.	E-2071-3	Fixed Bridge - 3 Pole	2
17.	E-2071-5	Fixed Bridge - 5 Pole	1
18.	E-1356-94	Marking Strip	1
19.	E-1356-95	Marking Strip	1
20.	E-1075-6.25SB	Fuse - 6-¼A SLO-BLO	1
21.	E-1736	Quencharc	4
22.	E-1198-1	Power Resister, 2 Ohm. 55 Watt	1
23.	E-1152-24	Stand-Off - ½" Long	6
24.	EE-2592	P.C.B. Asm. - Motor Controller	1
25.	E-2066-10	Plug Connector - P.C.B. 10 Pin	5
26.	E-2196-11	Hole Plug - ⅞ Dia.	7
27.	E-2196-21	Hole Plug - 2" Dia Mounting Hole	1
28.	S-1350-16	Strain Relief - Cable	8
29.	EE-2506	Receptacle Asm. - 14 Pin Rev.	1
30.	E-709-G	Wire, #18 Ga. Green MTW	As Needed
31.	E-709-R	Wire, #18 Ga. Red MTW	As Needed
32.	E-849-R	Wire, #16 Ga. Red MTW	As Needed
33.	E-1213-B	Wire, #10 Ga. Black MTW	As Needed
34.	E-2194	Motor Starter	1
35.	EE-2492	Prox. Assembly - Clamp Up Limit	1
36.	EE-2530	Cable Assembly - Console Power	1
37.	EE-2495	Cable Asm. - Console Signal	1
38.	EE-2593	Conduit Asm. - Rev. Limit & Motor	1
39.	EE-2508	Prox. Asm. - Forward Limit	1
40.	EE-2496	Prox. Assembly - Knife Up	1
41.	EE-2589	Cable Assembly - Knife up/dwn Solenoid	1
42.	EE-2590	Cable Assembly - Clamp up/dwn Solenoid	1
43.	E-1453-3	Shrink Tubing - 1" Long (Not Shown)	8
44.	E-1214-49	Connector - ¼" Fully ins. Quick Disc.	4
45.	EE-2502	Prox. Assembly - Hydraulic Up	1
46.	EE-2510	Conduit Assembly - Hydraulic Motor	1
47.	H-6910-63203	Screw, #6-32NC X ⅜" But Hd Cap.	10
48.	H-6910-63205	Screw, #6-32NC X ⅝" But Hd. Cap.	2
49.	H-6423-#6	Nut, #6-32NC Hex	6
50.	H-7324-#6	Washer, #6 Int. Tooth	18
51.	H-6910-83203	Screw, #8-32NC X ⅜" But Hd. Cap.	8
52.	H-6910-83205	Screw, #8-32NC X ⅝" But Hd. Cap.	2
53.	H-7324-#8	Washer, #8 Int. Tooth	10
54.	H-6910-102403	Screw, #10-24NC X ⅜" But Hd. Cap.	11
55.	H-7324-#10	Washer, #10 Int. Tooth	11
56.	E-2594	Fuse Puller	5
57.	E-2403-1	Contactor - Blower	1
58.	E-2228	Relay - Time Delay	1
59.	E-2113-5	Socket - 3PDT Panel Mount	1
60.	E-1136-18	Resistor -150K OHM 1/4W	1
61.	E-1977-6	Rail - Terminal - 4¼" Long	1
62.	47141	Blower Assembly - 3PH	REF
	47132	Blower Assembly - 1PH	REF
63.	E-1584-()	Label - Asm. Number	1
64.	H-6910-403	Screw, ¼-20NC X ⅜ But Hd. Cap.	4
65.	H-7324-8	Washer, ¼ Int. Tooth	4
66.	H-7319-4	Easher, ¼ Flat	4

POWER PANEL ASSEMBLY - MC 60 HZ.
EE-2586 SHEET 1







NOTES:

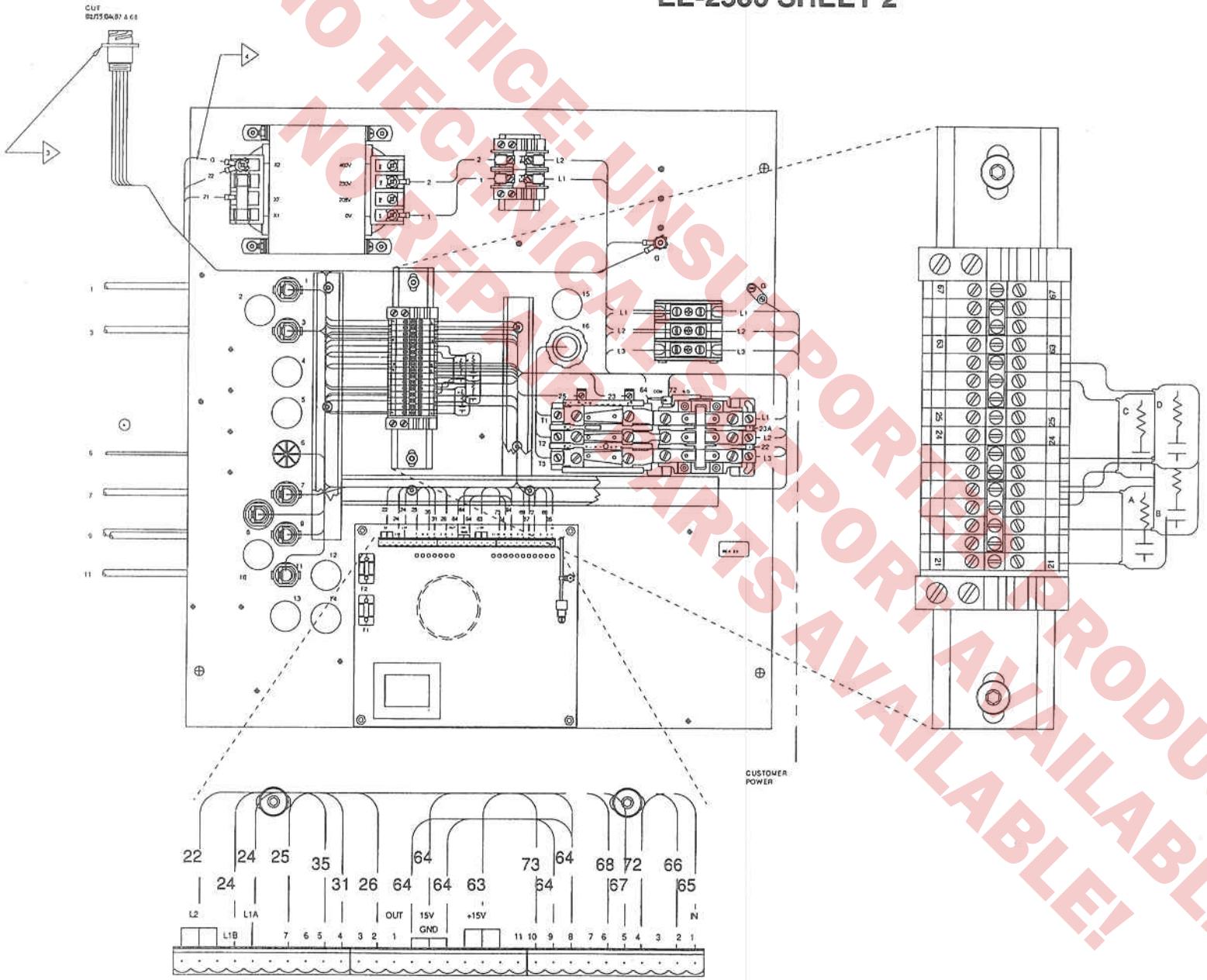
1. IF NECESSARY GRIND OFF PAINT UNDER THE GROUND LUG, GROUND SCREW AND THE UPPER RIGHT CORNER MOUNTING HOLE TO ASSURE PROPER GROUND.
2. USE #SV-22-105 LOCTITE TO RETAIN STUD (ITEM #23) TO SCREW (ITEM #48)
3. USE #18 GA. MTW WIRE (ITEM #31) FOR ALL PANEL WIRING UNLESS OTHERWISE SPECIFIED.
4. THIS ITEM IS TO BE WIRED AND TIED BACK NEATLY FOR SHIPPING (SEE SHEET 2).
5. ADD SHRINK TUBING (ITEM #41) TO THE LEADS OF THE QUECNHARCS FOE INSULATION.
6. INSERT TERMINATED FIBER THROUGH LOCKING NUT AND INTO THE CONNECTOR UNTIL THE CORE TIP SEATS AGAINST THE MOLDED LENS INSIDE THE DEVICE.

   SCREW CONNECTOR LOCKING NUT DOWN TO A SNUG FIT, LOCKING THE FIBER IN PLACE.
7. ITEM #55 FUSE PULLER SHOULD BE TIED TOGETHER AND ATTACHED TO ASSEMBLY TO KEEP FROM BEING LOST. THESE PARTS TO BE USED IN FINAL ASSEMBLY.

POWER PANEL ASSEMBLY - MC 60 HZ.
EE-2586 SHEET 1

Ref. No.	Part No.	Part Name	Qty.
1.	47156	Panel - Power	1
2.	E-1241-1	Connector - #10 Ins. Locking Fork	7
3.	E-1429-6	Wire Duct & Cover - 6" Long	1
4.	E-1429-7	Wire Duct & Cover - 12¾" Long	1
5.	E-1429-8	Wire Duct & Cover - 9" Long	1
6.	E-1089-29	Transformer - 208/230/460V 350VA	1
7.	E-1977-9	Rail - Terminal - 2½" Long	1
8.	E-1977-11	Rail - Terminal - 6¾" Long	1
9.	E-640-2	Ground Lug - 4Ga. Max.	1
10.	E-2591	Power Terminal Block, 3 Pole	1
11.	E-2068-4	Terminal Block - Through, 12 Awg.	16
12.	E-1974-6	Terminal Block - Fuse	2
13.	E-2069-3	End Plate	1
14.	E-2070-1	End Bracket	4
15.	E-2071-2	Fixed Bridge - 2 Pole	2
16.	E-2071-3	Fixed Bridge - 3 Pole	1
17.	E-2071-4	Fixed Bridge - 4 Pole	1
18.	E-1356-96	Marking Strip	1
19.	E-1356-97	Marking Strip	1
20.	E-1075-3SB	Fuse - 3A SLO-BLO	1
21.	E-1736	Quencharc	4
22.	E-1694-4	Tyrap	1
23.	E-1152-24	Stand-Off - ½" Long	4
24.	EE-2588	P.C.B. Asm. - Motor Controller	1
25.	E-2066-10	Plug Connector - P.C.B. 10 Pin	3
26.	E-2196-11	Hole Plug - ⅞ Dia.	9
27.	E-2196-21	Hole Plug - 2" Dia Mounting Hole	1
28.	S-1350-16	Strain Relief - Cable	5
29.	EE-2506	Receptacle Asm. - 14 Pin Rev.	1
30.	E-709-G	Wire, #18 Ga. Green MTW	As Needed
31.	E-709-R	Wire, #18 Ga. Red MTW	As Needed
32.	E-849-R	Wire, #16 Ga. Red MTW	As Needed
33.	E-1213-B	Wire, #10 Ga. Black MTW	As Needed
34.	E-2194	Motor Starter	1
35.	EE-2492	Prox. Assembly - Clamp Up Limit	1
36.	EE-2530	Cable Assembly - Console Power	1
37.	EE-2482-()	Cable - Fiber Optic	REF
38.	EE-2496	Prox. Assembly - Knife Up	1
39.	EE-2589	Cable Assembly - Knife up/dwn Solenoid	1
40.	EE-2590	Cable Assembly - Clamp up/dwn Solenoid	1
41.	E-1453-3	Shrink Tubing - 1" Long (Not Shown)	8
42.	E-1214-49	Connector - ¼" Fully ins. Quick Disc.	4
43.	EE-2502	Prox. Assembly - Hydraulic Up	1
44.	EE-2510	Conduit Assembly - Hydraulic Motor	1
45.	H-6910-44003	Screw, #4-40NC X ⅜" But Hd Cap.	1
46.	H-6423-#4	Nut, #4-40NC Hex	1
47.	H-7324-#4	Washer, #4 Int. Tooth	1
48.	H-6910-63203	Screw, #6-32NC X ⅜" But Hd. Cap.	8
49.	H-6423-#6	Nut, #6-32 Hex	4
50.	H-7324-#6	Washer, #6 Int. Tooth	12
51.	H-6910-83203	Screw, #8-32NC X 3/8" But Hd. Cap.	12
52.	H-7324-#8	Washer, #8 Int. Tooth	12
53.	H-6910-102403	Screw, #10-24NC X 3/8" But Hd. Cap.	9
54.	H-7324-#10	Washer, #10 Int. Tooth	9
55.	E-2594	Fuse Puller	2
56.	E-1584-()	Label - Asm. Number	1
57.	E-1172-19	Bushing - Universal Star	1

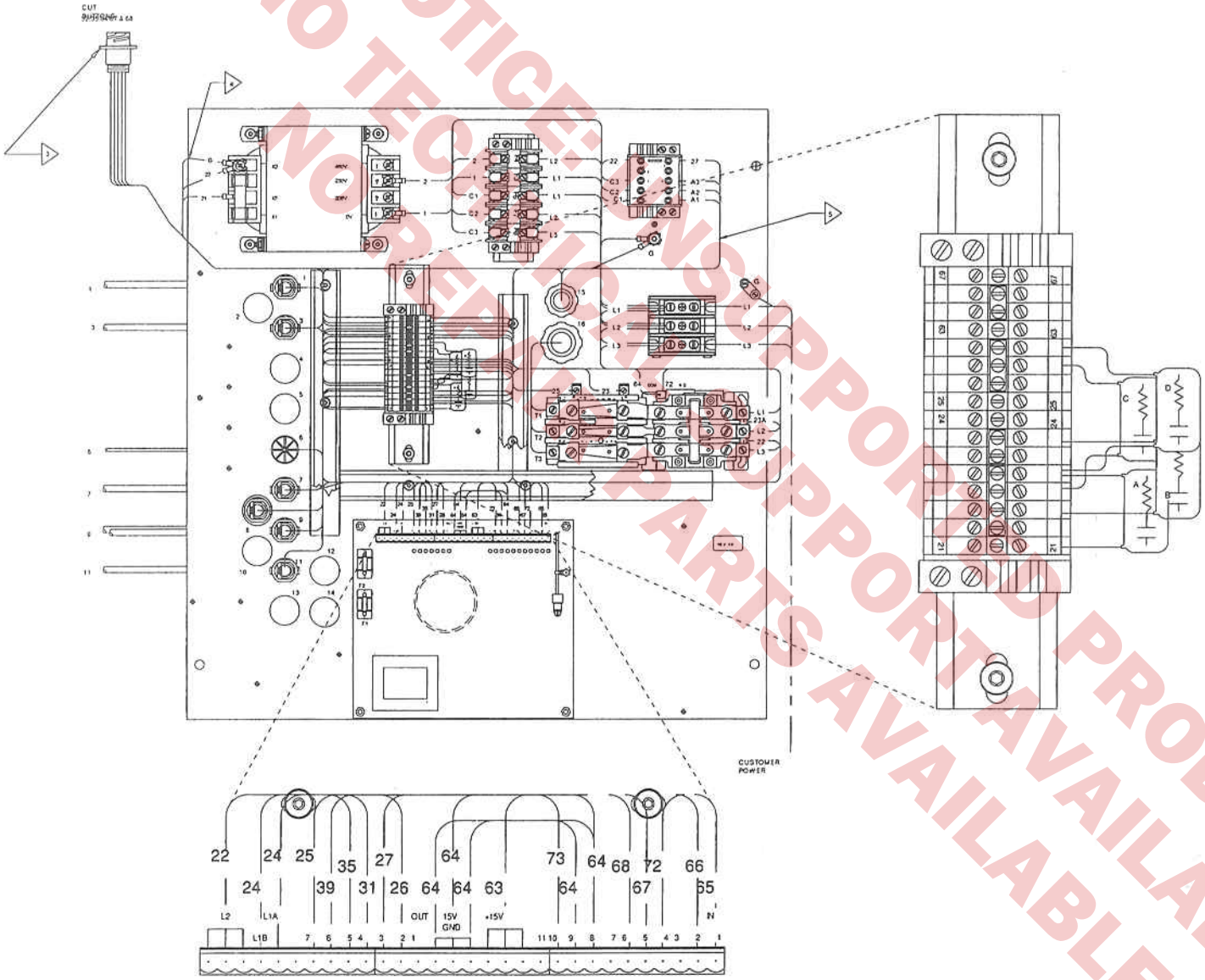
POWER PANEL ASSEMBLY - MC 60 HZ.
EE-2586 SHEET 2



NOTES:

1. WIRE TAG ALL WIRES BOTH ENDS AS SHOWN.
2. #10 GA. WIRE TO BE RUN TO ALL TERMINALS BEFORE THE FUSES. #16 GA. WIRE TO BE RUN FROM THE SECONDARY OF THE FUSES THROUGH THE TRANSFORMER TO THE TERMINAL BLOCKS. ALL WIRING TO BE #18 GA. WIRE UNLESS OTHERWISE SPECIFIED.
3. WIRE AND TIE BACK NEATLY FOE SHIPPING
4. USE #18 GA. GREEN MTW BETWEEN TRANSFORMER (#22 TERMINAL) & GROUND SCREW.

POWER PANEL ASSEMBLY - MC 60 HZ.
(Air Table Option)
EE-2587 SHEET 2



NOTES:

1. WIRE TAG ALL WIRES BOTH ENDS AS SHOWN.

2) #10 GA. WIRE TO BE RUN TO ALL TERMINALS BEFORE THE FUSES. #16 GA. WIRE TO BE RUN FROM THE SECONDARY OF THE FUSES THROUGH THE TRANSFORMER TO THE TERMINAL BLOCKS. ALL WIRING TO BE #18 GA. WIRE UNLESS OTHERWISE SPECIFIED.

3. WIRE AND TIE BACK NEATLY FOE SHIPPING

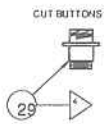
4. USE #18 GA. GREEN MTW BE-TWEEN TRANSFORMER (#22 TERMINAL) & GROUND SCREW.

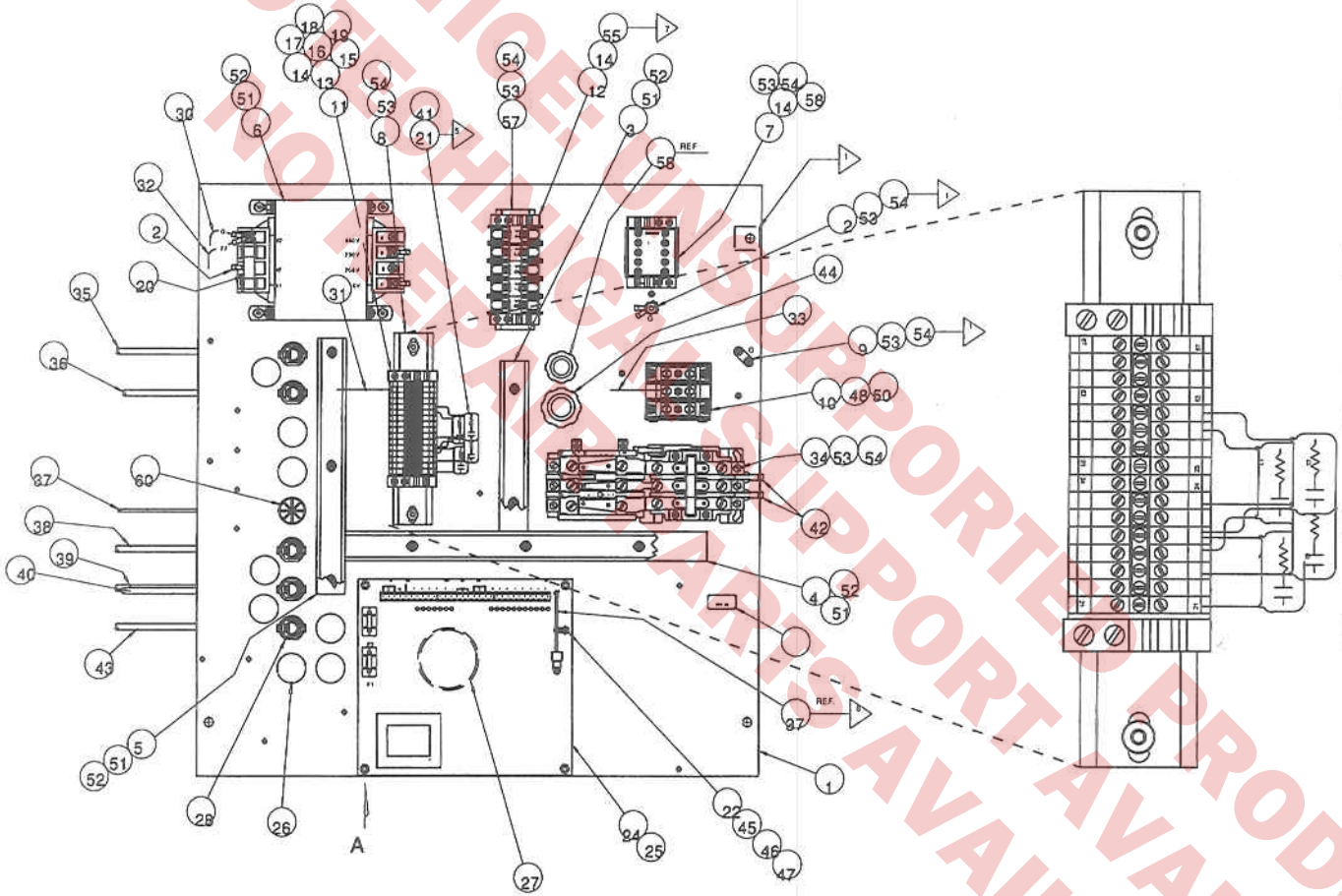
5. ATTACH THE WIRES FROM THE BLOWER ASSEMBLY (KNOCKOUT #15) AS FOLLOWS:

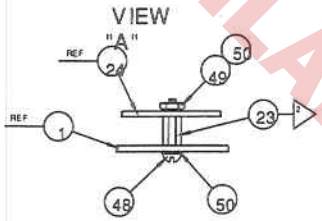
   THREE PHASE MACHINES
   - A1, A2 & A3 TO GO TO BLOWER STARTER
   - 22 TO GO TO TERMINAL BLOCK #22
   - 39 TO GO TO CIRCUIT BOARD TERMINAL NO. OUT 6

   SINGLE PHASE MACHINES
   - A1 & A2 TO GO TO BLOWER STARTER
   - 22 TO GO TO TERMINAL BLOCK #22
   - 39 TO GO TO CIRCUIT BOARD TERMINAL NO. OUT 6

POWER PANEL ASSEMBLY - MC 60 HZ.
(Air Table Option)
EE-2587 SHEET 1







NOTES:

1. IF NECESSARY, GRIND OFF PAINT UNDER THE GROUND LUG, GROUND SCREW AND THE UPPER RIGHT CORNER MOUNTING HOLE TO ASSURE PROPER GROUND.
2. USE #SV-22-105 LOCTITE TO RETAIN STUD (ITEM #23) TO SCREW (ITEM#48).
3. USE #18 GA MTW WIRE (ITEM #48).
4. THIS ITEM IS TO BE WIRED AND TIED BACK NEATLY FOR SHIPPING (SEE SHEET 2).
5. ADD SHRINK TUBING (ITEM #41) TO THE LEADS OF THE QUENCHARCS FOR INSULATION.
6. INSERT TERMINATED FIBER THROUGH LOCKING NUT AND INTO THE CONNECTOR UNTIL THE CORE TIP SEATS AGAINST THE MOLDED LENS INSIDE THE DEVICE.

   SCREW CONNECTOR LOCKING NUT DOWN TO A SNUG FIT, LOCKING THE FIBER IN PLACE.
7. ITEM #55 FUSE PULLER SHOULD BE TIED TOGETHER AND ATTACHED TO ASSEMBLY TO KEEP FROM BEING LOST. THESE PARTS TO BE USED IN FINAL ASSEMBLY.

POWER PANEL ASSEMBLY - MC 60 HZ.
(Air Table Option)
EE-2587 SHEET 1

Ref. No.	Part No.	Part Name	Qty.
1.	47156	Panel - Power	1
2.	E-1214-1	Connector - #10 Ins. Locking Fork	7
3.	E-1429-6	Wire Duct & Cover - 6" Long	1
4.	E-1429-7	Wire Duct & Cover - 12¾" Long	1
5.	E-1429-8	Wire Duct & Cover - 9" Long	1
6.	E-1089-29	Transformer - 208/230/460V 350VA	1
7.	E-1977-9	Rail - Terminal - 2½" Long	1
8.	E-1977-11	Rail - Terminal - 6¾" Long	1
9.	E-640-2	Ground Lug - 4Ga. Max.	1
10.	E-2591	Power Terminal Block, 3 Pole	1
11.	E-2068-4	Terminal Block - Through, 12 Awg.	16
12.	E-1974-6	Terminal Block - Fuse	5
13.	E-2069-3	End Plate	1
14.	E-2070-1	End Bracket	6
15.	E-2071-2	Fixed Bridge - 2 Pole	2
16.	E-2071-3	Fixed Bridge - 3 Pole	1
17.	E-2071-4	Fixed Bridge - 4Pole	1
18.	E-1356-96	Marking Strip	1
19.	E-1356-97	Marking Strip	1
20.	E-1075-3SB	Fuse - 3A SLO-BLO	1
21.	E-1736	Quencharc	4
22.	S-1964-4	TYRAP	1
23.	E-1152-24	Stand-Off - ½" Long	4
24.	EE-2588	P.C.B. Asm. - Motor Controller	1
25.	E-2066-10	Plug Connector - P.C.B. 10 Pin	3
26.	E-2196-11	Hole Plug - ⅞ Dia.	9
27.	E-2196-21	Hole Plug - 2" Dia Mounting Hole	1
28.	S-1350-16	Strain Relief - Cable	5
29.	EE-2506	Receptacle Asm. - 14 Pin Rev.	1
30.	E-709-G	Wire, #18 Ga. Green MTW	As Needed
31.	E-709-R	Wire, #18 Ga. Red MTW	As Needed
32.	E-849-R	Wire, #16 Ga. Red MTW	As Needed
33.	E-1213-B	Wire, #10 Ga. Black MTW	As Needed
34.	E-2194	Motor Starter	1
35.	EE-2492	Prox. Assembly - Clamp Up Limit	1
36.	EE-2530	Cable Assembly - Console Power	1
37.	E-2482-( )	Cable - Fiber Optic	REF
38.	EE-2496	Prox. Assembly - Knife Up	1
39.	EE-2589	Cable Assembly - Knife up/dwn Solenoid	1
40.	EE-2590	Cable Assembly - Clamp up/dwn Solenoid	1
41.	E-1453-3	Shrink Tubing - 1" Long (Not Shown)	8
42.	E-1214-49	Connector - ¼" Fully ins. Quick Disc.	4
43.	EE-2502	Prox. Assembly - Hydraulic Up	1
44.	EE-2510	Conduit Assembly - Hydraulic Motor	1
45.	H-6910-44003	Screw, #4-40NC X ⅜" But Hd Cap.	1
46.	H-6423-#4	Nut, #4-40NC Hex	1
47.	H-7324-#4	Washer, #4 Int. Tooth	1
48.	H-6910-63203	Screw, #6-32NC X ⅜" But Hd. Cap.	8
49.	H-6423-#6	Nut, #6-32NC Hex	4
50.	H-7324-#6	Washer, #6 Int. Tooth	12
51.	H-6910-83203	Screw, #8-32NC X ⅜" But Hd. Cap.	12
52.	H-7324-#8	Washer, #8 Int. Tooth	12
53.	H-6910-102403	Screw, #10-24NC X ⅜" But Hd. Cap.	11
54.	H-7324-#10	Washer, #10 Int. Tooth	11
55.	E-2594	Fuse Puller	5
56.	E-2403-1	Contactor - Blower	1
57.	E-1977-6	Rail - Terminal - 4¼" Long	1
58.	47141	Blower Assembly - 3PH	REF
	47132	Blower Assembly - 1PH	REF
59.	E-1584-( )	Label - Asm. Number	1
60.	E-1172-19	Bushing - Universal Star	1

DIAGRAM-INTERCONNECTION-MPX,MPC,CRT
E-2640

SEE INSET ON PAGE 97 FOR CUT BUTTON WIRING DETAIL

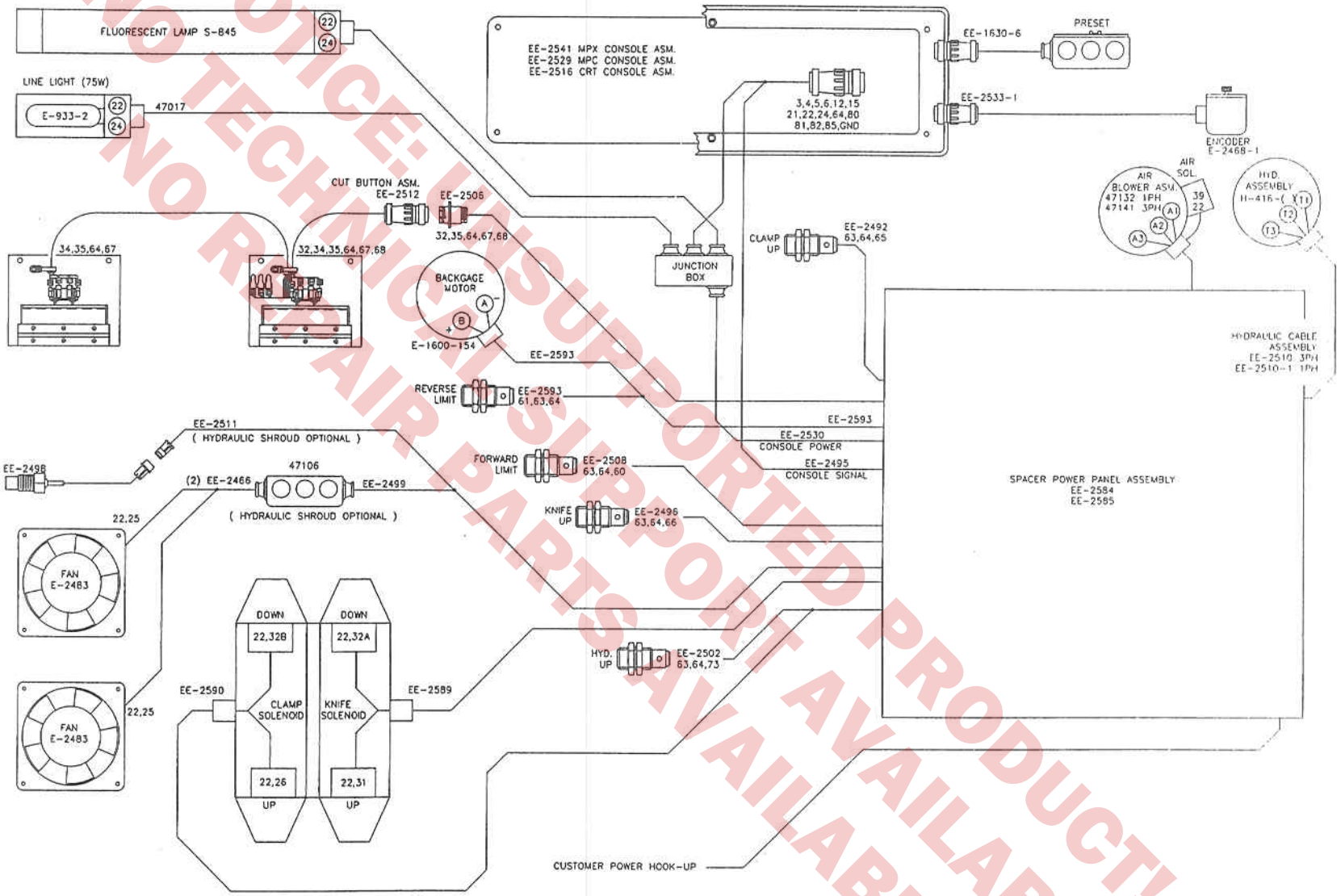
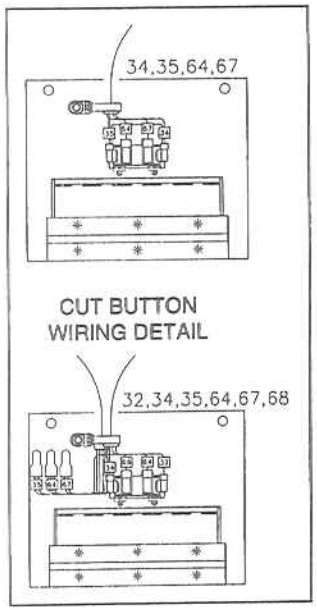
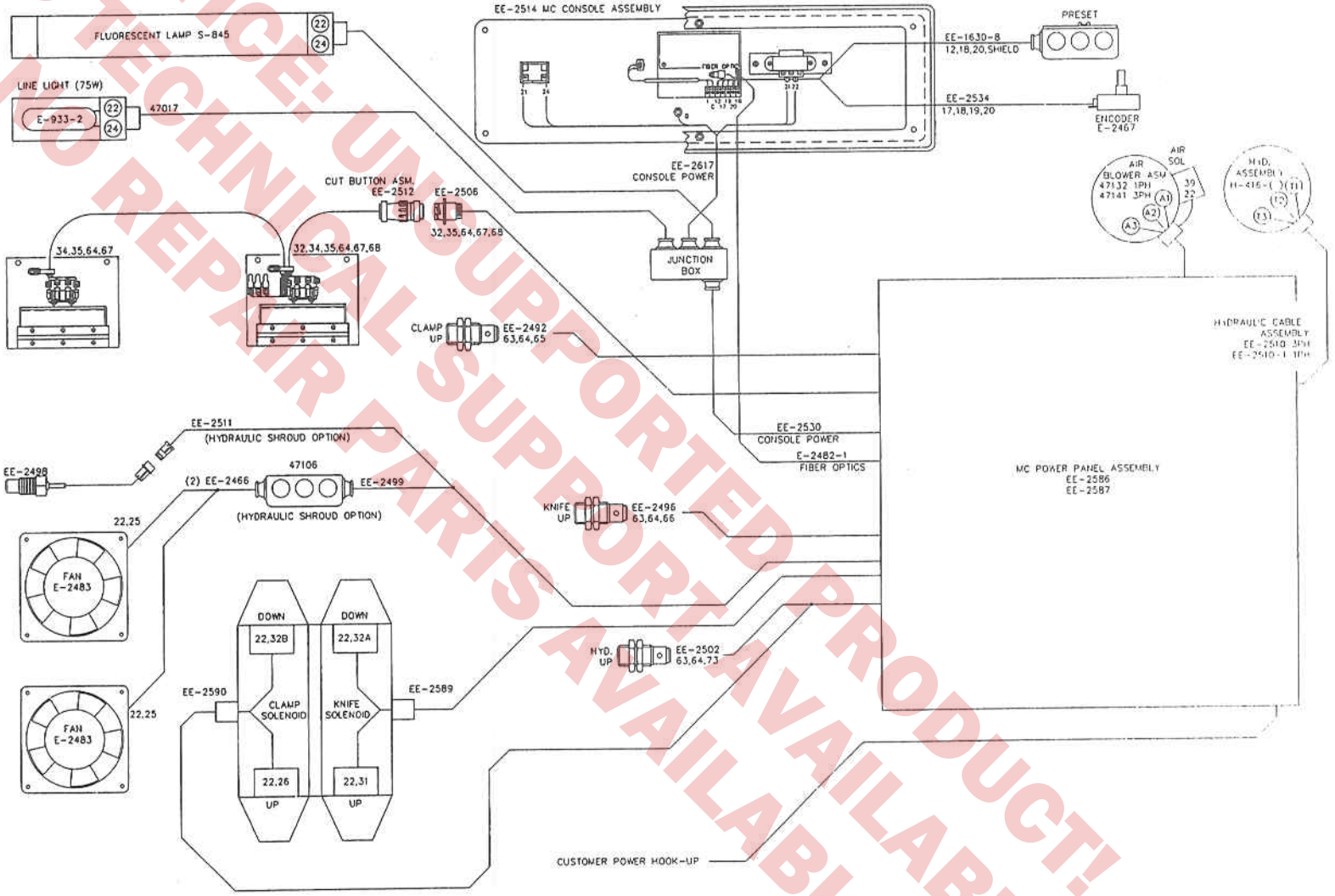


DIAGRAM-INTERCONNECTION-MC
E-2639

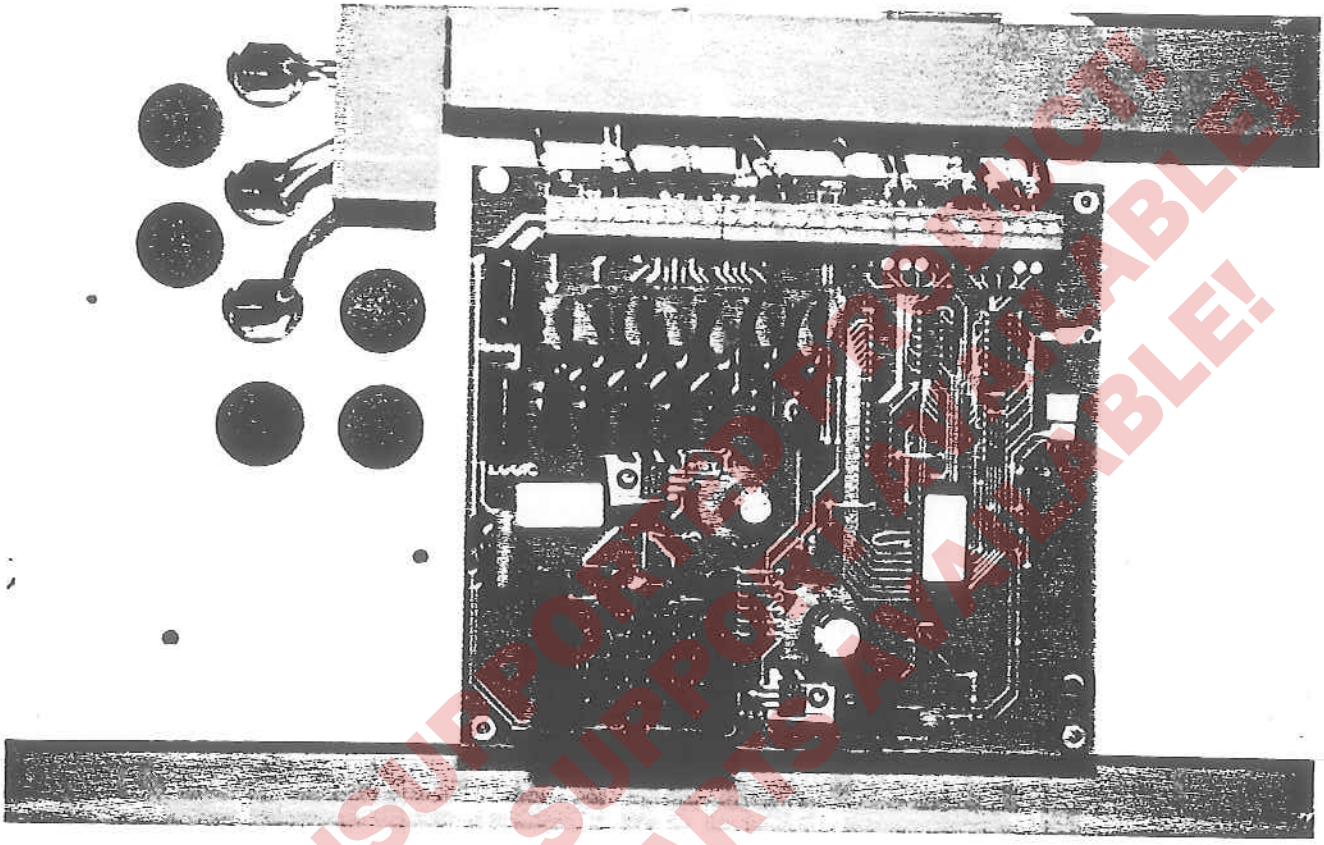




TROUBLESHOOTING

305 MC EE-2616 (order programmed IC chip separately)

The following is a description of the various diagnostic LEDs in the power panel. These lights are indicators used to show input and output status. For detailed drawing, see fig. 77 on the opposite page.



(fig. 76)

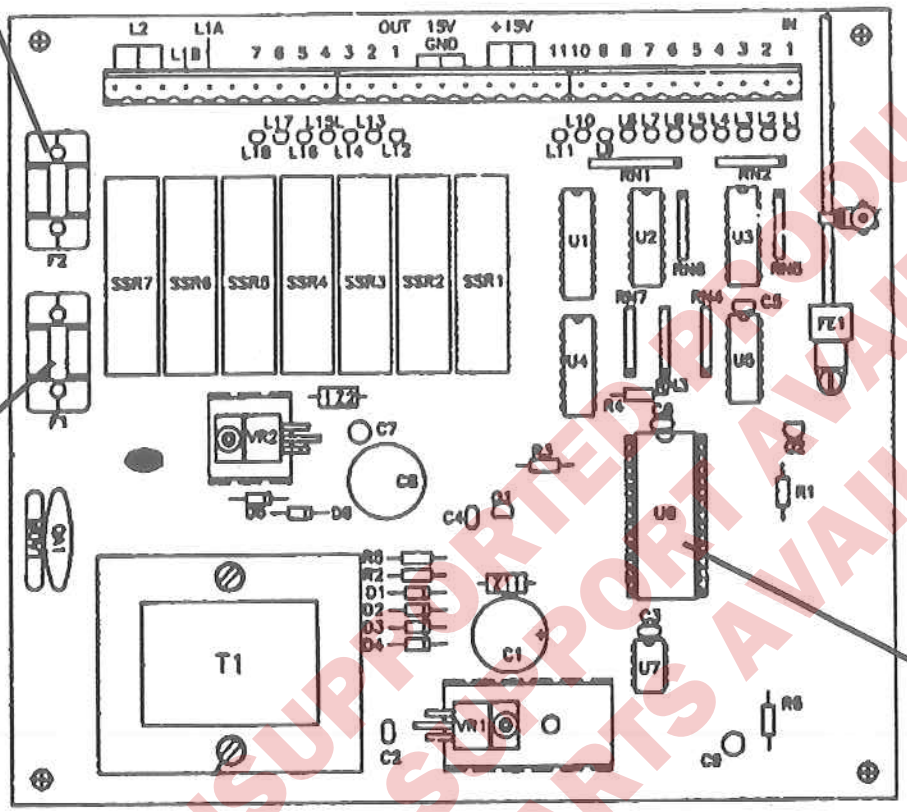
Description		Status
L1:	Clamp Up	on when clamp is up
L2:	Knife Up	on when knife is up
L3:	Not Used	
L4:	Hydraulic Motor	on when motor is on
L5:	Left Cut	off
L6:	Right Cut	off
L7:	FSD Stat	on
L8:	Oil Thermostat	on
L9:	Safety System	on
L10:	Hydraulic Cyulinder Upon	when cylinder is up
L11:	Not used	

Description		Status
L12:	Not Used	
L13:	Clamp Up	off
L14:	Air Relay	off if air is off
L15:	Knife Up	off
L16:	Knife and Clamp Down	off
L17:	Air Solenoid	
L18:	Hydraulic Motor	off if motor is off

EE-2616 SHEET 1

Fuse:
3.15 Amp
Slo-blo
(metric)

Fuse:
2/10 Amp
Slo-blo
(metric)



Programmed IC
Chip EE-1888-10*

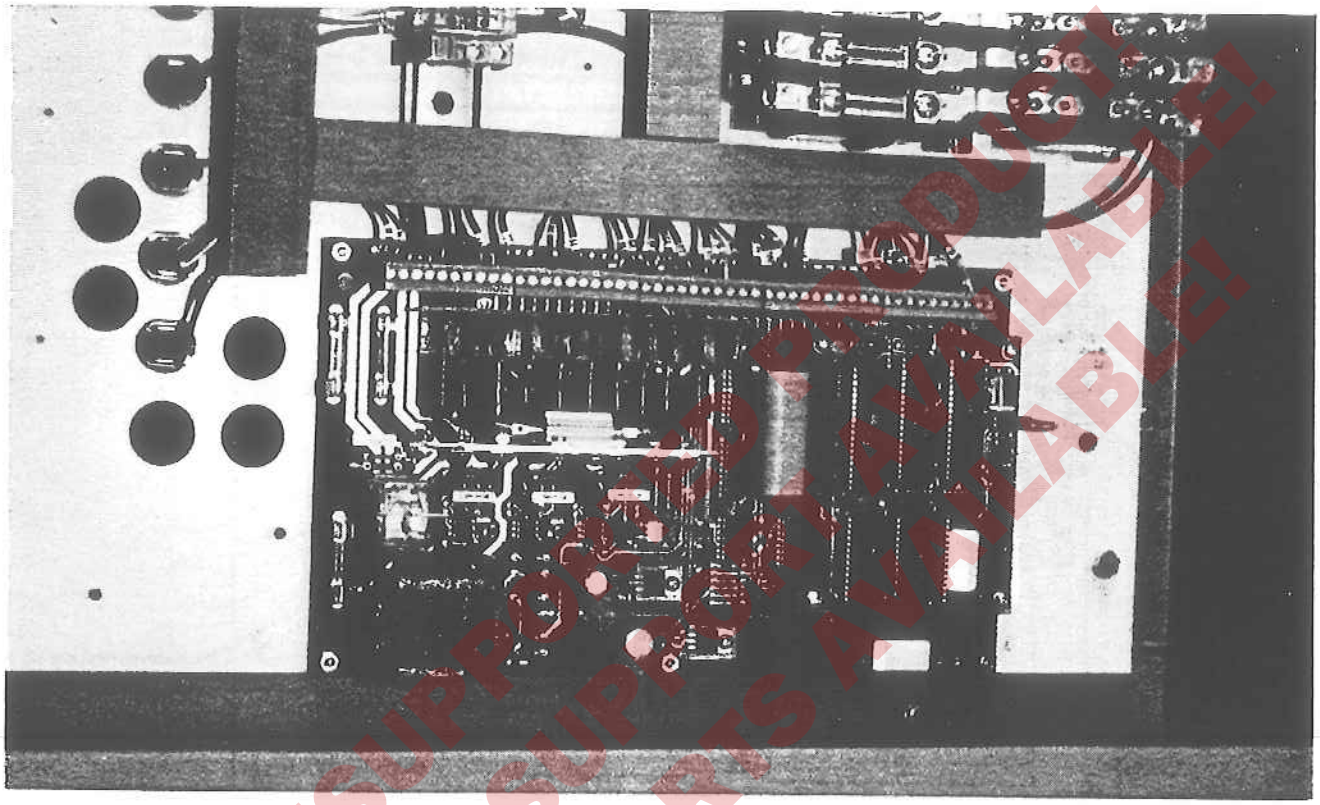
(fig. 77)

*ORDER PROGRAMMED IC CHIP SEPARATELY

TROUBLESHOOTING

305 MPX/MPC & CRT (order programmed IC chip separately)

The following is a description of the various diagnostic LEDs in the power panel. These lights are indicators used to show input and output status. For detailed drawing, see fig. 79 on the opposite page.

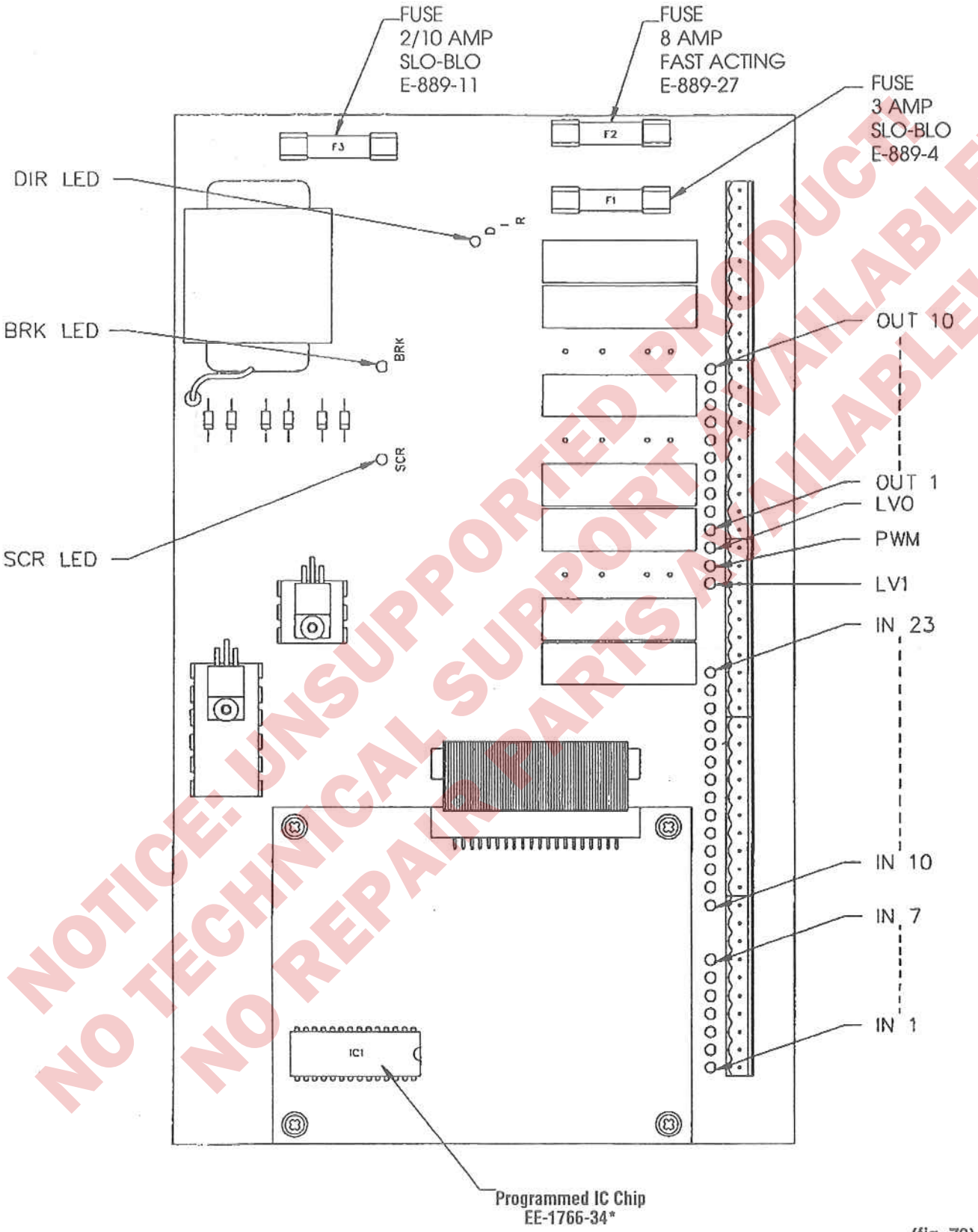


(fig. 78)

Description		Status
IN1:	FSD Status	off (on with safety system)
IN2:	Backgage Run (MSO)	on
IN3:	Not Used	
IN4:	Not Used	
IN5:	Left Cut	off
IN6:	Reverse Limit	on
IN7:	Hydraulic Cylinder Up	on
IN8:	FCP Comm	N/A
IN9:	Error Comm Line	N/A
IN10:	Right Cut	off
IN11:	Forward Limit	on
IN12:	Not Used	
IN13:	Not Used	
IN14:	Not Used	
IN15:	Not Used	
IN16:	Comm Stats	flashing
IN17:	Safety System	on (dim)
IN18:	Knife Up	on when knife is up
IN19:	Clamp Up	on when clamp is up
IN20:	Hydraulic Motor	off if motor is off

Description		Status
IN21:	Temp OK	on (dim)
IN22:	Stats	flaching
IN23:	Encoder Feedback	on or off
LV1:	Cut Signal	off
PWM:	Comm	on (dim)
LVO:		on, may flicker slightly
OUT1:	Clamp up	off
OUT2:	Not Used	
OUT3:	Not Used	
OUT4:	Not Used	
OUT5:	Knife & Clamp Down	off
OUT6:	Not Used	off
OUT7:	Knife Up	off
OUT8:	Air Relay	off if air is off
OUT9:	Air Solenoid	off if air is off
OUT10:	Hydraulic Motor	off if motor is off
SCR:		off
DIR:	off or on depending on which dir. was last run	
BRAKE:		on, may flicker

EE-2240



(fig. 79)

*ORDER PROGRAMMED IC CHIP SEPARATELY

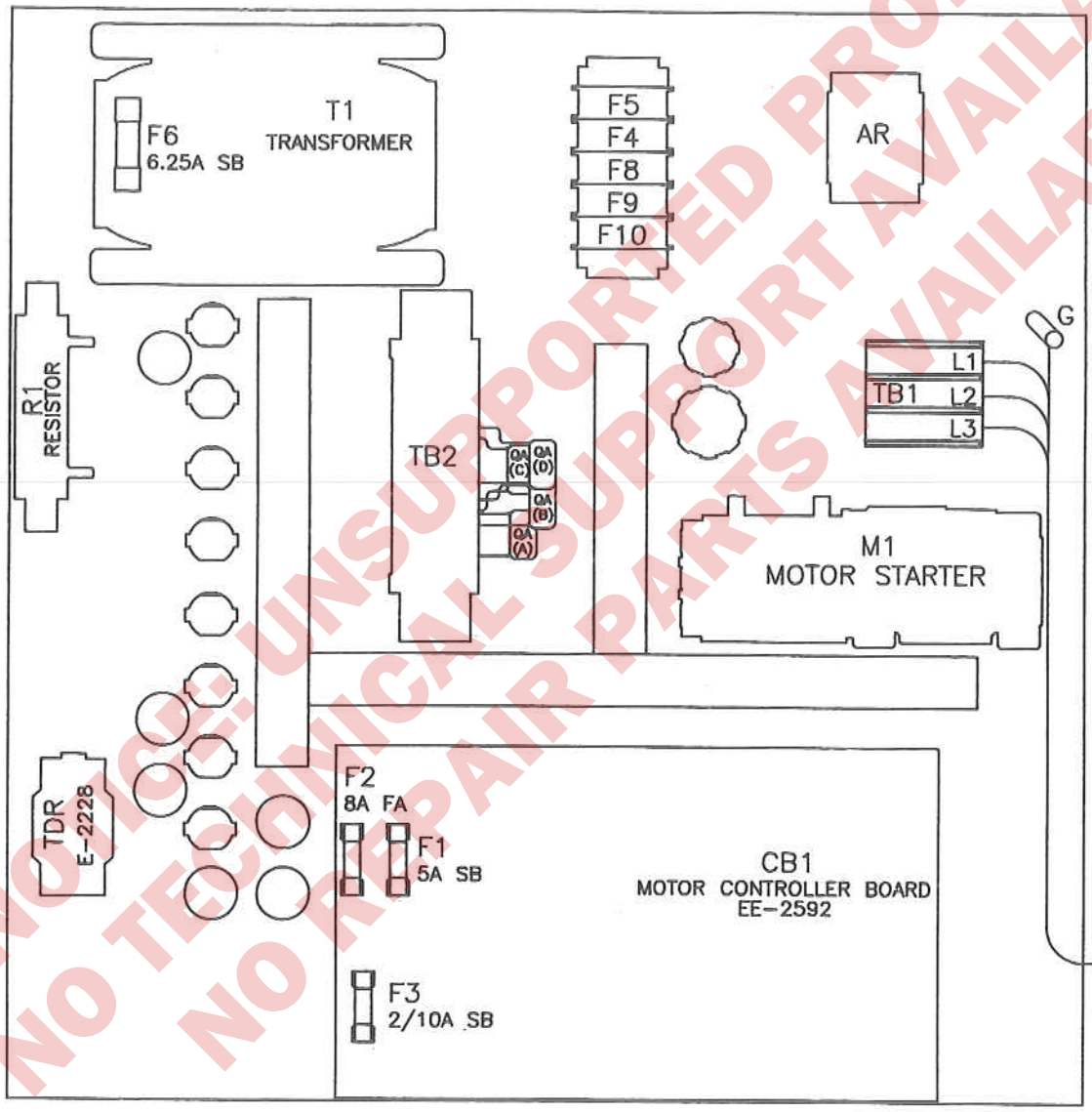
POWER PANEL LABEL
305 SPACER MODELS MPX/MPC/CRT
S-1781-32

!! NOTICE !!

INCORRECT POWER HOOK–UP WILL DAMAGE YOUR MACHINE!

⚠ WARNING: ALWAYS DISCONNECT POWER AT THE MAIN POWER PANEL BEFORE WORKING ON THE MACHINE. LOCK IT OUT TO PREVENT ACCIDENTAL POWER UP. SEE POWER PANEL LOCKOUT PROCEDURE, PAGE 4, OF THE INSTRUCTION AND PARTS MANUAL.

NOTE: BLOWER OPTION ONLY; "F8 THRU F10" (SEE CHART),"AR" BLOWER STARTER AND "TDR" TIME DELAY RELAY.



⚠ CAUTION: FOLLOW CONNECTION DIAGRAM ON CONTROL TRANSFORMER (T1) FOR PROPER PRIMARY TAP CONNECTION. USE PROPER TAP THAT MATCHES VOLTAGE SUPPLIED TO THE MACHINE.

FUSE VALUES FOR F4 AND F5	
208V	8A SB
230V	8A SB
460V	8A SB *

FUSE VALUES FOR F8, F9 AND F10	
208V	2.5A SB
230V	2.5A SB
460V	.8A SB

POWER SOURCE

⚠ CAUTION: FIRE HAZARD, REPLACE ONLY WITH SAME TYPE AND RATING FUSE.

* FOR 460V MACHINES FUSES MUST BE RATED FOR 500V OR MORE.

ON 3 PHASE MACHINES, CONNECT 3 PHASE POWER TO L1, L2 & L3 ON TB1. FOR 1 PHASE MACHINES, CONNECT POWER TO L1 & L2 ON TB1. POWER SOURCE MUST BE GROUNDED AT THE POWER PANEL AS SHOWN.

305 SPACER S–1781–32

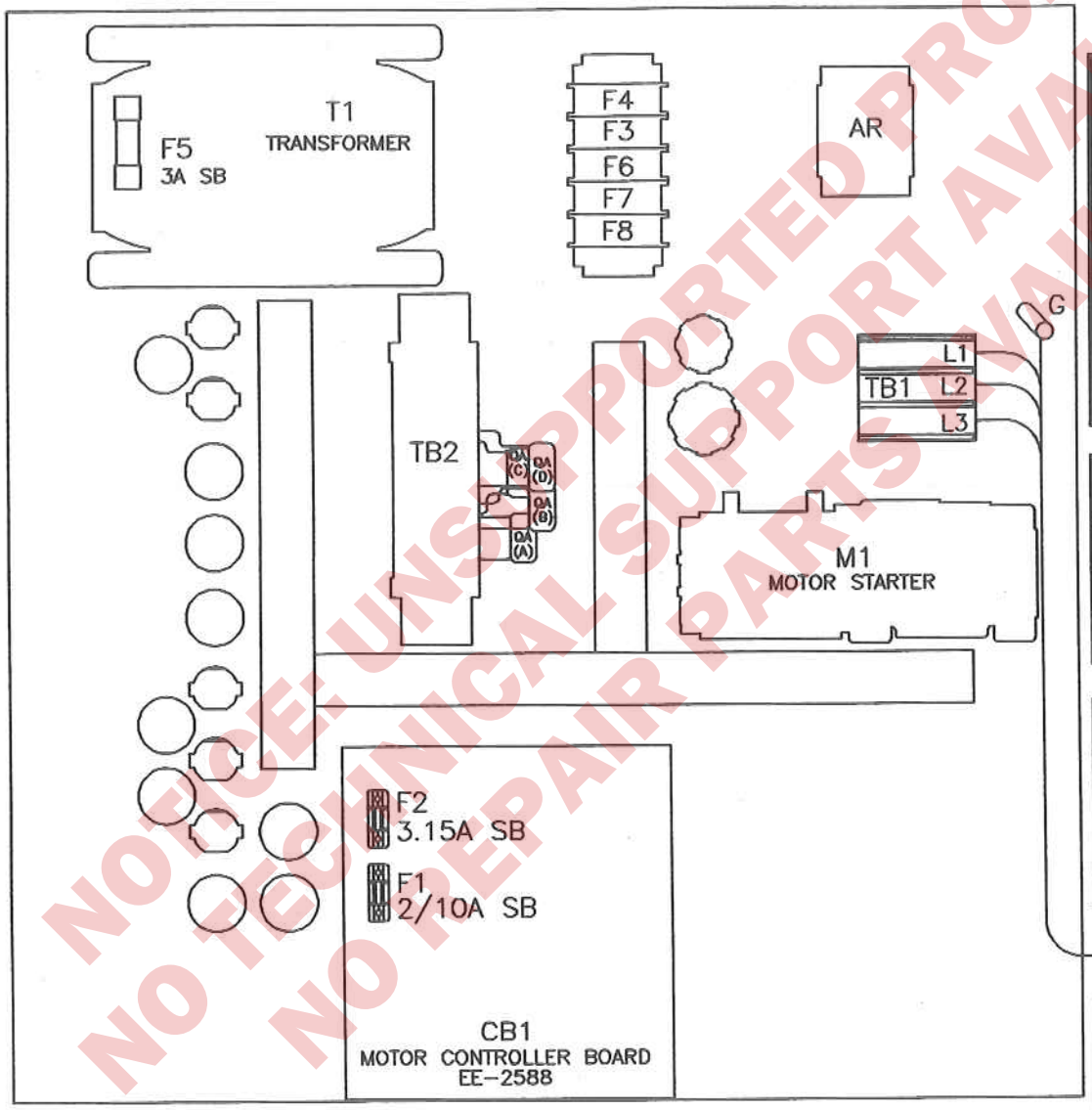
POWER PANEL LABEL
305 MC MODELS
S-1781-33

!! NOTICE !!

INCORRECT POWER HOOK–UP WILL DAMAGE YOUR MACHINE!

⚠ WARNING: ALWAYS DISCONNECT POWER AT THE MAIN POWER PANEL BEFORE WORKING ON THE MACHINE. LOCK IT OUT TO PREVENT ACCIDENTAL POWER UP. SEE POWER PANEL LOCKOUT PROCEDURE, PAGE 4, OF THE INSTRUCTION AND PARTS MANUAL.

NOTE: BLOWER OPTION ONLY; "F6 THRU F8" FUSES (SEE CHART) AND "AR" BLOWER STARTER.



⚠ CAUTION: FOLLOW CONNECTION DIAGRAM ON CONTROL TRANSFORMER (T1) FOR PROPER PRIMARY TAP CONNECTION. USE PROPER TAP THAT MATCHES VOLTAGE SUPPLIED TO THE MACHINE.

FUSE VALUES FOR F3 AND F4	
208V	8A SB
230V	8A SB
460V	8A SB *

FUSE VALUES FOR F6,F7 AND F8	
208V	2.5A SB
230V	2.5A SB
460V	.8A SB

POWER SOURCE

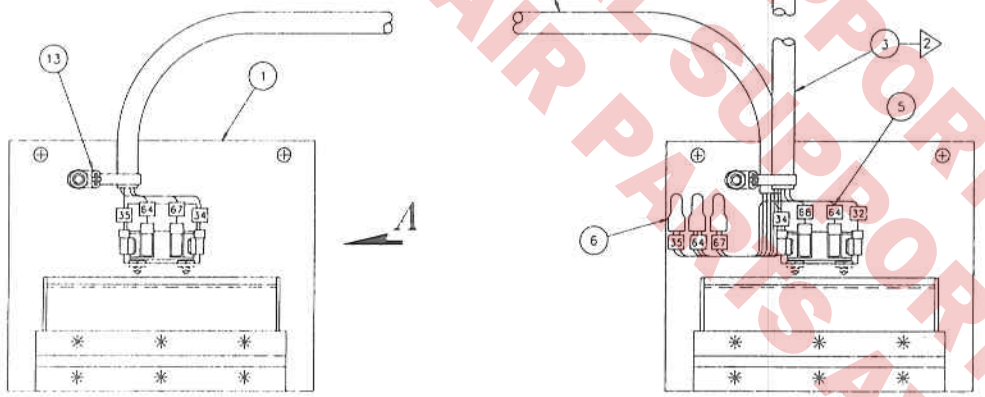
⚠ CAUTION: FIRE HAZARD, REPLACE ONLY WITH SAME TYPE AND RATING FUSE.

* FOR 460V MACHINES FUSES MUST BE RATED FOR 500V OR MORE.

ON 3 PHASE MACHINES, CONNECT 3 PHASE POWER TO L1, L2 & L3 ON TB1. FOR 1 PHASE MACHINES CONNECT POWER TO L1 & L2 ON TB1. POWER SOURCE MUST BE GROUNDED AT THE POWER PANEL AS SHOWN.

305 MC S–1781–33

CUT BUTTON ASSEMBLY
EE-2512

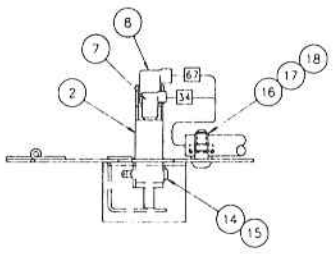


NOTE: SEE CHART #2

VIEW "B"
SCALE: NONE

NOTES:

1. STRIP CABLE JACKET BACK 4" - BOTH ENDS. SEE CHART #1 FOR WIRE COLORS & NUMBERS. CUT OFF GREEN & BLACK WIRES - BOTH ENDS.
2. STRIP CABLE JACKET BACK 4" ON SWITCH END & 1-1/2" ON AMP CONNECTOR END. SEE CHART #2 FOR WIRE COLORS & NUMBERS. CUT OFF GREEN WIRE - BOTH ENDS.
3. WIRE MARK ALL WIRES - BOTH ENDS.
4. STRIP WIRE INSULATION BACK 3/8" FROM ALL WIRES REQUIRING A WIRE NUT & 1/4" OFF INSULATION FROM ALL OTHERS.



VIEW "A"
SCALE: NONE

CHART #1

WIRE NO.	COLOR
67	WHITE
64	BLUE
35	ORANGE
34	RED

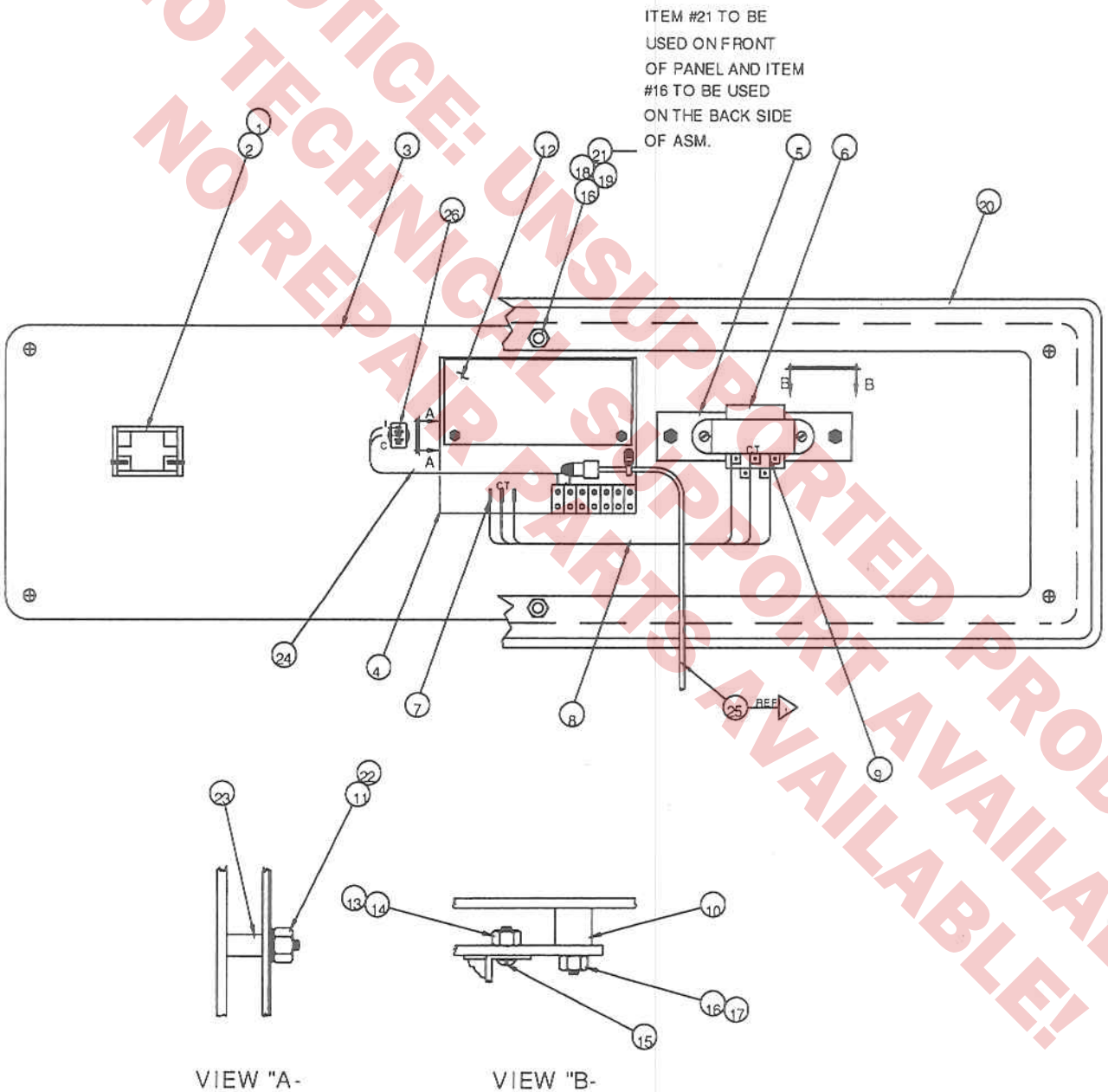
CHART #2

WIRE NO.	PIN NO.	COLOR
68	9	RED
67	7	WHITE
64	5	BLUE
35	3	ORANGE
32	1	BLACK

CUT BUTTON ASSEMBLY
EE-2512

Ref. No.	Part No.	Part Name	Qty
1.	47158	Switch Plate Assembly	2
2.	E-2457	Switch	2
3.	E-2078	Cable – #18 GA. 6 Cond. 30" Long	1
4.	E-2078	Cable – #18 GA. 6 Cond. 38" Long	1
5.	E-709-B	Wire – #18 GA. Black MTW 9" Long	1
6.	E-1237-6	Wire Nut	3
7.	E-1214-43	Connector – .187 90° Ins. Female Quick Disc.	4
8.	E-1214-60	Connector ¼" 90° Ins. Female Quick Disc.	4
9.	E-787-2	Pin – Male	5
10.			
11.	E-810-5	Plug – 14 Pin Rev.	1
12.	E-811	Strain Relief	1
13.	S-1694-2	Tyrap	2
14.	H-7330-#6	#6 Ext. Tooth Lockwasher	4
15.	H-6923-63212	#6 - 32 X ¾" Rd.Hd. Mach. Screw	4
16.	H-7330-#10	#10 Ext. Tooth Lockwasher	2
17.	H-6423-#10	#10 - 24NC Hex Nut	2
18.	H-6910-10204	#10 - 24NC X ½" But. Hd. Screw	2

PANEL ASSEMBLY - CONTROL CONSOLE- MC
EE-2514



NOTE:

1. INSERT TERMINATED FIBER THROUGH LOCKING NUT AND INTO THE CONNECTOR UNTIL THE CORE TIP SEATS AGAINST THE MOLDED LENS INSIDE THE DEVICE.

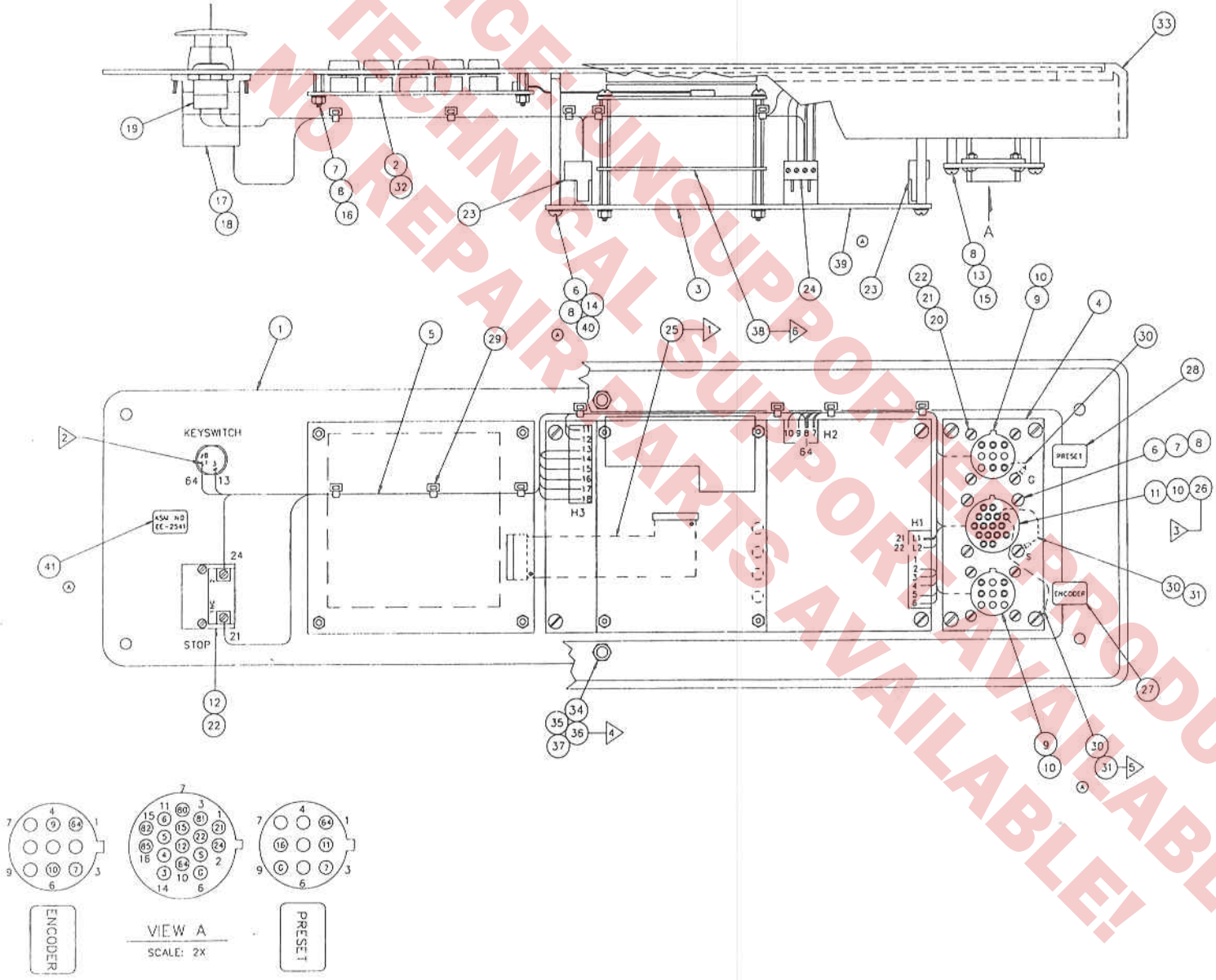
   SCREW CONNECTOR LOCKING NUT DOWN TO A SNUG FIT, LOCKING THE FIBER IN PLACE.

   CINCH TYRAP SNUG - ACTS AS STRAIN RELIEF.

PANEL ASSEMBLY – CONTROL CONSOLE – MC
EE-2514

Ref. No.	Part No.	Part Name	Qty
1.	E-1838-1	Pushbutton – Stop Keylock	1
2.	E-1839-2	Contact Block – NC	1
3.	A-13905	Panel – Front Console	1
4.	EE-2456	P.C.B. – Position Display	1
5.	8392-1	Bracket – Transformer	1
6.	E-1623-5	Transformer – 16 V.C.T. .08A	1
7.	E-1214-40	Connector	3
8.	E-709-RED	Wire, #18 GA Red MTW 9" Long	3
9.	E-1214-42	Connector	3
10.	E-1152-11	Spacer – Phenolic	2
11.	H-6423-#4	#4 - 40NC Hex Nut	2
12.	E-2203-4	Fish Paper	1
13.	H-6423-#8	#8 - 32NC Hex Nut	2
14.	H-7324-#8	#8 Lockwasher	2
15.	H-6923-83206	#8 - 32NC X ⅜ Screw Rd. Hd.	2
16.	H-7324-#10	#10 Lockwasher	4
17.	H-6427-#10	#10 - 32NF Hex Nut	2
18.	H-6423-#10	#10 - 24 Hex Nut	2
19.	H-6910-102404	#10 - 24 X ½ But. Hd. Screw	2
20.	13962	Bezel	1
21.	S-1864-3	Retaining Washer	2
22.	H-7324-#4	Washer – #4 Lock	2
23.	E-1152-8	Spacer	2
24.	EE-2436	Cable Assembly – Eng./Met. Switch	1
25.	E-2482-( )	Cable – Fiber Optic	Ref.

ASSEMBLY - CONTROL CONSOLE- MPX
EE-2541



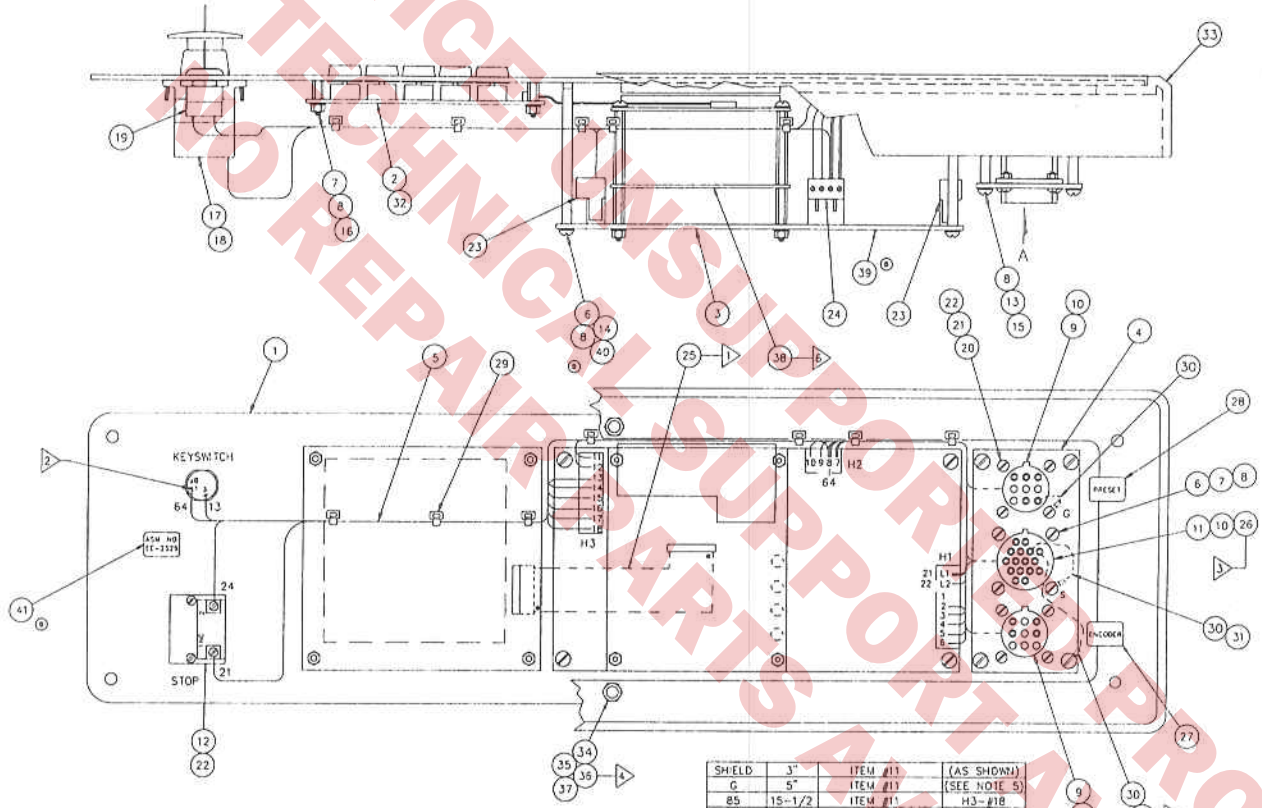
NOTE:

1. RIBBON CABLE (ITEM #25) RUNS FROM THE KEYBOARD TO THE HEADER ON THE DISPLAY BOARD, LOCATED IN THE BOARD STACK.
2. SOLDER WIRES TO TERMINALS – AS SHOWN.
3. USE ITEM #26 FOR #18 GA WIRE, AND USE ITEM #10 FOR ALL OTHERS.
4. USE ITEM #37 ON FRONT OF PANEL AND ITEM #35 LOCKWASHER ON THE BACKSIDE OF THE PANEL.
5. THE GROUND WIRE FROM ITEM #11 PIN 6 SHOULD BE TERMINATED WITH ITEM #31 CONNECTOR RING. ATTACH THE RING TO THE STUD ON THE PANEL BEFORE ASSEMBLING THE SPACER ITEM #13.
6. INSERT ITEM #38 EPROM INTO THE BOARD STACK INDICATED. SEE ELEC. ENGINEERING FOR CURRENT SOFTWARE REVISION NUMBER.

ASSEMBLY - CONTROL CONSOLE- MPX
EE-2541

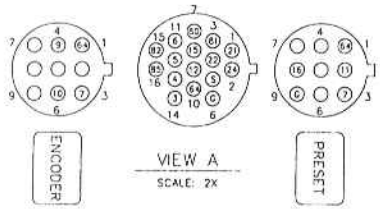
Ref. No.	Part No.	Part Name	Qty.
1.	A-13906	Panel - Control Console	1
2.	EE-2157-2	P.C.B. Assy - Keyboard	1
3.	EE-2243-1	P.C. Board Stack	1
4.	13912	Bracket	1
5.	E-1163-10	Wire, #20 Ga. Black Hook-up 193" Total	1
6.	H-6923-63208	#6-32NC x 1/2" Rd Hd Screw	8
7.	H-6423-#6	#6-32NC Hex Nut	8
8.	H-7234-#6	#6 Shakeproof Lockwasher	16
9.	E-809-3	Receptacle - 9 Pin	2
10.	E-787-6	Pin - Male	26
11.	E-809	Receptacle -16 Pin	1
12.	E-709-R	Wire, #18 Ga. Red MTW 62" Total	1
13.	E-1152-16	Spacer 2" Long	4
14.	E-1152-15	Spacer 1/8" Long - Nylon	4
15.	H-6923-63206	#6-32NC x 3/8" Rd Hd Screw	4
16.	E-1152-29	Spacer 3/8" Hex	4
17.	E-1839-2	Contact Block - NC	1
18.	E-1838-1	Pushbutton - Stop Keylock	1
19.	E-2082	Keyswitch - Memory Lock	1
20.	H-6923-44008	#4-40NC x 1/2" Rd Hd Screw	8
21.	H-6423-#4	#4-40NC Hex Nut	8
22.	H-7324-#4	#4 Shakeproof Lockwasher	8
23.	E-2059-8	Connector Plug - 8 Pin	2
24.	E-2059-4	Connector Plug - 4 Pin	1
25.	EE-1788-5	Ribbon Cable Assy	1
26.	E-787-2	Pin - Male	3
27.	E-1584-20	Label - Encoder	1
28.	E-1584-21	Label - Preset	1
29.	S-1694	Ty-Rap	9
30.	E-1163-10	Wire #20 Ga. Black Hook-up 3" Long	3
31.	E-1214-36	Connector, #6 Insulated Ring	3
32.	E-2203	Backer - Fishpaper	1
33.	13962	Bezel	1
34.	H-6910-102404	#10 - 24 x 1/2" But Hd Cap Screw	2
35.	H-7324-#10	#10 Int. Toothed Lockwasher	2
36.	H-6423-#10	#10 - 24 Hex Nut	2
37.	S-1864-3	Retaining Washer	2
38.	EE-1766-33-XX	Eprom - Programmed	1
39.	E-2203-1	Backer, Fishpaper	1
40.	E-1152-27	Spacer, 2-3/4" Long	4
41.	E-1584-46	Label, Assembly Number	1

ASSEMBLY - CONTROL CONSOLE- MPC
EE-2529



NOTE:

1. RIBBON CABLE (ITEM #25) RUNS FROM THE KEYBOARD TO THE HEADER ON THE DISPLAY BOARD, LOCATED IN THE BOARD STACK.
2. SOLDER WIRES TO TERMINALS - AS SHOWN.
3. USE ITEM #26 FOR #18 GA WIRE, AND USE ITEM #10 FOR ALL OTHERS.
4. USE ITEM #37 ON FRONT OF PANEL AND ITEM #35 LOCKWASHER ON THE BACKSIDE OF THE PANEL.
5. THE GROUND WIRE FROM ITEM #11 PIN 6 SHOULD BE TERMINATED WITH ITEM #31 CONNECTOR RING. ATTACH THE RING TO THE STUD ON THE PANEL BEFORE ASSEMBLING THE SPACER ITEM #13.
6. INSERT ITEM #38 EPROM INTO THE BOARD STACK INDICATED. SEE ELEC ENGINEERING FOR CURRENT SOFTWARE REVISION NUMBER.



WIRE NO.	LENGTH	FROM	TO
64	18"	H2-#8	KEYSWITCH
7	9-1/2	CONNECTOR PRESET	H2-#7
11	13-1/2	CONNECTOR PRESET	H3-#11
16	13	CONNECTOR PRESET	H3-#16
64	8-1/2	CONNECTOR PRESET	H2-#8
13	13	H3-#13	KEYSWITCH
21	25	H1-#L1	STOP BUTTON
7	9-1/2	CONNECTOR ENCODER	H2-#7
9	10-1/2	CONNECTOR ENCODER	H2-#9
10	10-1/2	CONNECTOR ENCODER	H2-#10
64	10	CONNECTOR ENCODER	H2-#8

WIRE CHART

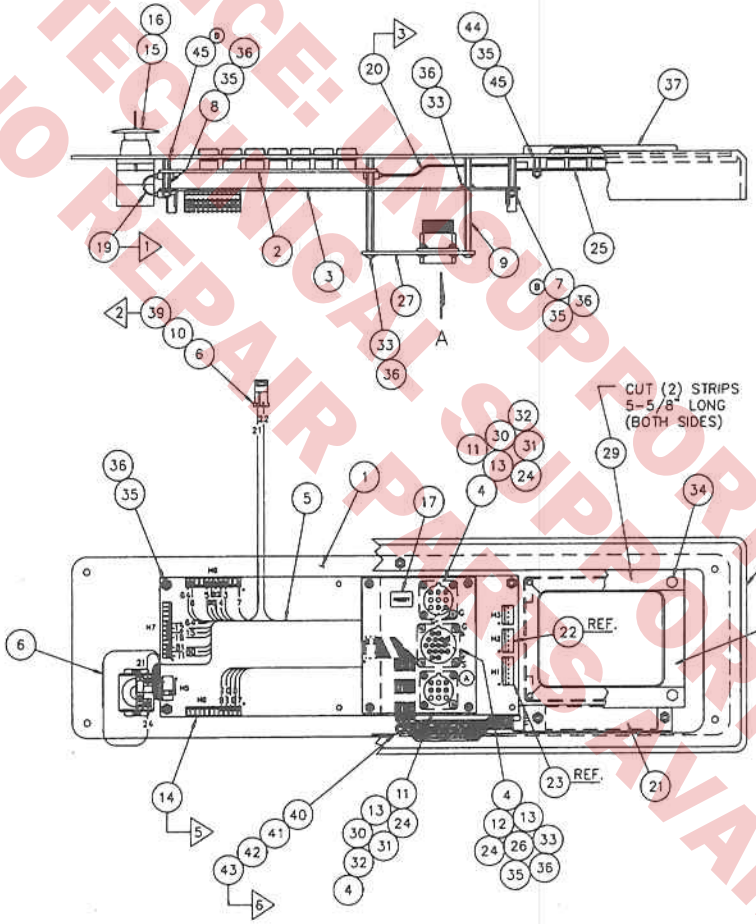
WIRE NO.	LENGTH	FROM	TO
SHIELD	3"	ITEM #11	(AS SHOWN)
G	5"	ITEM #11	(SEE NOTE 5)
85	15-1/2	ITEM #11	H3-#18
82	15-1/2	ITEM #11	H3-#17
81	7-1/2	ITEM #11	H1-#2
80	15	ITEM #11	H3-#14
64	8-1/2	ITEM #11	H2-#8
24	22-1/2	ITEM #11	STOP BUTTON
22	7-1/2	ITEM #11	H1-#L2
21	7-1/2	ITEM #11	H1-#L1
15	14	ITEM #11	H3-#15
12	14	ITEM #11	H3-#12
6	8-1/2	ITEM #11	H1-#6
5	8-1/2	ITEM #11	H1-#5
4	8-1/2	ITEM #11	H1-#4
3	8-1/2	ITEM #11	H1-#3

WIRE CHART

ASSEMBLY - CONTROL CONSOLE- MPC
EE-2529

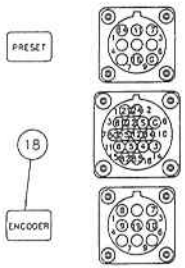
Ref. No.	Part No.	Part Name	Qty.
1.	A-13906	Panel - Control Console	1
2.	EE-2157-2	P.C.B. Assy - Keyboard	1
3.	EE-2540	P.C. Board Stack	1
4.	13912	Bracket	1
5.	E-1163-10	Wire, #20 Ga. Black Hook-up 193" Total	1
6.	H-6923-63208	#6-32NC x 1/2" Rd Hd Screw	8
7.	H-6923-#6	#6-32NC Hex Nut	8
8.	H-7234-#6	#6 Shakeproof Lockwasher	16
9.	E-809-3	Receptacle - 9 Pin	2
10.	E-787-6	Pin - Male	26
11.	E-809	Receptacle -16 Pin	1
12.	E-709-R	Wire, #18 Ga. Red MTW 62" Total	1
13.	E-1152-16	Spacer 2" Long	4
14.	E-1152-15	Spacer 3/8" Long - Nylon	4
15.	H-6923-63206	#6-32NC x 3/8" Rd Hd Screw	4
16.	E-1152-29	Spacer 3/8" Hex	4
17.	E-1839-2	Contact Block - NC	1
18.	E-1838-1	Pushbutton - Stop Keylock	1
19.	E-2082	Keyswitch - Memory Lock	1
20.	H-6923-44008	#4-40NC x 1/2" Rd Hd Screw	8
21.	H-6423-#4	#4-40NC Hex Nut	8
22.	H-7324-#4	#4 Shakeproof Lockwasher	8
23.	E-2059-8	Connector Plug - 8 Pin	2
24.	E-2059-4	Connector Plug - 4 Pin	1
25.	EE-1788-5	Ribbon Cable Assy	1
26.	E-787-2	Pin - Male	3
27.	E-1584-20	Label - Encoder	1
28.	E-1584-21	Label - Preset	1
29.	S-1694	Ty-Rap	9
30.	E-1163-10	Wire #20 Ga. Black Hook-up 3" Long	3
31.	E-1214-36	Connector, #6 Insulated Ring	3
32.	E-2203	Backer - Fishpaper	1
33.	13962	Bezel	1
34.	H-6910-102404	#10 - 24 x 1/2" But Hd Cap Screw	2
35.	H-7324-#10	#10 Int. Toothed Lockwasher	2
36.	H-6423-#10	#10 - 24 Hex Nut	2
37.	S-1864-3	Retaining Washer	2
38.	EE-1766-33-XX	Eprom - Programmed	1
39.	E-2203-1	Backer, Fishpaper	1
40.	E-1152-27	Spacer, 2-3/4" Long	4
41.	E-1584-45	Label, Assembly Number	1

ASSEMBLY - CONSOLE- 305 CRT
EE-2516



NOTE:

1. RIBBON CABLE (ITEM #19) RUNS FROM KEYBOARD TO HEADER ON DISPLAY BOARD, SHOWN ON THIS ASM. AS H5.
2. WIRE #21 GOES TO PIN #1 AND WIRE #22 GOES TO PIN #2 OF ITEM #39 - COIL AND TIE BACK NEATLY.
3. RIBBON CABLE (ITEM #20) RUNS FROM HEADER ON THE MAIN KEYBOARD TO THE HEADER ON THE SOFT-KEY KEYBOARD AS SHOWN.
4) WIRE TAG ALL WIRES - BOTH ENDS.
5. STRIP WIRE INSULATION BACK 1/4" ON AMP CONNECTOR END ONLY - CUT FLUSH ON PLUG ENDS (H6, H7 & H8).
6. USE ITEM #43 ON THE FRONT OF THE PANEL AND ITEM #41 ON THE BACKSIDE OF THE PANEL.
7) CHECK WITH ELECTRICAL ENGINEERING FOR CURRENT SOFTWARE REVISION NUMBER BEFORE INSTALLING EPROM ONTO THE VIDEO BOARD.

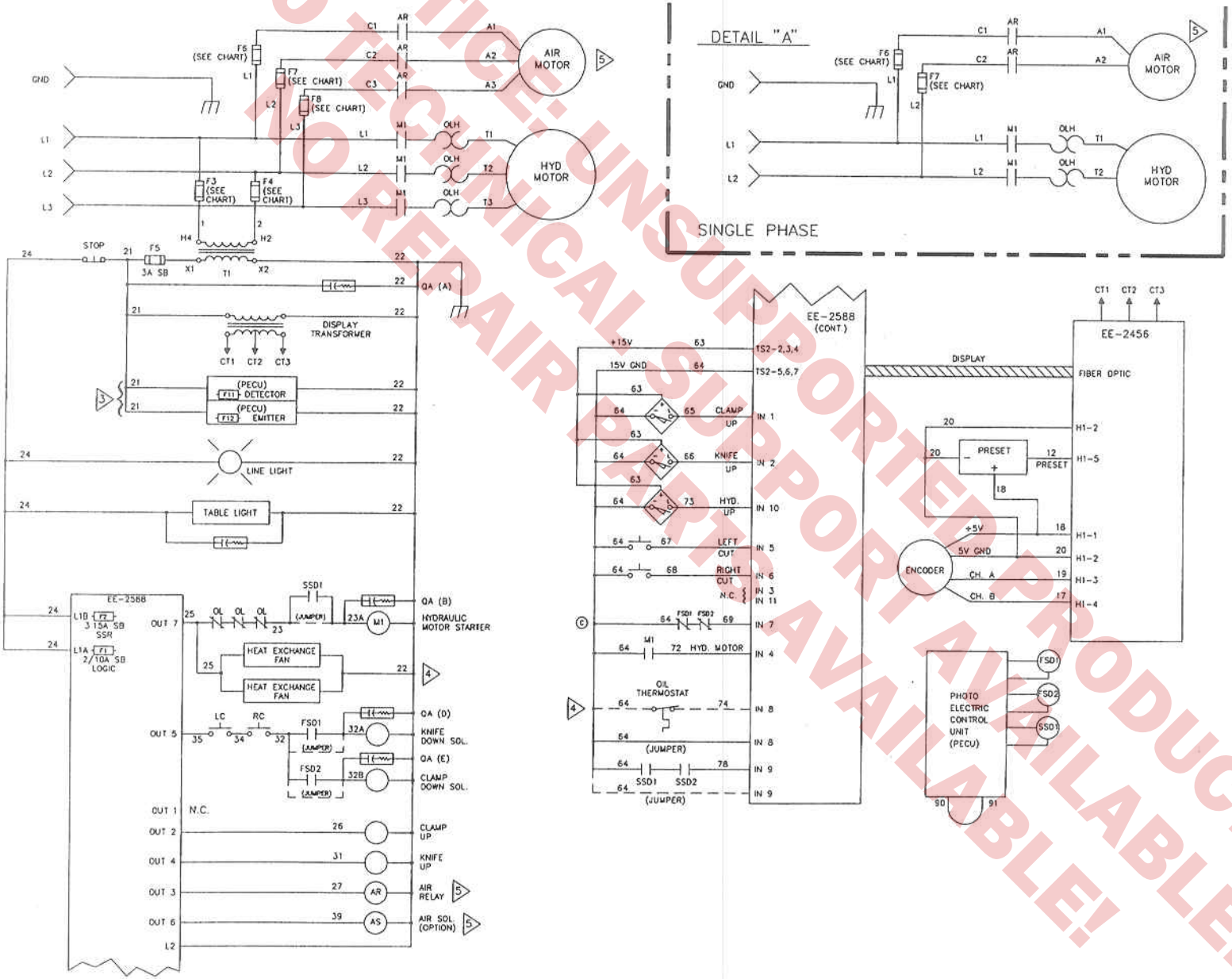


VIEW "A"
SCALE: 2X

ASSEMBLY – CONSOLE – 305 CRT
EE-2516

Ref. No.	Part No.	Part Name	Qty.
1.	13992	Panel – Control Console	1
2.	EE-2253-1	P.C.B. Asm. – Keyboard	1
3.	EE-2248	P.C.B. Asm. – Video	1
4.	E-1163-10	Wire, #20 GA MTW – Black – 3" Long	3
5.	E-1163-10	Wire, #10 GA MTW – Black	As Needed
6.	E-849-R	Wire, #16 GA MTW – Red	As Needed
7.	E-1152-20	Spacer 1" Long	2
8.	E-1152-24	Spacer ½" Long	4
9.	E-1152-16	Spacer 2" Long	4
10.	E-787-14	Pin – Female Socket	2
11.	E-809-3	Receptacle – 9 Pin	2
12.	E-809	Receptacle – 16 Pin	1
13.	E-787-6	Pin – Male (20 - 24 GA)	23
14.	E-2150-10	Plug – Through Connector – 12 Pin	3
15.	E-1838-1	Pushbutton – Stop Keylock	1
16.	E-1839-3	Contact Block – NC	1
17.	E-1584-21	Label – Preset	1
18.	E-1584-20	Label – Encoder	1
19.	EE-1788-8	Ribbon Cable Asm. 4" Long	1
20.	EE-1788-9	Ribbon Cable Asm. 9" Long	1
21.	E-2203-3	Backer – Fishpaper	1
22.	EE-2259	Cable Asm. – CRT	Ref.
23.	EE-2257	Asm. – Power Pack – CRT	Ref.
24.	E-1214-36	Connector – Ring	3
25.	EE-2383-1	P.C.B. Asm. – Soft-Key Keyboard	1
26.	E-787-2	Pin – Male (16 - 18 GA)	3
27.	13994	Bracket – Connector	1
28.	13962	Console Cover	1
29.	A-11219-1	Foam – CRT Bezel 18" Long	1
30.	H-6910-44004	Screw – #4 - 40NC X ½" Butt. Hd.	2
31.	H-6423-#4	Nut – #4 - 40NC Hex	8
32.	H-7324-#4	Washer – #4 Shakeproof	8
33.	H-6910-63203	Screw – #6 - 32NC X ⅜ Butt. Hd.	9
34.	H-6924-604	Screw – #6 X ¼ Rd. Hd. Drive	4
35.	H-6423-#6	Nut – #6 - 32NC Hex	11
36.	H-7324-#6	Washer – #6 Shakeproof	14
37.	A-13013-1	Bezel – 5" Diagonal	1
38.	S-1694	Tyrap (Not Shown)	As Needed
39.	E-2408	Plug – Socket Housing	1
40.	H-6910-102404	Screw – #10 - 24 X ½ But. Hd. Soc. Cap	2
41.	H-7330-#10	Lockwasher – #10 External Tooth	2
42.	H-6423-#10	Nut – #10 - 24 Hex	2
43.	S-1864-3	Washer – Retaining	2
44.	11288-7	Washer – Nylon	2
45.	E-1152-29	Spacer – ⅜" Long	6

BASIC MACHINE SCHEMATIC – MC 60 Hz
E-2582



NOTES:

1) JUMPER LINES WILL BE IN PLACE WHEN MACHINE IS NOT EQUIPPED WITH AN PHOTO ELECTRIC CONTROL UNIT.
2) FOR SINGLE PHASE MACHINES USE DETAIL "A".
3) FUSES "F11" & "F12" ARE BOTH 2/10 AMP. SLO-BLO AND ARE ONLY ON MACHINES WITH THE PHOTO ELECTRIC CONTROL UNIT. THERE IS NO "F9" OR "F10" FUSE ON THIS MACHINE.
4) OPTIONAL – FOR MACHINES WITH HYDRAULIC SHROUDING ONLY.
5) OPTIONAL – FOR MACHINES WITH AIR TABLES ONLY.

FUSE CHART
F3 & F4

VOLTAGE OPTION	FUSE VALUE	FUSE PART NO.	
208V	8A SB	E-1075-8SB	A B
230V	8A SB	E-1075-8SB	A B
460V	4A SB	E-2308-3	

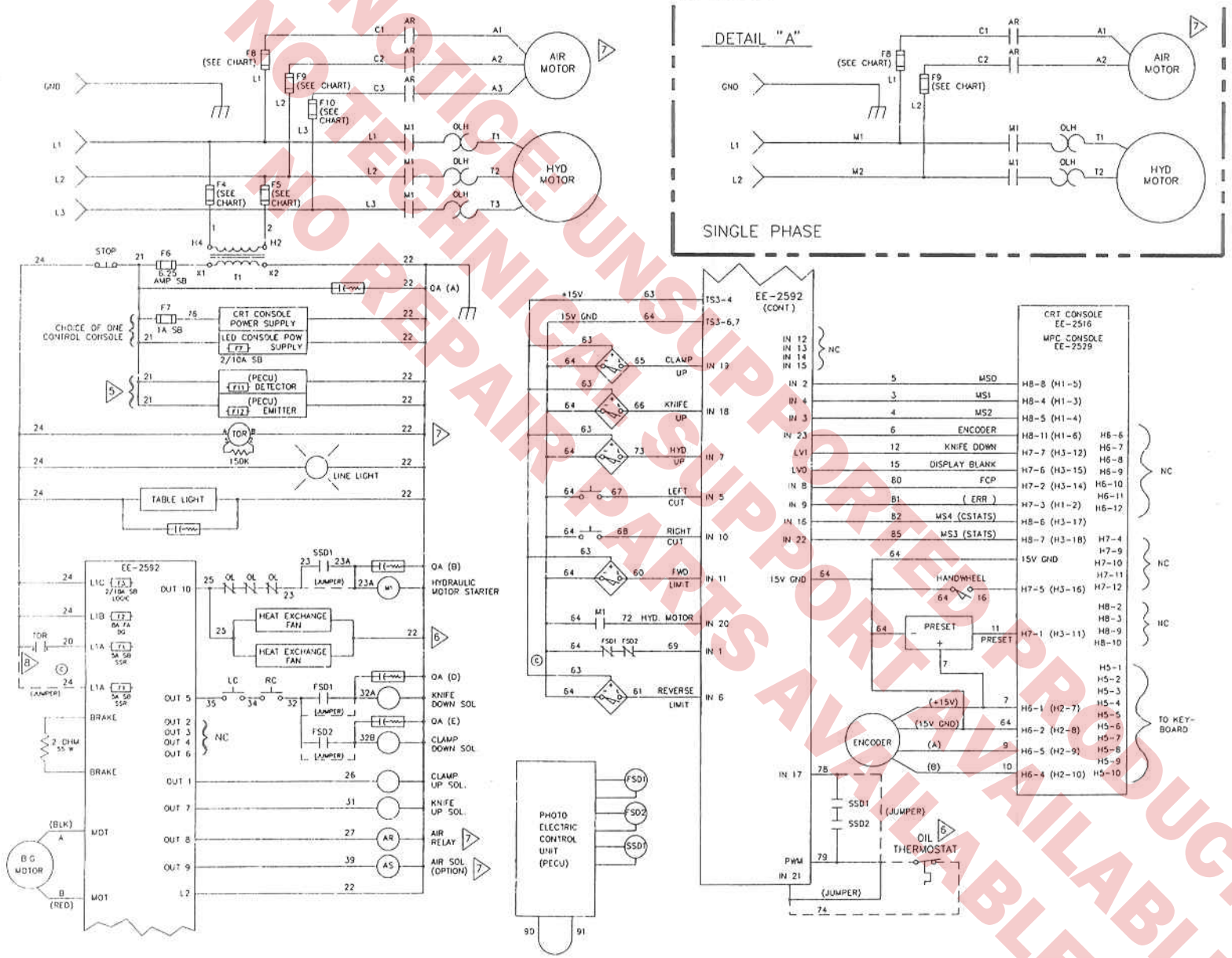
FUSE CHART
F6, F7 & F8
(3 PHASE MACHINES)

VOLTAGE OPTION	FUSE VALUE	FUSE PART NO.
208V	2.5A SB	E-1075-2.5SB
230V	2.5A SB	E-1075-2.5SB
460V	.8A SB	E-2308-8

FUSE CHART
F6 & F7
(SINGLE PHASE MACHINES)

VOLTAGE OPTION	FUSE VALUE	FUSE PART NO.
208V	2.5A SB	E-1075-2.5SB
230V	2.5A SB	E-1075-2.5SB

BASIC MACHINE SCHEMATIC – MPX, MPC, CRT 60 Hz
E-2583



NOTES:

1) IN THE CRT CONSOLE, WIRE NUMBERS 8 & 64 ARE 15V GND AND CAN BE TERMINATED AT H6-2, H7-8 OR H8-12.
   +15V IS AVAILABLE AT H6-1, H8-1, H8-2 AND H8-3.
2) DASHED JUMPER LINES DENOTE STANDARD MACHINE WITHOUT THE PHOTO ELECTRIC CONTROL UNIT.
3) FOR SINGLE PHASE MACHINES USE DETAIL "A"
4) TERMINATIONS FOR MPC CONSOLE ARE LISTED IN PARENTHESIS TO THE RIGHT OF THE CRT CONSOLE NUMBERS.
5) FUSE "F11" & "F12" ARE 2/10 AMP SLO-BLO AND ARE ONLY ON MACHINES WITH THE PHOTO ELECTRIC CONTROL UNIT.
6) OPTIONAL – FOR MACHINES WITH HYDRAULIC SHROUDING ONLY.
7) OPTIONAL – FOR MACHINES WITH AIR TABLES.
8) JUMPER MUST BE ADDED IF THE TIME DELAY RELAY IS NOT INSTALLED

FUSE CHART
F4 & F5

VOLTAGE OPTION	FUSE VALUE	FUSE PART NO.	
208V	8A SB	E-1075-8SB	A B
230V	8A SB	E-1075-8SB	A B
460V	8A SB	E-2308-2	C

FUSE CHART
F8, F9 & F10
(3 PHASE MACHINES)

VOLTAGE OPTION	FUSE VALUE	FUSE PART NO.
208V	2.5A SB	E-1075-2.5SB
230V	2.5A SB	E-1075-2.5SB
460V	.8A SB	E-2308-8

FUSE CHART
F8 & F9
(SINGLE PHASE MACHINES)

VOLTAGE OPTION	FUSE VALUE	FUSE PART NO.
208V	2.5A SB	E-1075-2.5SB
230V	2.5A SB	E-1075-2.5SB

JOGGING AID CONSTRUCTION GUIDE A-12608- ( )

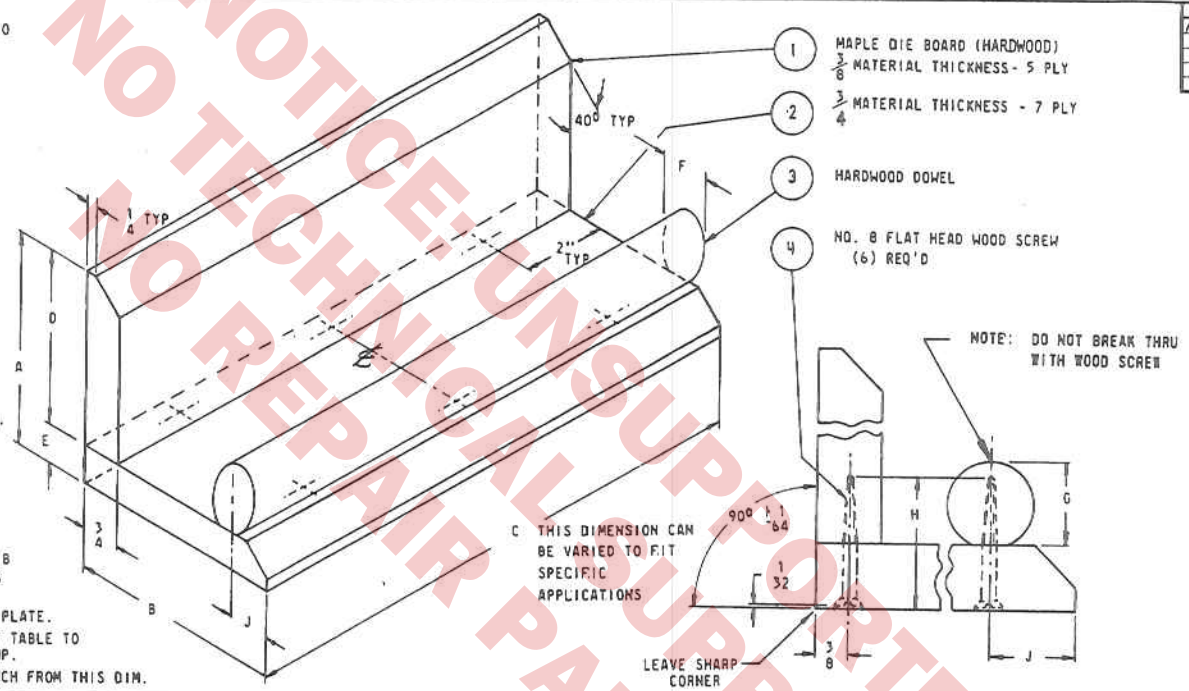
INSTRUCTIONS

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	BY	REVISION RECORD	SHEETS	APP'D	DR
11-1-84	—	RELEASED FOR PROD. (ADD ECN)		D. LW	

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		

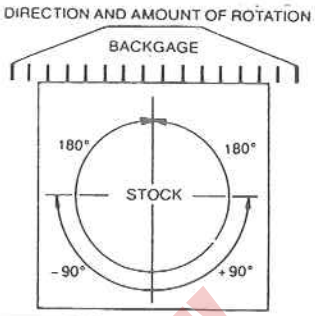
DRAWN	LW
TRACED	
CHECKED	12-1-84
SUPERSEDES DRAWING NO.	

THE CHALLENGE MACHINERY COMPANY
GRAND HAVEN, MICHIGAN
SCALE NONE DATE 10-15-84
SUPERSEDED BY DRAWING NO.

A-12608-( )

DE-

PROGRAM LOG



It is always a good practice to keep written records of important repeat jobs. In case a channel or the entire memory is accidently wiped out, important jobs won't 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
01		
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STEP	CUT POSITION	ROTATE
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CHANNEL LOG

It is recommended that you keep an abbreviated Channel Log and detailed Program Logs (copy the form inside back cover) 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.

CHANNEL	JOB/CUSTOMER	SAVE
01		
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CHANNEL	JOB/CUSTOMER	SAVE
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THE CHALLENGE MACHINERY COMPANY
1433 Fulton Ave • Grand Haven, MI 49417 USA
PH. 616-842-8300 FAX. 616-842-6511

SERVICE NOTICE

Please use the following supplements to order replacement parts and for adjusting hydraulic pressures on 305 M cutters with the letter "C" and "E" at the end of the serial number.

1433 Fulton Avenue
Grand Haven, MI
49417-1594 USA

Fax: 616 847-6665
Phone: 616 847-6660

THIS MANUAL SUPPLEMENT COVERS MACHINES BUILT WITH THE NEW H-465 HYDRAULIC MANIFOLD. PLEASE KEEP IT WITH THE REGULAR MANUAL. IT COVERS HYDRAULIC VALVE ADJUSTMENTS AND A NEW PARTS LIST FOR THE MANIFOLD.

HYDRAULIC VALVE ADJUSTMENTS

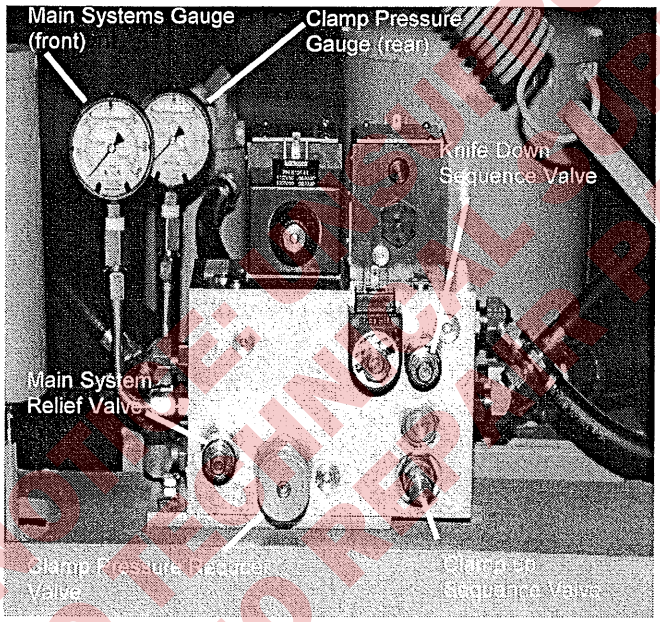
CAUTION: Several of the following tests require the machine to be operational for checking and adjusting. Be very careful that tools and other people are clear of moving parts and that the cutter is not accidentally operated while the adjustments are being made. Disconnect the power and lock it out, see Safety Precautions page 4, whenever working on the machine, unless the directions specifically require the machine to be powered.

Perform hydraulic checks and setup when oil is hot and adjust the valves in the following order:

1) Main Systems Relief Valve - 1800 psi
2) Knife Down Sequence valve - 1600 psi
3) Clamp Up Relief Valve - 400 - 600 psi
4) Pressure Reducer Valve - 1400 max/200 min psi

NOTICE: Pressures setting fluctuate with oil temperature. **Set Pressures when oil is hot.**

1) Main System Relief Valve (fig.54)



(fig. 54)

This valve maintains the overall hydraulic pressure for the entire system. Factory setting: 1800 psi.

Check Procedure:
1. Open the left access door on front of the cutter.
2. Turn the power on and make a cut to hold the knife down on the cutting stick. Read the pressure on the main system pressure gage (front gauge) while the knife is down. If the gauge does not read 1800 psi, an adjustment is needed.

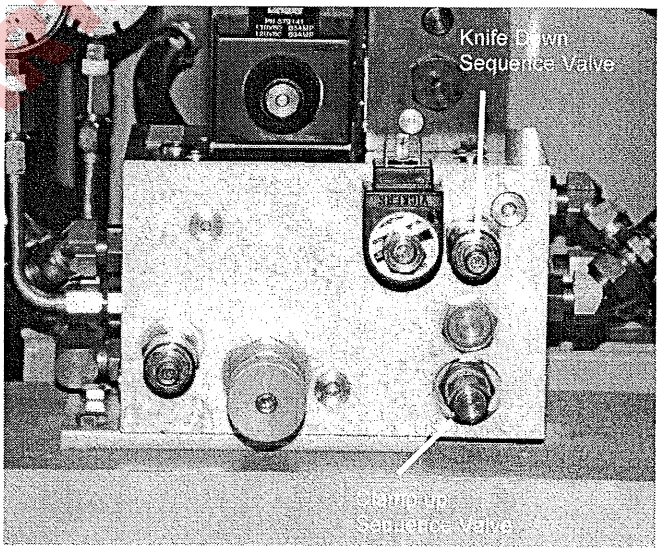
To Adjust:
1. Loosen the lock nut on the relief valve. Use an Allen wrench to turn the adjusting screw. TURN IN to increase pressure, OUT to decrease pressure.

CAUTION: PINCH POINT - You will require two people to perform the following adjustment. One to hold the cut buttons in and one to adjust the valve screw. Be extremely careful to keep hands and tools away from moving parts. The only thing that has to be handled is the adjusting wrench! A possible pinch point exists between the clamp parallel rod and the top of the valve solenoids. Do not place hands or tools in this area if the machine is to be cycled.

2. Make a cut and hold the buttons in. While reading the main system gauge, adjust the valve screw until you have the correct pressure.
3. Tighten the lock nut while holding the hex wrench in place.
4. Proceed to readjust the other valves.

2) Knife Down Sequence Valve (fig. 55)

This valve controls the clamp and knife sequence. It keeps the knife up until after the clamp has made contact. Factory setting: 1600 psi.



(fig. 55)

NOTE: Main System Pressure must be set at 1800 psi before making this adjustment.

Check Procedure:
1. Open the left access door on the front of the cutter.
2. Press the cut buttons while reading the pressure on the main system pressure gauge (front gauge). The gauge should read appoximately 1600 psi as the knife

is coming down (when bottomed, the gauge will jump to 1800 psi showing the Main System Relief pressure previously set).
3. If correct, proceed to check the Pressure Reducer.

To Adjust:
1. Loosen the lock nut.
2. Make a cut and hold the cut buttons in. While reading the main system gauge, adjust the valve - screw until you have the correct pressure (1600 psi).
NOTICE: The knife should not move until the clamp contacts the stock. If it does, you must increase the pressure.
3. Tighten the lock nut while holding the hex wrench in place.
4. Proceed to readjust the other valves.

3) Clamp Up Sequence Valve (fig. 55)

This valve maintains clamp pressure so the clamp remains down until the knife has stopped in the up position. Factory setting 400-600 psi.

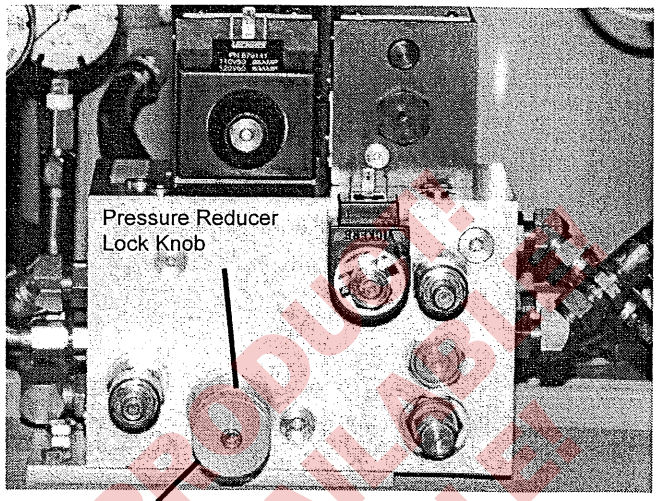
Check procedure:
1. Open the left access door on the front of the cutter.
2. Press the cut buttons, and while reading the pressure on the main gauge (front gauge), release them. The gauge should read between 400-600 psi as the clamp is going up. There should be no clamp movement until the knife is stopped in the up position.
3. If correct, proceed to check the Pressure Reducer.

To Adjust:
1. Remove the protective cap and loosen the lock nut on the clamp up sequence valve.
2. Make a cut, then release the buttons. Read the main gauge as the clamp is returning, adjust the valve for a reading of 400-600 psi.
3. Tighten the lock nut while holding the hex wrench in place and replace the protective cap.
4. Procede to readjust other valves.

4) Pressure Reducer Valve (fig. 56)

This valve limits the amount of pressure to the clamp system. Factory setting: 1000 psi (1400max/200min).

To check:
1. With the hydraulic access door open, activate the cut buttons and read the pressure off the clamp gauge (rear gauge). It should read 750 psi for average cuttting purposes.

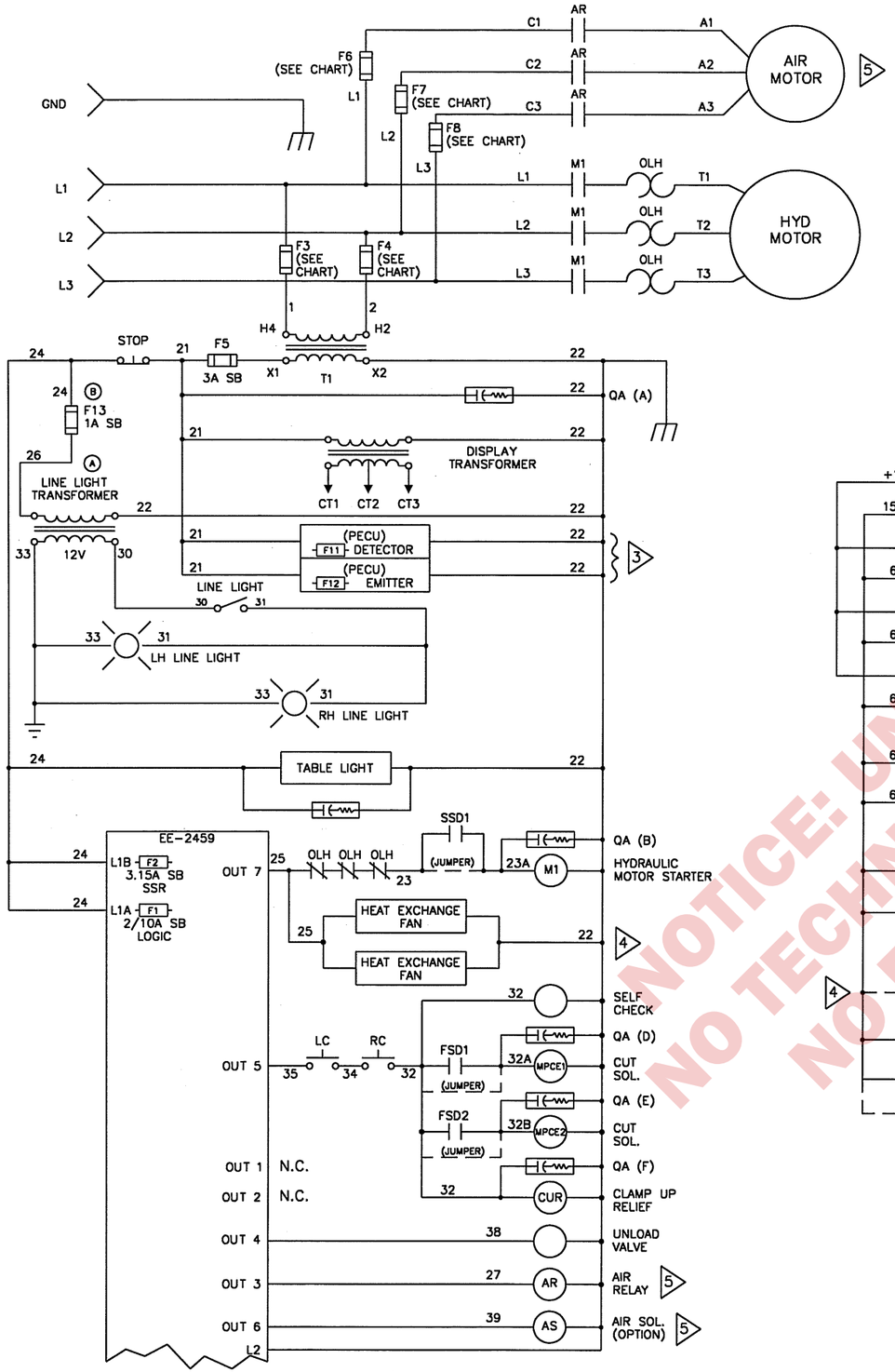


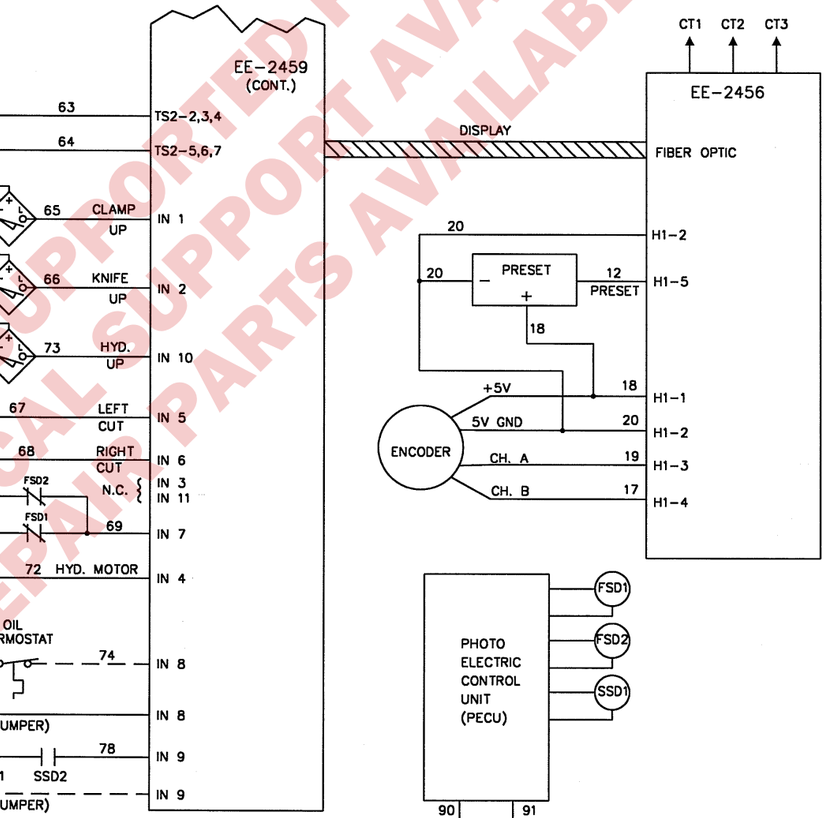
Adjusting Knob (fig. 56)

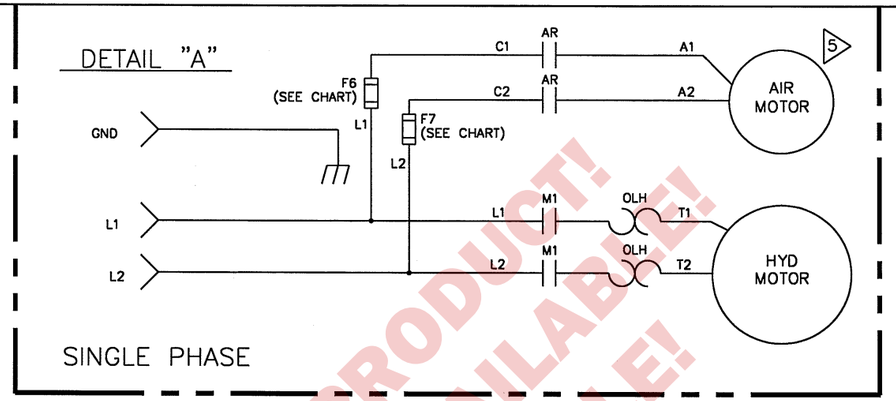
To Adjust:
1. Loosen the lock knob. There are two knobs, one behind the other, fig. 56. The outer is the adjusting knob, the inner is the lock knob.
2. Push the cut buttons and check the reading on the clamp gauge (rear gauge) when the clamp is on the table and the knife is coming down.
3. Turn the pressure adjusting knob clockwise for MORE pressure, counter-clockwise for LESS.

CAUTION: DO NOT set the clamp pressure below 200 psi. severe lacerations or dismemberment could result! The Knife and Clamp System loses sequence at settings below 200 psi and the knife could come down before the clamp.

4. Make another cut and check the pressure gauge. Adjust the pressure to your cutting needs (see OPERATING TIPS).
5. Tighten the locking knob.







DATE	SYM	REVISION RECORD	RQD	APP	DRN
8-93	—	RELEASED FOR PRODUCTION (8N3093)		MW	PC
2-96	A	REVISED LINE LIGHTS (2N1096)		MW	PC
9-96	B	REVISED FUSE "F13" LOCATION (9N496)		MW	PC

NOTES:

1) JUMPER LINES WILL BE IN PLACE WHEN MACHINE IS NOT EQUIPPED WITH AN PHOTO ELECTRIC CONTROL UNIT.

2) FOR SINGLE PHASE MACHINES USE DETAIL "A".

3 FUSES "F11" & "F12" ARE BOTH 2/10 AMP. SLO-BLO AND ARE ONLY ON MACHINES WITH THE PHOTO ELECTRIC CONTROL UNIT. THERE IS NO "F9" OR "F10" FUSE ON THIS MACHINE.

4 OPTIONAL – FOR MACHINES WITH HYDRAULIC SHROUDING ONLY.

5 OPTIONAL – FOR MACHINES WITH AIR TABLES ONLY.

FUSE CHART
F3 & F4

VOLTAGE OPTION	FUSE VALUE	FUSE PART NO.
208V	8A SB	E-1075-8SB
230V	8A SB	E-1075-8SB
380V	5A SB	E-2308-4
415V	5A SB	E-2308-4
460V	4A SB	E-2308-3

FUSE CHART
5 F6, F7 & F8
(3 PHASE MACHINES)

VOLTAGE OPTION	FUSE VALUE	FUSE PART NO.
208V	2.5A SB	E-1075-2.5SB
230V	2.5A SB	E-1075-2.5SB
380V	.8A SB	E-2308-8
415V	.8A SB	E-2308-8
460V	.8A SB	E-2308-8

FUSE CHART
5 F6 & F7
(SINGLE PHASE MACHINES)

VOLTAGE OPTION	FUSE VALUE	FUSE PART NO.
208V	2.5A SB	E-1075-2.5SB
230V	2.5A SB	E-1075-2.5SB

USED IN 305 "E" SERIES

DO NOT SCALE DRAWING

DE-BURR SHARP EDGES UNLESS OTHERWISE SPECIFIED

TOLERANCES UNLESS OTHERWISE SPECIFIED

FRACTIONAL	±1/32
TWO PLACE	±.010
THREE PLACE	±.005

ANGULAR LIMITS ±1°

A "√" ON A SURFACE INDICATES A FINISH REQUIRED

A "√" WITH NO VALUE WILL REPRESENT A 125 MICRO FINISH

EST. NO

FLATNESS
STRAIGHTNESS
ANGULARITY
PERPENDICULARITY (SQUARENESS)
PARALLELISM
ROUNDNESS (CIRCULARITY)
CYLINDRICITY
PROFILE OF ANY SURFACE
PROFILE OF ANY LINE
RUNOUT
TRUE POSITION
CONCENTRICITY

MODIFIERS
Ⓜ MAXIMUM MATERIAL CONDITION
Ⓢ REGARDLESS OF FEATURE SIZE

THE CHALLENGE MACHINERY CO.
1433 FULTON ST. GRAND HAVEN, MI 49417

MATERIAL: SCHEMATIC "E" SERIES

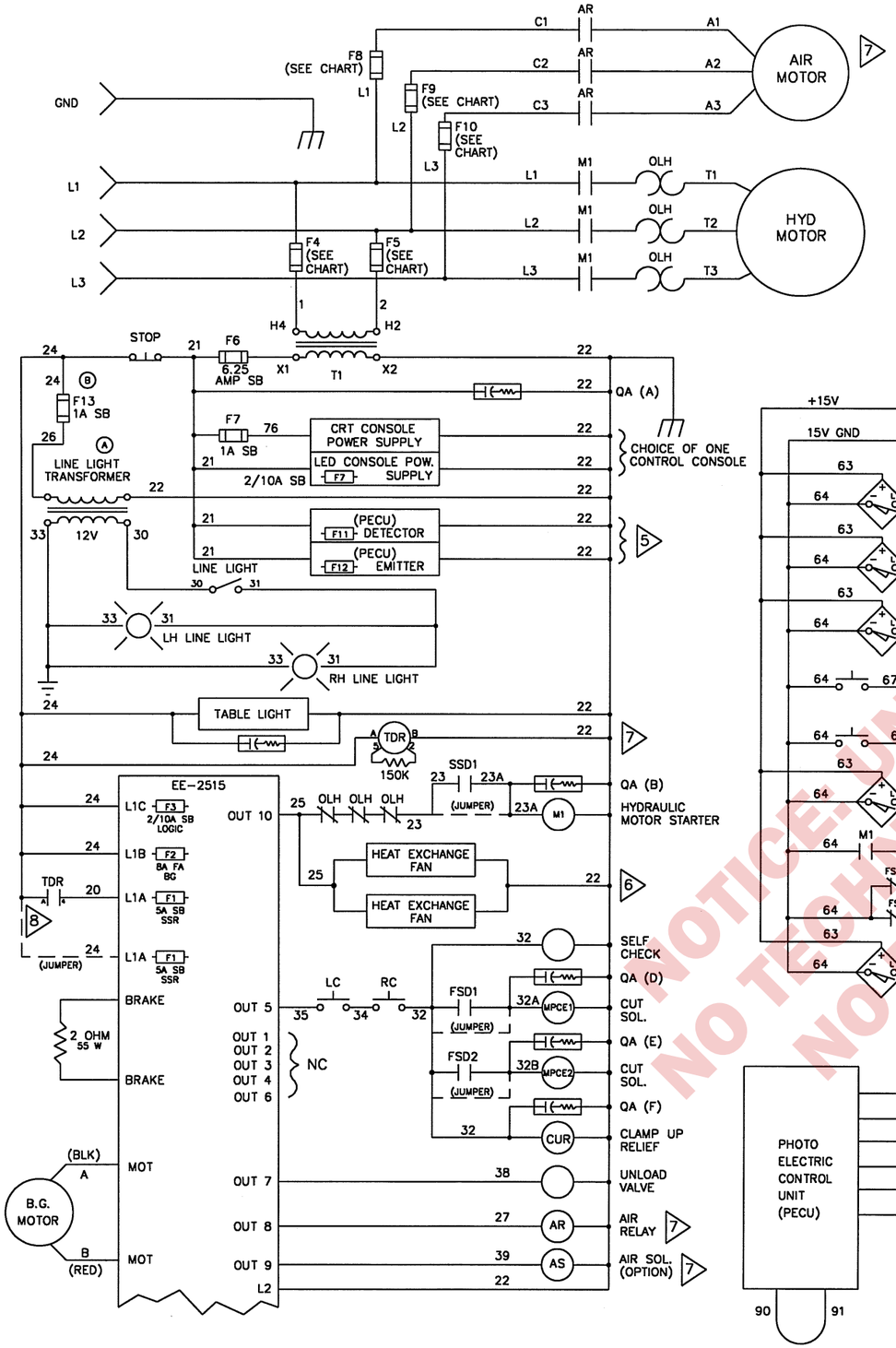
NAME: SCHEM. – BASIC MACHINE – 50/60Hz MC

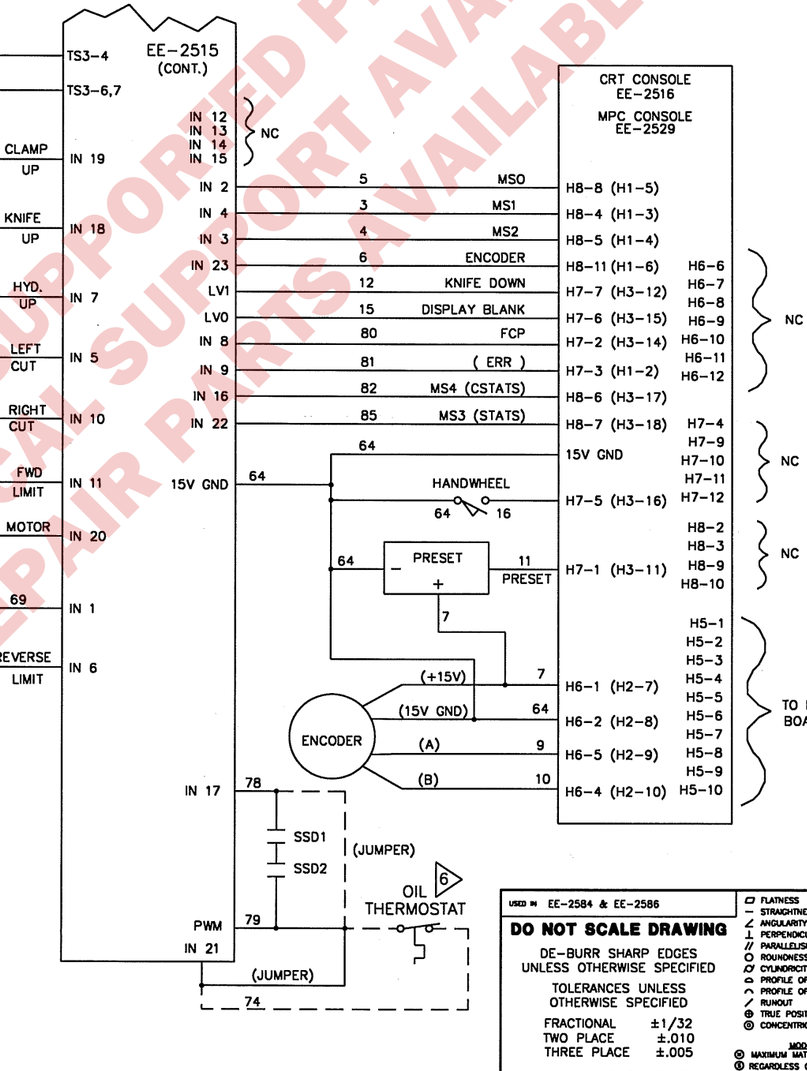
DRAWN	DATE	CHECKED	DATE
PC	8-12-93	MW	8-16-93

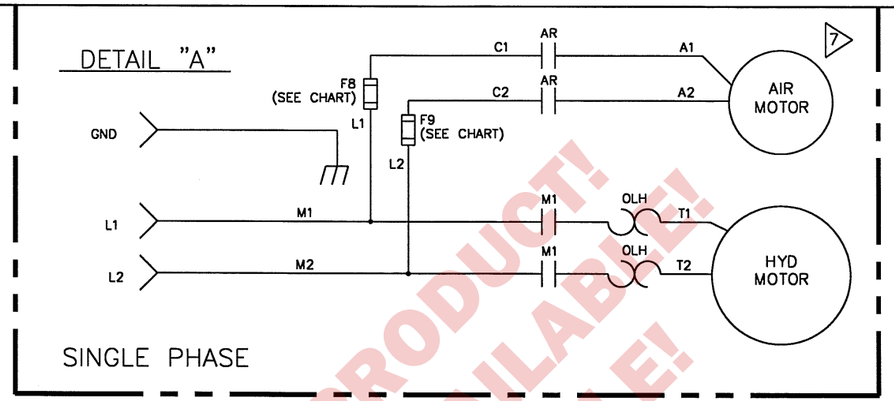
SUPERSEDES: SUPERSEDED BY:

CAD NO. E2582-1 DISK NO. ~~E=033~~ SCALE 1=1 QTY USED 1

E-2582-1 –VOID– (7N397)







DATE	SYM	REVISION RECORD	RQD	APP	DRN
8-93	—	RELEASED FOR PRODUCTION (8N3093)		MW	PC
2-96	A	REVISED LINE LIGHTS (2N1096)		MW	PC
9-96	B	REVISED FUSE "F13" LOCATION (9N496)		MW	PC

NOTES:

1) IN THE CRT CONSOLE, WIRE NUMBERS 8 & 64 ARE 15V GND AND CAN BE TERMINATED AT H6-2, H7-8 OR H8-12.

   +15V IS AVAILABLE AT H6-1, H8-1, H8-2 AND H8-3.

2) DASHED JUMPER LINES DENOTE STANDARD MACHINE WITHOUT THE PHOTO ELECTRIC CONTROL UNIT.

3) FOR SINGLE PHASE MACHINES USE DETAIL "A".

4) TERMINATIONS FOR MPC CONSOLE ARE LISTED IN PARENTHESIS TO THE RIGHT OF THE CRT CONSOLE NUMBERS.

5) FUSE "F11" & "F12" ARE 2/10 AMP. SLO-BLO AND ARE ONLY ON MACHINES WITH THE PHOTO ELECTRIC CONTROL UNIT.

6) OPTIONAL – FOR MACHINES WITH HYDRAULIC SHROUDING ONLY.

7) OPTIONAL – FOR MACHINES WITH AIR TABLES.

8) JUMPER MUST BE ADDED IF THE TIME DELAY RELAY IS NOT INSTALLED.

FUSE CHART
F4 & F5

VOLTAGE OPTION	FUSE VALUE	FUSE PART NO.
208V	8A SB	E-1075-8SB
230V	8A SB	E-1075-8SB
380/415	5A SB	E-2308-4
460V	8A SB	E-2308-2

FUSE CHART
F8, F9 & F10
(3 PHASE MACHINES)

VOLTAGE OPTION	FUSE VALUE	FUSE PART NO.
208V	2.5A SB	E-1075-2.5SB
230V	2.5A SB	E-1075-2.5SB
380/415	.8A SB	E-2308-8
460V	.8A SB	E-2308-8

FUSE CHART
F8 & F9
(SINGLE PHASE MACHINES)

VOLTAGE OPTION	FUSE VALUE	FUSE PART NO.
208V	2.5A SB	E-1075-2.5SB
230V	2.5A SB	E-1075-2.5SB

USED IN EE-2584 & EE-2586

DO NOT SCALE DRAWING

DE-BURR SHARP EDGES UNLESS OTHERWISE SPECIFIED

TOLERANCES UNLESS OTHERWISE SPECIFIED

FRACTIONAL	±1/32
TWO PLACE	±.010
THREE PLACE	±.005

ANGULAR LIMITS ±1°

A "√" ON A SURFACE INDICATES A FINISH REQUIRED
A "√" WITH NO VALUE WILL REPRESENT A 125 MICRO FINISH

EST. HO

FLATNESS
STRAIGHTNESS
ANGULARITY
PERPENDICULARITY (SQUARENESS)
PARALLELISM
ROUNDNESS (CIRCULARITY)
CYLINDRICITY
PROFILE OF ANY SURFACE
PROFILE OF ANY LINE
RUNOUT
TRUE POSITION
CONCENTRICITY

MODIFIERS
Ⓜ MAXIMUM MATERIAL CONDITION
Ⓢ REGARDLESS OF FEATURE SIZE

THE CHALLENGE MACHINERY CO.
1433 FULTON ST. GRAND HAVEN, MI 49417

MATERIAL: SCHEMATIC

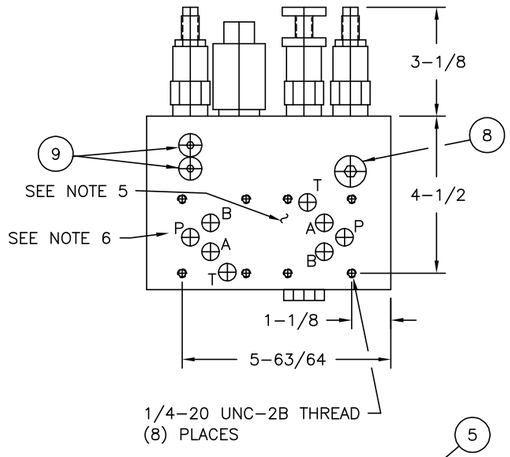
NAME: SCHEM.– BASIC MACH. – 50/60Hz SPACER

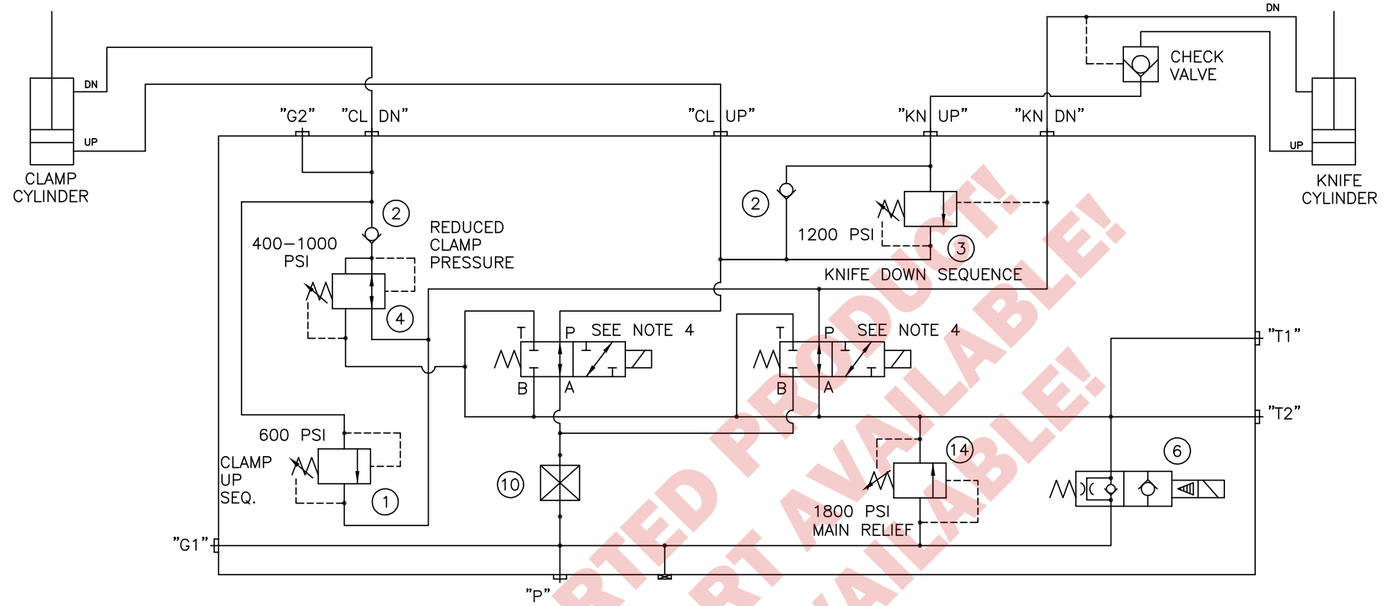
DRAWN	PC	DATE	8-12-93	CHECKED	MW	DATE	8-16-93
SUPERSEDES:				SUPERSEDED BY:			
CAD NO.	E2583-1	DISK NO.		SCALE	1=1	QTY USED	1

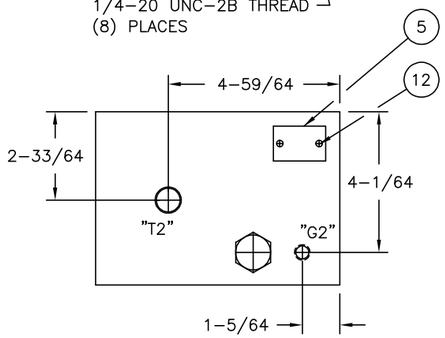
E-2583-1 –VOID– (7N397)

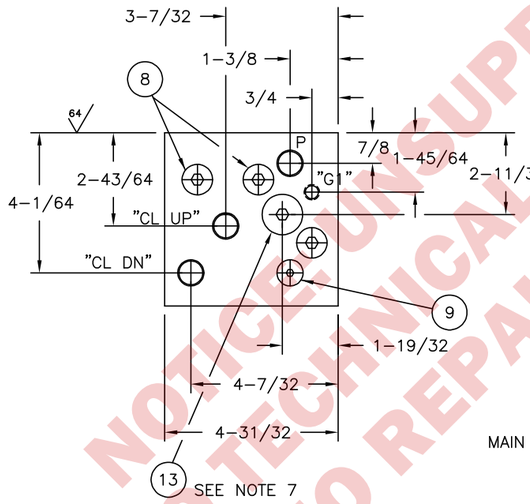
DATE	SYM	REVISION RECORD	RQD	APP	DRN
3-91	–	RELEASED FOR PRODUCTION (2N2891)	–	DEL	JV

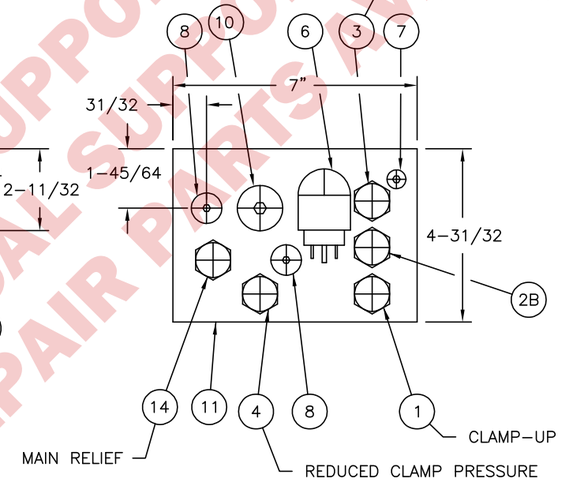
'C' SERIES MANIFOLD

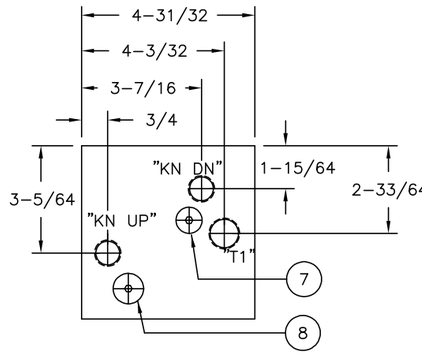


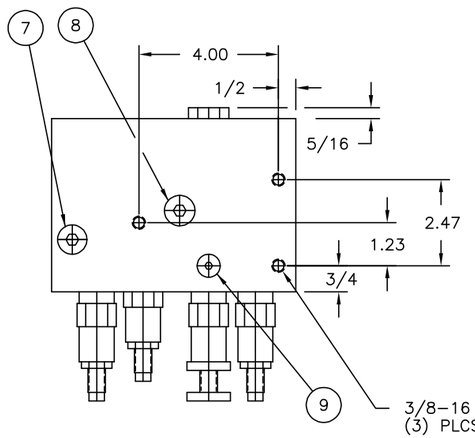












NOTES:
1. ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.
2. METAL STAMP PORT NOMENCLATURES AND PART NO. AS SHOWN IN QUOTES.
3. TORQUE ALL CARTRIDGES & PLUGS PER MC SPEC NO. 19020.
4. (2) 4 WAY VALVES ARE SUPPLIED BY CUSTOMER.
5. THIS SURFACE MUST BE PROTECTED DURING STORAGE AND HANDLING.
6. DO NOT STAMP (FOR REF. ONLY).
7. OPTIONAL "P" PORT.

PORT SIZES:
"G1" & "G2"----------SAE #4(7/16-20 THD.)
"CL UP", "CL DN", "KN UP", "KN DN",
"P" & "T2"----------SAE #8(3/4-16 THD.)
"T1"----------SAE #10(7/8-14 THD.)
(2) DO2 MTG. PADS
(1) C-10-2 CAVITY PLUGGED (REF. ITEM 10)

NO.	CMC PART NO.	MFR. PART NO.	DESCRIPTION OF ACCESSORIES	QTY
15				
14	H-203-26	RV5-10-S-0-20	RELIEF VALVE	1
13	H-427-3	121-8T	SAE PLUG	1
12	N/P	18027	RIVET	2
11	N/P	XP40714	VALVE MANIFOLD	1
10	H-427-4	121-10T	SAE PLUG	1
9	H-427	121-2T	SAE PLUG	4
8	H-427-2	121-5T	SAE PLUG	8
7	H-427-1	121-4T	SAE PLUG	3
6	H-200-3	SV5-10-0-0-115AG	SOLENOID VALVE	1
5	N/P	20297	NAMEPLATE	1
4	H-203-25	PRV2-10-K-0-25	PRESSURE REDUCING VALVE	1
3	H-203-24	PSV2-10-S-0-12	SEQUENCE VALVE	1
2	H-203-27	CV1-10-P-0-05	CHECK VALVE	2
1	H-203-23	RV10-10-C-0-10	RELIEF VALVE	1

USED IN H-418, H-419

DO NOT SCALE DRAWING

DE-BURR SHARP EDGES UNLESS OTHERWISE SPECIFIED

TOLERANCES UNLESS OTHERWISE SPECIFIED

FRACTIONAL	±1/32
TWO PLACE	±.010
THREE PLACE	±.005

ANGULAR LIMITS ±1°

A "√" ON A SURFACE INDICATES A FINISH REQUIRED
A "√" WITH NO VALUE WILL REPRESENT A 125 MICRO FINISH

EST. NO 12A2390

FLATNESS
STRAIGHTNESS
ANGULARITY
PERPENDICULARITY (SQUARENESS)
PARALLELISM
ROUNDNESS (CIRCULARITY)
CYLINDRICITY
PROFILE OF ANY SURFACE
PROFILE OF ANY LINE
RUNOUT
TRUE POSITION
CONCENTRICITY

MODIFIERS
Ⓜ MAXIMUM MATERIAL CONDITION
Ⓢ REGARDLESS OF FEATURE SIZE

THE CHALLENGE MACHINERY CO.
1433 FULTON ST. GRAND HAVEN, MI 49417

MATERIAL: PURCHASE

NAME: MANIFOLD

DRAWN	DATE	CHECKED	DATE
DEL	12-26-90	DEL	12-26-90

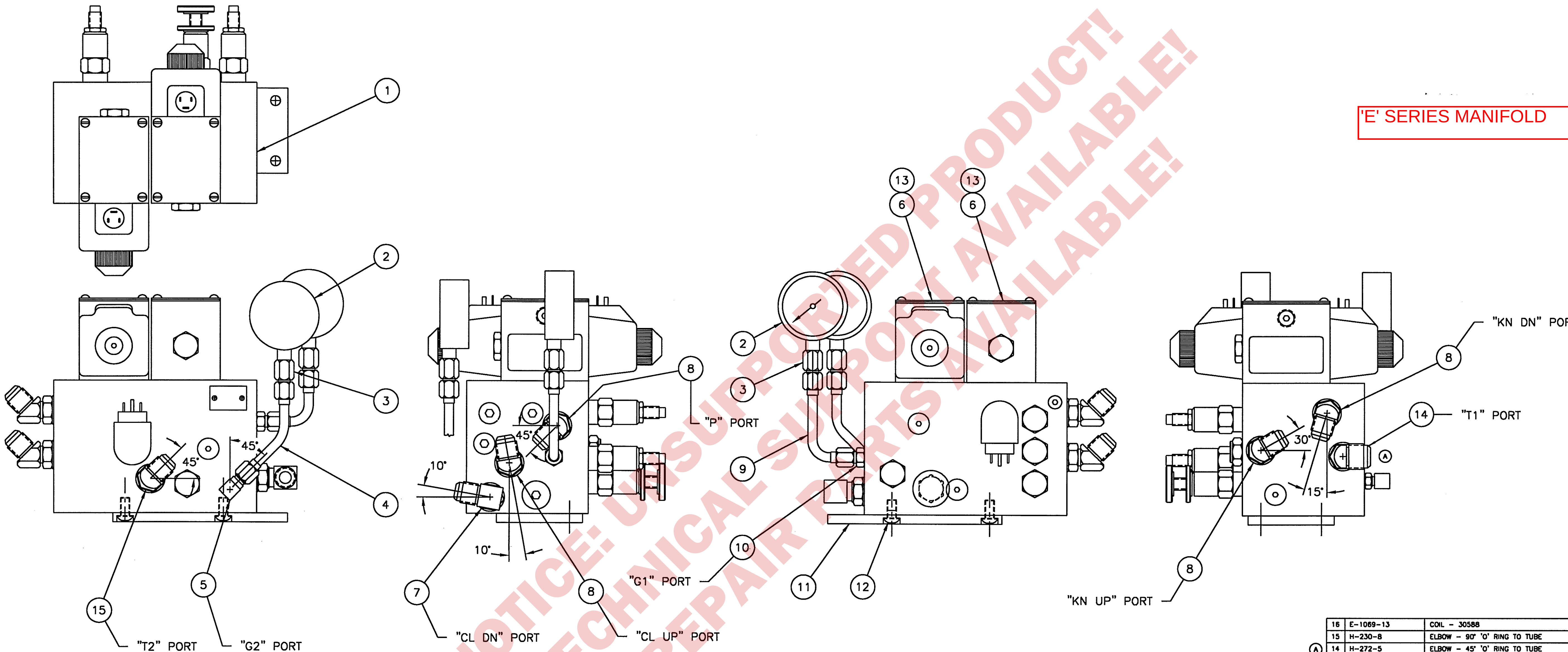
SUPERSEDES: VM-014 SUPERSEDED BY:

CAD NO. H417 DISK NO. ~~H=057~~ SCALE 1=2 QTY USED 1

H-417 –VOID– (8N3093)

DATE	SYM	REVISION RECORD	RQD	APP	DRN
8-93	–	RELEASED FOR PRODUCTION (8N3093)	–	MW	PC
4-94	A	H-272-5 WAS H-272-4 (4N1494)		MW	PC

'E' SERIES MANIFOLD



NO.	PART NO.	DESCRIPTION OF ACCESSORIES	QTY
16	E-1069-13	COIL – 30588	REF
15	H-230-8	ELBOW – 90° 'O' RING TO TUBE	1
(A) 14	H-272-5	ELBOW – 45° 'O' RING TO TUBE	1
13	H-423	VALVE – 4 WAY	2
12	H-6910-606	3/8-16 X 3/4 BUTTON HD. CAP SCREW	3
11	47256	PLATE – MANIFOLD MOUNT	1
10	H-236-5	ADAPTER – 'O' RING TO TUBE	1
9	H-329	TUBE ASSEMBLY – "G1" PORT	1
8	H-272-3	ELBOW – 45° 'O' RING TO TUBE	4
7	H-230-4	ELBOW – 'O' RING TO TUBE	1
6	H-6918-412	1/4-20 X 1-1/2" SOCKET HD. CAP SCREW	8
5	H-230	ELBOW – 'O' RING TO TUBE	1
4	H-425	TUBE ASSEMBLY – "G2" PORT	1
3	H-253-2	ADAPTER – PIPE TO TUBE	2
2	8P-629-3	GAGE	2
1	H-468	MANIFOLD – HYDRAULIC	1

USED IN H-456, H-457

DO NOT SCALE DRAWING

DE-BURR SHARP EDGES
UNLESS OTHERWISE SPECIFIED

TOLERANCES UNLESS
OTHERWISE SPECIFIED

FRACTIONAL	±1/32
TWO PLACE	±.010
THREE PLACE	±.005

ANGULAR LIMITS ±1°
A "√" ON A SURFACE INDICATES A FINISH REQUIRED
A "√" WITH NO VALUE WILL REPRESENT A 125 MICRO FINISH

EST. NO

- FLATNESS
- STRAIGHTNESS
- ANGULARITY
- PERPENDICULARITY (SQUARENESS)
- PARALLELISM
- ROUNDNESS (CIRCULARITY)
- CYLINDRICITY
- PROFILE OF ANY SURFACE
- PROFILE OF ANY LINE
- RUNOUT
- TRUE POSITION
- CONCENTRICITY

MODIFIERS
- Ⓜ MAXIMUM MATERIAL CONDITION
- Ⓢ REGARDLESS OF FEATURE SIZE

THE CHALLENGE MACHINERY CO.
1433 FULTON ST. GRAND HAVEN, MI 49417

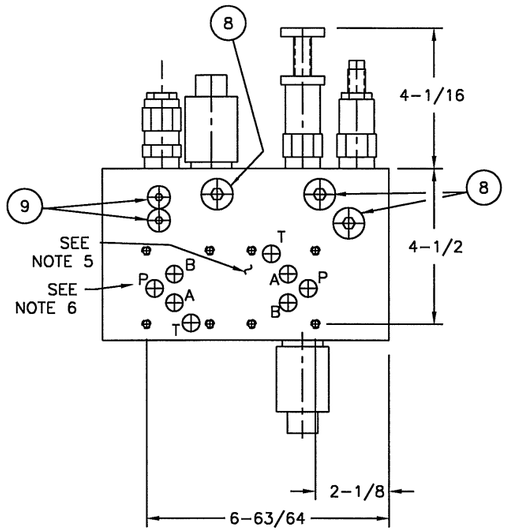
MATERIAL: SEE PARTS LIST

NAME: MANIFOLD ASSEMBLY (STANDARD)

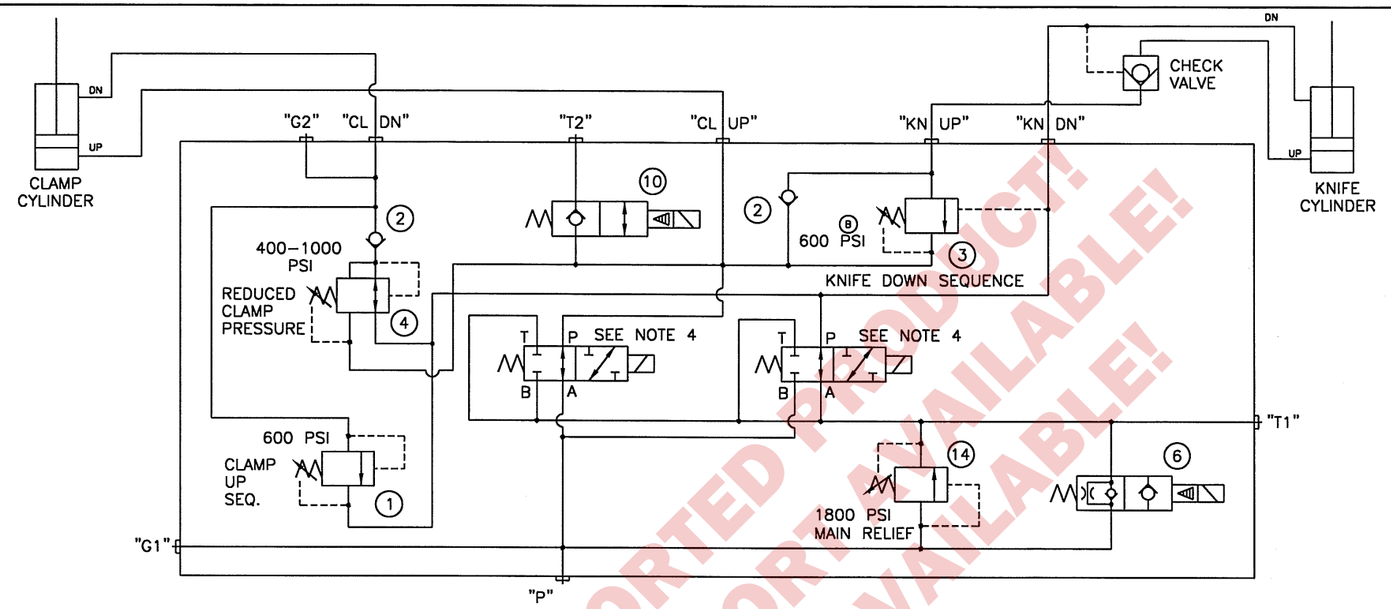
DRAWN PC	DATE 9-1-93	CHECKED MW	DATE 9-10-93
SUPERSEDES:		SUPERSEDED BY:	
CAD NO. H465	DISK NO. ~~[illegible]~~	SCALE 1=2	QTY USED 1

~~H-465~~ –VOID–
7N397

DATE	SYM	REVISION RECORD	RQD	APP	DRN
8-93	-	RELEASED FOR PRODUCTION (8N3093)	-	DH	PC
10-95	A	H-200-4 WAS H-200-5 (10N295)		MW	PC
10-95	B	WAS 1200 PSI (NO CN)		MW	PC

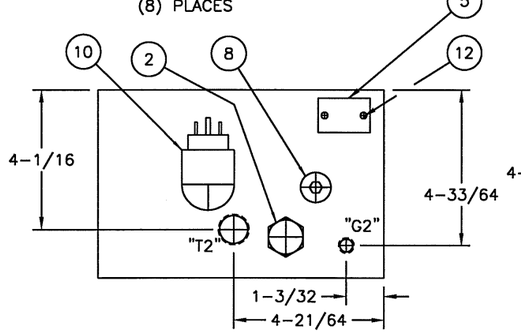


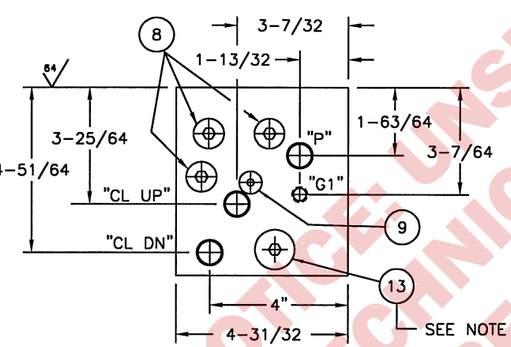
1/4-20 UNC-2B THREAD — (8) PLACES

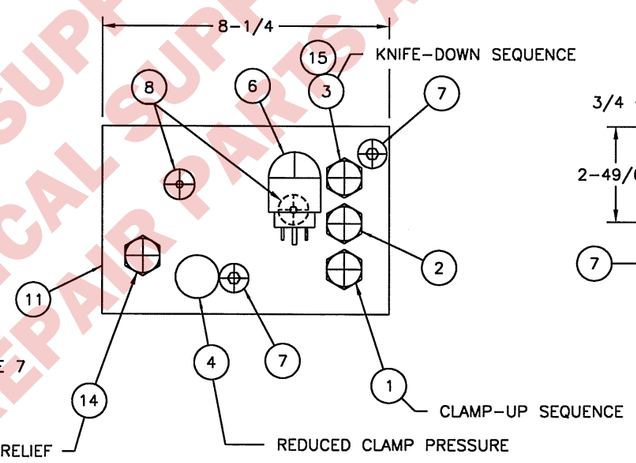


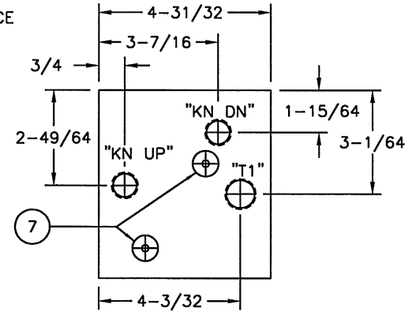
'F' SERIES MANIFOLD

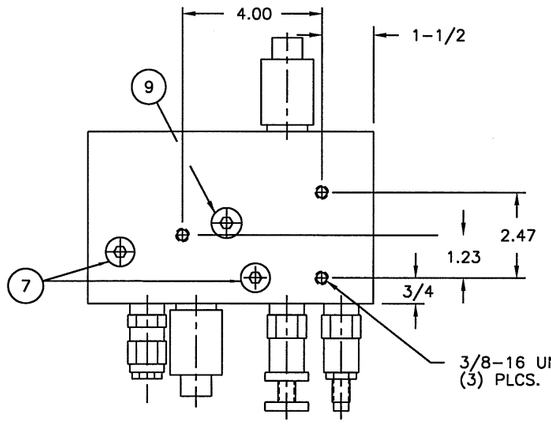
REPAIR NOTE:
"O" RING REPLACEMENT KIT – PART NUMBER H-468-SK











NOTES:
1. ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.
2. METAL STAMP PORT NOMENCLATURES AND PART NO. AS SHOWN IN QUOTES.
3. TORQUE ALL CARTRIDGES & PLUGS PER MC SPEC NO. 19020.
4. (2) 4 WAY VALVES ARE SUPPLIED BY CUSTOMER.
5. THIS SURFACE MUST BE PROTECTED DURING STORAGE AND HANDLING.
6. DO NOT STAMP (FOR REF. ONLY).
7. OPTIONAL "P" PORT.

PORT SIZES:
"G1" & "G2"----------SAE #4(7/16-20 THD.)
"CL UP", "CL DN", "KN UP", "KN DN",
"P" ----------SAE #8(3/4-16 THD.)
"T1" & "T2"----------SAE #10(7/8-14 THD.)
(2) DO2 MTG. PADS

NO.	CMC PART NO.	MFR. PART NO.	DESCRIPTION OF ACCESSORIES	QTY
15	N/P	21781-.020	ORFICE PLUG	1
14	H-203-26	RV5-10-S-0-20	RELIEF VALVE	1
13	H-427-3	121-8T	SAE PLUG	2
12	N/P	18027	RIVET	2
11	N/P	41112	VALVE MANIFOLD	1
(A) 10	H-200-4	SV3-10-C-0-115AG	SOLENOID VALVE	1
9	H-427	121-2T	SAE PLUG	4
8	H-427-2	121-5T	SAE PLUG	9
7	H-427-5	121-6T	SAE PLUG	6
6	H-200-3	SV5-10-0-0-115AG	SOLENOID VALVE	1
5	N/P	20297	NAMEPLATE	1
4	H-203-2	PRV2-16-K-0-30	PRESSURE REDUCING VALVE	1
3	H-203-30	PSV2-10-S-0-24/16	SEQUENCE VALVE	1
2	H-203-29	CV3-10-P-0-03	CHECK VALVE	2
1	H-203-23	RV10-10-C-0-10	RELIEF VALVE	1

USED IN H-465, -1, H-466, -1

DO NOT SCALE DRAWING

DE-BURR SHARP EDGES UNLESS OTHERWISE SPECIFIED

TOLERANCES UNLESS OTHERWISE SPECIFIED

FRACTIONAL	±1/32
TWO PLACE	±.010
THREE PLACE	±.005

ANGULAR LIMITS ±1°

A "√" ON A SURFACE INDICATES A FINISH REQUIRED
A "√" WITH NO VALUE WILL REPRESENT A 125 MICRO FINISH

- FLATNESS
- STRAIGHTNESS
- ANGULARITY
- PERPENDICULARITY (SQUARENESS)
- PARALLELISM
- ROUNDNESS (CIRCULARITY)
- CYLINDRICITY
- PROFILE OF ANY SURFACE
- PROFILE OF ANY LINE
- RUNOUT
- TRUE POSITION
- CONCENTRICITY

MODIFIERS
- Ⓜ MAXIMUM MATERIAL CONDITION
- Ⓢ REGARDLESS OF FEATURE SIZE

EST. NO

THE CHALLENGE MACHINERY CO.
1433 FULTON ST. GRAND HAVEN, MI 49417

MATERIAL: PURCHASE

NAME: MANIFOLD

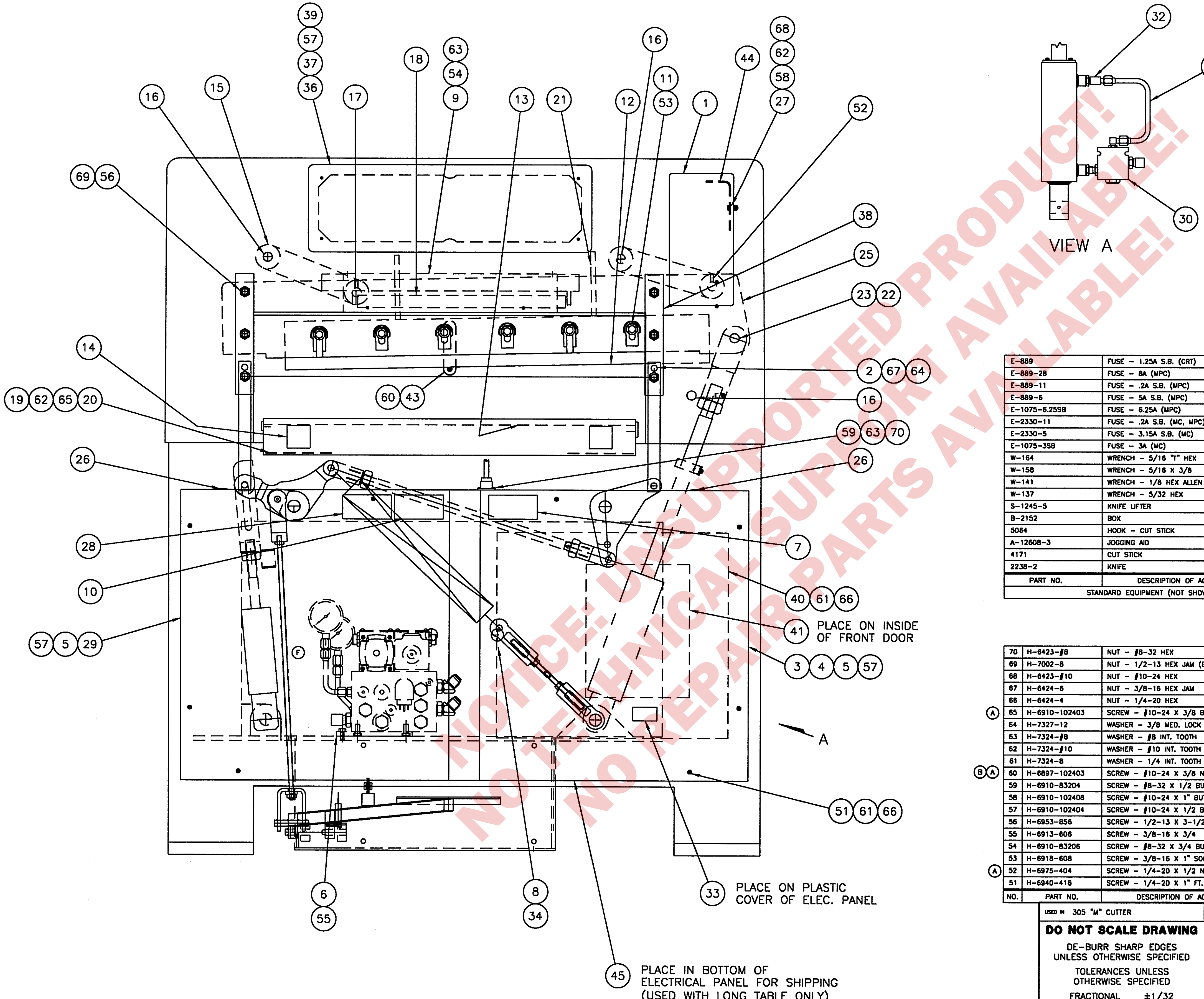
DRAWN	DATE	CHECKED	DATE
PC	8-26-93	DH	8-30-93

SUPERSEDES: H-417 | SUPERSEDED BY:

CAD NO. H468 | DISK NO. ~~H-DS3~~ | SCALE 1=2 | QTY USED 1

H-468 -VOID- 7N397

DATE	SYM	REVISION RECORD	RQD	APP	DRN
8-93	–	RELEASED FOR PRODUCTION (8N3093)	–	MW	PC
4-94	A	REVISED HARDWARE (4N1494)		MW	PC
8-94	B	WAS (2) H-6897-83203 (8N2594)		DEL	PC
6-95	C	WAS E-2482-1 FIBER OPTIC (6N695)		MW	PC
2-96	D	ADDED EURO TABLE LIGHT (2N1096)		MW	PC
12-96	E	S-1781-50 WAS S-1781-35 (12N696)	JM	MW	TMH
2-97	F	REMOVE LABEL S-1781-20 (2N1097)	MIM	MW	MIM



STANDARD EQUIPMENT (NOT SHOWN)

PART NO.	DESCRIPTION OF ACCESSORIES	QTY
E-889	FUSE – 1.25A S.B. (CRT)	1
E-889-28	FUSE – 8A (MPC)	1
E-889-11	FUSE – .2A S.B. (MPC)	1
E-889-6	FUSE – 5A S.B. (MPC)	1
E-1075-6.25SB	FUSE – 6.25A (MPC)	1
E-2330-11	FUSE – .2A S.B. (MC, MPC)	1
E-2330-5	FUSE – 3.15A S.B. (MC)	1
E-1075-3SB	FUSE – 3A (MC)	1
W-164	WRENCH – 5/16 "T" HEX	1
W-158	WRENCH – 5/16 X 3/8	1
W-141	WRENCH – 1/8 HEX ALLEN	1
W-137	WRENCH – 5/32 HEX	1
S-1245-5	KNIFE LIFTER	2
B-2152	BOX	1
5064	HOOK – CUT STICK	1
A-12608-3	JOGGING AID	1
4171	CUT STICK	3
2238-2	KNIFE	1

REV.	NO.	PART NO.	DESCRIPTION OF ACCESSORIES	QTY
	70	H-6423-#8	NUT – #8-32 HEX	2
	69	H-7002-8	NUT – 1/2-13 HEX JAM (BLACK)	6
	68	H-6423-#10	NUT – #10-24 HEX	3
	67	H-6424-6	NUT – 3/8-16 HEX JAM	2
	66	H-6424-4	NUT – 1/4-20 HEX	12
A	65	H-6910-102403	SCREW – #10-24 X 3/8 BUTT. HD.	4
	64	H-7327-12	WASHER – 3/8 MED. LOCK	2
	63	H-7324-#8	WASHER – #8 INT. TOOTH	4
	62	H-7324-#10	WASHER – #10 INT. TOOTH	7
	61	H-7324-8	WASHER – 1/4 INT. TOOTH	12
B A	60	H-6897-102403	SCREW – #10-24 X 3/8 NYLOK FL HD.SOC.CAP	2
	59	H-6910-83204	SCREW – #8-32 X 1/2 BUTT. HD.	2
	58	H-6910-102408	SCREW – #10-24 X 1" BUTT. HD.	3
	57	H-6910-102404	SCREW – #10-24 X 1/2 BUTT. HD.	14
	56	H-6953-856	SCREW – 1/2-13 X 3-1/2 OVAL PT. SOC. SET	6
	55	H-6913-606	SCREW – 3/8-16 X 3/4 HEX	2
	54	H-6910-83206	SCREW – #8-32 X 3/4 BUTT. HD.	2
	53	H-6918-608	SCREW – 3/8-16 X 1" SOC. HD.	6
A	52	H-6975-404	SCREW – 1/4-20 X 1/2 NYLOK CUP PT. SS	2
	51	H-6940-416	SCREW – 1/4-20 X 1" FT. PT. SET	8

REV.	NO.	PART NO.	DESCRIPTION OF ACCESSORIES	QTY
	45	S-1781-34	DECAL – EXTENSION TABLES (LONG TABLE ONLY)	2
C	44	EE-2741	CABLE ASM. – FIBER OPTIC ,110" LONG(MC ONLY)	1
	43	47252	FIBER BOARD – KNIFE SLIDE	1
	42			
	41	SEE CHART, SHT. 2	LABEL – POWER CONNECTION PROCEDURE	1
	40	SEE CHART, SHT. 2	ELECTRICAL PANEL	1
	39	S-1864-3	CAPTIVE RETAINING DEVICE	4
	38	4505	GIB – KNIFE BAR	2
	37	E-1152-28	SPACER	4
	36	EE-2514	ASSEMBLY – CONTROL CONSOLE (MC)	1
D	35			
	34	11145-1	RIVET – 3/16	4
D	33	S-1781-35	LABEL – CAUTION (EURO MACH. ONLY)	1
		S-1781-11A	LABEL – CAUTION (NON-EURO 50 HZ. ONLY)	
	32	H-435	TEE – MALE RUN	1
	31	H-433	TUBE ASSEMBLY – KNIFE CYL. PILOT	REF.
	30	H-437	CHECK VALVE ASSEMBLY	REF.
	29	47173-1	DOOR ASM. – L.H. FRONT	1
	28	S-1781-25	LABEL – INSTRUCTION	1
	27	S-1694-2	TYRAP – #10	3
	26	E-2196-11	PLUG – HOLE	2
	25	4501-1	KNIFE BAR	1
F	24			
	23	S-1087-1	PIN – ROD END	1
	22	S-1193-75	"E" RING – 3/4	2
	21	4449	SCREW – KNIFE ADJUSTING	2
	20	EE-2512	CUT BUTTON ASM.	1
E D	19	S-1781-50	LABEL – CAUTION (EURO MACH. ONLY)	2
		S-1781-11A	LABEL – CAUTION (NON-EURO ONLY)	
	18	S-845	LIGHT – TABLE	1
	17	4518	PIN – KNIFE LINK	2
	16	E-2196	PLUG – HOLE	3
	15	4503-2	LINK – KNIFE BAR	2
	14	A-9121	CUT PLATE	2
	13	4171	CUT STICK	1
	12	2238-2	KNIFE	1
	11	8815	WASHER – KNIFE SCREWS	6
	10	S-1781-16	LABEL – CAUTION	1
D	9	EE-2149-8	TABLE LIGHT ASSEMBLY (50 HZ. EURO)	1
		EE-2149-2	TABLE LIGHT ASSEMBLY (50 HZ.)	
		EE-2149-4	TABLE LIGHT ASSEMBLY (50 HZ. CRT)	
		EE-2149-1	TABLE LIGHT ASSEMBLY (60 HZ.)	
	8	47101	LATCH – FRONT ENCLOSURE	2
D	7	S-1781-35	LABEL – CAUTION (EURO MACH. ONLY)	1
		S-1781-11	LABEL – CAUTION (NON-EURO ONLY)	
	6	SEE CHART, SHT. 2	MANIFOLD ASSEMBLY	REF.
	5	47163	GASKET	6
	4	47033-2	ENCLOSURE – FRONT	1
	3	47097	DOOR ASM. – R.H. FRONT	1
	2	4506	STUD – CLAMP	2
	1	S-1781-8	LABEL	1

USED IN 305 "M" CUTTER

DO NOT SCALE DRAWING

DE-BURR SHARP EDGES
UNLESS OTHERWISE SPECIFIED

TOLERANCES UNLESS
OTHERWISE SPECIFIED

FRACTIONAL ±1/32
TWO PLACE ±.010
THREE PLACE ±.005

ANGULAR LIMITS ±1°
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A "√" WITH NO VALUE WILL REPRESENT A 125 MICRO FINISH

FLATNESS
STRAIGHTNESS
ANGULARITY
PERPENDICULARITY (SQUARENESS)
PARALLELISM
ROUNDNESS (CIRCULARITY)
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PROFILE OF ANY SURFACE
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TRUE POSITION
CONCENTRICITY

MODIFIERS
Ⓜ MAXIMUM MATERIAL CONDITION
Ⓢ REGARDLESS OF FEATURE SIZE

EST. NO

THE CHALLENGE MACHINERY CO.
1433 FULTON ST. GRAND HAVEN, MI 49417

MATERIAL: ASSEMBLY

NAME: MAIN ASSEMBLY – FRONT VIEW

DRAWN: PC	DATE: 6-2-93	CHECKED: MW	DATE: 8-30-93
SUPERSEDES: 47000-1		SUPERSEDED BY:	
CAD NO. 47250S1	DISK NO. ~~058~~	SCALE 1=4	QTY USED

~~47250 SHT. 1 OF 12~~ –VOID–
1N397

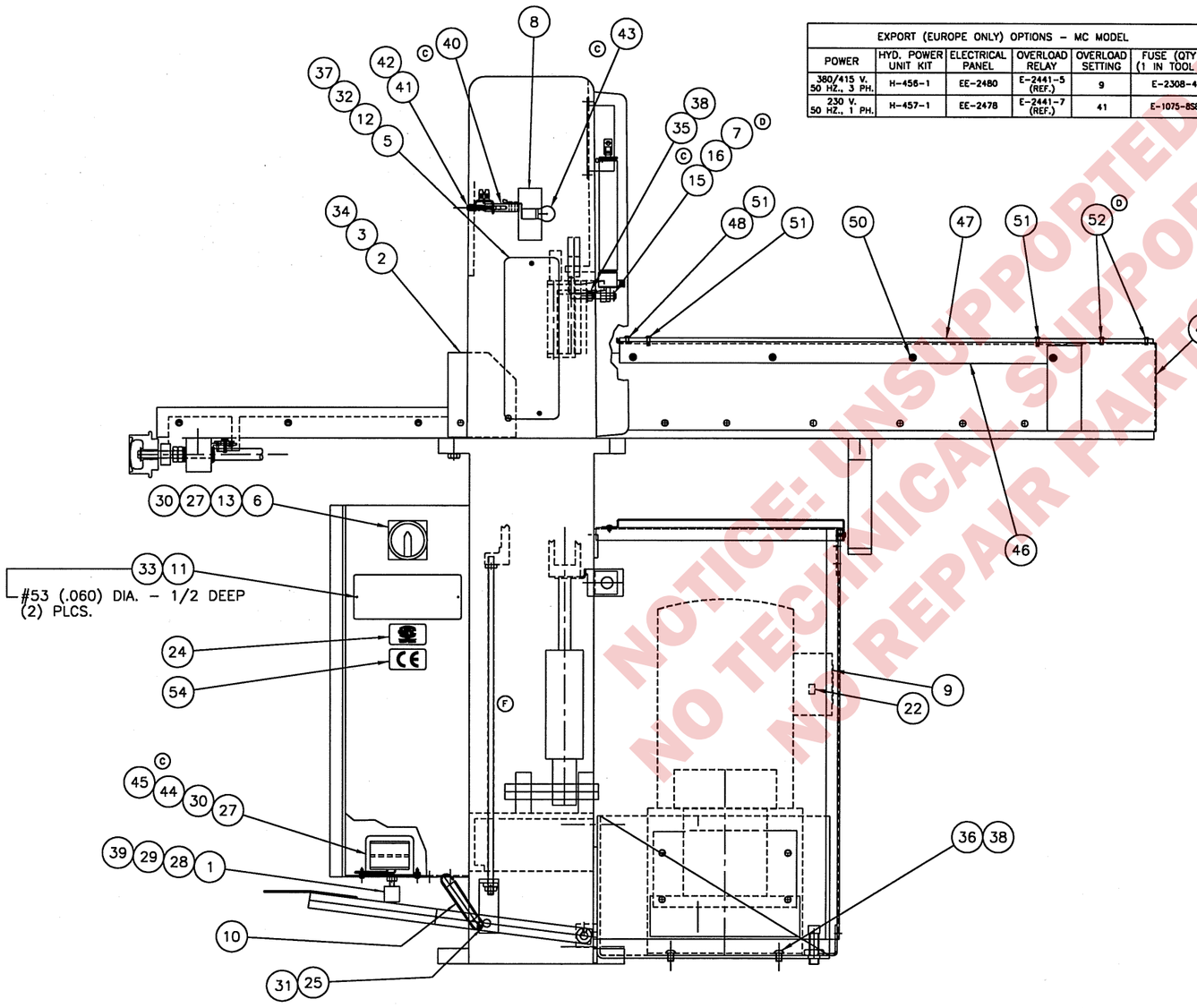
DOMESTIC/EXPORT OPTIONS – MC MODEL								
AIR	POWER	HYD. POWER UNIT KIT	ELECTRICAL PANEL	ELECTRICAL LABEL	BLOWER MOTOR ASM	HEATER	FUSE (QTY: 3) (1 IN TOOL KIT)	BLOWER FUSE
	208/230 V. 60Hz 3PH	H-463	EE-2668	S-1781-33		E-2195-E61	E-1075-8SB	
X	208/230 V. 60Hz 3PH	H-463	EE-2669	S-1781-33	47141 (REF)	E-2195-E61	E-1075-8SB	E-1075-2.5SB (QTY 3)
X	230 V. 50Hz 3PH	H-456	EE-2669	S-1781-33	47141 (REF)	E-2195-E61	E-1075-8SB	E-1075-2.5SB (QTY 3)
X	380/415V. 50Hz 3PH	H-456	EE-2664	S-1781-38	47141 (REF)	E-2195-E52	E-1075-8SB	E-2308-8 (QTY 3)
	460 V. 60Hz 3PH	H-463	EE-2668	S-1781-33		E-2195-E48	E-2308-3 (F)	
X	460 V. 60Hz 3PH	H-463	EE-2669	S-1781-33	47141 (REF)	E-2195-E48	E-2308-3 (F)	E-2308-8 (QTY 3)
	208/230 V. 60Hz 1PH	H-464	EE-2668	S-1781-33		E-2195-E73	E-1075-8SB	
X	208/230 V. 60Hz 1PH	H-464	EE-2669	S-1781-33	47132 (REF)	E-2195-E73	E-1075-8SB	E-1075-2.5SB (QTY 2)
X	230 V. 50Hz 1PH	H-457	EE-2669	S-1781-33	47132 (REF)	E-2195-E73	E-1075-8SB	E-2308-8 (QTY 2)

DOMESTIC/EXPORT OPTIONS – SPACER MODEL								
AIR	POWER	HYD. POWER UNIT KIT	ELECTRICAL PANEL	ELECTRICAL LABEL	BLOWER MOTOR ASM	HEATER	FUSE (QTY: 3) (1 IN TOOL KIT)	BLOWER FUSE
	208/230 V. 60Hz 3PH	H-463	EE-2666	S-1781-32		E-2195-E61	E-1075-8SB	
X	208/230 V. 60Hz 3PH	H-463	EE-2667	S-1781-32	47141 (REF)	E-2195-E61	E-1075-8SB	E-1075-2.5SB (QTY 3)
X	230 V. 50Hz 3PH	H-456	EE-2667	S-1781-32	47141 (REF)	E-2195-E61	E-1075-8SB	E-1075-2.5SB (QTY 3)
X	380/415V 50Hz 3PH	H-456	EE-2665	S-1781-37	47141 (REF)	E-2195-E52	E-1075-8SB	E-2308-8 (QTY 3)
	460 V. 60Hz 3PH	H-463	EE-2666	S-1781-32		E-2195-E52	E-2308-2	
X	460 V. 60Hz 3PH	H-463	EE-2667	S-1781-32	47141 (REF)	E-2195-E52	E-2308-2	E-2308-8 (QTY 3)
	208/230 V. 60Hz 1PH	H-464	EE-2666	S-1781-32		E-2195-E73	E-1075-8SB	
X	208/230 V. 60Hz 1PH	H-464	EE-2667	S-1781-32	47132 (REF)	E-2195-E73	E-1075-8SB	E-1075-2.5SB (QTY 2)
X	230 V. 50Hz 1PH	H-457	EE-2667	S-1781-32	47132 (REF)	E-2195-E73	E-1075-8SB	E-2308-8 (QTY 2)

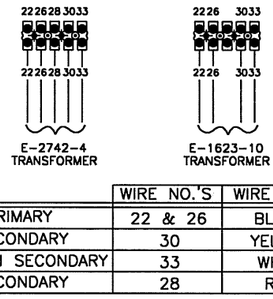
DATE	SYM	REVISION RECORD	RQD	APP	DRN
8-93	–	RELEASED FOR PRODUCTION (8N3093)		MW	PC
4-94	A	WAS H-6938-532 (4N1494)		MW	PC
8-94	B	WAS H-6938-548 (8N2594)		MW	PC
2-96	C	ADD LINE LIGHT ASM./47266 (2N1096)		MW	MIM
12-96	D	ADD COLLAR, REM HDW (11N2996)		MW	MIM
2-97	E	REM. FOOT PEDAL CYL. REF'S. (2N1097)	MIM	MW	MIM
4-97	F	FUSE WAS LISTED AS E-2308-2 (NO CN)		MW	PC

EXPORT (EUROPE ONLY) OPTIONS – MC MODEL						
POWER	HYD. POWER UNIT KIT	ELECTRICAL PANEL	OVERLOAD RELAY	OVERLOAD SETTING	FUSE (QTY 3) (1 IN TOOL KIT)	ELECTRICAL LABEL
380/415 V. 50 HZ., 3 PH.	H-456-1	EE-2480	E-2441-5 (REF.)	9	E-2308-4	S-1781-30
230 V. 50 HZ., 1 PH.	H-457-1	EE-2478	E-2441-7 (REF.)	41	E-1075-8SB	S-1781-30

EXPORT (EUROPE ONLY) OPTIONS – SPACER MODEL						
POWER	HYD. POWER UNIT KIT	ELECTRICAL PANEL	OVERLOAD RELAY	OVERLOAD SETTING	FUSE (QTY 3) (1 IN TOOL KIT)	ELECTRICAL LABEL
380/415 V. 50 HZ., 3 PH.	H-456-1	EE-2481	E-2441-5 (REF.)	9	E-2308-2	S-1781-29
230 V. 50 HZ., 1 PH.	H-457-1	EE-2479	E-2441-7 (REF.)	41	E-1075-8SB	S-1781-29



CMC TRANSFORMER HOOK–UP (REF.)



	WIRE NO.'S	WIRE COLOR
120V PRIMARY	22 & 26	BLACK
12V SECONDARY	30	YELLOW
COMMON SECONDARY	33	WHITE
24V SECONDARY	28	RED

	NO.	PART NO.	DESCRIPTION OF ACCESSORIES	QTY
C	54	5177-5	LABEL – CE MARK (EURO MACH. ONLY)	1
C	52	H-6910-102404	SCREW – #10-24 X 1/2 BUT HD SOC	3
C	51	H-6910-102403	SCREW – #10-24 X 3/8 BUT HD SOC	7
C	50	H-6910-403	SCREW – 1/4-20 X 3/8 BUT HD.	8
C	49	47265	GUARD – BACKGAGE, REAR	1
C	48	47180	SUPPORT – BACKGAGE	1
C	47	47002-1	SHIELD – BACKGAGE	1
C	46	47003	BRACKET – BACKGAGE SHIELD	2
C	45	H-7324-#8	WASHER – #8 INT. TOOTHLOCK (EURO)	4
		H-7324-#8	WASHER – #8 INT. TOOTHLOCK (NON-EURO)	2
C	44	E-1623-10	TRANSFORMER – 12V SECONDARY, 50/60Hz	1
		E-2742-4	TRANSFORMER – DUAL SECONDARY (EURO ONLY)	1
C	43	E-967-1	LAMP	2
D C	42	H-7324-#10	LOCKWASHER– #10 INT. TOOTH	4
C	41	H-6910-102406	SCREW– #10-24 X 3/4 BUTT. HD.	4
C	40	47261	LINE LIGHT ASM.	2

	NO.	PART NO.	DESCRIPTION OF ACCESSORIES	QTY
	39	H-7321-5	WASHER – 5/16 PLAIN	2
	38	H-7327-12	WASHER – 3/8 LOCK	5
	37	H-7324-8	WASHER – 1/4 INT. TOOTH	4
	36	H-6910-604	SCREW – 3/8-16 X 1/2 BUTT. HD.	4
	35	H-6423-6	NUT– 3/8-16 HEX	1
	34	H-6918-606	SCREW – 3/8-16 X 3/4 SOC. HD.	4
C	33	H-6924-004	SCREW – #0 X 1/4 RD. HD. DR.	2
	32	H-6910-404	SCREW – 1/4-20 X 1/2 BUTT. HD.	4
	31	H-6910-406	SCREW – 1/4-20 X 3/4 BUTT. HD.	1
C	30	H-6910-83204	SCREW – #8-32 X 1/2 BUT HD SOC (EURO)	8
		H-6910-83204	SCREW – #8-32 X 1/2 BUT HD (NON-EURO)	4
B A	29	H-6938-532	SCREW – 5/16-18 X 2" CUP PT. SOC. SET	1
	28	H-6423-5	NUT – 5/16-18 HEX	2
C	27	H-6423-#8	NUT – #8-32 HEX (EURO)	8
		H-6423-#8	NUT – #8-32 HEX (NON-EURO)	4
	26	H-6443-6	NUT – 3/8-24 NYLOC HEX	2
	25	H-6424-4	NUT – 1/4-20 HEX	1
C	24	5177-6	LABEL – EMC	1
	23			
	22	E-1237-2	WIRE NUT – RED	4
	21			
	20			
	19			
	18			
	17			
C	16	S-1193-37	"E" RING– 3/8	1
	15	47266	STUD– HYDRAULIC DAMPER	1
	14			
C	13	S-1864-1	CAPTIVE RETAINING DEVICE (NON-EURO ONLY)	2
	12	S-1864-3	CAPTIVE RETAINING DEVICE	4
C	11	41130	PLATE – SERIAL	1
	10	47136-1	SPRING – EXTENSION	1
C	9	S-1781-35	LABEL – CAUTION (EURO MACH. ONLY)	1
		S-1781-11A	LABEL – CAUTION (NON-EURO ONLY)	
	8	S-1781-15	LABEL	2
D	7	A-10644-1	COLLAR– 3/8	1
C	6	EE-2513	SWITCH ASSEMBLY (EURO MACH. ONLY)	1
		47139	COVER (NON-EURO ONLY)	
	5	4469-1	COVER – ARCH END	2
	4			
	3	47115	GUIDE – L.H. FRONT TABLE	1
	2	47116	GUIDE – R.H. FRONT TABLE	1
	1	40016-3	MOUNT – VIBRATION	1

USED IN 305 "M" CUTTER

DO NOT SCALE DRAWING

DE–BURR SHARP EDGES UNLESS OTHERWISE SPECIFIED

TOLERANCES UNLESS OTHERWISE SPECIFIED

FRACTIONAL	±1/32
TWO PLACE	±.010
THREE PLACE	±.005

ANGULAR LIMITS ±1°
A "√" ON A SURFACE INDICATES A FINISH REQUIRED
A "√" WITH NO VALUE WILL REPRESENT A 125 MICRO FINISH

- FLATNESS
- STRAIGHTNESS
- ANGULARITY
- PERPENDICULARITY (SQUARENESS)
- PARALLELISM
- ROUNDNESS (CIRCULARITY)
- CYLINDRICITY
- PROFILE OF ANY SURFACE
- PROFILE OF ANY LINE
- RUNOUT
- TRUE POSITION
- CONCENTRICITY

MODIFIERS
- (M) MAXIMUM MATERIAL CONDITION
- (S) REGARDLESS OF FEATURE SIZE

EST. NO

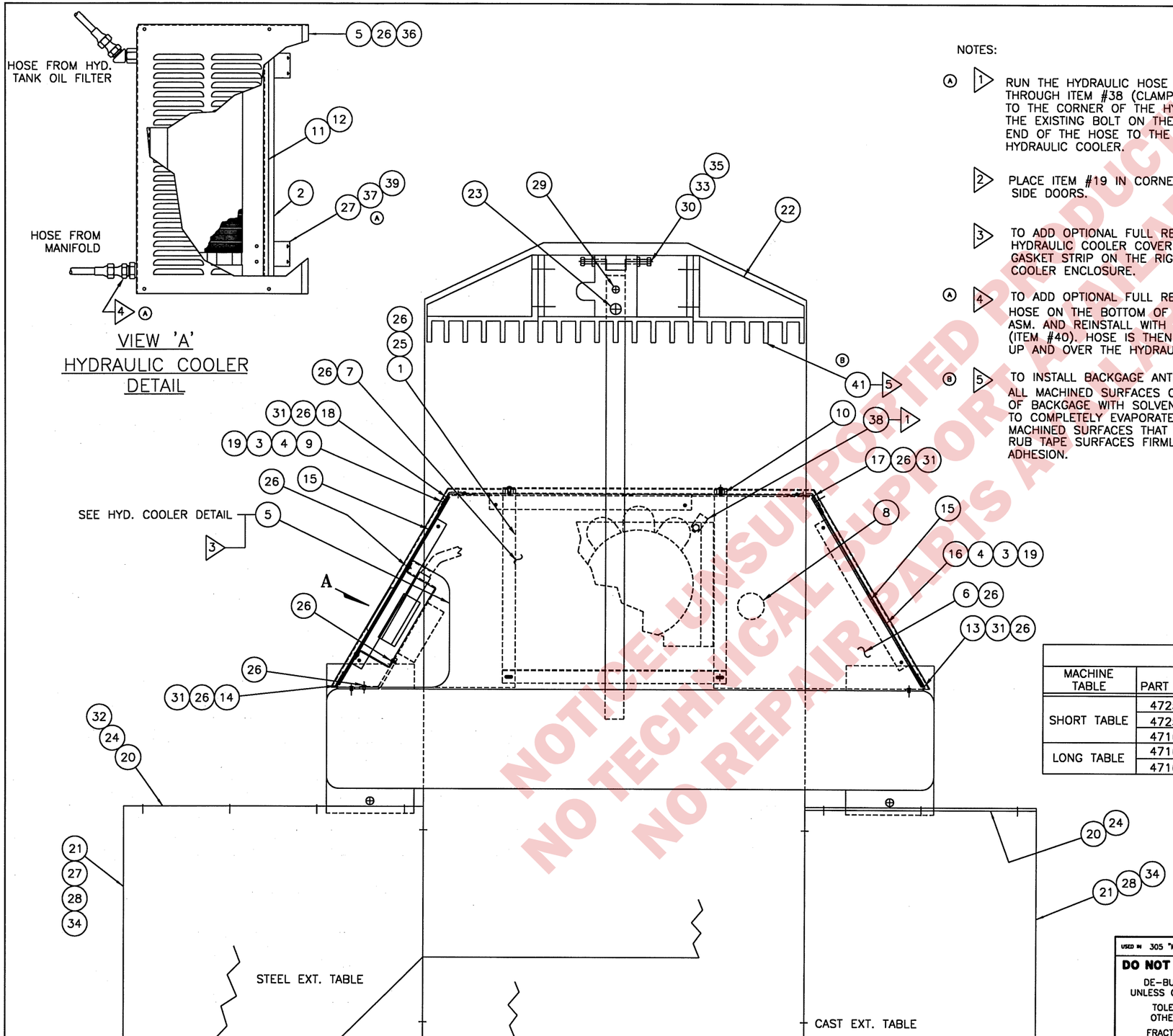
THE CHALLENGE MACHINERY CO.
1433 FULTON ST. GRAND HAVEN, MI 49417

MATERIAL: ASSEMBLY

NAME: MAIN ASSEMBLY – SIDE VIEW

DRAWN PC	DATE 6-3-93	CHECKED MW	DATE 8-30-93
SUPERSEDES: 47000-2		SUPERSEDED BY:	
CAD NO. 47250S2	DISK NO. 38=DS8	SCALE 1=4	QTY USED

~~47250 SHT. 2 OF 12~~ –VOID– 1N397



DATE	SYM	REVISION RECORD	RQD	APP	DRN
8-93	-	RELEASED FOR PRODUCTION (8N3093)	-	MW	PC
4-94	A	REVISED HOSE CLAMP (4N1494)		MW	PC
4-97	B	ADDED ITEM #41 AND NOTE #5 (4N2397)		MW	MM

NOTES:

(A) 1. RUN THE HYDRAULIC HOSE FROM THE MANIFOLD THROUGH ITEM #38 (CLAMP) AND ATTACH THE CLAMP TO THE CORNER OF THE HYDRAULIC TANK USING THE EXISTING BOLT ON THE TANK. ATTACH THE LOOSE END OF THE HOSE TO THE BOTTOM PORT ON THE HYDRAULIC COOLER.

2. PLACE ITEM #19 IN CORNER ABOVE LATCH ON BOTH SIDE DOORS.

3. TO ADD OPTIONAL FULL REAR COVER, REMOVE ITEM #5 HYDRAULIC COOLER COVER AND (1) ITEM #11 GASKET STRIP ON THE RIGHT HAND SIDE OF THE COOLER ENCLOSURE.

(A) 4. TO ADD OPTIONAL FULL REAR COVER, REMOVE THE HOSE ON THE BOTTOM OF THE HYD. COOLER ASM. AND REINSTALL WITH THE 90° ELBOW (ITEM #40). HOSE IS THEN TO BE ROUTED UP AND OVER THE HYDRAULIC MOTOR.

(B) 5. TO INSTALL BACKGAGE ANTI-SCRATCH TAPE, WIPE ALL MACHINED SURFACES ON THE BOTTOM SIDE OF BACKGAGE WITH SOLVENT. ALLOW SOLVENT TO COMPLETELY EVAPORATE. APPLY TAPE TO ALL MACHINED SURFACES THAT CONTACT THE TABLE. RUB TAPE SURFACES FIRMLY TO ASSURE PROPER ADHESION.

ITEM #21			
MACHINE TABLE	EXTENSION TABLE PART NO.	(QTY)	DESCRIPTION
SHORT TABLE	47257	1	R.H. STEEL
	47258	1	L.H. STEEL
	47165	2	R.H./L.H. CAST IRON
LONG TABLE	47166	2	R.H./L.H. STEEL
	47165	2	R.H./L.H. CAST IRON

NO.	PART NO.	DESCRIPTION OF ACCESSORIES	QTY
(B)	41	47264	POLYETHELENE TAPE	46"
(A)	40	H-442	HYD. FITTING - 90° ELBOW (OPTIONAL)	1
(A)	39	47105	BRACKET - HYD. COOLER (OPTIONAL)	2
(A)	38	S-1506-3	CLAMP - HYDRAULIC HOSE	1
(A)	37	H-7324-#10	WASHER - #10 INT. TOOTHLOCK (OPTIONAL)	4
(A)	36	S-1682	TRIM - BLACK, 44" LONG	1
	35	S-1149-1	NUT - 1/2-13 LONG (MC)	2
	34	H-7321-6	WASHER - 3/8 SAE FLAT	REF
	33	H-6424-6	NUT - 3/8-16 HEX JAM	2
	32	H-6424-6	NUT - 3/8-16 HEX JAM (FOR STEEL TABLE)	8
	31	H-6423-#10	NUT - #10-24 HEX (OPTIONAL)	12
	30	H-6931-614	SCREW -3/8-16 X 1-3/4 SQ. HD. SET	2
	29	H-6918-608	SCREW - 3/8-16 X 1" SOC.	1
	28	H-6913-608	SCREW - 3/8-16 X 1" HEX (EXT. TABLE)	REF.
	27	H-6939-616	SCREW-3/8-24 x 1" SET (STEEL TABLE)	4
(A) 26	H-6910-102404	SCREW - #10-24 X 1/2 BUTT. HD. (OPTIONAL)	42
	H-6910-102404	SCREW - #10-24 X 1/2 BUTT. HD.	4
	25	H-6910-102408	SCREW - #10-24 X 3/4 BUTT. HD. (OPTIONAL)	2
24	H-6913-606	SCREW - 3/8-16 X 3/4 HEX (STEEL TABLES)	8
	H-6913-606	SCREW - 3/8-16 X 3/4 HEX (CAST TABLES)	6
	23	H-5254-1010	SCREW - 5/8-11 X 1-1/4 SHOULDER	1
22	A-4455-2	BACKGAGE - SPLIT (MC)	1
	4472-1	BACKGAGE (MPC)	
21	SEE CHART	TABLE - EXTENSION (STEEL)	2
	SEE CHART	TABLE - EXTENSION (CAST IRON)	
20	47164	PLATE - EXTENSION TABLE (CAST TABLES)	2
	47164-1	PLATE - EXTENSION TABLE (STEEL TABLES)	
	19	S-1781-16	LABEL (OPTIONAL)	2
	18	47067	SUPPORT - REAR L.H. (OPTIONAL)	1
	17	47066	SUPPORT - REAR R.H. (OPTIONAL)	1
	16	47075	DOOR ASM. - R.H. SIDE (OPTIONAL)	1
	15	47080	BRACKET - COVER (OPTIONAL)	2
	14	47065	SUPPORT - L.H. (OPTIONAL)	1
	13	47084	SUPPORT - R.H. (OPTIONAL)	1
	12	47163-2	GASKET - COOLER, 9-1/4" LONG	2
	11	47163-1	GASKET - COOLER, 19-7/16" LONG	2
	10	11288-9	WASHER/SPACER (OPTIONAL)	2
	9	47078	DOOR ASM. L.H. SIDE (OPTIONAL)	1
	8	E-2198-21	PLUG (OPTIONAL)	1
	7	47081-1	COVER - L.H. (OPTIONAL)	1
	6	47082	COVER - R.H. (OPTIONAL)	1
	5	47198	COVER - HYDRAULIC COOLER	1
	4	47100	LATCH - REAR (OPTIONAL)	2
	3	11145-2	RIVET - 1/8 (OPTIONAL)	4
	2	47197	COOLER ASSEMBLY - HYDRAULIC	1
	1	47083-1	VENT - HYDRAULIC MOTOR (OPTIONAL)	1

USED IN 305 "M" CUTTER

DO NOT SCALE DRAWING

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TOLERANCES UNLESS OTHERWISE SPECIFIED

FRACTIONAL	±1/32
TWO PLACE	±.010
THREE PLACE	±.005

ANGULAR LIMITS ±1°

A "√" ON A SURFACE INDICATES A FINISH REQUIRED
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EST. NO

- FLATNESS
- STRAIGHTNESS
- ANGULARITY
- PERPENDICULARITY (SQUARENESS)
- PARALLELISM
- ROUNDNESS (CIRCULARITY)
- CYLINDRICITY
- PROFILE OF ANY SURFACE
- PROFILE OF ANY LINE
- RUNOUT
- TRUE POSITION
- CONCENTRICITY

MODIFIERS
- (M) MAXIMUM MATERIAL CONDITION
- (S) REGARDLESS OF FEATURE SIZE

MATERIAL ASSEMBLY

NAME MAIN ASSEMBLY - TOP VIEW

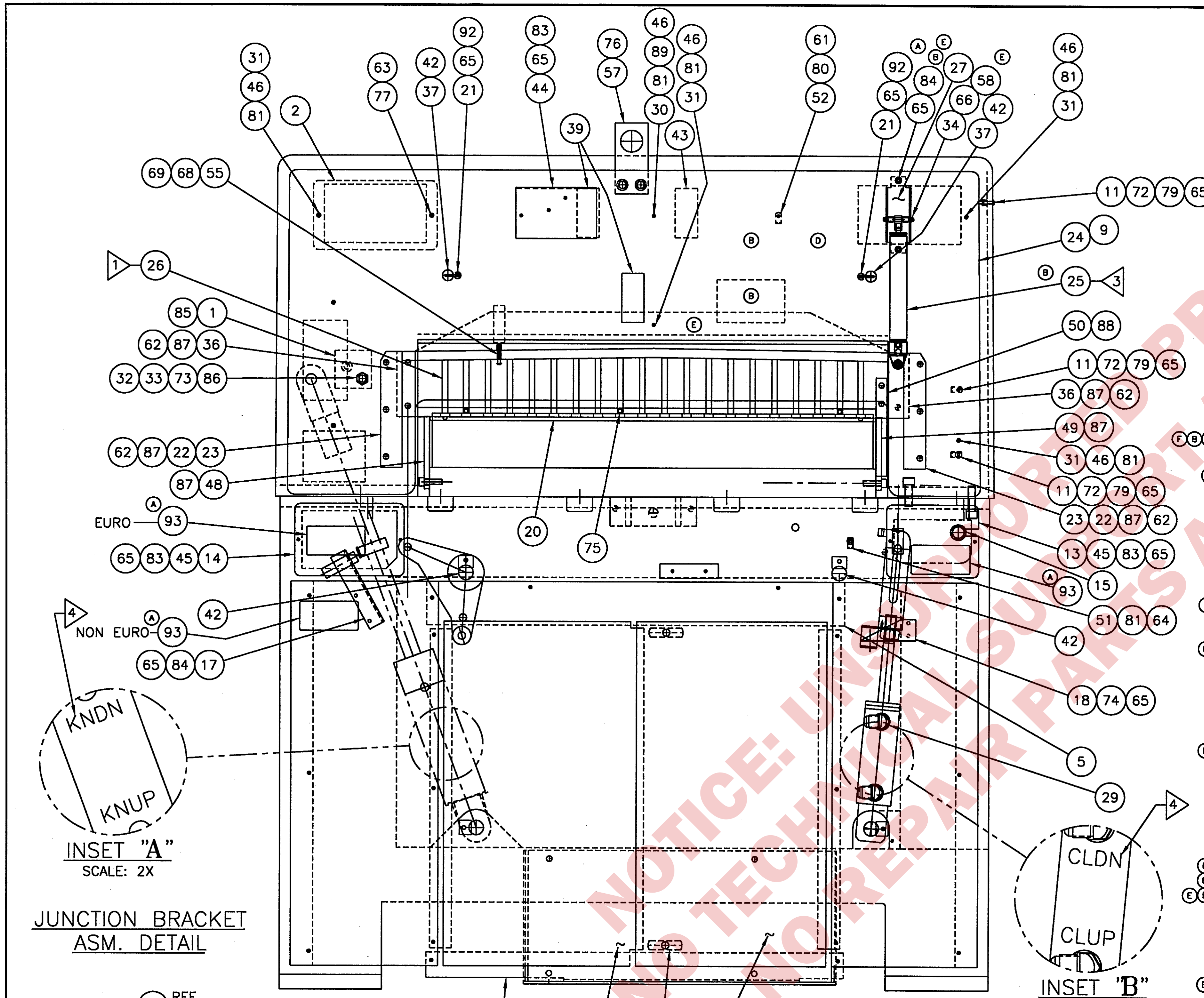
DRAWN	DATE	CHECKED	DATE
PC	6-3-93	MW	8-30-93

SUPERSEDES: 47000-3 SUPERSEDED BY:

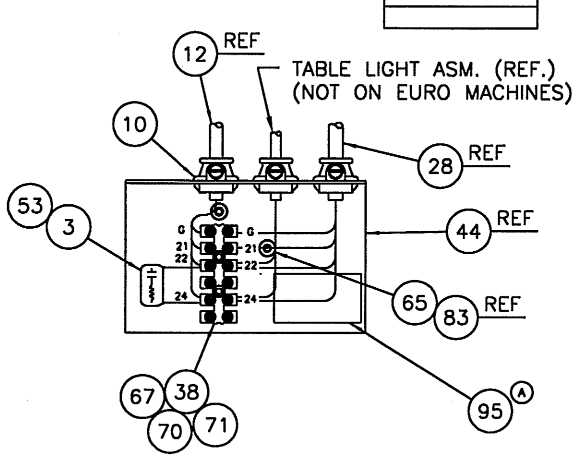
CAD NO. 4725053 DISK NO. 3EM058 SCALE 1=4 QTY USED

47250 SHT. 3 OF 12 -VOID- 1N397

DATE	SYM	REVISION RECORD	RQD	APP	DRN
8-93	–	RELEASED FOR PRODUCTION (8N3093)	–	MW	PC
4-94	A	ADDED LABELS (4N1494)		MW	PC
(2N1096) 2-96	B	REM. 47017, 13941, ADD 47264, H-444		MW	MIM
9-96	C	UPDATED LABEL VIEW (NO CN)	JM	TMH	PAD
(NO CN) 10-96	D	REM CRT WARN LABEL(ALREADY ON SHT10)	JM	MW	TMH
(11N2996) 12-96	E	REM LINE LIGHT TAPE, ADD DAMPER PARTS		MW	MIM
12-96	F	S-1781-50 WAS S-1781-35 (12N696)	JM	MW	TMH
1-97	G	REMOVED (2) 2" JUMPERS (1N2397)	DM	MW	PC



JUNCTION BRACKET ASM. DETAIL



NOTES:

1. FOR 1/2 MINIMUM CUTS USE CLAMP #47259 AND PROX. BRACKET 47046-2.
2. (G)
3. (B) ADJUST DAMPER SETTING BY 1 WITH EACH MACHINE CYCLE. WHEN SETTING IS FOUND, TIGHTEN ADJUSTMENT SETSCREW. THE MOST PROBABLE SETTING IS 1.
4. (B) LABEL AS SHOWN USING A BLACK PERMANENT MARKER. (4) PLC'S

Rev.	NO.	PART NO.	DESCRIPTION OF ACCESSORIES	QTY
F B A	95	S-1781-50	LABEL – SHOCK HAZARD (EURO MACH. ONLY)	1
		S-1781-11A	LABEL – SHOCK HAZARD (NON-EURO ONLY)	
	94			
A	93	S-1781-16	LABEL – CRUSH HAZARD	2
	92	H-6903-102404	SCREW – #10-24 X 1/2 NYLOK BUT HD	2
	91			
	90			
	89	H-6910-408	SCREW – 1/4-20 X 1" BUTT. HD.	1
	88	H-6918-606	SCREW – 3/8-16 X 3/4 SOC. HD.	2
	87	H-6918-608	SCREW – 3/8-16 X 1" SOC. HD.	22
	86	H-6953-836	SCREW – 1/2-13 X 2-1/4 OVAL SET	1
	85	H-6910-604	SCREW – 3/8-16 X 1/2 BUTT. HD.	1
E	84	H-6910-102406	SCREW – #10-24 X 3/4 BUTT.HD.	4
	83	H-6910-102404	SCREW – #10-24 X 1/2 BUTT. HD.	6
	82	H-6910-102404	SCREW – #10-24 X 1/2 BUTT. HD. (OPTIONAL)	2
B	81	H-6910-404	SCREW – 1/4-20 X 1/2 BUTT. HD.	7
	80	H-6910-102404	SCREW – #10-24 X 1/2 BUTT.HD. (MC ONLY)	1
	79	H-6910-102408	SCREW – #10-24 X 1" BUTT. HD.	3
	77	H-6910-404	SCREW – 1/4-20 X 1/2BUTT.HD(50HZ. SPACER)	1
	76	H-6918-812	SCREW – 1/2-13 X 1-1/2 SOC.	2
	75	H-6951-406	SCREW – 1/4-20 X 3/8 S.S. NYLOC	3
B	74	H-6910-102403	SCREW – #10-24 X 3/8 BUTT. HD.	10
	73	H-6424-8	NUT – 1/2-13 HEX JAM	1
	72	H-6423-#10	NUT – #10-24 HEX	3
	71	H-6423-#4	NUT – #4-40 HEX	2
	70	H-6922-44012	SCREW – #4-40 X 3/4 FLAT HD	2
	69	S-1193-18	"E" RING – 3/16	2
	68	35048-10	COMPRESSION SPRING	1
	67	H-7324-#4	WASHER – #4 INT. TOOTH LOCK	2
B	66	S-1193-25	"E" RING– 1/4	2
E	65	H-7324-#10	WASHER – #10 INT. TOOTH	17
E B	64	H-7324-8	WASHER – 1/4 INT. TOOTH	1
	63	H-7324-8	WASHER – 1/4 INT. TOOTH (50 HZ. SPACER)	1
	62	H-7327-12	WASHER – 3/8 LOCK	8
	61	H-7324-#10	WASHER – #10 INT. TOOTH (MC ONLY)	1
	60			
	59			
E	58	E-1152-11	SPACER	2
	57	47169	PLATE – LIFT	1
	56			
	55	47194	ACTUATOR – CLAMP PROX	1
G	54			
G	53	E-1453-3	SHRINK TUBING – 1" LONG (NON-EURO ONLY)	2
	52	E-2186-6	CLAMP – WIRE HARNESS (MC ONLY)	1

Rev.	NO.	PART NO.	DESCRIPTION OF ACCESSORIES	QTY
	51	S-1694-3	TIE – CABLE	1
	50	4441	PAPER GUIDE	1
	49	47020	GUIDE – REAR L.H.	1
	48	47019	GUIDE – REAR R.H.	1
	47			
B	46	S-1864-3	CAPTIVE RETAINING DEVICE	6
	45	S-1864-2	CAPTIVE RETAINING DEVICE	4
	44	47195	BRACKET – ARCH JUNCTION	1
B	43	S-1781-35	LABEL – CAUTION (EUROPEAN MACH. ONLY)	1
		S-1781-12	LABEL – CAUTION (NON-EURO MACHINES)	
	42	S-1725	FITTING – GREASE	4
	41			
	40			
	39	S-1781-15	LABEL – CAUTION	2
	38	E-2626-6	TERMINAL BLOCK – 6 POLE	1
	37	4507-1	PIN – KNIFE BAR LINK	2
	36	4508	CLAMP – GUIDE BAR	2
	35			
	34	47268	PIN– HYDRAULIC DAMPER	1
	33	S-1255-1	SPRING	1
	32	S-1254	PLUNGER – CLAMP	1
	31	E-1152-36	SPACER	5
	30	E-1152-35	SPACER	1
	29	H-272-1	ELBOW – 45° "O" RING TO TUBE	2
	28	EE-2617	CABLE ASM. – CONSOLE POWER (MC ONLY)	1
		EE-2495	CABLE ASM. – CONSOLE SIGNAL (SPACER ONLY)	REF.
	27	47267	BRACKET– HYDRAULIC DAMPER	1
	26	47251	CLAMP	1
	25	H-444	DAMPER– HYDRAULIC	1
	24	47001	COVER – REAR ARCH	1
	23	4509	BAR – CLAMP GUIDE	2
	22	S-1861	SHIM	2
	21	S-1244	PIN – LOCK	2
	20	47006-2	PLATE ASM. – FALSE CLAMP	1
	19			
	18	47171	BRACKET – CLAMP PROX. SW.	1
	17	47131-1	BRACKET – KNIFE PROX. SW.	1
	16	47069	BRACKET – REAR (OPTIONAL)	1
	15	E-1172-18	BUSHING – SNAP-IN	1
	14	47050	COVER – BASE R.H. REAR	1
	13	47051	COVER – BASE L.H. REAR	1
	12	EE-2530	CABLE ASSEMBLY – CONSOLE POWER	REF.
	11	S-1694-2	TYRAP – #10	3
G	10	S-1350-16	BUSHING	3
	9	47049	TRIM – PLASTIC 9ft LONG	1
	8	11145-2	RIVET – 1/8 (OPTIONAL)	4
	7	47073	DOOR ASM. – L.H. (OPTIONAL)	1
	6	47072	DOOR ASM. – R.H. (OPTIONAL)	1
	5	47068-1	PLATE – TOP (OPTIONAL)	1
	4	47100	LATCH – REAR (OPTIONAL)	2
G	3	E-1736	QUENCHARC (NON-EURO ONLY)	1
	2	EE-2374	COVER ASM. – BALLAST (50 HZ. SPACER)	1
	1	4519-1	CAM PLATE	1

USED IN 305 "M" CUTTER

DO NOT SCALE DRAWING

DE-BURR SHARP EDGES UNLESS OTHERWISE SPECIFIED

TOLERANCES UNLESS OTHERWISE SPECIFIED

FRACTIONAL	±1/32
TWO PLACE	±.010
THREE PLACE	±.005

ANGULAR LIMITS ±1°

A "√" ON A SURFACE INDICATES A FINISH REQUIRED
A "√" WITH NO VALUE WILL REPRESENT A 125 MICRO FINISH

- FLATNESS
- STRAIGHTNESS
- ANGULARITY
- PERPENDICULARITY (SQUARENESS)
- PARALLELISM
- ROUNDNESS (CIRCULARITY)
- CYLINDRICITY
- PROFILE OF ANY SURFACE
- PROFILE OF ANY LINE
- RUNOUT
- TRUE POSITION
- CONCENTRICITY

MODIFIERS
- Ⓜ MAXIMUM MATERIAL CONDITION
- Ⓢ REGARDLESS OF FEATURE SIZE

EST. NO

THE CHALLENGE MACHINERY CO.
1433 FULTON ST. GRAND HAVEN, MI 49417

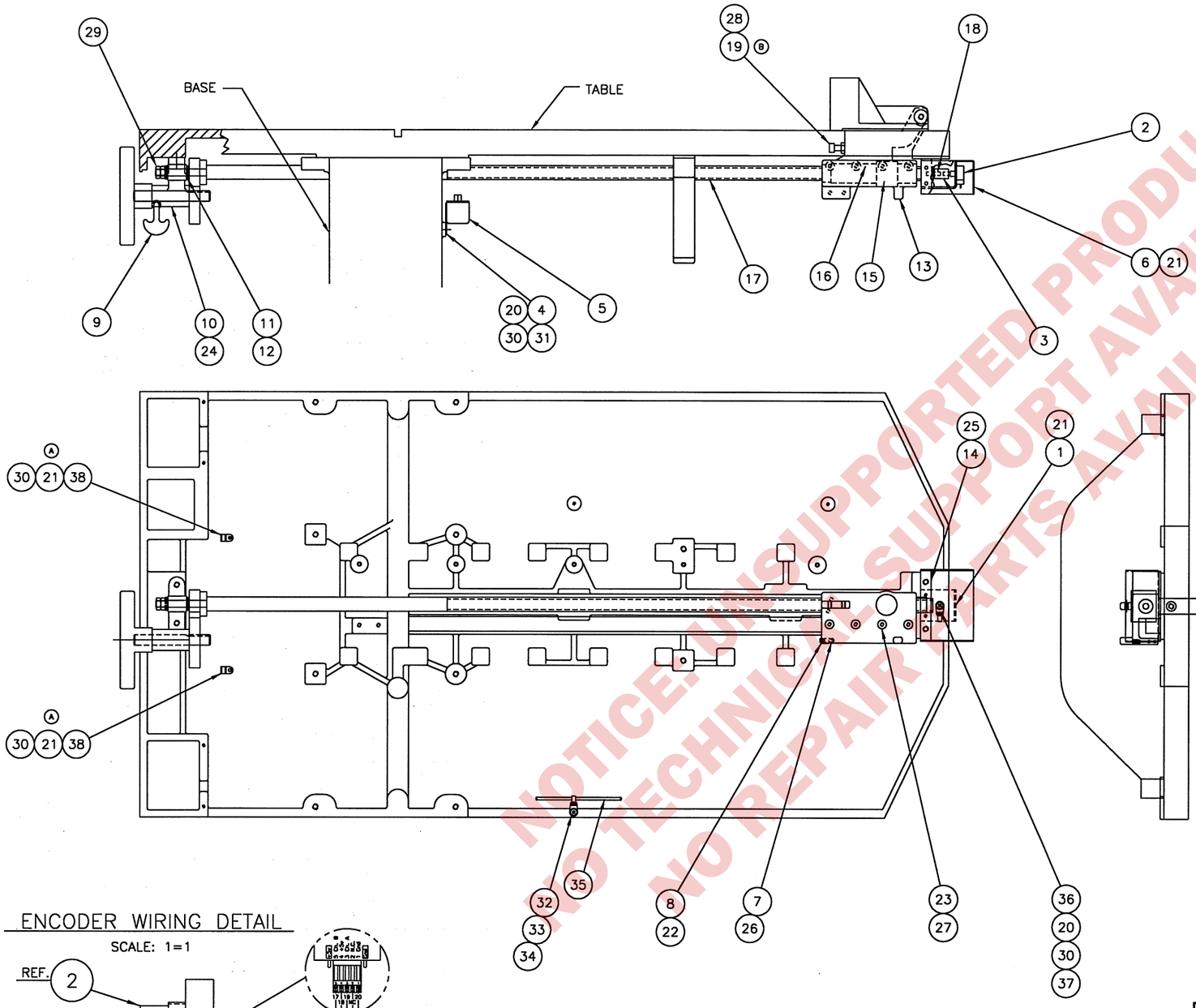
MATERIAL: ASSEMBLY

NAME: MAIN ASSEMBLY – REAR VIEW

DRAWN: PC	DATE: 6-3-93	CHECKED: MW	DATE: 8-30-93
SUPERSEDES: 47000-4		SUPERSEDED BY:	
CAD NO. 47250S4	DISK NO. ~~058~~	SCALE 1=4	QTY USED

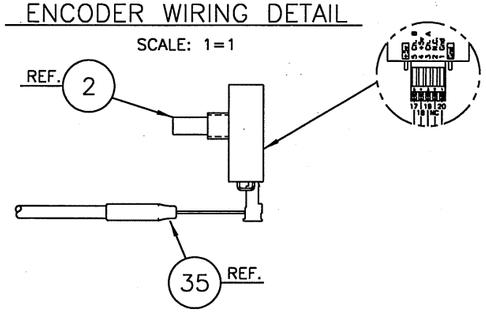
~~47250 SHT. 4 OF 12~~ –VOID–
1N397

DATE	SYM	REVISION RECORD	RQD	APP	DRN
8-93	–	RELEASE FOR PRODUCTION (8N3093)	–	MW	PC
4-94	A	CHANGE TO BUTTON HD		MW	MIM
(3N2096) 3-95	B	REPLACE 1-3/4 SCR W/ 1-1/2 SCR		MW	PC



ENCODER WIRING DETAIL

SCALE: 1=1



NO.	PART NO.	DESCRIPTION OF ACCESSORIES	QTY
38	E-968-3	CLAMP – CABLE	2
37	H-6423-#10	NUT – #10-24 HEX	1
36	S-1694-2	TYRAP	1
35	EE-2534	CABLE ASSEMBLY – ENCODER – MC	1
34	S-1694-3	TYRAP	1
33	H-7324-8	WASHER, 1/4 INT. TOOTH	1
32	H-6910-404	SCREW, 1/4-20 X 1/2 BUT HD	1
31	H-7321-#10	WASHER – #10 PLAIN	2
30	H-7324-#10	WASHER – #10 INT. TOOTH	5
29	H-6428-8	NUT – 1/2-20 HEX	2
28	H-6424-6	NUT – 3/8-16 HEX	1
27	H-6424-4	NUT – 1/4-20 HEX	8
26	H-6965-406	SCREW – 1/4-28 X 3/8 CONE PT. SET	1
25	H-6918-620	SCREW – 3/8-16 X 2-1/2 SOC.	2
24	H-6918-608	SCREW – 3/8-16 X 1" SOC.	2
23	H-6940-420	SCREW – 1/4-20 X 1-1/4 FLAT PT. SET	8
22	H-6910-83202	SCREW – #8-32 X 1/4 BUTT.	2
A 21	H-6910-102403	SCREW – #10-24 X 3/8 BUTT. HD.	8
A 20	H-6910-102404	SCREW – #10-24 X 1/2 BUTT.	3
B 19	H-6931-612	SCREW – 3/8-16 X 1-1/2 SQ. HD. SET	1
18	H-215-250-1000	PIN – 1/4 X 1" ROLL	1
17	47031	LEADSCREW ASSEMBLY – BACKGAGE SHORT	1
	47030	LEADSCREW ASSEMBLY – BACKGAGE LONG	
16	4510	GIB – BACKGAGE NUT	2
15	47029	NUT – BACKGAGE SCREW	1
14	47043	PILLOW BLOCK – REAR	1
13	47135	NUT – BACKGAGE	1
12	S-1300	BEARING – NEEDLE THRUST	2
11	S-1295-5	THRUST WASHER	4
10	47059	HANDWHEEL ASSEMBLY	1
9	S-653-1	THUMBSCREW	1
8	8641-1	ACTUATOR – HALL SWITCH	1
7	S-1867	PIN – PUSHER	1
6	47045	COVER – ENCODER	1
5	EE-1630-8	PRESET CONTROL ASM.	1
4	8391	SPACER	1
3	47053	COUPLING – ENCODER DRIVE	1
2	E-2467	ENCODER	1
1	47154	BRACKET – ENCODER	1

USED IN 305 CUTTER (MC)

DO NOT SCALE DRAWING

DE-BURR SHARP EDGES UNLESS OTHERWISE SPECIFIED

TOLERANCES UNLESS OTHERWISE SPECIFIED

FRACTIONAL	±1/32
TWO PLACE	±.010
THREE PLACE	±.005

ANGULAR LIMITS ±1°

A "√" ON A SURFACE INDICATES A FINISH REQUIRED

A "√" WITH NO VALUE WILL REPRESENT A 125 MICRO FINISH

EST. NO

- FLATNESS
- STRAIGHTNESS
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- ROUNDNESS (CIRCULARITY)
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- PROFILE OF ANY SURFACE
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- TRUE POSITION
- CONCENTRICITY

MODIFIERS

Ⓜ MAXIMUM MATERIAL CONDITION

Ⓢ REGARDLESS OF FEATURE SIZE

THE CHALLENGE MACHINERY CO.

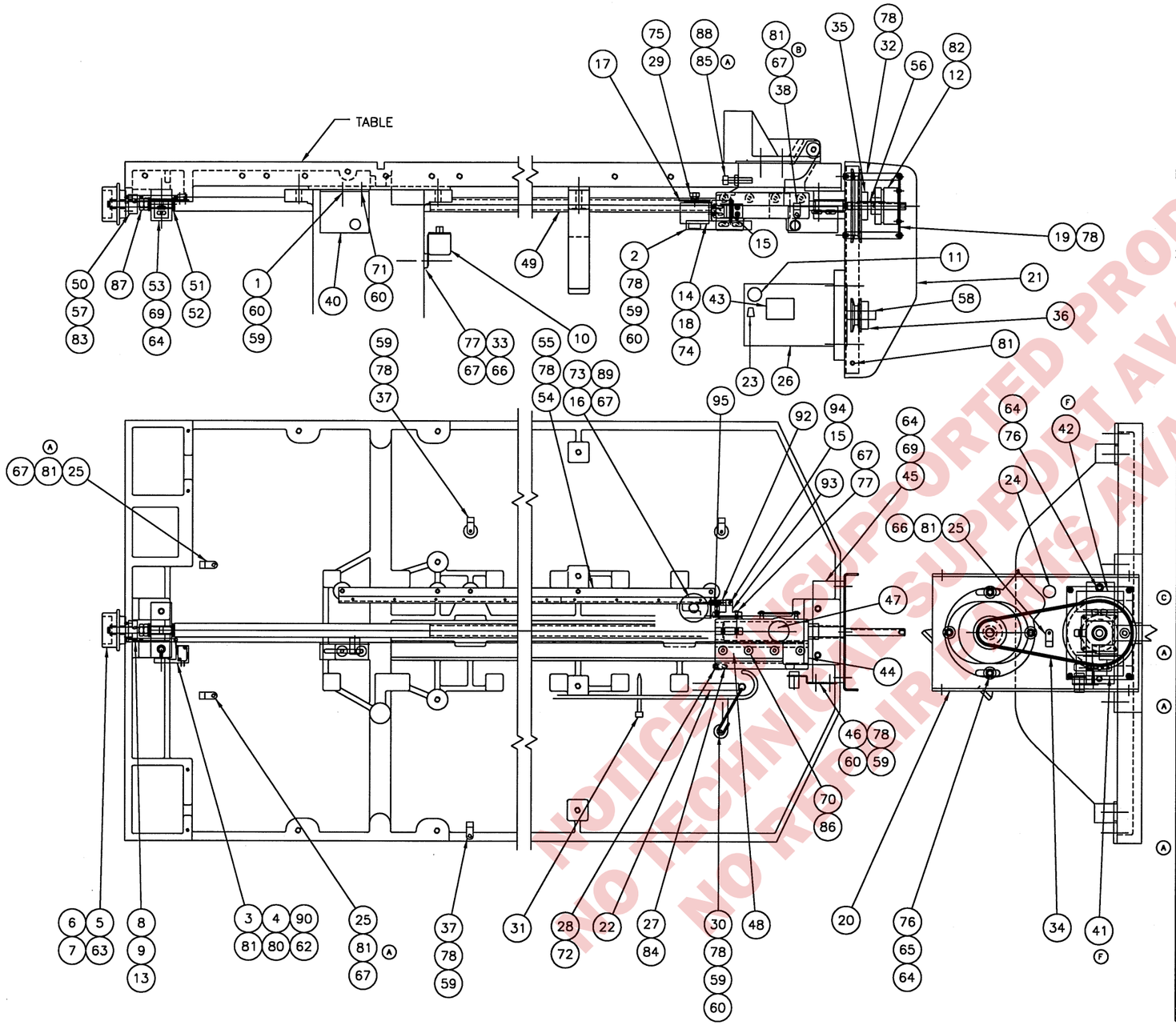
1433 FULTON ST. GRAND HAVEN, MI 49417

MATERIAL

NAME: MAIN ASM. – MC TABLES

DRAWN	PC	DATE	6-3-93	CHECKED	MW	DATE	8-30-93
SUPERSEDES:	47000-5			SUPERSEDED BY:			
CAD NO.	47250S5	DISK NO.	~~3dm058~~	SCALE	1=4	QTY USED	

~~47250 SHT. 5 OF 12~~ –VOID– 1N397



DATE	SYM	REVISION RECORD	RQD	APP	DRN
8-93	–	RELEASE FOR PRODUCTION (8N3093)	–	MW	PC
4-94	A	REVISED ENCODER (4N1494)		MW	PC
11-94	B	ADDED (1) E-968-2 (11N2894)		MW	PC
(3N2096) 3-96	C	REM. 1-3/4 SCR, ADD 1-1/2 SCR	FD	MW	MIM
2-96	D	ADDED (2) S-1781-35 (2N1096)	–	MW	TMH
9-96	E	UPDATED LABEL VIEW (NO CN)	JM	TMH	PAD
11-96	F	SWITCHED POSITION OF LABELS (NO CN)	JM	MW	TMH
12-96	G	S-1781-50 WAS S-1781-35 (12N696)	JM	MW	TMH

NOTE:

1. ITEMS 41 & 42 TO BE PLACED ON BRAKE MOUNTING BRACKET, ONE ON EACH SIDE OF BRAKE.
2. SNUG TIGHTEN ITEM 71, ENOUGH TO ALLOW PROXIMITY BRACKET TO SLIDE.

NO.	PART NO.	DESCRIPTION OF ACCESSORIES	QTY
95	7922	SPRING	1
94	S-1193-18	"E" RING – 3/16	2
93	47193	BRACKET – ENCODER MOUNT	1
92	47192	BRACKET – ENCODER	1
91			
90	H-6423-#4	NUT – #4-40 HEX	2
89	H-6423-#10	NUT – #10-24 HEX	2
88	H-6424-6	NUT – 3/8-16 HEX	1
87	H-6428-8	NUT – 1/2-20 HEX	2
86	H-6424-4	NUT – 1/4-20 HEX	8
C 85	H-6931-612	SCREW – 3/8-16 X 1-1/2 SQ. HD. SET	1
84	H-6966-406	SCREW – 1/4-28 X 3/8 CONE PT. SET	1
83	H-6938-102406	SCREW – #10-24 X 3/8 SOC. SET	1
82	H-6910-83203	SCREW – #8-32 X 3/8 BUTT. HD.	4
A 81	H-6910-102403	SCREW – #10-24 X 3/8 BUTT. HD.	9
80	H-6923-44012	SCREW – #4-40 X 3/4 RD. HD.	2
79			
78	H-6910-404	SCREW – 1/4-20 X 1/2 BUTT. HD.	21
A 77	H-6910-102406	SCREW – #10-24 X 3/4 BUTT. HD.	4
76	H-6918-606	SCREW – 3/8-16 X 3/4 SOC.	6
75	H-6964-63202	SCREW – #6-32 X 1/8 BRASS TIP SET	1
74	H-6921-44004	SCREW – #4-40 X 1/4 FILL HD.	4
73	H-6910-102402	SCREW – #10-24 X 1/4 BUTT. HD.	2
72	H-6910-83202	SCREW – #8-32 X 1/4 BUTT. HD.	2
71	H-6903-404	SCREW – 1/4-20 X 1/2 NYLOC BUTT. HD.	1
70	H-6940-420	SCREW – 1/4-20 X 1-1/4 FLAT PT. SET	8
69	H-6918-620	SCREW – 3/8-16 X 2-1/2 SOC.	4
68			
A 67	H-7324-#10	WASHER – #10 INT. TOOTH	8
66	H-7321-#10	WASHER – #10 PLAIN	3
65	H-7321-6	WASHER – 3/8 PLAIN	4
64	H-7327-12	WASHER – 3/8 LOCK	10
63	H-7322-7	WASHER – 7/16 POLISH	1
62	H-7324-#4	WASHER – #4 INT. TOOTH	2
61			
60	H-7321-4	WASHER – 1/4 PLAIN	7
59	H-7324-8	WASHER – 1/4 INT. TOOTH	9
58	H-6123-30305	KEY – 3/16 X 3/16 X 5/8	REF.
57	H-6121-604	KEY – 1/8 X 3/8 WOODRUFF	1
56	H-6123-20212	KEY – 1/8 X 1/8 X 1-1/2 STRAIGHT	1

NO.	PART NO.	DESCRIPTION OF ACCESSORIES	QTY
55	H-7327-8	WASHER, 1/4 MEDIUM LOCK	5
54	AA-8226-1	RACK ASSEMBLY	1
53	47037	PILLOW BLOCK ASSEMBLY – FRONT	1
52	S-1300	BEARING – NEEDLE THRUST	2
51	S-1295-5	THRUST WASHER	4
50	47142	COLLAR	1
49	47025	LEADSCREW – SHORT	1
	47024	LEADSCREW – LONG	
48	4510	GIB – BACKGAGE NUT	2
47	47028	NUT – BACKGAGE SCREW	1
46	47040	BRACKET – REVERSE LIMIT	1
45	47039	PILLOW BLOCK ASSEMBLY – REAR	1
44	47135	NUT – BACKGAGE	1
G D 43	S-1781-50	LABEL – CAUTION (EURO MACH. ONLY)	1
	S-1781-11A	LABEL – CAUTION (NON-EURO ONLY)	
D 42	S-1781-35	LABEL – CAUTION (EURO MACH. ONLY)	1
	S-1781-12	LABEL – CAUTION (NON-EURO ONLY)	
41	S-1781-15	LABEL – CAUTION	1
40	47046-1	BRACKET – FORWARD PROXIMITY SWITCH	1
39			
A B 38	E-968-2	CLIP – WIRE	1
37	S-1694-3	TYRAP	3
36	13927	PULLEY – DRIVE	1
35	A-12616	PULLEY	1
34	13939	BELT	1
33	8391	SPACER	2
32	E-1152-40	SPACER/STANDOFF	4
31	S-1694-1	TYRAP	3
30	8658	RETAINER – SPRING	1
29	8230	PINION – ENCODER	1
28	8641-1	ACTUATOR – HALL SWITCH	1
27	S-1867	PIN – PUSHER	1
26	E-1600-154	MOTOR	1
B 25	E-968-3	CLIP – WIRE	3
24	S-1350-16	STRAIN RELIEF	1
23	E-1237-1	WIRE NUT – YELLOW	2
22	8657	SPRING – ENCODER CABLE	2
21	47055	COVER – BACKGAGE DRIVE	1
20	47054	BRACKET – MOTOR	1
19	47052	BRACKET – BRAKE	1
A 18	EE-2533-1	CABLE ASM. – ENCODER	1
17	47177	SHIELD – ENCODER	1
16	47175	BRACKET – ENCODER	1
15	47191	PIN – ENCODER	1
A 14	E-2468-1	ENCODER – MPC	1
13	8636	SPRING	1
12	47047	BRAKE	1
11	E-2180-2	CONNECTOR	1
10	EE-1630-6	PRESET CONTROL ASM.	1
9	S-1193-25	'E' RING – 1/4	1
8	8635	PLUNGER – HANDWHEEL LIMIT SWITCH	1
7	8577	PLUG – HANDWHEEL	1
6	S-1193-43	'E' RING – 7/16	1
5	A-8633	HANDWHEEL ASM.	1
4	E-866-4	SWITCH – MICRO	1
3	47042	BRACKET – SWITCH	1
2	47041	ACTUATOR – FORWARD LIMIT	1
1	7957-6	KNOB – ADJUSTMENT	1

USED IN 305 CUTTERS – (MPC)

DO NOT SCALE DRAWING

DE-BURR SHARP EDGES UNLESS OTHERWISE SPECIFIED

TOLERANCES UNLESS OTHERWISE SPECIFIED

FRACTIONAL	±1/32
TWO PLACE	±.010
THREE PLACE	±.005

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- CONCENTRICITY

MODIFIERS

- Ⓜ MAXIMUM MATERIAL CONDITION
- Ⓢ REGARDLESS OF FEATURE SIZE

THE CHALLENGE MACHINERY CO.

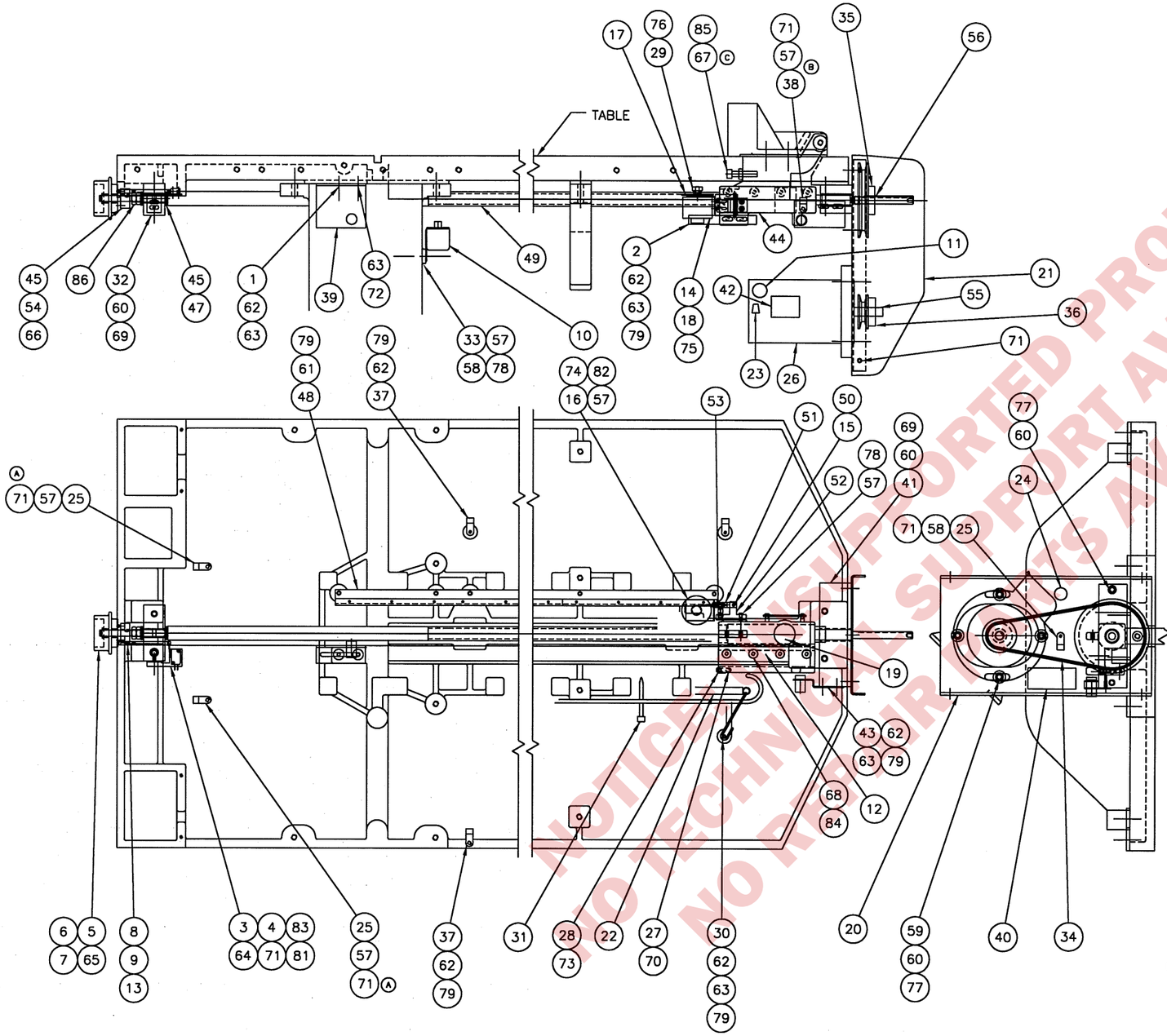
1433 FULTON ST. GRAND HAVEN, MI 49417

MATERIAL

NAME: MAIN ASM. – SPACER TABLE, W/BRAKE

DRAWN PC	DATE 6-3-93	CHECKED MW	DATE 8-30-93
SUPERSEDES: 47000-6		SUPERSEDED BY:	
CAD NO. 4725056	DSN NO. ~~32mc063~~	SCALE 1=4	QTY USED

47250 SHT. 6 OF 12 –VOID– 1N397



DATE	SYM	REVISION RECORD		ROD	APP	DRN
8-93	–	RELEASED FOR PRODUCTION	(8N3093)	–	MW	PC
4-94	A	REVISED ENCODER	(4N1494)		MW	PC
11-94	B	ADDED (1) E-968-2	(11N2894)		MW	PC
(3N2096) 3-96	C	REPLACE 1-3/4 SCR W/ 1-1/2 SCR			MW	MIM
2-96	D	ADDED (1) S-1781-35	(2N1096)	–	MW	TMH
9-96	E	UPDATED LABEL VIEW	(NO CN)	JM	TMH	PAD
12-96	F	S-1781-50 WAS S-1781-35	(12N696)	JM	MW	TMH

NOTE:

1. ITEM 40 TO BE PLACED ON MOTOR MOUNTING BRACKET.
2. SNUG TIGHTEN ITEM 72, ENOUGH TO ALLOW PROXIMITY BRACKET TO SLIDE.

NO.	PART NO.	DESCRIPTION OF ACCESSORIES	QTY
53	7922	SPRING	1
52	47193	BRACKET – ENCODER MOUNT	1
51	47192	BRACKET – ENCODER	1
50	S-1193-18	"E" RING – 3/16	2
49	47025	LEADSCREW – SHORT	1
	47024	LEADSCREW – LONG	
48	AA-8226-1	RACK ASSEMBLY	1
47	S-1300	BEARING – NEEDLE THRUST	2
46	S-1295-5	THRUST WASHER	4
45	47142	COLLAR – HANDWHEEL	1
44	47135	NUT – BACKGAGE	1
43	47040	BRACKET – REVERSE LIMIT	1
(F)(D) 42	S-1781-50	LABEL – CAUTION (EURO MACH. ONLY)	1
	S-1781-11A	LABEL – CAUTION (NON-EURO ONLY)	
41	47039	PILLOW BLOCK ASSEMBLY – REAR	1
40	S-1781-15	LABEL – CAUTION	1
39	47046-1	BRACKET – FORWARD PROXIMITY SWITCH	1
(B)(A) 38	E-968-2	CLIP – WIRE	1
37	S-1694-3	TYRAP	3
36	13927	PULLEY – DRIVE	1
35	A-12616	PULLEY	1
34	13939	BELT	1
33	8391	SPACER	2
32	47037	PILLOW BLOCK ASSEMBLY – FRONT	1
31	S-1694-1	TYRAP	3
30	8658	RETAINER – SPRING	1
29	8230	PINION – ENCODER	1
28	8641-1	ACTUATOR – HALL SWITCH	1
27	S-1867	PIN – PUSHER	1
26	E-1600-154	MOTOR	1
(B) 25	E-968-3	CLIP – WIRE	3
24	E-2196-11	PLUG – HOLE	1
23	E-1237-1	WIRE NUT – YELLOW	2
22	8657	SPRING – ENCODER CABLE	2
21	47055	COVER – BACKGAGE DRIVE	1
20	47054	BRACKET – MOTOR	1
19	47028	NUT – BACKGAGE SCREW	1
(A) 18	EE-2533-1	CABLE ASM. – ENCODER	1
17	47177	SHIELD – ENCODER	1
16	47175	BRACKET – ENCODER	1
15	47191	PIN – ENCODER	1
(A) 14	E-2468-1	ENCODER – MPC	1
13	8636	SPRING	1
12	4510	GIB – BACKGAGE NUT	2
11	E-2180-2	CONNECTOR	1
10	EE-1630-6	PRESET CONTROL ASM.	1
9	S-1193-25	'E' RING – 1/4	1
8	8635	PLUNGER – HANDWHEEL LIMIT SWITCH	1
7	8577	PLUG – HANDWHEEL	1
6	S-1193-43	'E' RING – 7/16	1
5	A-8533	HANDWHEEL ASM.	1
4	E-866-4	SWITCH – MICRO	1
3	47042	BRACKET – SWITCH	1
2	47041	ACTUATOR – FORWARD LIMIT	1
1	7957-6	KNOB – ADJUSTMENT	1

NO.	PART NO.	DESCRIPTION OF ACCESSORIES	QTY
86	H-6428-8	NUT – 1/2-20 HEX	2
85	H-6424-6	NUT – 3/8-16 HEX	1
84	H-6424-4	NUT – 1/4-20 HEX	8
83	H-6423-#4	NUT – #4-40 HEX	2
82	H-6423-#10	NUT – #10-24 HEX	2
81	H-6923-44012	SCREW – #4-40 X 3/4 RD. HD.	2
(A) 80			
79	H-6910-404	SCREW – 1/4-20 X 1/2 BUTT. HD.	13
(A) 78	H-6910-102406	SCREW – #10-24 X 3/4 BUTT. HD.	4
77	H-6918-606	SCREW – 3/8-16 X 3/4 SOC.	6
76	H-6964-63202	SCREW – #6-32 X 1/8 BRASS TIP SET	1
75	H-6921-44004	SCREW – #4-40 X 1/4 FILL HD.	4
74	H-6910-102402	SCREW – #10-24 X 1/4 BUTT. HD.	2
73	H-6910-83202	SCREW – #8-32 X 1/4 BUTT. HD.	2
72	H-6903-404	SCREW – 1/4-20 X 1/2 NYLOC BUTT. HD.	1
(A) 71	H-6910-102403	SCREW – #10-24 X 3/8 BUTT. HD.	9
70	H-6966-406	SCREW – 1/4-28 X 3/8 CONE PT. SET	1
69	H-6918-620	SCREW – 3/8-16 X 2-1/2 SOC.	4
68	H-6940-420	SCREW – 1/4-20 X 1-1/4 FLAT PT. SET	8
(C) 67	H-6931-612	SCREW – 3/8-16 X 1-1/2 SQ. HD. SET	1
66	H-6938-102406	SCREW – #10-24 X 3/8 SOC. SET	1
65	H-7322-7	WASHER – 7/16 POLISH	1
64	H-7324-#4	WASHER – #4 INT. TOOTH	2
63	H-7321-4	WASHER – 1/4 PLAIN	7
62	H-7324-8	WASHER – 1/4 INT. TOOTH	14
61	H-7327-8	WASHER – 1/4 MEDIUM LOCK	5
60	H-7327-12	WASHER – 3/8 LOCK	10
59	H-7321-6	WASHER – 3/8 PLAIN	4
58	H-7321-#10	WASHER – #10 PLAIN	3
(A) 57	H-7324-#10	WASHER – #10 INT. TOOTH	8
56	H-6123-20206	KEY – 1/8 X 1/8 X 3/4 STRAIGHT	1
55	H-6123-30305	KEY – 3/16 X 3/16 X 5/8	REF.
54	H-6121-604	KEY – 1/8 X 3/8 WOODRUFF	1

USED IN 305 CUTTERS – (MPC)

DO NOT SCALE DRAWING

DE-BURR SHARP EDGES UNLESS OTHERWISE SPECIFIED

TOLERANCES UNLESS OTHERWISE SPECIFIED

FRACTIONAL	±1/32
TWO PLACE	±.010
THREE PLACE	±.005

ANGULAR LIMITS ±1°

A "√" ON A SURFACE INDICATES A FINISH REQUIRED

A "√" WITH NO VALUE WILL REPRESENT A 125 MICRO FINISH

EST. NO

- FLATNESS
- STRAIGHTNESS
- ANGULARITY
- PERPENDICULARITY (SQUARENESS)
- PARALLELISM
- ROUNDNESS (CIRCULARITY)
- CYLINDRICITY
- PROFILE OF ANY SURFACE
- PROFILE OF ANY LINE
- RUNOUT
- TRUE POSITION
- CONCENTRICITY

MODIFIERS

- Ⓜ MAXIMUM MATERIAL CONDITION
- Ⓢ REGARDLESS OF FEATURE SIZE

THE CHALLENGE MACHINERY CO.

1433 FULTON ST. GRAND HAVEN, MI 49417

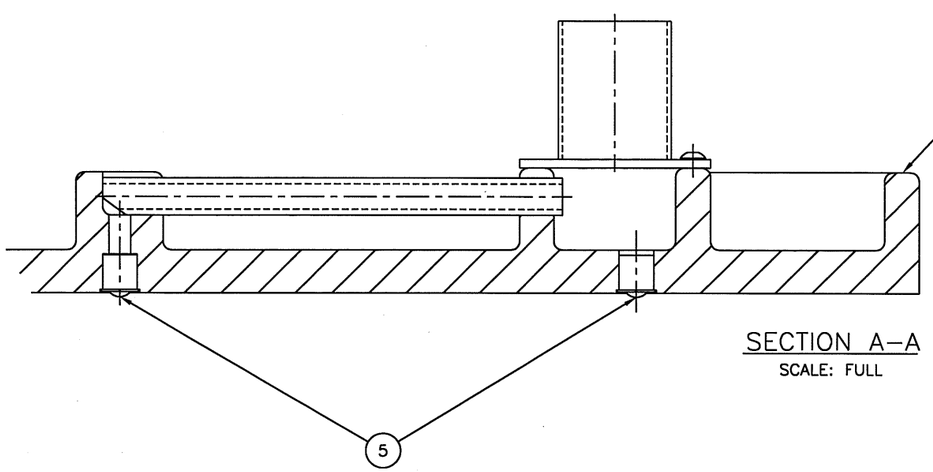
MATERIAL

NAME: MAIN ASM. – SPACER TABLE W/O BRAKE

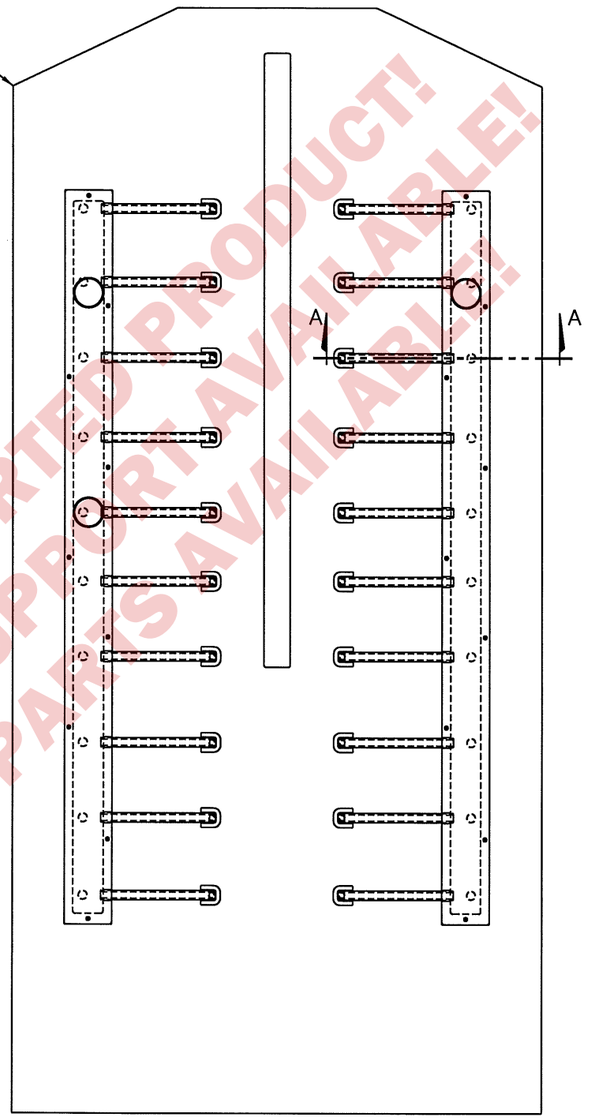
DRAWN PC	DATE 6-3-93	CHECKED MW	DATE 8-30-93		
SUPERSEDES 47000-6A		SUPERSEDED BY:			
CAD NO. 4725057	DISK NO. 38=083	SCALE 1 in 4	QTY USED		

47250 SHT. 7 OF 12 –VOID– 7N397

DATE	SYM	REVISION RECORD	RQD	APP	DRN
8-93	–	RELEASED FOR PRODUCTION (8N3193)	–	MW	PC



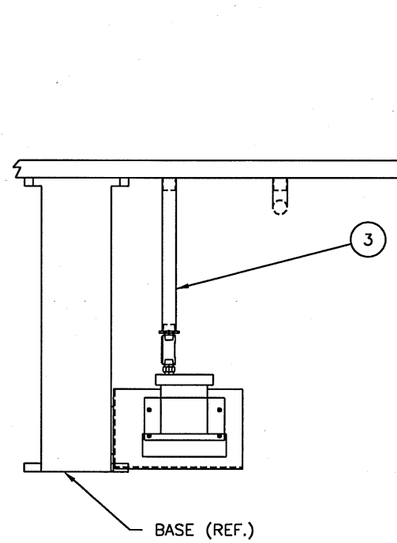
SECTION A–A
SCALE: FULL



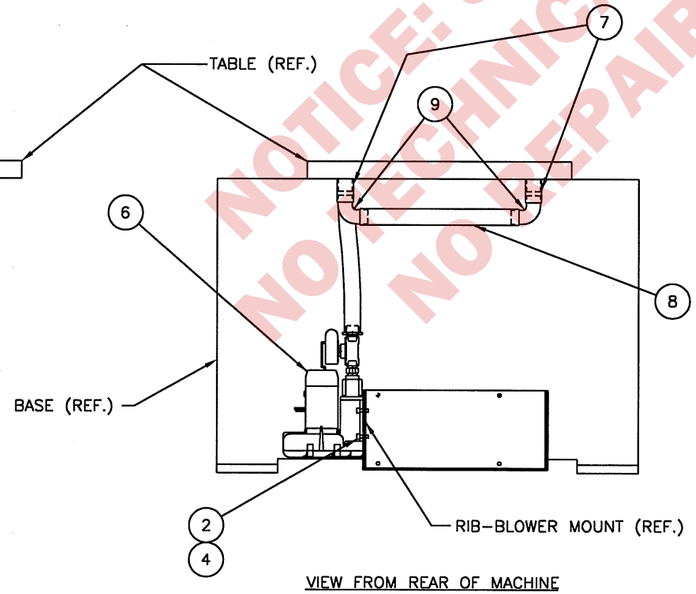
VIEW FROM BOTTOM OF TABLE
(LONG TABLE SHOWN)

NOTE:
FOR ELECTRICAL HOOKUP SEE:

EE–2472–1 FOR MC 1PH 50Hz
EE–2473–1 FOR SPACER 1PH 50Hz
EE–2476–1 FOR MC 3PH 50Hz
EE–2477–1 FOR SPACER 3PH 50Hz
EE–2478–1 FOR UK MC 1PH 50Hz
EE–2479–1 FOR UK SPACER 1PH 50Hz
EE–2480–1 FOR UK MC 3PH 50Hz
EE–2481–1 FOR UK SPACER 3PH 50Hz
EE–2587–1 FOR MC 1 OR 3PH 60Hz
EE–2585–1 FOR SPACER 1 OR 3PH 60Hz
EE–2664 FOR MC 3PH 50Hz
EE–2665 FOR SPACER 3PH 50Hz



VIEW FROM RIGHT SIDE OF MACHINE
(SHOWN WITH REAR COVER REMOVED)



VIEW FROM REAR OF MACHINE
(SHOWN WITH REAR COVER REMOVED)

NO.	PART NO.	DESCRIPTION OF ACCESSORIES	QTY
9	P–235–2	ELBOW – HOSE	2
8	P–240	HOSE – 1–1/2 X 19"	1
7	P–240	HOSE – 1–1/2 x 3"	2
6	47141	BLOWER ASM. – 3 PHASE	1
	47132	BLOWER ASM. – SINGLE PH.	
5	P–207–1	JET – AIR (SHORT TABLE)	36
		JET – AIR (LONG TABLE)	40
4	H–7327–6	WASHER – 3/8 LOCK	4
3	P–240	HOSE – 1–1/2 X 18"	1
2	H–6913–608	SCREW – 3/8–16 x 1" HEX	4
1	47062	TABLE ASSEMBLY – AIR TUBES (SHORT)	1
	47130	TABLE ASSEMBLY – AIR TUBES (LONG)	

USED IN "305" AIR TABLE

DO NOT SCALE DRAWING

DE–BURR SHARP EDGES
UNLESS OTHERWISE SPECIFIED

TOLERANCES UNLESS OTHERWISE SPECIFIED

FRACTIONAL	±1/32
TWO PLACE	±.010
THREE PLACE	±.005

ANGULAR LIMITS ±1°
A "√" ON A SURFACE INDICATES A FINISH REQUIRED
A "√" WITH NO VALUE WILL REPRESENT A 125 MICRO FINISH

EST. NO

- FLATNESS
- STRAIGHTNESS
- ANGULARITY
- PERPENDICULARITY (SQUARENESS)
- PARALLELISM
- ROUNDNESS (CIRCULARITY)
- CYLINDRICITY
- PROFILE OF ANY SURFACE
- PROFILE OF ANY LINE
- RUNOUT
- TRUE POSITION
- CONCENTRICITY

MODIFIERS
- Ⓜ MAXIMUM MATERIAL CONDITION
- Ⓢ REGARDLESS OF FEATURE SIZE

THE CHALLENGE MACHINERY CO.
1433 FULTON ST. GRAND HAVEN, MI 49417

MATERIAL: AS NOTED

NAME: AIR TABLE ASSEMBLY

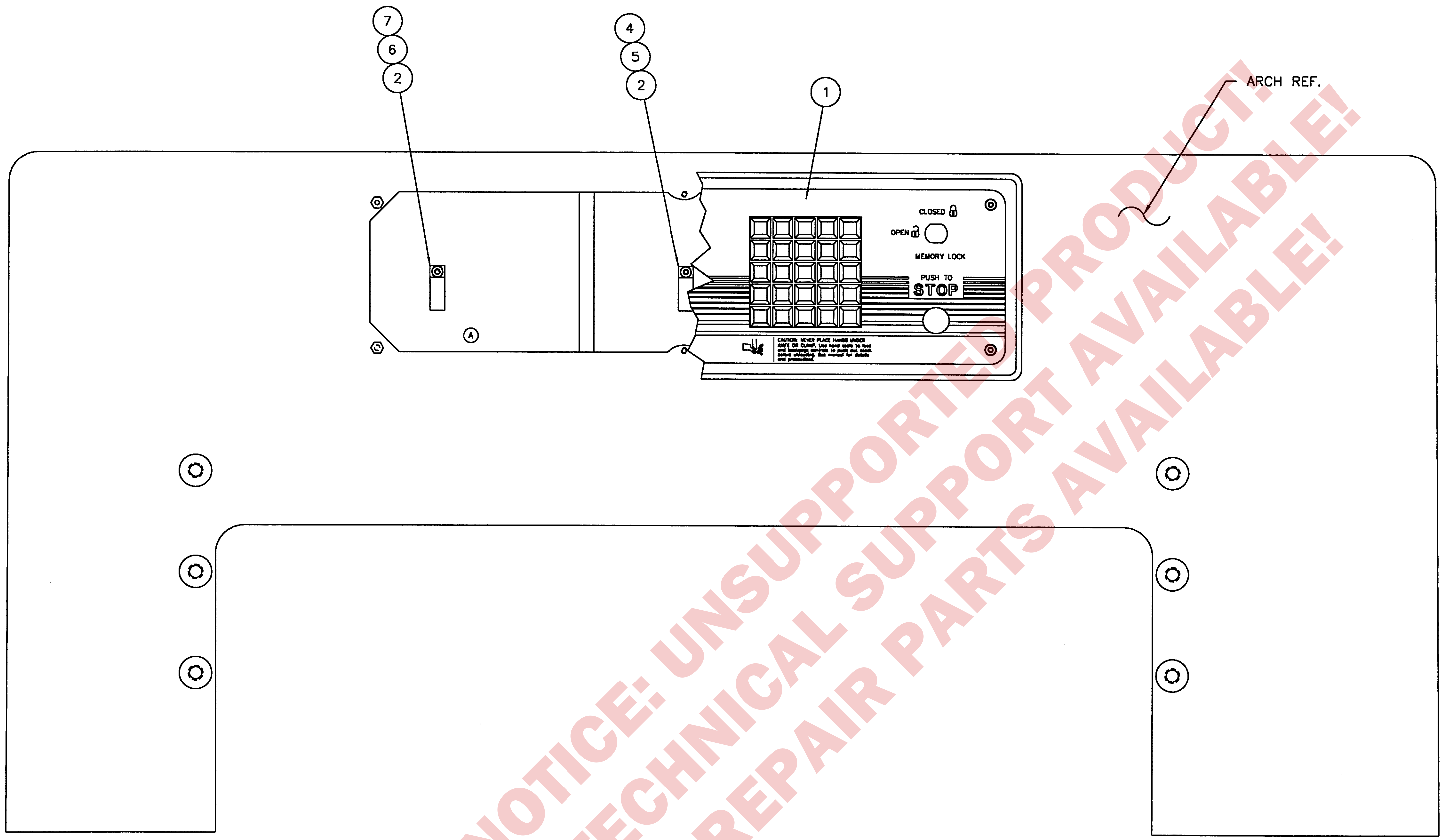
DRAWN	DATE	CHECKED	DATE
PC	6–3–93	MW	9–16–93

SUPERSEDES: SUPERSEDED BY:

CAD NO.	DISK NO.	SCALE	QTY USED
47250S8	~~3½HD83~~	1=4	1

~~47250 SHT 8 OF 12~~ –VOID– 7N397

DATE	SYM	REVISION RECORD	RQD	APP	DRN
8-93	–	RELEASED FOR PRODUCTION (8N3093)	–	MW	PC
2-96	A	REM. REFLECTOR/13941 (2N1096)		MW	MIM



NO.	PART NO.	DESCRIPTION OF ACCESSORIES	QTY
(A) 8			
7	H-7324-#10	LOCKWASHER – #10 INT. TOOTH	1
6	H-6910-102404	SCREW – #10-24 X 1/2 BUT HD SOC. CAP	1
5	H-6910-408	SCREW – 1/4-20 X 1" BUT. HD. SOC. CAP	1
(A) 4			
3			
2	E-2186-6	CLAMP – WIRE HARNESS	2
1	EE-2529	ASSEMBLY – CONTROL CONSOLE – MPC	1

USED IN 305 "M" CUTTER

DO NOT SCALE DRAWING

DE-BURR SHARP EDGES
UNLESS OTHERWISE SPECIFIED

TOLERANCES UNLESS
OTHERWISE SPECIFIED

FRACTIONAL ±1/32
TWO PLACE ±.010
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A "√" ON A SURFACE INDICATES A FINISH REQUIRED
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TRUE POSITION
CONCENTRICITY

MODIFIERS
MAXIMUM MATERIAL CONDITION
REGARDLESS OF FEATURE SIZE

THE CHALLENGE MACHINERY CO.
1433 FULTON ST. GRAND HAVEN, MI 49417

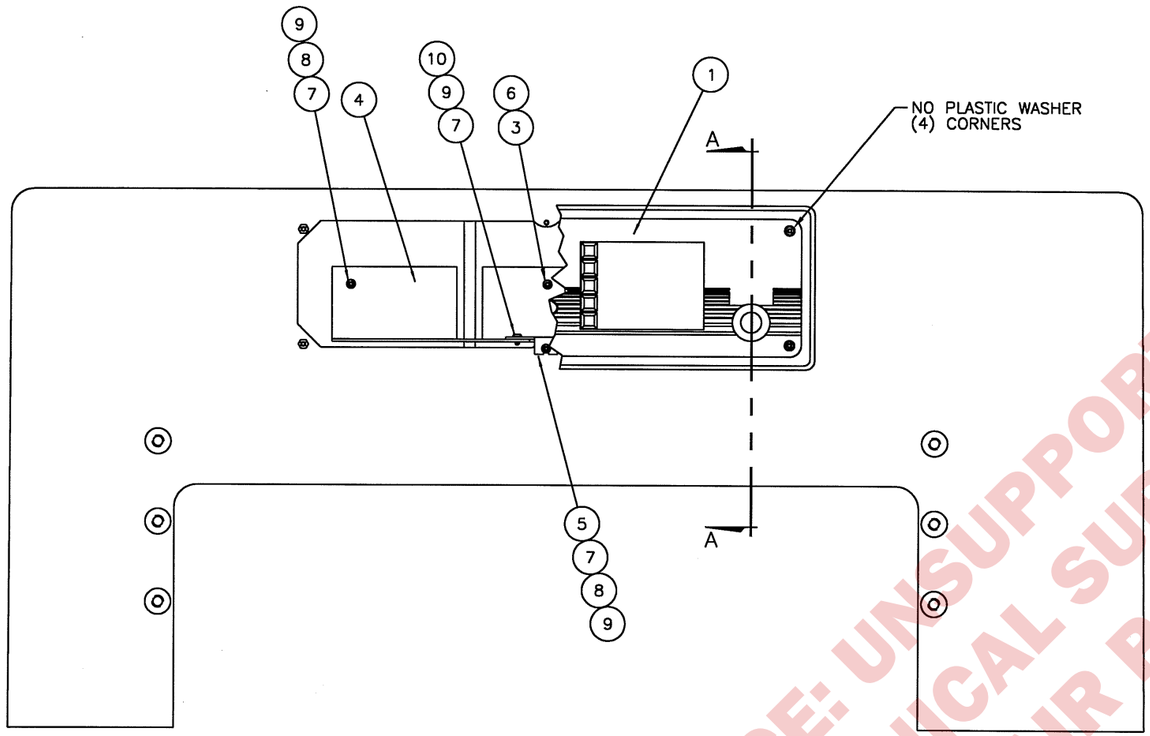
MATERIAL ASSEMBLY

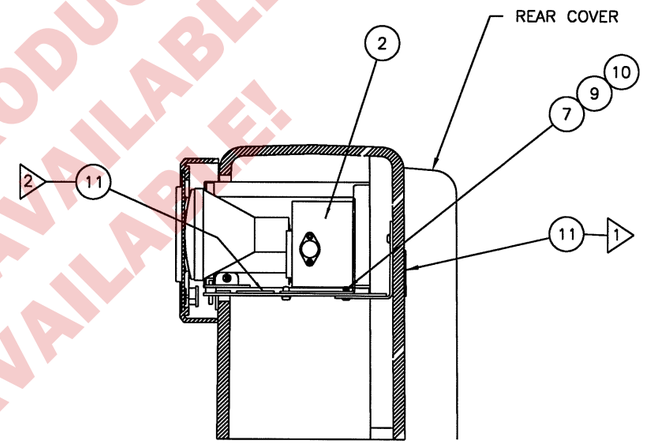
NAME: MAIN ASSEMBLY – MPC OPTION

DRAWN PC | DATE 6-3-93 | CHECKED MW | DATE 8-30-93
SUPERSEDES: 47000 | SUPERSEDED BY:
CAD NO. 47250S9 | DISK NO. | SCALE 1=2 | QTY USED 1

~~47250 SHT. 9 OF 12~~ –VOID–
7N397

DATE	SYM	REVISION RECORD	ROD	APP	DRN
8-93	–	RELEASED FOR PRODUCTION (8N3093)	–	MW	PC
2-96	A	ADDED FERRITE FILTER DETAIL (2N1096)		MW	PC
9-96	B	UPDATED LABEL VIEW (NO CN)	JM	TMH	PAD

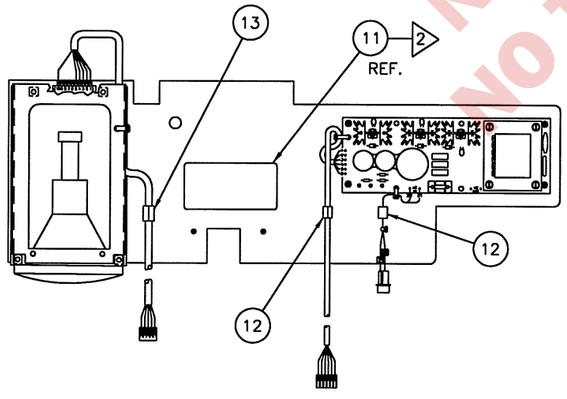




SECTION "A–A"

SCALE: 1/3X

FERRITE FILTER DETAIL Ⓐ
(EUROPEAN CRT OPTIONS ONLY)



NOTES:

1. INSTALL ITEM #11 WARNING LABEL LEFT OF THE RIGHT UPPER ARCH OPENING, AS VIEWED FROM THE REAR.

2. INSTALL ITEM #11 WARNING LABEL ONTO THE TOP OF THE CRT COVER ASSEMBLY – NEXT TO THE CRT. THE LABEL SHOULD BE READABLE WHEN THE CRT CONSOLE (ITEM #1) IS REMOVED.

FERRITE FILTER	INSTALLATION LOCATION (EUROPEAN CRT OPTION ONLY)
E-2756	SNAP-ON TO PRESET CABLE
E-2756	SNAP-ON TO TRIPLE VOLT POWER SUPPLY CABLE
E-2756	SNAP-ON TO TRIPLE VOLT POWER SUPPLY PIGTAIL
E-2756-1	SNAP-ON TO ENCODER CABLE
E-2756-1	SNAP-ON TO CRT CABLE ASM.
E-2756-1	SNAP-ON TO CONSOLE POWER CABLE FROM EE-2495
E-2756-2	SNAP-ON TO CONSOLE SIGNAL CABLE FROM EE-2495

NO.	PART NO.	DESCRIPTION OF ACCESSORIES	QTY
Ⓐ 14	E-2756-2	FERRITE FILTER – SPLIT, (EURO CRT ONLY)	1
Ⓐ 13	E-2756-1	FERRITE FILTER – SPLIT, (EURO CRT ONLY)	3
Ⓐ 12	E-2756	FERRITE FILTER – SPLIT, (EURO CRT ONLY)	3
Ⓐ 11	S-1781-35	LABEL – EURO SHOCK WARNING (EURO ONLY)	2
	S-1781-23	LABEL – WARNING	2
10	H-7321-4	WASHER – 1/4 FLAT	3
9	H-7321-#10	WASHER – #10 FLAT	5
8	H-7324-#10	LOCKWASHER – #10 INT. TOOTH	2
7	H-6910-102404	SCREW – #10-24 X 1/2 BUT HD SOC. CAP	5
6	H-6910-408	SCREW – 1/4-20 x 1" BUTT.	1
5	13993-1	BRACKET – CRT COVER HOLD-DOWN	1
4	13991	BRACKET – CRT – ARCH	1
3	H-7324-8	WASHER – 1/4 INT. TOOTH	1
2	EE-2389	ASSEMBLY – CRT COVER	1
1	EE-2516-1	ASSEMBLY – CONTROL CONSOLE – CRT (SPAN.)	1
	EE-2516	ASSEMBLY – CONTROL CONSOLE – CRT (ENG.)	

USED IN 305 "M" CUTTER

DO NOT SCALE DRAWING

DE-BURR SHARP EDGES UNLESS OTHERWISE SPECIFIED

TOLERANCES UNLESS OTHERWISE SPECIFIED

FRACTIONAL	±1/32
TWO PLACE	±.010
THREE PLACE	±.005

ANGULAR LIMITS ±1°

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A "√" WITH NO VALUE WILL REPRESENT A 125 MICRO FINISH

EST. NO

FLATNESS
STRAIGHTNESS
ANGULARITY
PERPENDICULARITY (SQUARENESS)
PARALLELISM
ROUNDNESS (CIRCULARITY)
CYLINDRICITY
PROFILE OF ANY SURFACE
PROFILE OF ANY LINE
RUNOUT
TRUE POSITION
CONCENTRICITY

MODIFIERS
Ⓜ MAXIMUM MATERIAL CONDITION
Ⓢ REGARDLESS OF FEATURE SIZE

THE CHALLENGE MACHINERY CO.
1433 FULTON ST. GRAND HAVEN, MI 49417

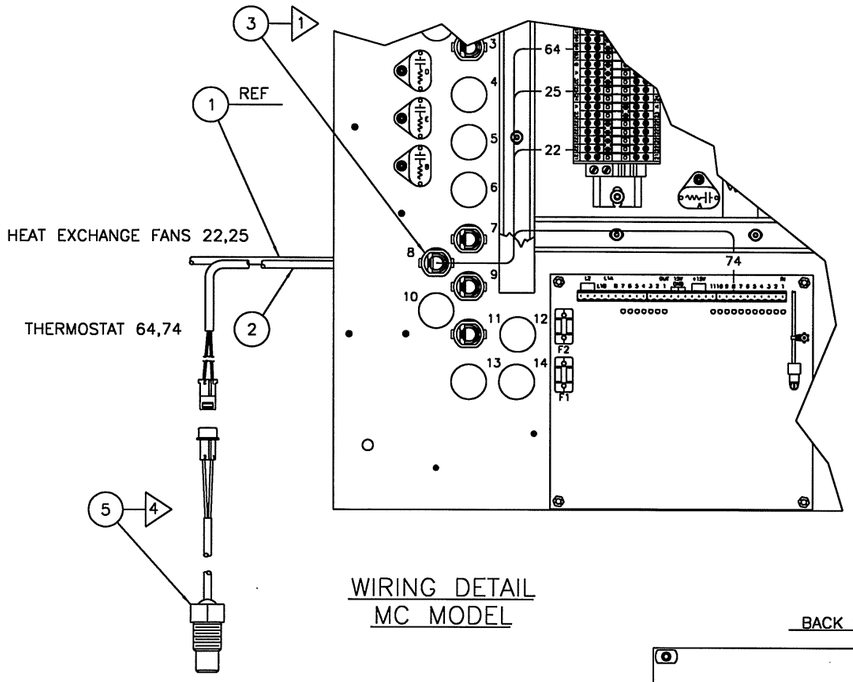
MATERIAL: ASSEMBLY

NAME: MAIN ASSEMBLY – CRT OPTION

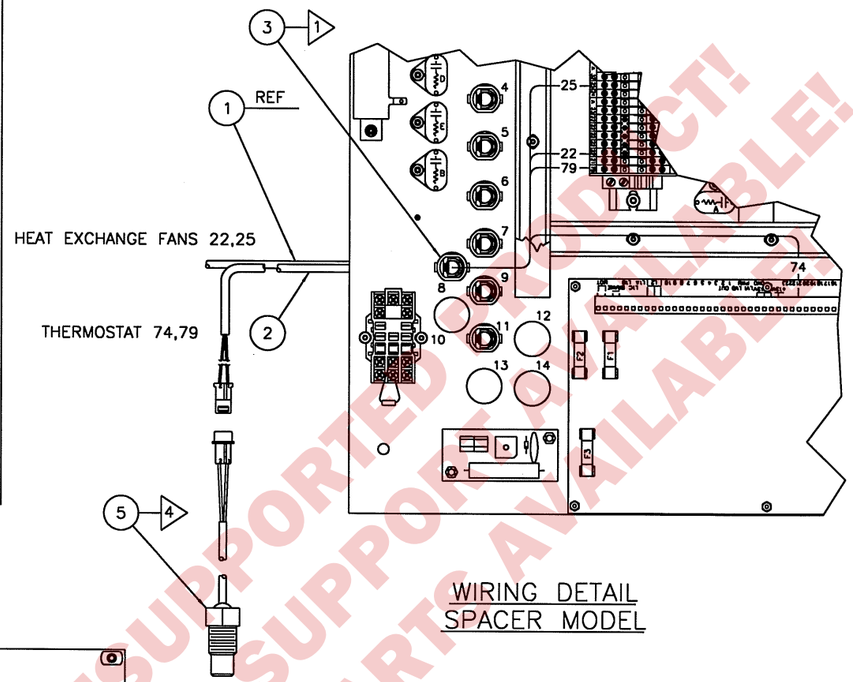
DRAWN PC	DATE 6-3-93	CHECKED MW	DATE 8-30-93
SUPERSEDES: 47000		SUPERSEDED BY:	
CAD NO. 47250S10	DISK NO.	SCALE 1=3	QTY USED 1

47250 SHT. 10 OF 12 –VOID– 4N397

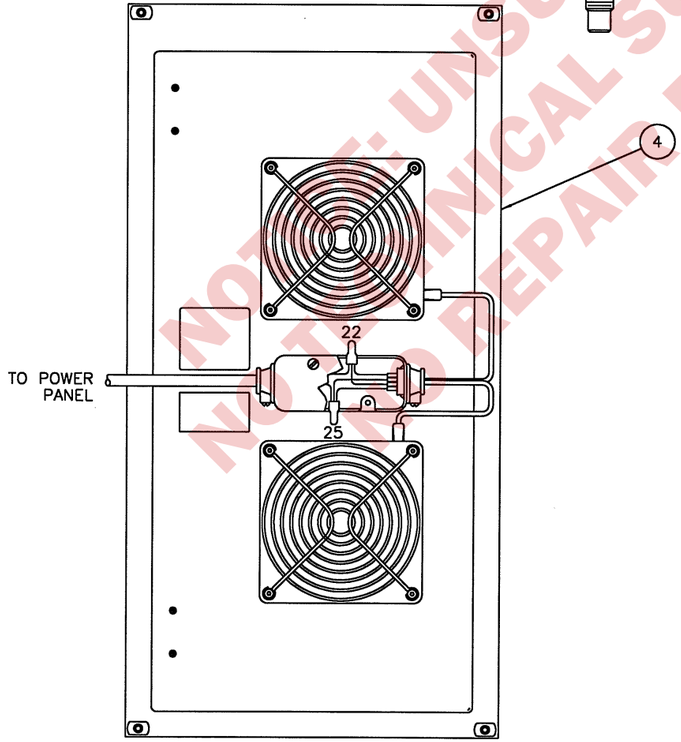
DATE	SYM	REVISION RECORD		RQD	APP	DRN
8-93	—	RELEASED FOR PRODUCTION	(8N3093)		MW	PC
4-94	A	ADDED COOLER ASM.	(4N1494)		MW	PC
9-96	B	UPDATED LABEL VIEW	(NO CN)	JM	TMH	PAD



WIRING DETAIL
MC MODEL



WIRING DETAIL
SPACER MODEL



WIRING DETAIL
ALL MODELS

NOTES:

1. REMOVE HOLE PLUG FROM KNOCK OUT HOLE #8 AND INSERT CABLE STRAIN RELIEF (ITEM #3) FROM THE BACKSIDE OF THE POWER PANEL.
2. BEFORE WIRING, REMOVE JUMPER WIRE AS FOLLOWS:
   MC MODELS – JUMPER WIRE BETWEEN TERMINAL BLOCK #64 AND P.C.B. TERMINAL IN–8.
   SPACER MODELS – JUMPER WIRE BETWEEN TERMINAL BLOCK #79 AND P.C.B. TERMINAL IN–21.
3. WIRE NUT LIKE WIRE NUMBERS TOGETHER.
4. DO NOT PLUG THE PLUGS TOGETHER YET.

   REMOVE 1/2 NPT PLUG FROM THE TOP OF THE HYDRAULIC TANK. THREAD IN ITEM #5. PLUG ITEM #2 AND ITEM #5 TOGETHER.

NO.	PART NO.	DESCRIPTION OF ACCESSORIES	QTY
5	EE-2498	SWITCH ASSEMBLY – THERMO-SENSOR	1
A 4	47197	HYDRAULIC COOLER ASM.	REF
3	S-1350-16	STRAIN RELIEF – CABLE	1
2	EE-2511	CABLE ASSEMBLY – THERMO SENSOR	1
A 1	EE-2499	CABLE ASSEMBLY – FANS	REF

USED IN MC & SPACER 305

DO NOT SCALE DRAWING

DE–BURR SHARP EDGES UNLESS OTHERWISE SPECIFIED

TOLERANCES UNLESS OTHERWISE SPECIFIED

FRACTIONAL	±1/32
TWO PLACE	±.010
THREE PLACE	±.005

ANGULAR LIMITS ±1°

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- FLATNESS
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- PROFILE OF ANY SURFACE
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- TRUE POSITION
- CONCENTRICITY

MODIFIERS
- Ⓜ MAXIMUM MATERIAL CONDITION
- Ⓢ REGARDLESS OF FEATURE SIZE

THE CHALLENGE MACHINERY CO.
1433 FULTON ST. GRAND HAVEN, MI 49417

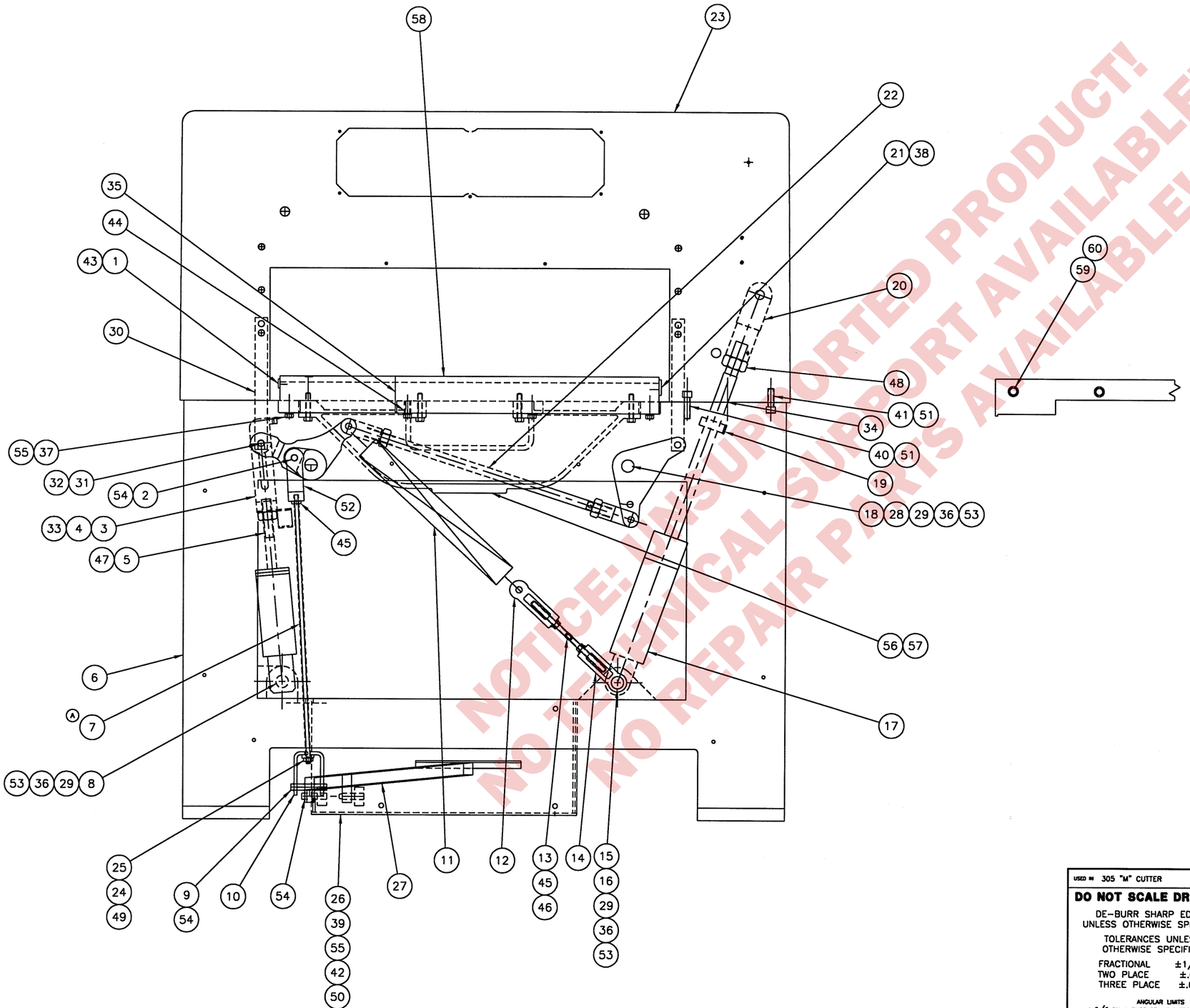
MATERIAL: ASSEMBLY

NAME: MAIN ASM. – REAR COVER OPTION – ELEC.

DRAWN PC	DATE 6-3-93	CHECKED MW	DATE 8-30-93
SUPERSEDES: 47000		SUPERSEDED BY:	
CAD NO. 47250S11	DISK NO. 3½=DS4	SCALE 1=2	QTY USED 1

47250 SHT 11 OF 12 –VOID– 7N397

	DATE	SYM	REVISION RECORD	ROD	APP	DRN
	8-93	–	RELEASED FOR PRODUCTION (8N3093)	–	MW	PC
(2N1097)	2-97	A	REMOVED 47170, ADDED 47176		MW	MIM



	NO.	PART NO.	DESCRIPTION OF ACCESSORIES	QTY
	60	H-7321-6	WASHER – 3/8 SAE FLAT (LONG TABLE)	6
		H-7321-6	WASHER – 3/8 SAE FLAT (SHORT TABLE)	4
	59	H-6913-608	SCREW – 3/8-16 X 1" HEX (LONG TABLE)	6
		H-6913-608	SCREW – 3/8-16 X 1" HEX (SHORT TABLE)	4
	58	47130	TABLE ASSEMBLY – AIR TUBES (LONG)	1
		47082	TABLE ASSEMBLY – AIR TUBES (SHORT)	
		47023	TABLE – SHORT	
		47022	TABLE – LONG	
	57	H-6913-616	SCREW – 3/8-16 X 2" HEX HD.	4
	56	4484	BRACE – TABLE	1
	55	H-7327-12	WASHER – 3/8 LOCK	12
	54	S-1193-50	"E" RING – 1/2	7
	53	H-7324-8	WASHER – 1/4 INT. TOOTH	4
A	52	47099	CLEVIS– FOOT PEDAL	1
	51	H-7329-8	WASHER – 1/2 HI COLLAR	8
	50	H-6424-10	NUT – 5/8-11 HEX	2
	49	H-5247-6	NUT – 3/8-16 FLEX LOCK	1
	48	H-6427-16	NUT – 1"-14 HEX	1
	47	H-6427-12	NUT – 3/4-16 HEX	1
	46	H-6433-6	NUT – 3/8-16 L.H. HEX	1
A	45	H-6423-6	NUT – 3/8-16 HEX	2
	44	H-6951-824	SCREW – 1/2-13 X 1-1/2 FLT PT. S.S. NYLOC	2
	43	H-6909-83203	SCREW – #8-32 X 3/8 FLAT HD.	1
	42	H-6931-1016	SCREW – 5/8-11 X 2" SQ. HD.	2
	41	H-6918-814	SCREW – 1/2-13 X 1-3/4 SOC.	6
	40	H-6918-812	SCREW – 1/2-13 X 1-1/2 SOC.	2
	39	H-6918-608	SCREW – 3/8-16 X 1" SOC.	4
	38	H-6913-606	SCREW – 3/8-16 X 3/4 HEX	1
	37	H-6913-614	SCREW – 3/8-16 X 1-3/4 HEX	8
	36	H-6910-404	SCREW – 1/4-20 X 1/2 BUTT. HD.	4
	35	H-6633-718	PIN – #7 X 2-1/4 TAPER	2
	34	H-6633-612	PIN – #6 X 1-1/2 TAPER	2
	33	H-215-125-0500	PIN – 1/8 DIA. X 1/2 ROLL	1
	32	H-6451-0500	RING – EXTERNAL GRIPRING	2
	31	47063	PIN – CLAMP CYLINDER CLEVIS	1
	30	4504	BAR – CLAMP PULL DOWN	1
	29	8835	PIN – KEEPER	4
	28	SS-798	COLLAR	1
	27	47149	PEDAL ASSEMBLY – FOOT	1
	26	47143	BRACKET ASSEMBLY – HYDRAULIC POWER UNIT	1
	25	47084	WASHER – SPHERICAL – BOTTOM	1
	24	47084-1	WASHER – SPHERICAL – TOP	1
	23	47168	ARCH	1
	22	47005	BELLCRANK ASSEMBLY – CLAMP	1
	21	4542	STOP – CUT STICK R.H.	1
	20	4411	CLEVIS – KNIFE CYLINDER	1
	19	47125	CAM ASSEMBLY – KNIFE CYLINDER	1
	18	47110	PIN – BELLCRANK	2
	17	H-342	CYLINDER ASSEMBLY – KNIFE	1
	16	S-1073-100	RETAINING RING 1"	1
	15	47087	PIN – KNIFE CYLINDER	1
	14	47254	CLEVIS – R.H.	1
	13	47253	TIE ROD – CLAMP RETURN	1
	12	47255	CLEVIS – L.H.	1
	11	47136-2	SPRING – EXTENSION	1
	10	47102	BRACKET – PEDAL	1
	9	47098	PIN – PEDAL BRACKET	1
	8	47111	PIN – CLAMP CYLINDER	1
A	7	47276	TIE ROD– FOOT PEDAL	1
	6	47032	BASE	1
	5	H-431-1	CYLINDER ASM. – CLAMP	1
	4	47172	ACTUATOR –CLAMP PROX.	1
	3	47093	CLEVIS – CLAMP CYLINDER	1
	2	47088	PIN – CLAMP RETURN CLEVIS	1
	1	S-6-278	STOP – CUT STICK L.H.	1

USED IN 305 "M" CUTTER

DO NOT SCALE DRAWING

DE–BURR SHARP EDGES UNLESS OTHERWISE SPECIFIED

TOLERANCES UNLESS OTHERWISE SPECIFIED

FRACTIONAL	±1/32
TWO PLACE	±.010
THREE PLACE	±.005

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A "√" WITH NO VALUE WILL REPRESENT A 125 MICRO FINISH

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- TRUE POSITION
- CONCENTRICITY

MODIFIERS

Ⓜ MAXIMUM MATERIAL CONDITION

Ⓢ REGARDLESS OF FEATURE SIZE

THE CHALLENGE MACHINERY CO.

1433 FULTON ST. GRAND HAVEN, MI 49417

MATERIAL: ASSEMBLY

NAME: MAIN ASSEMBLY – FRONT VIEW (ROUGH)

DRAWN PC	DATE 6-3-93	CHECKED MW	DATE 8-30-93
SUPERSEDES 47000		SUPERSEDED BY:	
CAD NO. 47250512	DISK NO. 3SMC084	SCALE 1=4	QTY USED

47250 SHT. 12 OF 12 –VOID– 7N397