Challenge Titan 200BC 20" Hydraulic Paper Cutter with Tilt Shield

Instruction Manual

TECHNICAL MANUAL

TITAN 200
PAPER CUTTER

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INTRODUCTION The information contained in this document is intended solely for Challenge trained service technicians. There may be situations that are not covered by this manual. The information contained in this manual is to guide a technician to possible repair solutions. This manual is to be used in conjunction with the TITAN 200 instruction and parts manual P/N F-200 (A).

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SINGLE OPERATOR

Do not operate with more than one person.

SHOCK HAZARD

Disconnect power before removing cover.
Replace cover before operation

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Disconnect power before removing cover.
Replace cover before operation

HAZARD AREA

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

GENERAL INFORMATION

ELECTRICAL SPECIFICATIONS

The cutter requires a 208-230vac 15-amp service. The cutter has a power cord, which requires a NEMA 6-15R or 6-20R receptacle. The proper way to test voltage is from before power up through a complete cycle. The voltage must be tested at the main fuse holders. The meter used must have a reaction time of at least 100ms or a low voltage record function. A low quality meter will not respond fast enough to give a true minimum voltage reading. Low voltage to the cutter will blow the main fuses. When the voltage drops, the 24vac (solenoids) and 5vdc (computer) will have problems. The low limit is 190 vac using the above test. The high limit is 245 vac.

The voltage for the power panel can be matched to the measured incoming voltage. Reposition the jumper located in the center of the terminal strip. **Do not remove any wires.**

All Titan 200s n 981388 and down are 230vac only. If the voltage drop are 210vac or below during a cut, a buck-boost transformer, p/n K-2834, is required. Note: The buck boost can also be rewired to back voltage 250vac down. Call Challenge for rewiring. Always check the serial number tag to determine the proper voltage range.

MACHINE DIMENSIONS

The Net weight is 755 LB (342kg). The height is 53" (135cm), length is 49" (124cm), and width is 36" (91cm). Removal of the table, front guard and treadle will allow the machine to go through a 31 1/4" (79.4cm) door way.

MACHINE REVISIONS

TITAN MAIN BOARD REVISIONS

The main circuit board, EE-2762, was changed to EE-2762-1. When using an EE-2762-1, the H-10 and H-11 must not be connected.

Titan 200 cutters above s/n 971103 use EE-2807, the LCD display is no longer back lit. On EE-2807, the H-10 jumper must be connected and H-11 jumper must **not** be connected. Both black plastic jumpers are located near the F3 fuse. The EE-2807 can not be used for replacement a EE-2762 and EE-2762-1.

The EE-2807-1 is a direct replacement for the EE-2807. The H-10 jumper must be connected and the H-11, 12, 13, 14 must not be connected.

CLAMP DAMPENER ASSEMBLY MOUNT REVISION

The upper mounting stud for the clamp-dampened cylinder has been changed to a three-piece mounting. The first production Titan with the change is s/n 981319, (July-98). The part numbers are H-6938-416 (1/4x20x1" set screw), E-1152-68 (1/4x20x1" hex spacer), H-6918-412 (1/4x20x1" cap screw). If the stud is broken, it can be removed with an "screw extractor". Install the set screw so " is extended out from the frame. Tighten the spacer onto the setscrew. Slide the cap screw into the top hole of the dampened then tighten screw and damper to the spacer. The fluid in the damper is 10lb# hydraulic fluid, which is used in the reservoir of the pump.

MANUAL MISPRINT

Titans s/n 971103 and up main board yellow IN7 input, for hydraulic latch will never light. The Sensor Data input "HYDLAT" will function. Titans s/n 971102 and down the hydraulic latch relay was located on a separate relay board.

SINGLE CUT BUTTON REVISION

The green light button was changed to a heavier duty non-lighting style. This heavy duty button was used beginning with serial number 981342. Early machines require conversion kit K-2874

HYDRAULIC PUMP REVISION

The first machine with the revised motor pump is s/n 971157 (Dec 97). Replacement pump motor number is H-220-5. Replacement motor pump units have a different mounting bolt pattern. It is acceptable to use only two mounting bolts. Parts are not interchangeable from earlier to later units. The manifold and valves are not affected

MANIFOLD SEAL REVISION

Hydraulic manifolds stamped with an "-A" in the top corner use a 7/8" O- ring. The two O- rings are located between the manifold and the pump. The machines affected are s/n 981271 (Sept-98) to s/n 991570 (Mar-99).

BACKGAUGE FUSE REVISION

A kit is available to keep the "F1" fuse from blowing. The kit number is K-2908. A 5A (SB) fuse is being added. The first Titan 200 with the new fuse is s/n 991734, August 99. It is located on the revised circuit board (EE-2807-1) and is labeled "FL".

FRONT GUARD INTERLOCK SWITCH REVISION

The interlock switch mounted on either side of the front opening was changed by the manufacturer. The first machines affected were built late April 2000. The replacement switch is part number E-2457-6, also six E-1214-65, " quick disconnects are needed (per switch).

GENERAL HYDRAULIC INFORMATION

HYDRAULIC FLUID CHANGE

The oil should be changed every 1000 hours or once a year. Use 100 weight (ISO VG 100) hydraulic oil only. An electric hand drill pump can be used to remove the oil from reservoir through the filler hole. The hydraulic pump does have a strainer and magnet. It is recommended as part of the regular oil change that the reservoir be removed to wipe the interior of the tank clean. The O- ring seal may be reused if it is not damaged (p n is S-1810-37).

PRESSURE GAGE

The gage supplied with the Titan is filled with clear glycerin. If the gauge liquid turns yellow, hydraulic fluid has leaked into the gauge and it must be replaced. If the rubber top seal leaks, replace the gauge (p n sP-629-3).

OPERATOR SETTING CLAMP PRESSURE

The clamping pressure range is 400 to 800 psi. Turning the clamp pressure reducer cartridge cw increases pressure and ccw decreases pressure. One turn of the adjustment screw equals approximately 75 psi. Don't adjust below 400 psi, the because clamp and knife will be out of sequence.

PRELIMINARY VALVE SETTING

The four adjustable cartridge valves in the hydraulic system can be preset manually to an approximate setting. These adjustments should be done only as a last resort. The valves are not interchangeable. Each valve is to be turned in all the way (cw) then turned out (ccw) a specific amount of turns. Main pressure cartridge 4 turns. Knife down sequence 3 turns. Clamp up sequence 1 turn. Clamp pressure reducer (adjustable by the operator) 4 turns (800 psi). Use the hydraulic pressure setting section in the manual for final adjustment.

VALVE INFORMATION

Listed is general information for testing and checking

VALVE	CHALLENGE NUMBER	MANUFACTURES NUMBER	SPRING TENSION	INNER SPOOL MOVEMENT
MAIN SYSTEM	HH-304-1	RV1-10-S-0-18*	HEAVY	" (6MM)
DOWN VALVE	H-200-2	SV1-10-4-0-00	LIGHT	1/8" (3MM)
CL. UP SEQ.	H-203-6	RV3-10-S-0-36*	MEDIUM	_" (6MM)
CLAMP PRESS	H-203-13	PRV1-10-S-0-12*	MEDIUM	" (6MM)
KN. DN. SEQ.*	H-203-7	PSV2-10-S-0-12*	MEDIUM	1/8" (3MM)
		PSV4-10-S-0-12*	MEDIUM	1/8" (3MM)
ELEC. CL.**	H-203-33	EPRV1-5824-14	LIGHT	3/16" (5MM)

* KN. DN. SEQ. Used two different valves

** Cartridge comes with coil E-1069-19

SOFTWARE REVISIONS

Titan 200 with front guard using EE-2762 circuit board and **EE-1766-41** software.

1.0 Original software.

1.1 Increased knife latch timing.

1.2 False Clamp Plate limit was 1.750; changed it to 1.875.

1.3 This revision contains all of the languages. In fraction mode corrected positioning problem.

1.4 Increased timing between set and brake turning on an off. This is performed at the beginning of each zero cross.

1.5 Enables the Preset interrupt during the zero cross. Allowed maintenance mode access during preset screen. Changed send routine for better positioning accuracy.

1.6 Added noise protection to prevent erroneous backgauge control touch pad movement. This error causes the machine to show actual backgauge position instead of the "sent to" value.

1.7 Allow accuracy adjust to be set in mm. Fixed a backgauge creep problem that would occur if the foot pedal was pressed during a send. **Note**: This is the highest possible revision software that for EE-2762 circuit board.

New Board. **EE-2807** Starting at s/n 97,102

1.9 Added a delay in the backgauge routine to prevent fuses from being blown if the back-gauge circuit when using the slide pot in the center or bottom edge.

2.0 A) Added Challenge logo to sleep screen.
B) Added electric clamp option in the "diagnostic" menu.
C) Immediately position to 5" after preset.

2.1 Changed reverse limit from 20.050 to 20.030 to prevent bumping in the back.

2.2 A) Electronic clamp pressures range adjustable in the DIAGNOSTIC menu.
B) REPOSITIONING is added as an option in the parameters menu. This allows the machine to reposition automatically from a sent position if the back gauge moves back .005" or more.
C) When entering data in a job, if a math function key is pressed, the operation assumes the previous data, not the backgauge position.

2.3 Forced PUSHOUT if the forward movement is < .005".

2.4 Allow ELECTRIC CLAMP option to be on

2.5 If the backgauge is moving at a high speed, the brake is applied near the front and back to prevent bumping.

2.6 A) Added auto memory initialization for new boards.
B) Added memory test to initialization routine.
C) Correct translation errors

2.7 A) Improved positioning time by shortening the slow down distances and making the slow down distance self-adjusting between .2" and .75".
B) Added input status to the end of several error messages.
Knife Latch Failure 1 = Latch disengaged when it should be engaged
Knife Latch Failure 0 = Latch engaged when it should be disengaged
Hyd Latch failure 1 = Latch Relay is off When it should be on.
Hyd Latch failure 0 = Latch Relay is on when it should be off.

2.8 A) Adjust for new 1.8 hp back garage motor
B) Service message reads "Lubricate Machine"
C) Lubricate alarm frequency twice knife alarm count
D) Attempt to reduce F1 blowing computer responds quicker to the backgauge movement Commands

2.9 Improved electronic clamp pressure routine to reducing changing "CP" number.

Titan 200 with cut buttons (N.C.) using EE-2807 circuit board and **EE-1766-42** software
The revision descriptions for 2.0 and on is the same as EE-1766-41

Titan 200 with cut buttons (N.O.) using EE-2807 circuit board and **EE-1766-50** software

2.3 Original software.

2.5 If the backgauge is moving at a high speed, the brake is applied near the front and back to prevent bumping.

2.6 A) Added auto-memory initialization for new boards.
B) Added memory test to initialization routine
C) Correct translation errors.

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ERROR CODES DESCRIPTIONS

ERROR MESSAGES THAT DON'T REQUIRE A FLOW CHART

ERROR	EXPLANATION	PROCEDURE
Result is Negative	Math operation result was negative	Press Clear key
Data out of Range	Send position beyond forward or reverse limits	Press Clear key
Send Canceled	Back gauge in motion and a console key was pressed	Press Clear key then Send key to complete movement
Number Outside Limit	Send position beyond forward or reverse Limits	Press Clear key
Back gauge at Limit	Back gauge position at either end of table	Move back gauge in opposite direction
Memory Locked	Tried to change a locked channel	Press Clear key
Next Channel Locked	Linked channel locked	Press Clear key. Move locked channel to another location
Sharpen Knife	Operator sets knife count for sharpening	Clear message Enter Maintenance. Enter Parameters. Enter Knife count Enter clear count. Press exit 4 times Change knife count Enter Knife Count Enter Knife Alarm. Enter number of cycles Press exit 4 times
Lubricate Machine	The relubrication message has been activated	Clear message: Enter Maintenance Enter Parameters. Enter Knife count Enter clear lube. Press exit 4 times
Checksum Error Memory Failed	Defective EPROM chip. Memory failured	Replace chip Replace main board.
Hyd latch error 0	Board mounted relay failed to turn off Sensor data. "hydlat" didn't change from 0 to 1 Occurs when pump motor turns off	Replace main board EE-2807-1

ERRORS (NO MESSAGE) THAT REQUIRE A FLOW CHART

ERROR	EXPLANATION	PROCEDURE
Clamp stuck down	Upward movement of spring return clamp Did not overcome mechanical bind	See flow chart page 27
Slow backgauge movement to end of table	Main board is sensing the preset is always activated.	See flow chart page 28
Hydraulic motor didn't start	Motor didn't start at the beginning of a cut	See flow chart page 24
A continuous beeping	Press CLEAR to stop alarm	See Positoning Error.

ERROR MESSAGES THAT REQUIRE A FLOW CHART

ERROR	EXPLANATION	TEST PROCEDURE
Hyd up failure	Clamp failed to return up after 4 sec.	See flow chart page 29
Knife down failure	Knife failed to go down after 4 sec.	See flow chart page 30
Knife up failure	See Sequence Error or Knife at both limits	
Sequence error	Knife came down before clamp or Clamp came up before knife. Clamp up prox made while knife up prox unmade.	See flow chart page 31
Knife at both limits	Knife up or knife down proximity sensor not switching or switching at the wrong time	See flow chart page 32
Positioning error	Back gauge missed programmed position by .005". Back gauge accuracy off by .010" when wand goes through preset sensor.	See flow chart page 25
Clamp Knife down	When in a program or send mode (Not manual backgauge model knife or clamp not up	See flow chart page 26
Clamp down failure	Clamp did not come down at the start of a cycle	See flow chart page 33
Backgauge failure	Backgauge did not move after presetting	See flow chart page 34
Shorted key error	Any key (except backgauge slide)held on for longer than 90 seconds	See flow chart page 35
Encoder wires 9 and 10 are reversed or Backgage direction Reversed	Encoder wire pulse wire are backwards or backgage power wires are backwards. Typically this happens only on a table out installation.	See flow chart page 36

Knife latch failure 1	Prox sensor on when should be off. The pin should be in the disengaged position i.e. pulled out from under knife bar.	See flow chart page 37
Knife latch failure 0	Prox sensor off when should be on. The pin should be in the engaged position i.e. pushed under knife bar.	See flow chart page 38
Hyd latch error 1	Board mounted relay failed to turn on Motor will not start Sensor data, "hydlat" didn't change from 1 to 0	See flow chart page 39

SENSOR DATA ABBREVIATIONS AND MEANINGS

The knife and clamp are at top of stroke with the hydraulic motor off and line light on

INPUTS/OUTPUTS	IDLE	DESCRIPTION	LOCATION
RHSAFE (in)	0	R. H. safety switch or cut button	Inside right font cover
LHSAFE (in)	0	L. H. safety switch or cut button	Inside left front cover
KNFLAT (in)	1	Knife latch proximity sensor	Left side of cutter opening
HYDLAT (out)	1	hydraulic latch relay	Main board
KNFDWN (in)	1	Knife down proximity sensor	Lower right corner of knife bar
PRESET (in)	1	Preset sensor	Under left side of table
CUTSOL (out)	0	Cut Down valve	Solenoid on left side of hyd. manifold
UNLOAD (out)	0	Not used	
KNLATSOL (out)	0	Knife latch solenoid	Left side of cutter opening
CLAMPUP (in)	1	Clamp up proximity	Top right corner of clamp (rear view)
HYDCUP (in)	1	Clamp cylinder up proximity	Bottom of clamp cylinder
KNFLUP (in)	1	Knife up proximity	Top left corner of knife bar
CUTBTN (in)	0	Single cut button	Green button on console
N.C.	0	not used	
HYDMOT (out)	0	hydraulic motor relay	Right of main board
N.C	0	Not used	
LTLINE (out)	1	Line table light	Two light bulbs above knife bar
CBTNLIT (out)	0	Not used	

TITAN 200 TEST & ADJUSTMENT PROCEDURES

TESTING DOWN VALVE COIL MAGNETISM

1. Remove the " nut holding the coil to the valve.
2. Slide the coil away from the base of the valve ".
3. The coil should move easily on the valve stem.
4. Make a cut.
5. If there is voltage and the coil is good, magnetism will move it back the " to the base of the valve. If a screw driver blade is placed inside the center of the coil then cycle the cutter. If magnetism is felt the coil, cable and main board is good tested.

TESTING ANY HYDRAULIC VALVE SPOOL OPERATION

1. Remove the valve from the manifold. There isn't trapped hydraulic pressure, some fluid will flow out. Always use a 1" box end wrench or deep well socket only on the hex on the valve. Never use an adjustable wrench or pliers to remove or install a valve.
2. Use a small rod to push in on the end of the valve that was in the manifold. The spool inside the valve must move smoothly in both directions. Each valve type has a different spring tension and some do not have springs at all. On adjustable valves, the spring tension can be lessened to help in testing spool movement. Loosen the jam nut then turn the allen screw CCW to reduce spring pressure. See General Hydraulic Information, ie Valve information for spring tension.
3. Check for damaged black "O" rings or white split Teflon spacers.
4. Check the manifold cavity for loose particles.
5. Reinstall valve. It does not require excessive force to retighten the valve. Do not tighten over 40 FT LB of torque.
6. Typically, a valve that cannot adjust its pressure range is defective.

SEQUENCE OF ADJUSTING HYDRAULIC PRESSURES

Turn adjuster clockwise to increase pressure, counter clock wise to reduce pressure. Reference T. 200 parts manual hydraulic schematic page for cartridge location.

1. Turn the clamp reducer valve (item 4), located on front face of blue manifold block, CW all the way.
2. Read main system pressure when clamp and knife are at the bottom of stroke. Adjust valve (item 11) on front of black pump to 1400psi.
3. Read knife down sequence pressure when clamp is at the table and the knife is moving down. Adjust front valve (item 5) located on right face of manifold block to 900psi.
4. Read clamp up sequence when the knife is at top of stroke and the clamp is moving up. Adjust rear valve (item 11 located on right face of manifold block to 600psi.
5. Adjust clamp reducer valve, item 4, to a range of 400 to 800psi when clamp and knife are at the bottom of stroke.

TESTING AND ADJUSTING PROX SENSOR

1. Access the "SENSOR DATA" menu in the console. The zero and ones to the right of the abbreviations will indicate changed status as the prox is activated.
2. Place a thin metal strip in front of sensor. The target area has four red squares in a block pattern. When the strip is placed in front of the sensor the red LED should turn on and the sensor data indicator should change.
3. The distance from the rectangular prox sensor to a moving part is typically .01" to .06". The distance from the round prox sensor to a moving part is typically .01" to .125".

MANUALLY ACTIVATING THE HYDRAULIC MOTOR

Pressing the manual pin on the motor relay will activate the motor. This will raise the clamp and knife to the full up position. The relay is located on the right side center of the electrical panel. Do not push the relay for longer than 3 seconds, the main fuses may blow.

1. S.N 971102 and down the relay is 1.5" x 3" and brown-black with a small button on the long side
2. S. N 971103 and up the relay is 3" x 3" and black in color. Press the top white plastic piece down.

TESTING AND REPAIR OF BACKGAUGE BRAKE RESISTOR

1. Resistor is white, 2" long by 3.8" square (may be two side by side), located on the right end of main board EE-2807-1. The resistor is next to the BRK, SCR, and DIR red LED's
2. Measure resistance from one lead to the other. A reading of 5 ohms means the resistor is good. A reading of infinity means the resistor is open and must be replaced.
3. A pair of 10 ohm, 10watt resistors can be purchased from Radio Shack, # 271-132.
4. Cut the defective resistor leads at the end of the resistor. This will leave a lead from the board to solder too.
5. Apply silicon sealant to the bottom of the new resistor
6. Lay the new resistors side by side (with silicone sealant in between) then wrap one lead around the other lead and solder.
7. Place new resistor on the board then cut the leads to overlap the leads on the board by 3/8".
8. Solder resistor leads to board leads.

TESTING ENCODER

Measure voltages on the screw heads of the EE-2807-1 header. If the voltages are correct, the EE-2807 is defective. The test gives a general condition of the encoder as it impossible to count all encoder pulses. If the voltages are not correct, see "TESTING CABLE". If cable is good, the encoder is defective. Turn motor pulley very, very slowly when testing A and B pulse.

Cable connector	Header	Function	Voltage
18 (black)	H2-4	common	common
20 (red)	H2-3	"+" voltage	5 vdc. power
17 (white)	H2-1	"A" pulses	toggles 5 & 0 vdc
19 (green)	H2-2	"B" pulses	toggles 5 & 0 vdc

TESTING ENCODER BACKGAGE ACCURACY

This test is preformed when the accuracy alarm is activated or there is a question of backgage point to point accuracy.

1. Remove the backgauge pulley cover.
2. Turn off the REPOSITIONING option in the parameter menu.
3. Move the backgage to rear of the table. Manually turn the leadscrew pulley back til the backgage stops. Write down the dimension shown on the display.
4. Move the backgage only with the manual slide control to at least 6 different positions, never coming forward of 7" (178mm).
5. Repeat step 3. The two numbers should match within (+ or -) .002.
6. If the numbers match the accuray problem is in the loading of the paper, backgage squaring or accuracy adjustment. If the numbers do not match the encoder, encoder cable or main board may be defective.

TESTING ENCODER CABLE:

1. Unplug the cable connector at encoder. Measure voltages at the cable connector.
2. If voltages are correct, cable (EE-2534-1) and main board (EE-2807) are good.
   If voltages are not correct, go to step 3.
3. With the cable connector still unplugged at encoder, measure the voltage at the header screws.
   If voltage is correct the main board is good and the cable is defective.

Cable connector	Header	Function	Voltage
18 (black)	H2-4	common	common
20 (red)	H2-3	"+" voltage	5 vdc
17 (white)	H2-1	"A" pulses	5 vdc
19 (green)	H2-2	"B" pulses	5 vdc

REPLACEMENT EE-2807 & EE-2807-1 CIRCUIT BOARDS

1. Transfer all fuses from the original board to the new board. The FL fuse (EE-2807-1 only) will not have to be transferred. Fuse clips may have to be tightened (squeezed together) before reinstalling a fuse.
2. Transfer the EPROM from original board to the new board. Tip: Before removing old EPROM note position of locating notch on the chip.
3. The H-10 link must be connected, otherwise "Hydraulic Latch Error" will be displayed. The H-11 link must not be connected, otherwise the display and keyboard will not work.
   On EE-2807-1 links H-12, H-13, H-14 should not be made.
4. Test and adjust the back gauge accuracy.

TESTING INPUTS ON MAIN CIRCUIT BOARD

Inputs on the main board, EE-2807-1, can be manually activated. If the LED does not light nor the sensor data input change, the main board EE-2807 is defective. The sensor data menus are based on: the the power on, knife clamp in the up position and the hydraulic motor off.

1. Remove wire for the input to be tested from green header.
2. Touch one end of 12" insulated jumper wire to any 64 wire terminal.
3. Touch the other end of the jumper wire to the screw head where the input wire was attached.
4. If yellow LED lights, then the sensor or wiring is defective. If the yellow LED or the sensor data input doesn't change the main board, EE-2807, is defective.

TESTING MAIN BOARD OUTPUT and OUTPUT DEVICES

Outputs can be manually activated, except for the backgauge motor. The red output LED's only indicates computer commands, not actual operation of the output device.

Connect an insulated jumper wire from the 24vac supply (wire #33) then touch the other end of the wire to the to the screw head where output device wire is attached. The desired output device should turn on (i.e., solenoid, relay or light. (Note: An error may be displayed). If the device turns on manually, the main board, EE-2807 is defective. If the device does not turn on, the device, wiring or F2, F3 is defective.

Output voltage can be measured. Check the voltage between at the main board output wire (?) and wire #35 when the machine is activated. NOTE: An unloaded output will measure a static voltage. The voltage will disappear or change when a load is applied.

TESTING AND LEVELING THE CLAMP

1. Remove the cut stick, false plate clamp if installed. Clean the bottom of the clamp.
2. Place a 2 1" x 22" strips of paper lengthwise from under the clamp (right and left), to the front edge of the table.
3. Close guard, if equipped, and make a cut.
4. When the clamp is at the table and the knife is swinging down, pull on the paper strips.
5. If the clamp is parallel, both strips will be held. If one of the strips is loose the clamp will have to be adjusted.
6. The adjustment is made by turning the nuts on the top and bottom of the pull clamp pull down rods. Adjust the side that does not hold the strip. Make only 1 8-turn adjustments. Loosen the upper nut. Tighten the lower nut to lower the high side.
7. Repeat steps 1 through 7 until both strips are held.

INSTALLATION AND ADJUSTMENTS FOR OF THE KNIFE LATCH ASSEMBLY:

1. The retracted position of the knife latch pin is adjusted before installation. The end of the pin should be flush with the face of the block that it slides through (the plastic screw head does not matter). Check the position of the pin by pushing in the solenoid plunger (not the lever) to bottom of its travel.
   a). Loosen the mounting screws of the solenoid.
   b). Push in the solenoid plunger to bottom of its travel.
   c). On the 41120-1 version slide the solenoid with plunger pushed in so the knife latch pin end is flush with the block. On the 41120-3 version, slide the solenoid with plunger pushed in so the plastic screw on end of the latch pin is flush with the block.
   d). Retighten the solenoid mounting screws.
2. The latch assembly mounting plate should be visually parallel to the knife bar.
3. The top of the knife latch pin should be 1/64" (0.3mm) to 1/32" (0.8mm) below the knife bar. This clearance is set only when the knife is in the full up position (see manually section "Activating the hydraulic motor"). The latch plate mounting screws will have to be loosened slightly. The height adjusting screw is located at the bottom of the plate. Turn the screw CW to raise and CCW to lower the plate then tighten the jam nut. Tighten the mounting plate screws.

   INSTALLATION TIP. The top cover of the cutter should be tilted forward and the left front table side guide should be removed for easier access. Table side guide mounting screws can be removed through the two side left access hole covers using the knife bolt wrench.
4. The proximity sensor should be 1/64" (0.5mm) to 1/32" (1.5mm) from the solenoid lever arm. The sensor has a red four-point target for activation.

TEST BACKGUAGE ARMATURE (Procedure measuring backgauge motor for opens and shorts)

1. Turn power off.
2. Unplug the H1 connector on the main board and remove motor cover. Measure the resistance between wire 45 and 46. Rotate motor pulley in small increments (one complete turn) while reading the resistance at each incremental stop. The nominal resistance should be 12 ohms. Values above 12 indicate open and values below indicate a short in the armature.
3. Unplug the H1 connector on the main board. Measure the resistance between wire 45 and 46 to the unpainted part of the motor case. A reading of infinity (open) is correct. A reading less than infinity indicates a short.

FRONT GUARD INTERLOCK SWITCH ADJUSTMENT

1. Remove the interlock switch bracket assembly from the top cover.
2. Bend the strap, near the mounting screws, so it is parallel to the face of the interlock switch and has .025" clearance to the tip of the plunger.
3. Reinstall the bracket on the top cover. Open the front guard then adjust the interlock switch bracket assembly so the strap is flat against the cover but not depressing the plunger.

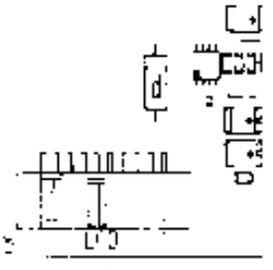
DISASSEMBLY OF SOLENOID COIL CABLE CONNECTOR

1. Remove screw completely from the center of square connector then remove connector from coil.
2. Unscrew cable strain relief nut.
3. Turn connector upside down. Place a small screwdriver in the narrow slot in one of the corners of the red center piece then pry it out. The cable will need to be pushed in.
4. Voltage can then be measured between the wires.

TESTING THE DISPLAY CONTRAST

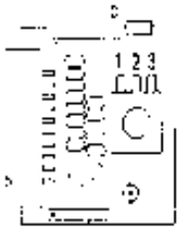
The LCD display uses 19 Volts DC for the contrast adjustment. The voltage is produced on the main circuit board, EE-2807. The contrast voltage on the main board can be measured from header H2 pin 7, to the non-line end (anode) of the diode located next to the H8 header. Use the left drawing below for the diode location.

EE-2807-1



H8 Header

EE-2764



The level of contrast is adjusted by a potentiometer located on the back of the console. The voltage is measured on the keyboard interface board located under the console cover. Use the above right drawing for reference. Use the left end of the resistor (shown with a "C") as the common. The voltage at leg 3 on the potentiometer should read -19vdc. The voltage at "2" on the potentiometer will have a range of 9vdc to 19vdc. Nominal operational voltage is approximately 12vdc.

Conclusions: No voltage between diode and H7-2, defective EE-2807.
No voltage between "C" and # 3, defective ribbon cable EE-2855-2.
No voltage between "C" and # 2, defective EE-2764.
All voltages good, defective LCD display, defective EE-2758-1.

TESTING AND MANUALLY ACTIVATING KEYBOARD

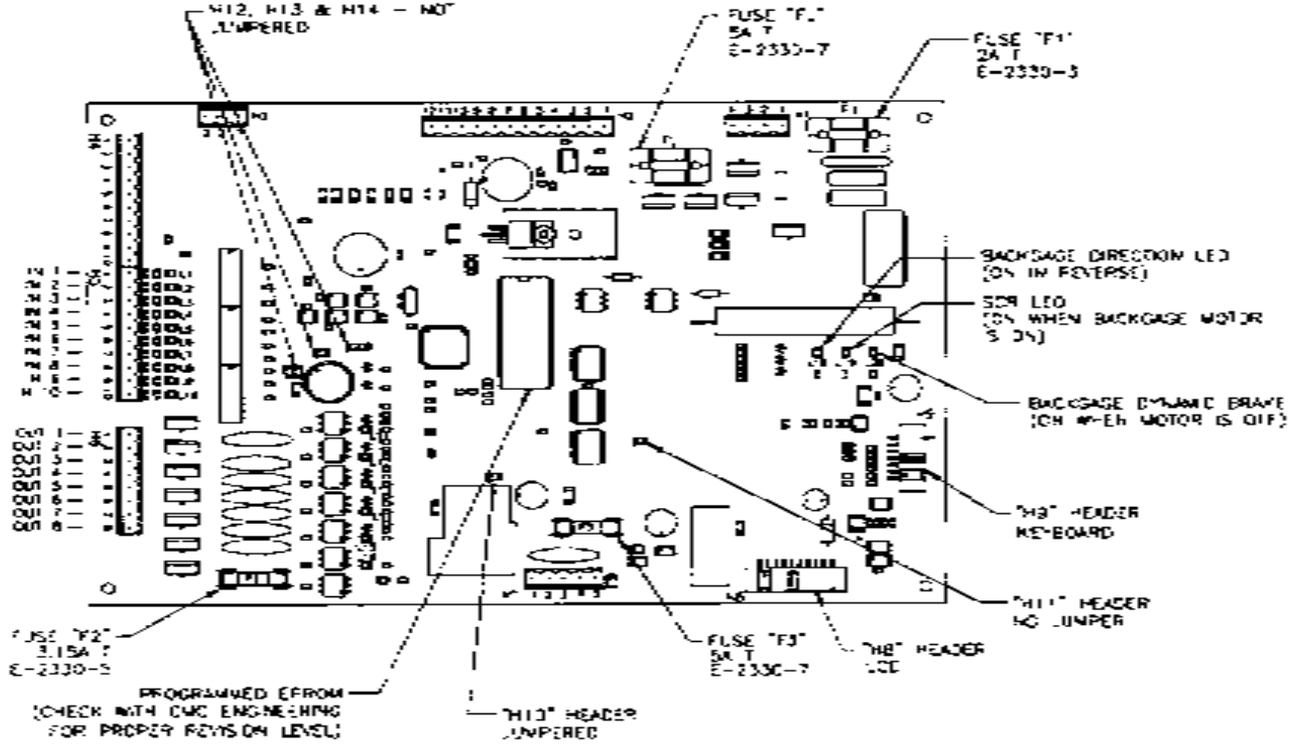
1. Remove the metal cover behind the console
2. Disconnect blue tipped ribbon cable from interface board.
3. Turn power on.
4. Use a jumper wire shorting the exposed pins to manually activate a key function. Use the diagram and key list below.
5. If the console shows activity by manually jumping the pins, the keyboard is defective, 43002.

KEY	PIN	KEY	PIN
Clear	5 to 11	Send	5 to 13
# 1	9 to 13	# 2	8 to 13
# 3	7 to 13	# 4	9 to 12
# 5	8 to 12		
# 6	7 to 12		
# 7	9 to 11	# 8	8 to 11
# 9	7 to 11	# 0	8 to 10

Backgauge Slide Key

Pin 1 to 3 1 K ohms fixed
Pin 1 to 2 1 K ohms variable*
Pin 2 to 3 1 K ohms variable*
*when pressing guide

Interface board



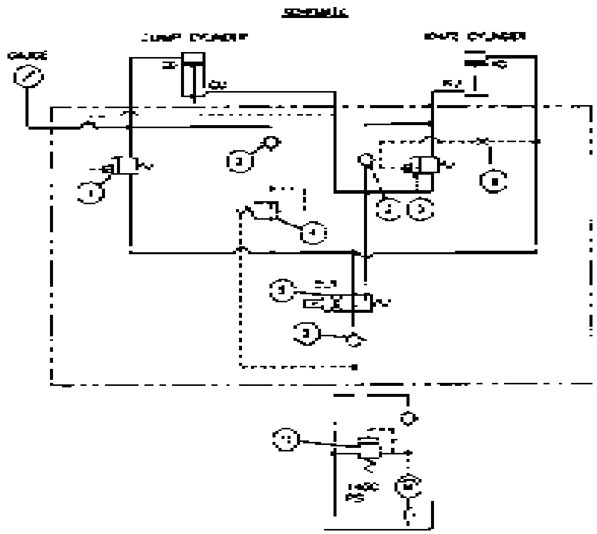
EE-2807-1

TITAN 230

	DESCRIPTION	IDLE STATUS
IN1:	Left Interlock Switch	off when cover is closed
IN2:	Ram Up Limit	on when ram is up
IN3:	Hyd. Cylinder Up Limit	on when hyd. ram up
IN4:	Knife Up Limit	on when knife is up
IN5:	Right Interlock Switch	off when cover is closed
IN6:	Knife Latch Switch	off when S.I. is pulled in
IN7:	Not Used	
IN8:	Cut Switch	on when switch is pushed
IN9:	Knife Down Limit	off when knife is down
IN10:	Not Used	

	DESCRIPTION	IDLE STATUS
OUT1:	Hydraulic Motor	on when motor is running
OUT2:	Cut Solenoid	off except for downward motion
OUT3:	Not Used	
OUT4:	Ram Up Solenoid	off when ram is up
OUT5:	Aux Light	on when the lights are on
OUT6:	Knife Latch Solenoid	off when knife is up
OUT7:	Cut Sw. Light	on when ready for cut

Basic hydraulic schematic



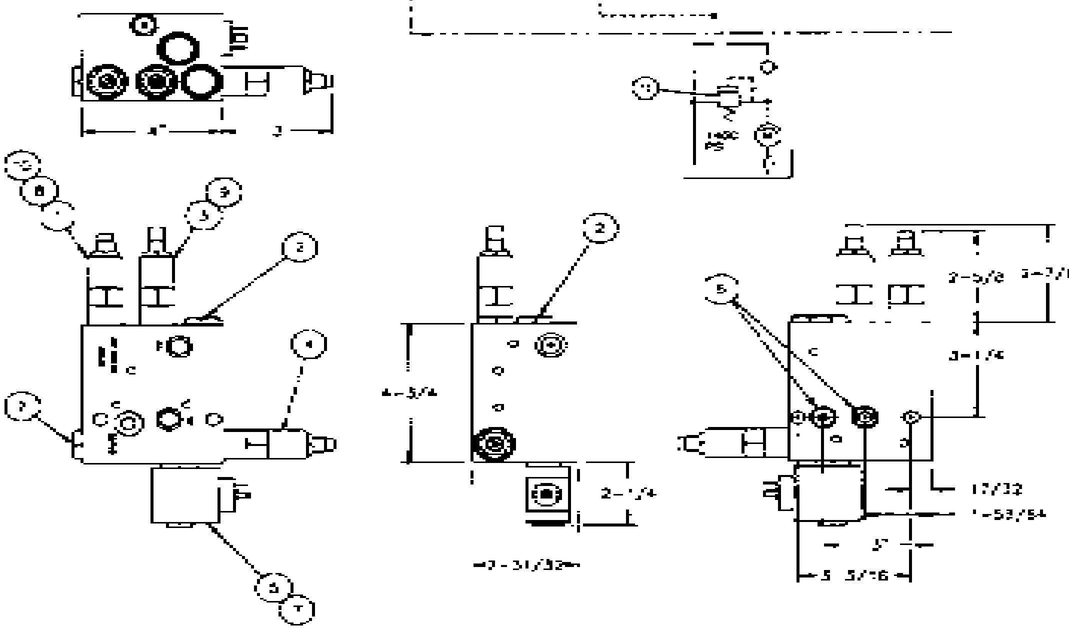
SERVICE NOTE:
REPLACEMENT COILS MUST BE ORDERED SEPARATELY - THEY ARE NO LONGER INCLUDED AS PART OF THIS ASSEMBLY.
E-1065-15 120V COIL (MODEL 20)
E-1065-17 24V COIL (DOCUTRIM & TRIM 200)

NOTES

1) PORT SIZES
GAUGE = SAE #4(7/16-20 THD)
CL UP, CL DOWN, K UP, K DOWN, ARE SAE #6(9/16-18 THD)
MANIFOLD MOUNTS = 3/4" DIA.

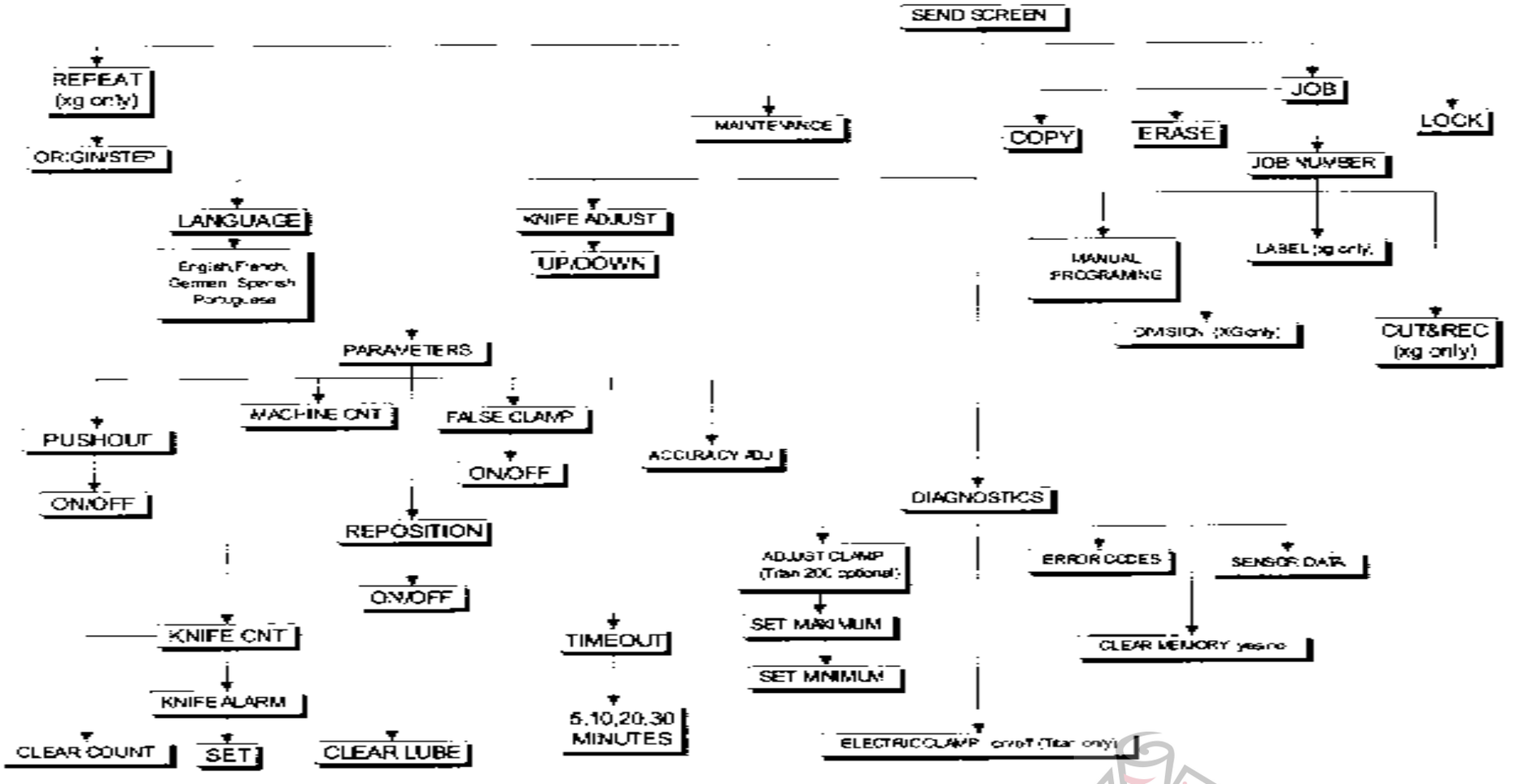
2) SOURCE
CTS FLUID POWER CORP
MODULAR CONTROLS
PART #[illegible]

NOTE (RELIEF):
* = PARTS SUPPLIED IN THE K-4[illegible] KIT

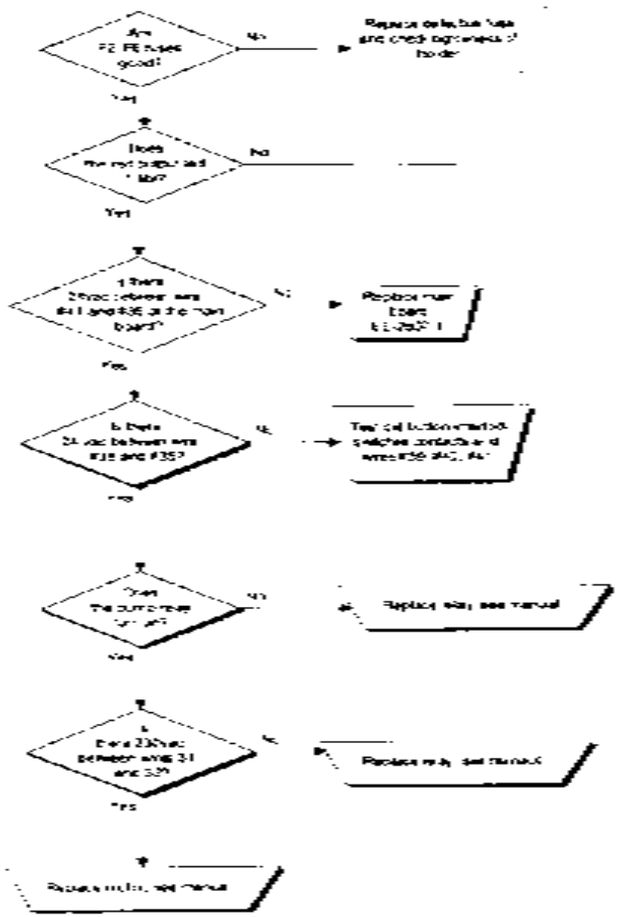


NO.	PART NO.	DESCRIPTION OF ACCESSORIES	QTY
* 1	K-205-5	CLAMP UP SEQUENCE VALVE	1
* 2	K-205-16	CHECK VALVE	3
* 3	K-205-17	KNIFE SEQUENCE VALVE	1
* 4	K-203-13	PRESSURE REDUCING VALVE	1
* 5	K-200-2	SOLENOID VALVE	1
* 6	S-1010-15	O-RING	4
7	E-1065-1[illegible]	COIL	REF
8	K-204	PISTON - [illegible] VALVE	1
9	K-484	ORIFICE PLUG 1/64	1
10	S-2030	"O"-RING	1
11	K-204-1	RELIEF VALVE KIT	REF

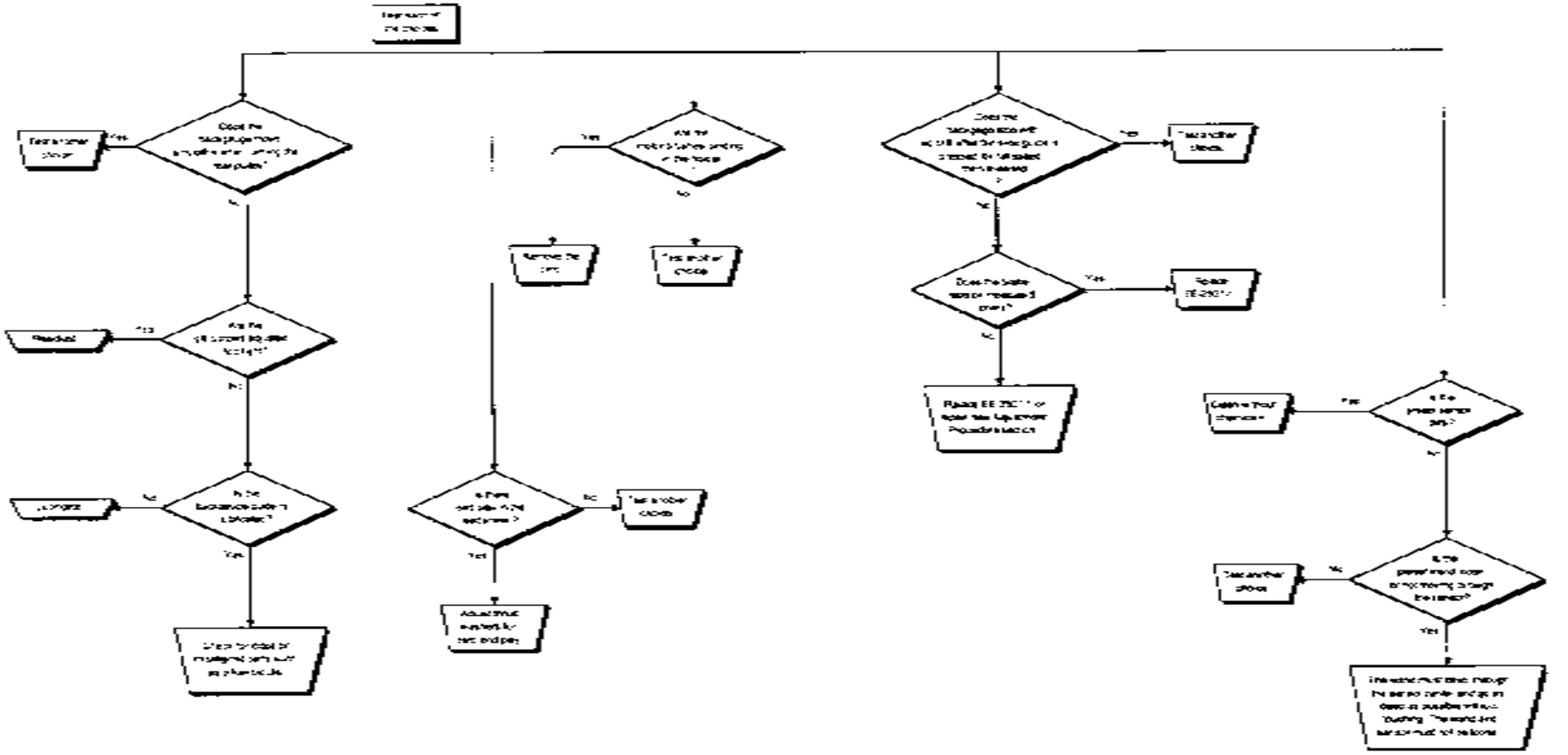
CHAMPION and TITAN CONSOLE PROGRAM MAP



Hydraulic Motor didn't start



Positioning error



SERVICE QUALITY ISSUES / INSTALL FORM

CSS TECH NAME	REP #	TIME IN	TIME OUT	GBC LOCAL TECH AT SITE? X ONE	YES X	NO
Gordon Rice	344	12, 11, 1030	1400/1300/1200	LOCAL TECH NAME – Brian Thompson, Doug Wood		

DATE	CUSTOMER NAME	ADDRESS	CITY	STATE	ZIP
4/26,27,30/07	Kinkos	2646 Colonel Glenn Hwy	Fairborn	Oh.	45324

PHONE NUMBER	CONTACT NAME	MODEL NO.	SERIAL NO.	INSTALL DATE	TRACKER #	CYCLE COUNT
937-429-2585	Rob S.	Challenge Titan-200	52753		PH0213793	N/A

ACTIVITY / CUSTOMER COMPLAINT- Wont Cut

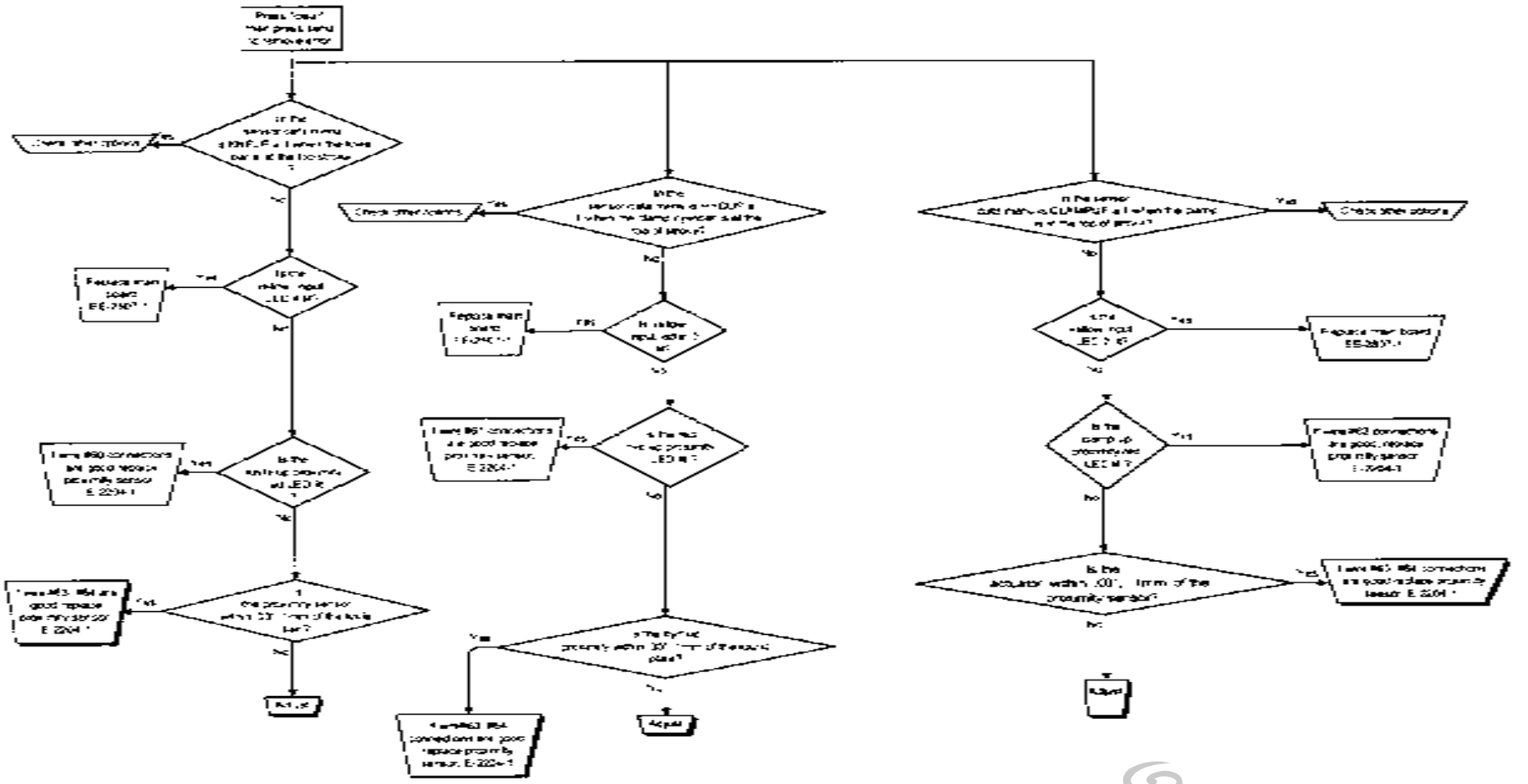
CONDITION / MODE OF FAILURE – When cut buttons pressed, pump will run but clamp will not come down/ Clamp Down Failure.

LIST EACH PROBLEM AND CORRECTIVE ACTION SEPARATELY - USE ANOTHER SHEET OF PAPER IF NECESSARY. LIST THE PARTS REPLACED TO CORRECT THE PROBLEM IN THE CORRECTIVE ACTION COLUMN NEXT TO THE CORRECTIVE ACTION.

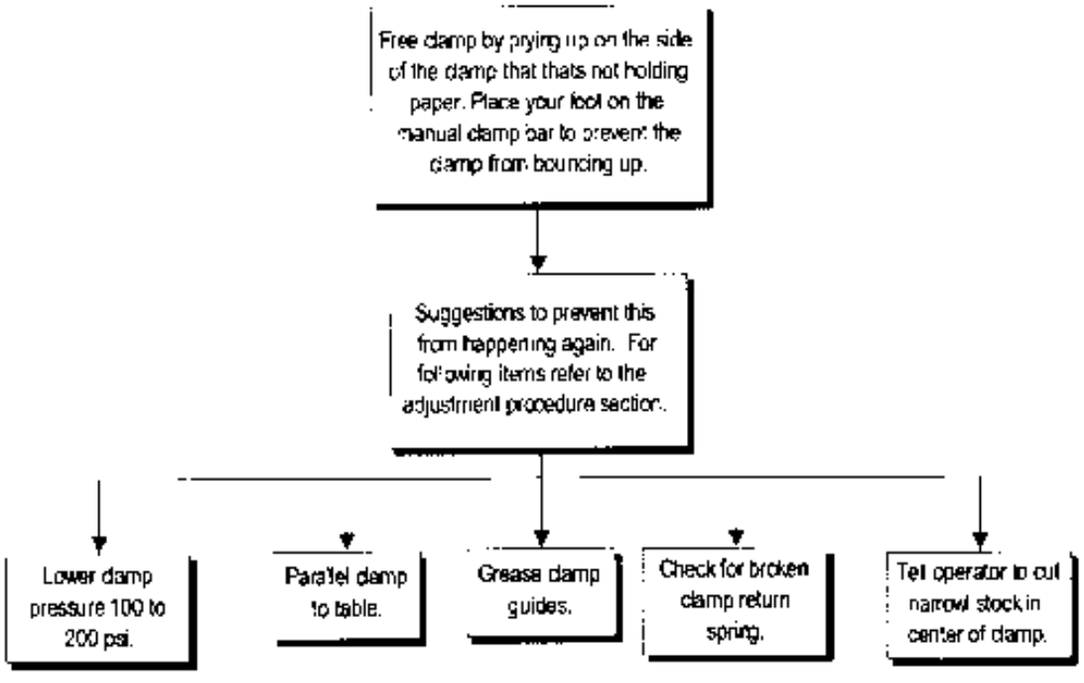
Problem	Repair
One hood switch was bad (right side)	R&R switch
One cut button also bad (left side)	**R&R Cut Buttons**

Comments –	Suggestions to Tech. – Add both switches to their inventory. This is the 3rd titan I've been involved with that has had issues with these switches.

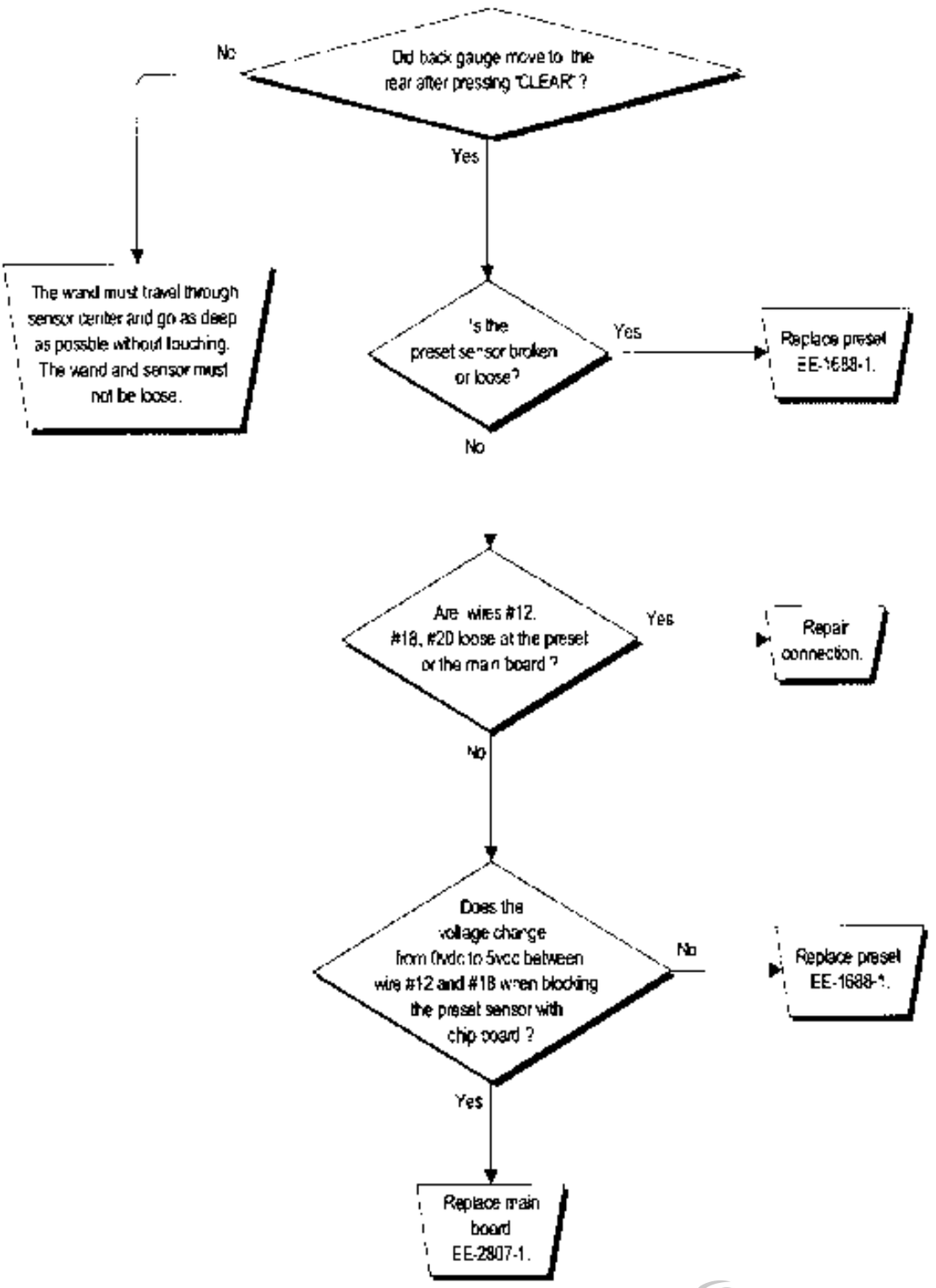
Clamp/Knife down



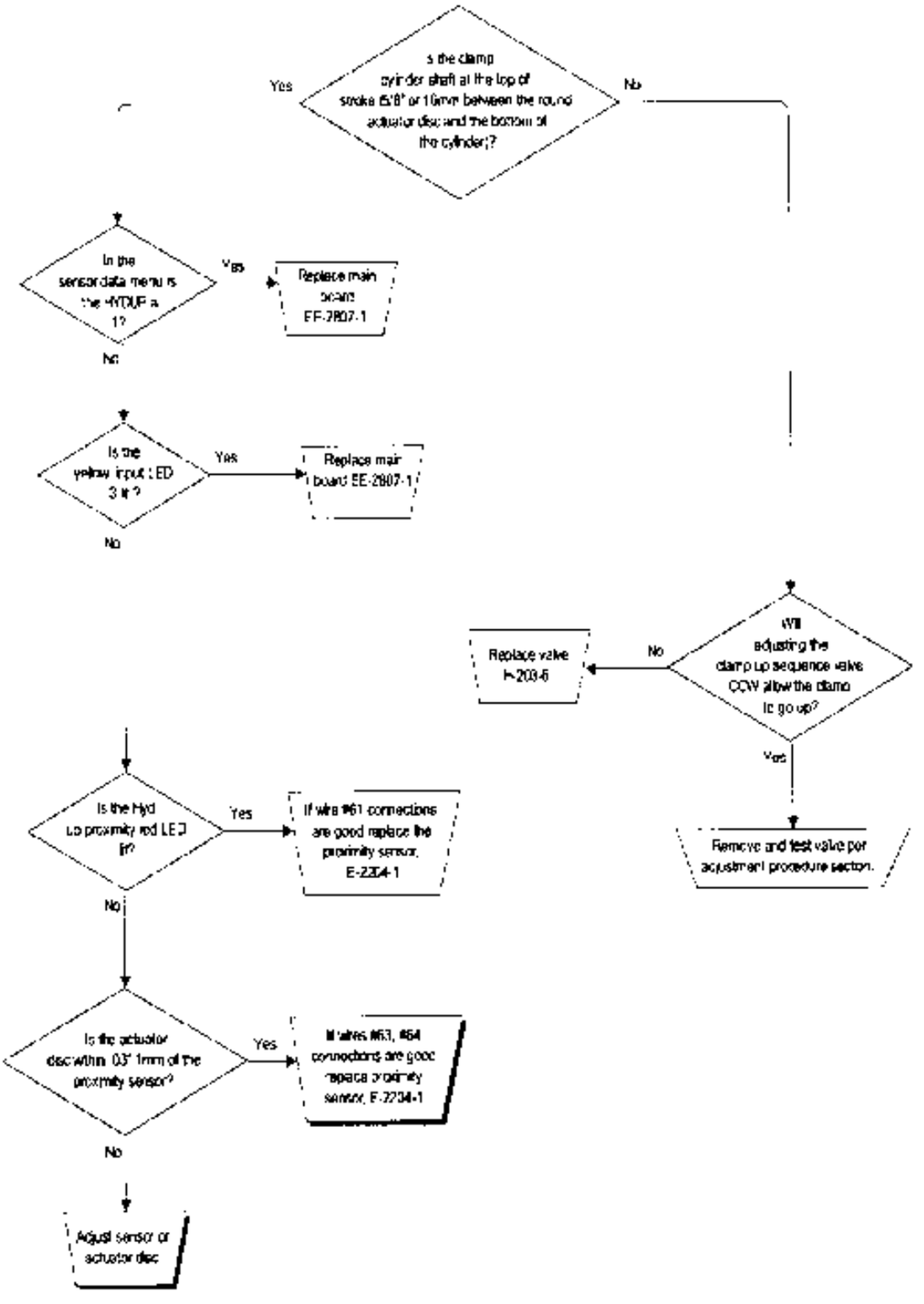
Clamp stuck down



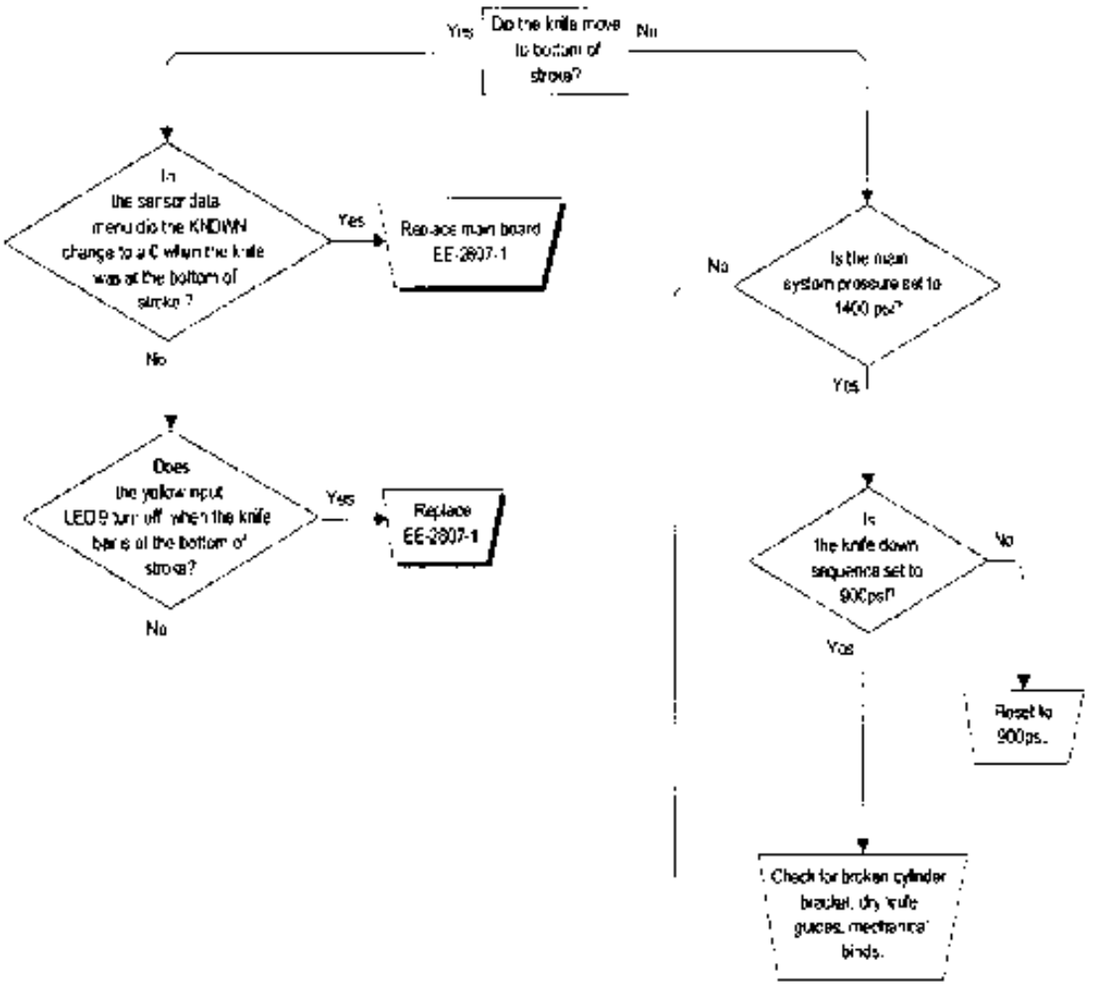
Slow backgauge movement to end of table

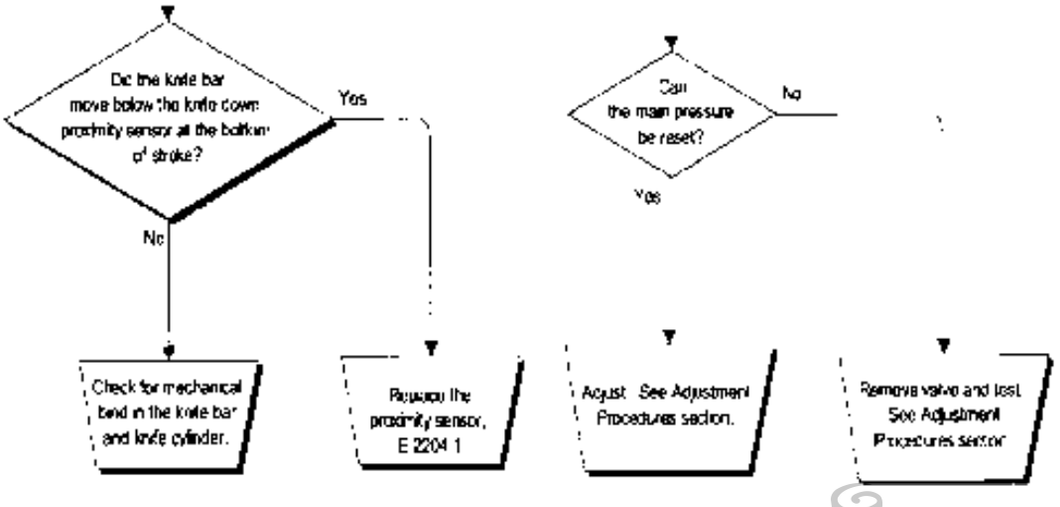


Hydraulic up failure

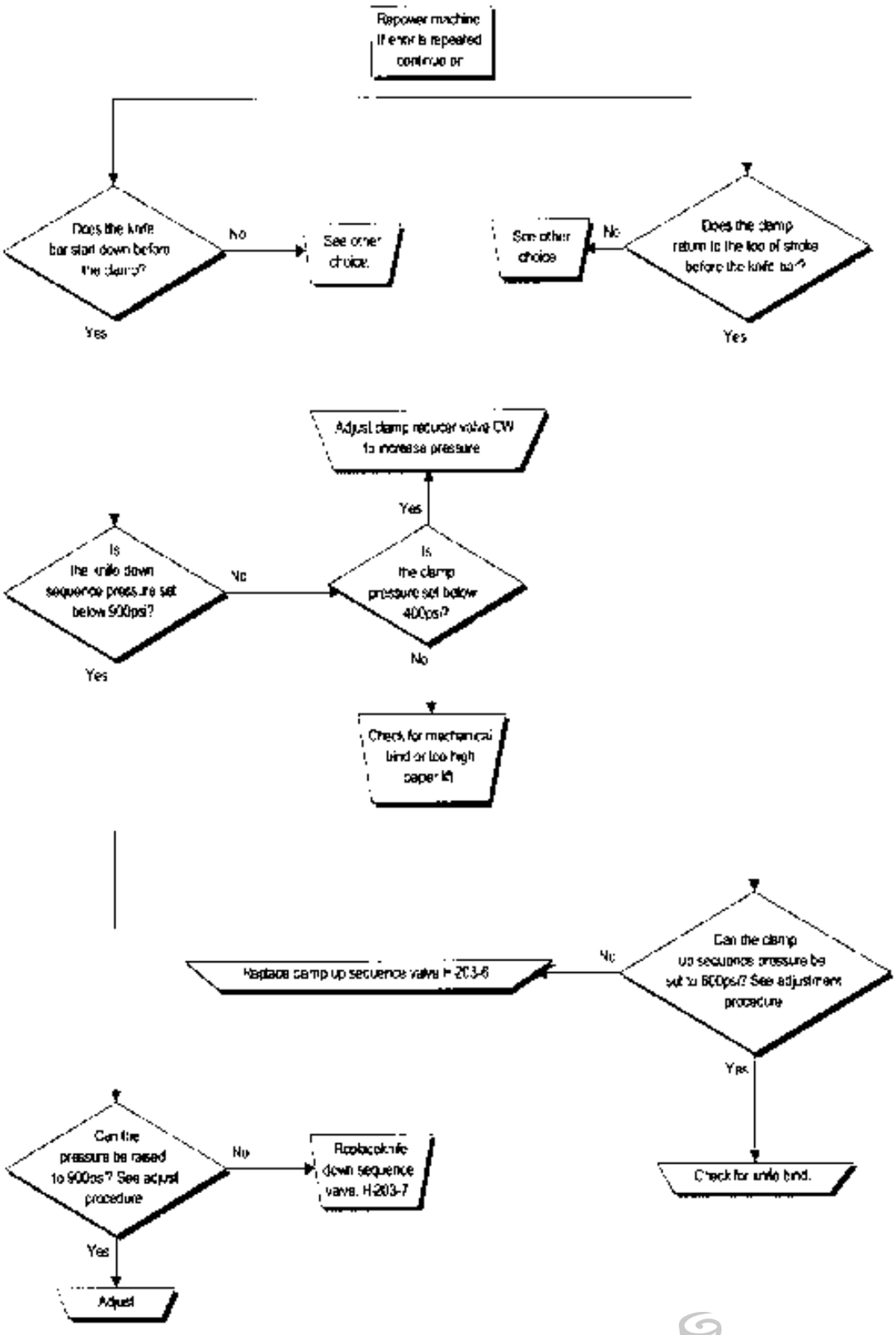


Knife down failure

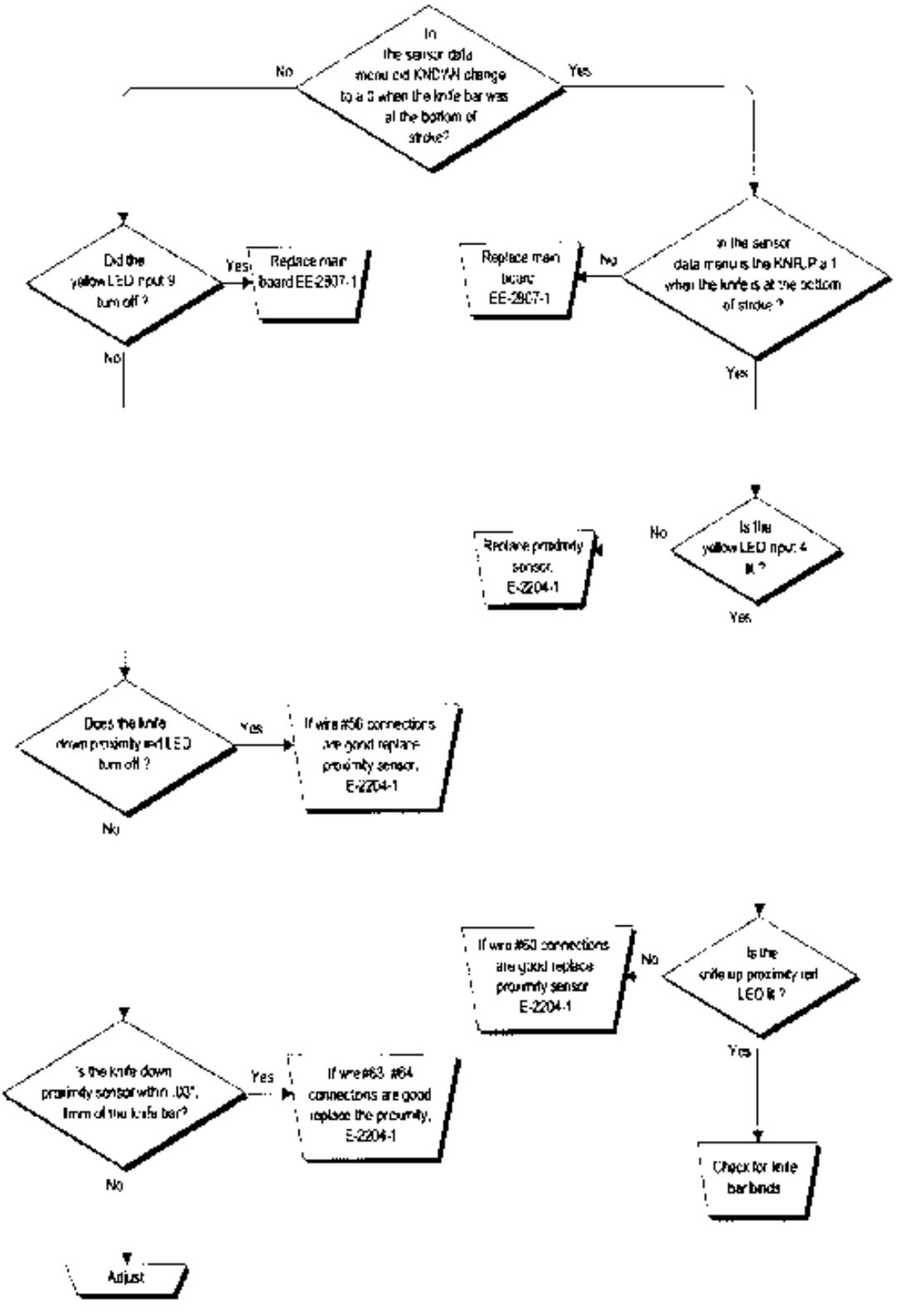




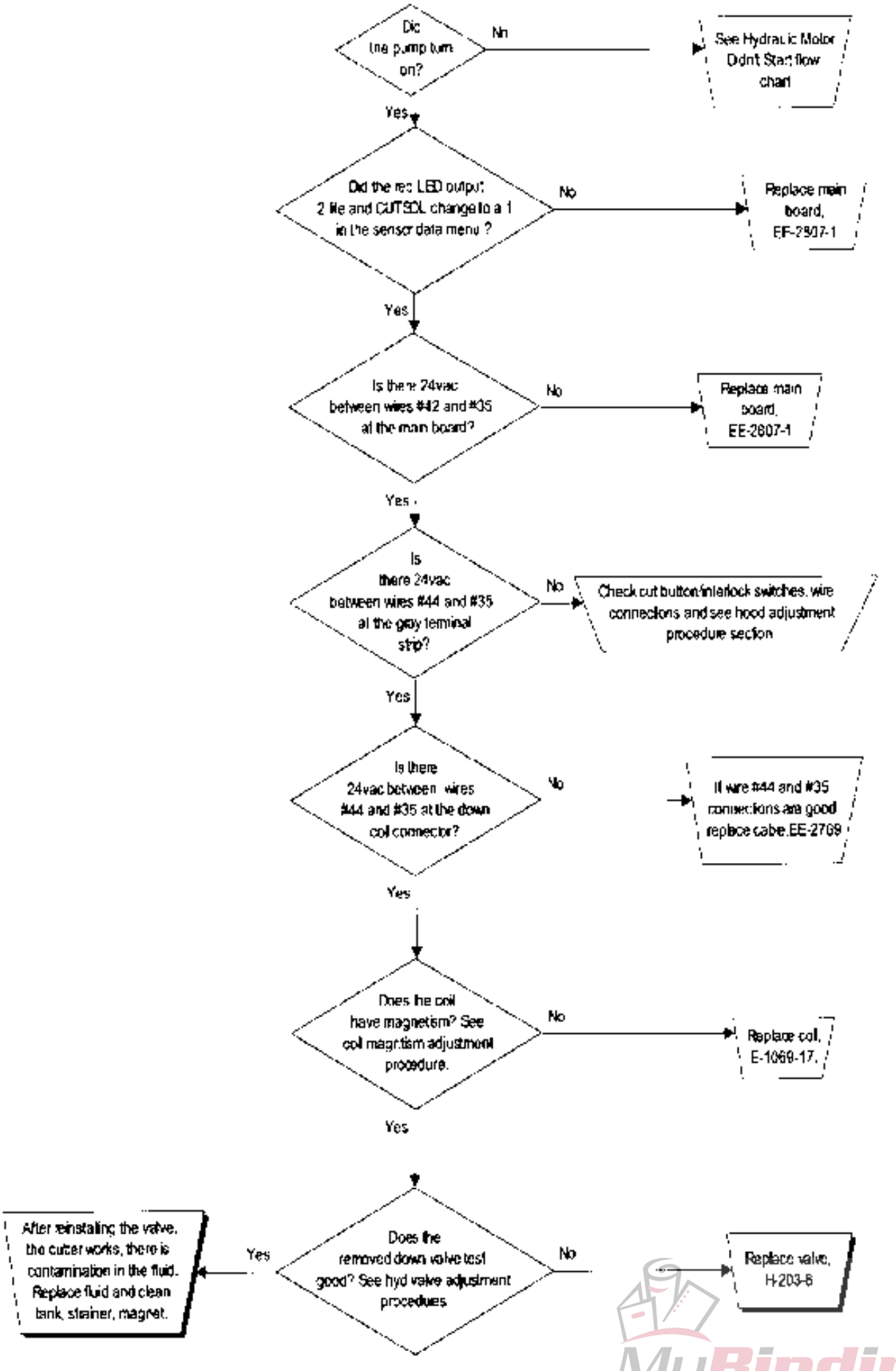
Sequence error



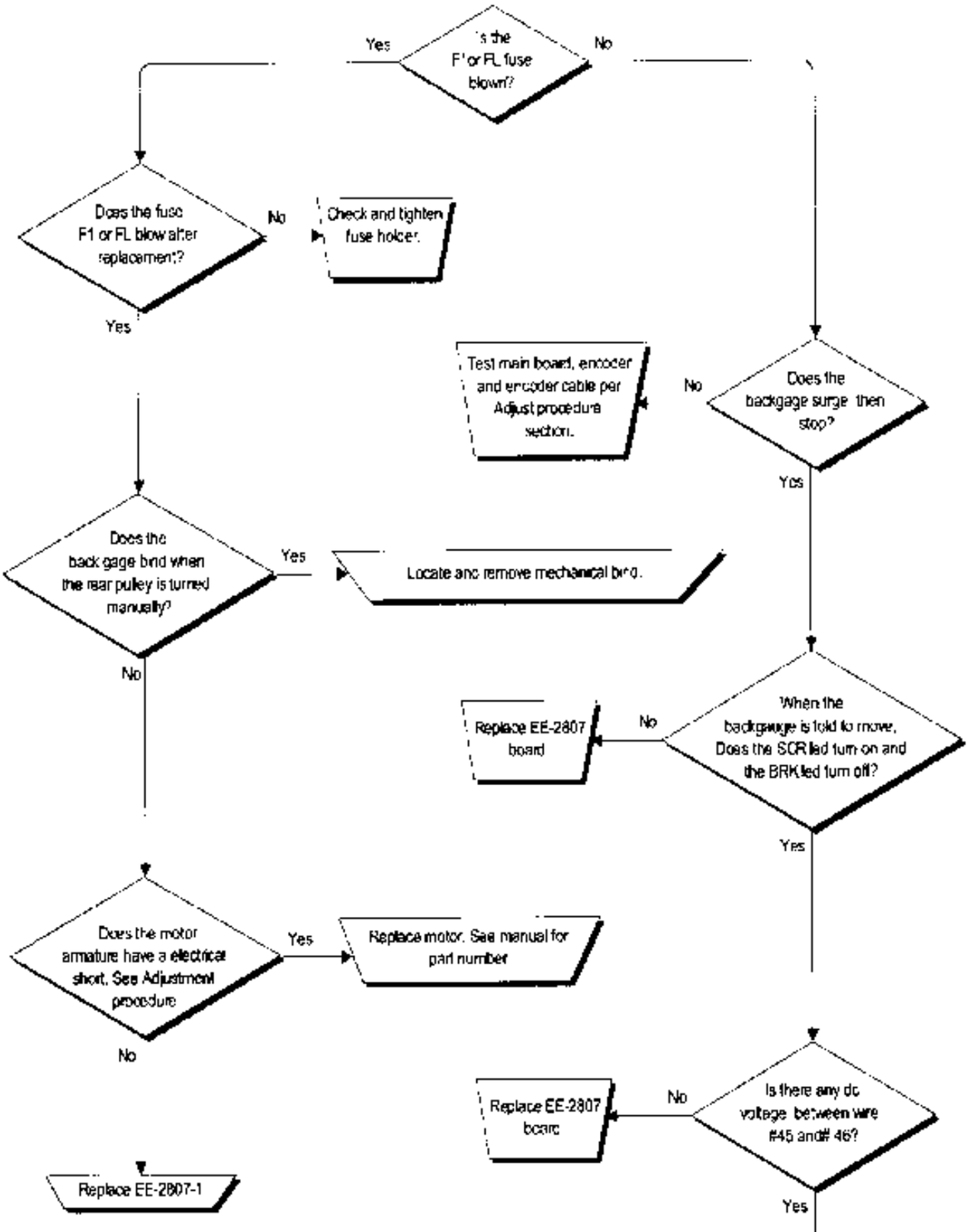
Knife at both limits



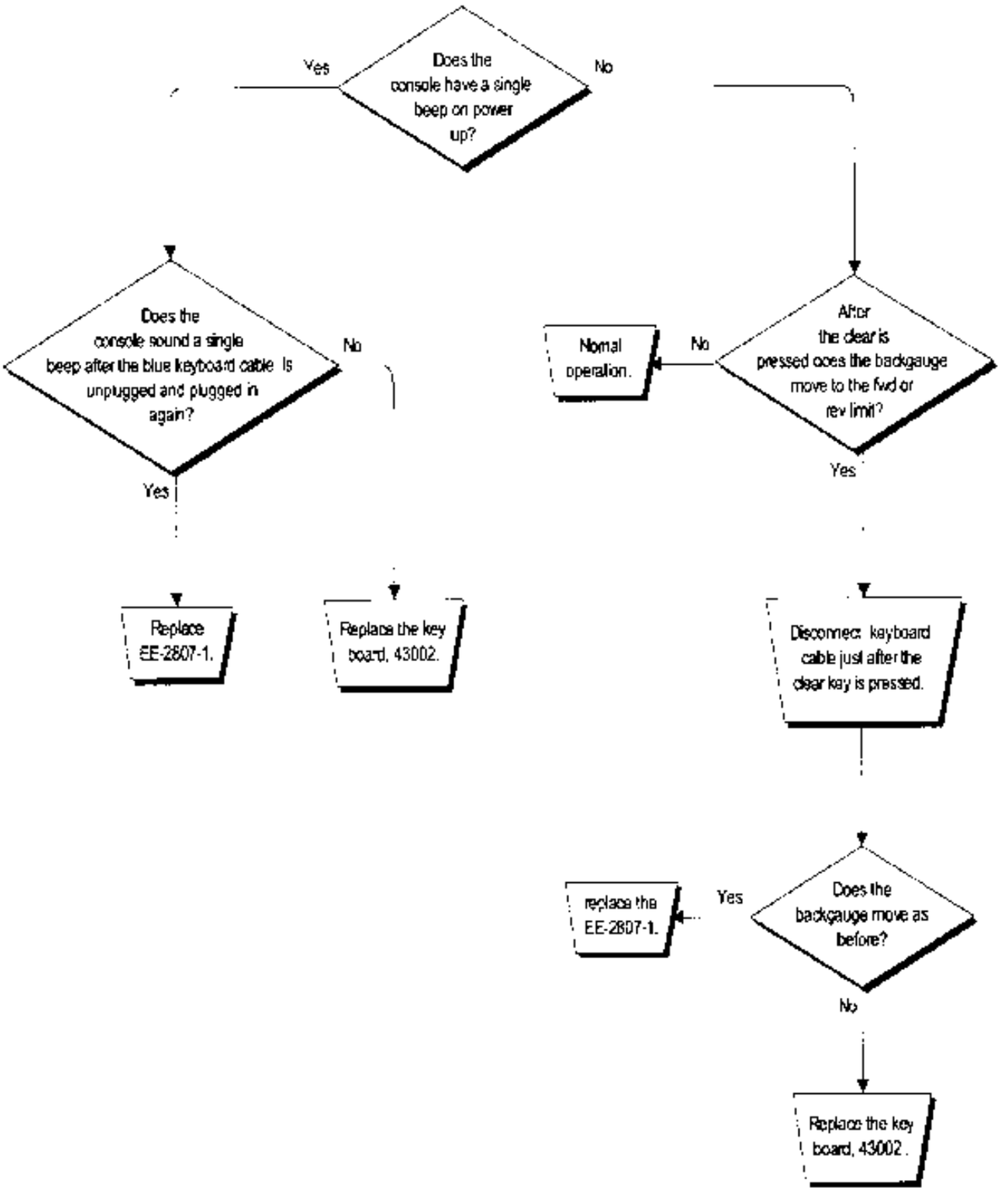
Clamp down failure



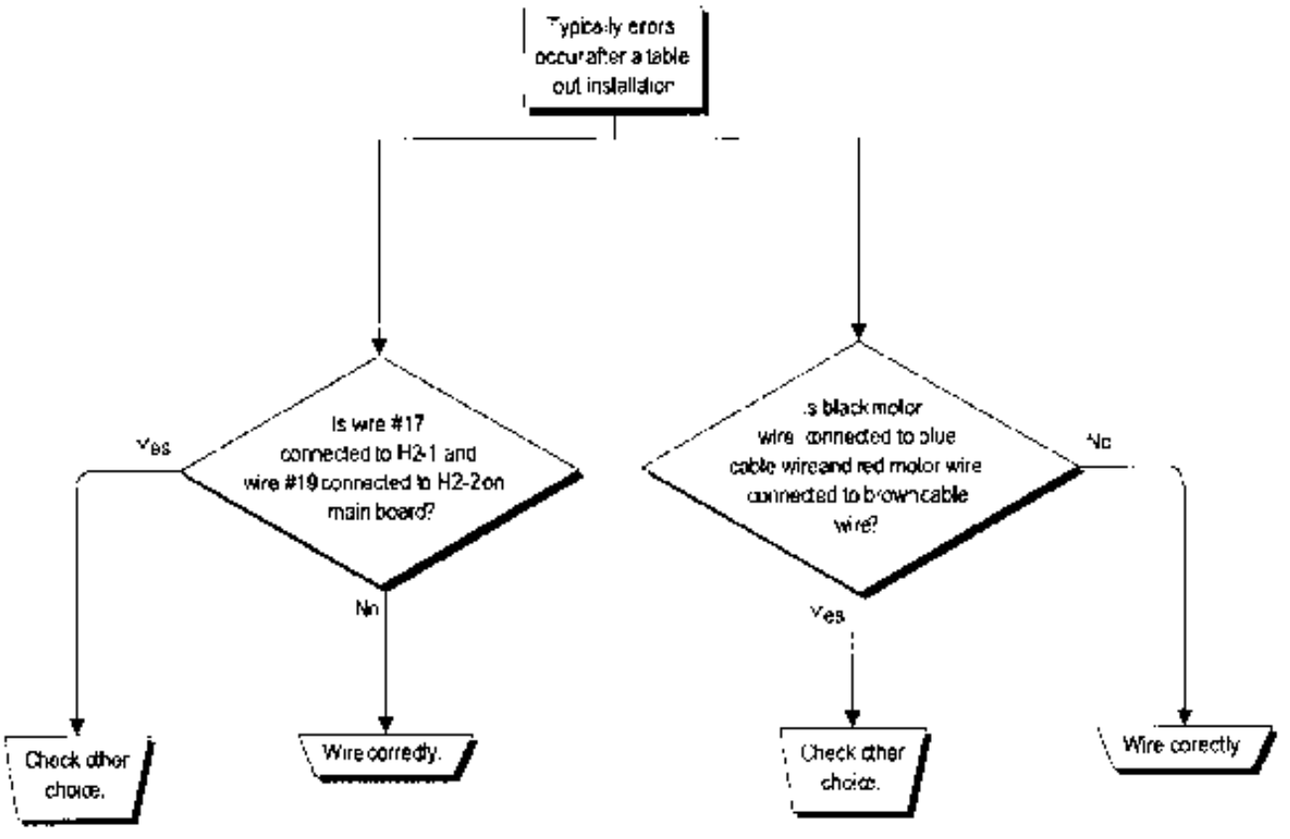
Backgauge failure



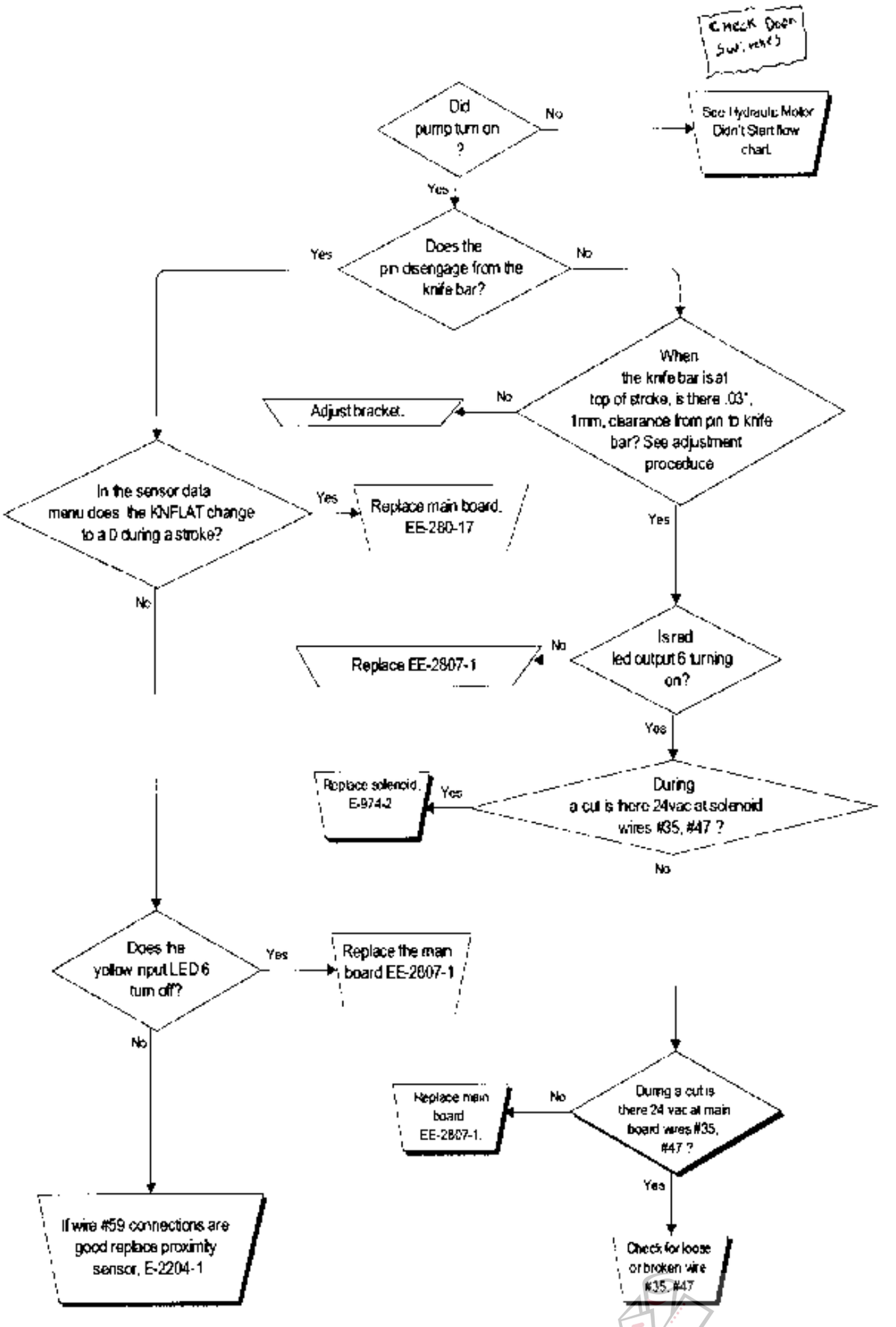
Shorted key error



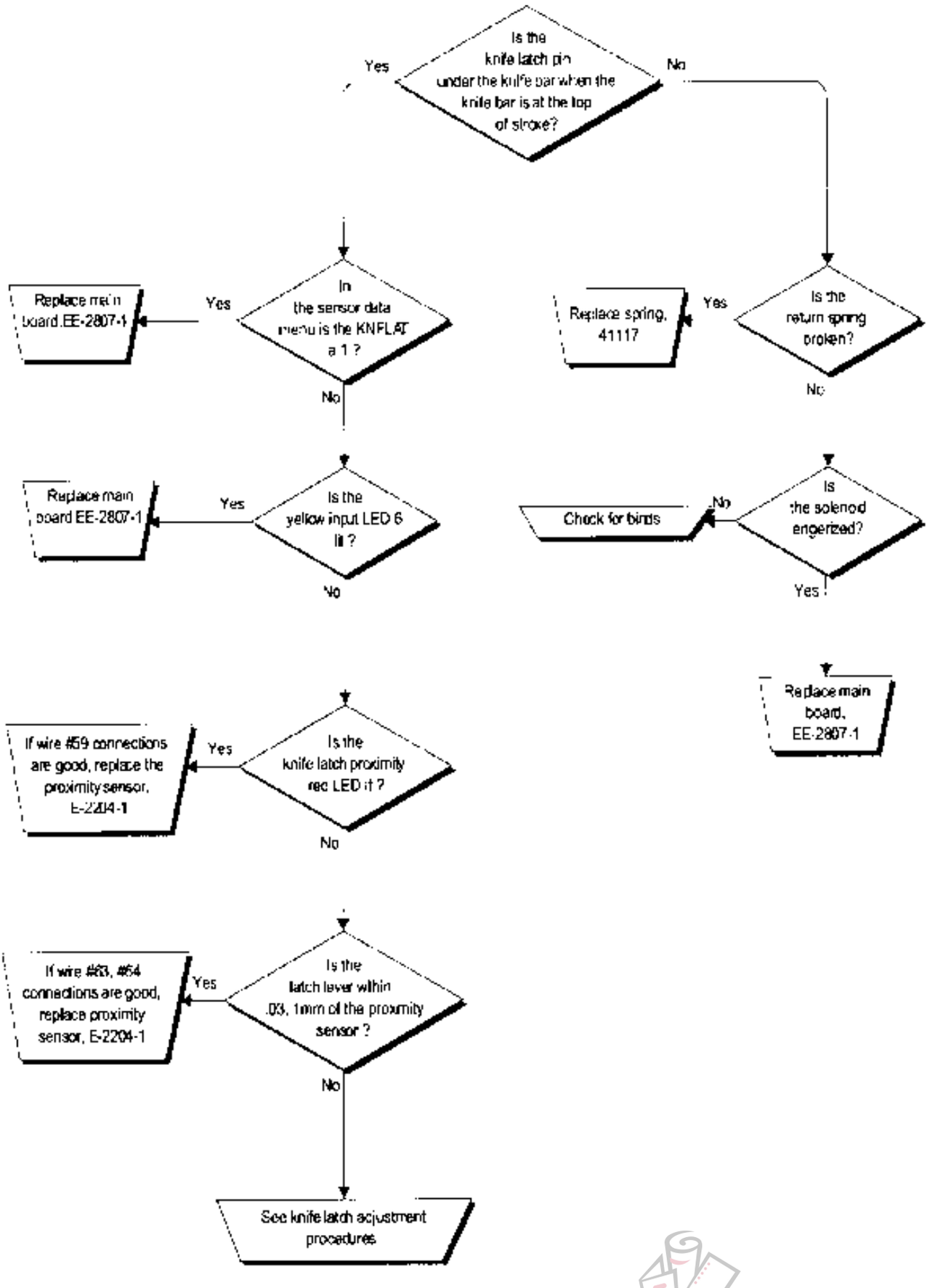
"Encoder wires 9 and 10 are reversed" or "Backgauge direction reversed"



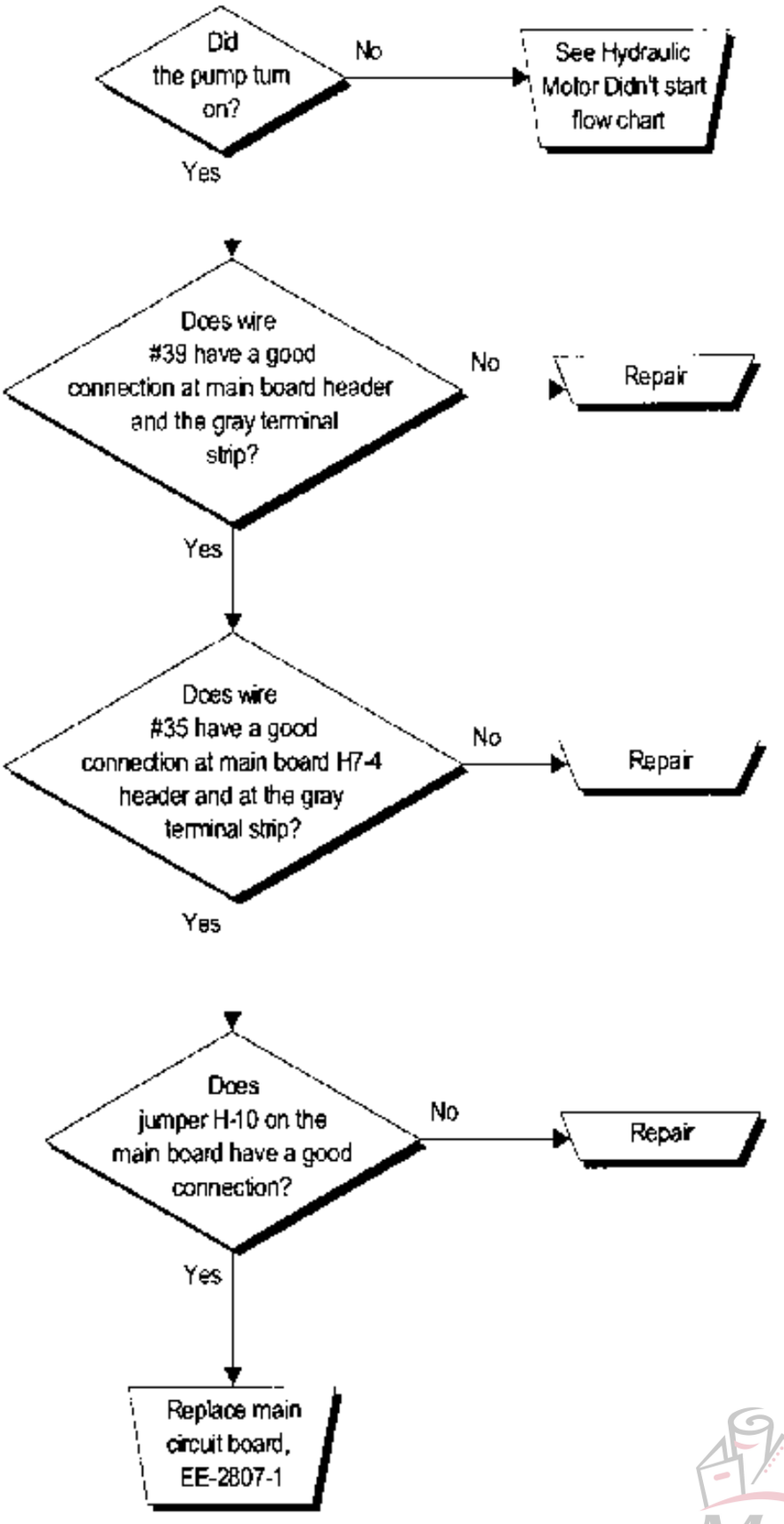
Knife latch failure 1



Knife latch failure 0



Hydraulic latch error 1



Serial Numbers 971103 & Up

INSTRUCTION AND PARTS MANUAL

TITAN 200
PAPER CUTTING MACHINE
Power Backgauge & Programmable Models

Sold and Serviced by

The Challenge Machinery Company
1433 Fulton Avenue
Grand Haven, MI 49417-1594 USA
Phone: 616-842-8300
Fax: 616-842-6511

www.challengemachinery.com

F. 200-A
Sept. 1999

INTRODUCTION

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

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. See SAFETY PRECAUTIONS, pg. viii.

- 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.
- **CUT/CRUSH HAZARD** - Keep hands from under paper clamp and knife.

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 (616)-842-8300.

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

Take a few minutes right now to **RECORD YOUR MACHINE SERIAL NUMBER** in the space provided on the front cover of this manual. Also be sure to fill out the warranty card accompanying 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 Avenue, Grand Haven, MI 49417-1594. Fax (616) 842-6511. Phone (616) 842-8300.

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

WARRANTY INFORMATION

PLEASE REVIEW THE ENCLOSED WARRANTY SHEET!

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

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

SERIAL NO - _____

UPGRADE CODE - _____

PACKING LIST

Part No.	Description	Qty.
A-10034	Knife	2
4166	Cutting Stick (in addition to one installed in machine)	3
F.200-A	Instruction and Parts Manual	1
A-12608-2	Jogging Aid	1
20-2150-2	Tool Kit	1
H-6918-608	Knife Bolts 3/8 - 16 x 1"	4
8815	Knife Washers, Special	4
5064	Cutting Stick Puller	1
S-1245-5	Knife Lifters	2
W-130	3/16" Allen Wrench	1
W-137	5/32" Allen Wrench	1
W-164	5/16" Hex "T" Wrench	1
W-170	9/16 x 1/2" Wrench	1
SU-10-113	Grease Brush	1

OPTIONAL ITEMS

Part No.	Description	Qty.
AA-10061	False Clamp Plate	
5 7 M361	Backgauge Book Guides	
4166	Cutting Sticks (in addition to one installed in machine)	

SPECIFICATIONS

Cutting Dimensions	
Cutting Width	20" (508 mm)
Minimum Cut*	½" (13 mm)
Clamp Opening	3¼" (83 mm)
Table Space	
Front	16" (406 mm)
Back	20" (508 mm)
Machine Dimensions**	
Table Height	36" (91 cm)
Overall Height	53" (135 cm)
Overall Length***	49" (124 cm)
Overall Width	36" (91 cm)
Net Weight (Approximate)	755 lbs (342 kg)
Shipping Weight (Approximate)	950 lbs (431 kg)
Electrical	
208/230 Volts (±10%)/12 Amps, 1 Phase, 50/60 Hz. AC. Service size 15 Amps	
Recommended Receptacle: 208-230 Volt, NEMA 6-15R, NEMA 6-20R	
Sound Emission	
A-weighted sound pressure level measured in an enclosed room at operator level (6 feet/183 cm)	
Machine cutting a full lift of paper	77 dB

*With false clamp plate attached, minimum cut is 1-7/8" (48 mm).

**For complete floor plan layout, see page 5-24

***With table front guard and foot treadle removed, can be fit through a 28" (71 cm) door opening

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

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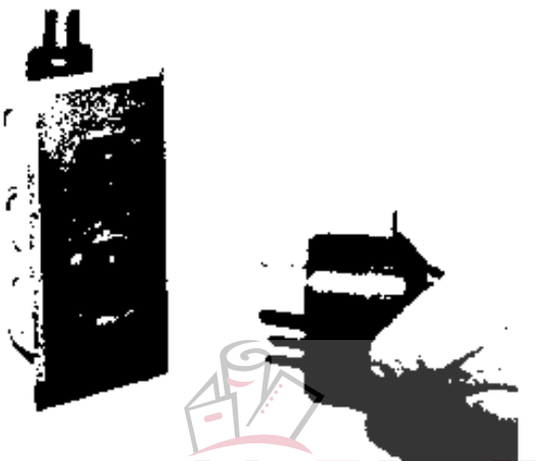
SAFETY PRECAUTIONS

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

- This machine is designed and safeguarded for ONE PERSON operation. NEVER operate the cutter with more than one person.
- Safety is the responsibility of the user of this machine. 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 - fingers and hands are too valuable to risk experimentation.
- Only trained and authorized persons should operate the cutter.
- DO NOT ALTER SAFETY MECHANISMS, 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. Turn the main disconnect switch to the off position and disconnect the power plug, see Disconnect Procedure below.
- Be sure the cutter is properly grounded.
- Be sure there is sufficient power to operate the cutter properly.
- Observe all caution plates mounted on this cutter.
- Keep foreign objects off table and away from cutter blade.
- BE EXTREMELY CAREFUL when handling and changing the cutter knife. Severe lacerations or dismemberment could result from careless handling procedures.
- Keep the floor around the cutter free of trim, debris, oil and grease.
- When replacing hydraulic parts, loosen the connections slowly to release pressure. Never loosen connections with the machine running.
- If the cutter sounds or operates unusually, turn it off and consult the troubleshooting section of this manual. If the problem cannot be corrected, have it checked by a qualified service person.
- CRUSH HAZARD, keep hand and fingers from under the clamp when clamping paper. Use Jogging Aid to load paper, and use the backgauge to push paper out before unloading. DO NOT REACH UNDER THE KNIFE AND CLAMP AREA!

CAUTION: POWER LOCK-OUT PROCEDURE

For maximum safety and to prevent unauthorized use, turn the power switch to the off position and disconnect the power cord whenever adjusting, lubricating, or making ropairs to the machine.



(fig. i)

¡OJO!

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

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

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

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

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

WARNING LABEL DEFINITIONS

SINGLE OPERATOR

Do not operate with more than one person.

SHOCK HAZARD

Disconnect power before removing cover. Replace cover before operation.

SHOCK HAZARD

Disconnect power before removing cover. Replace cover before operation.

HAZARDOUS AREA

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

1.0 INSTALLATION & SETUP

1.1 UNCRATING

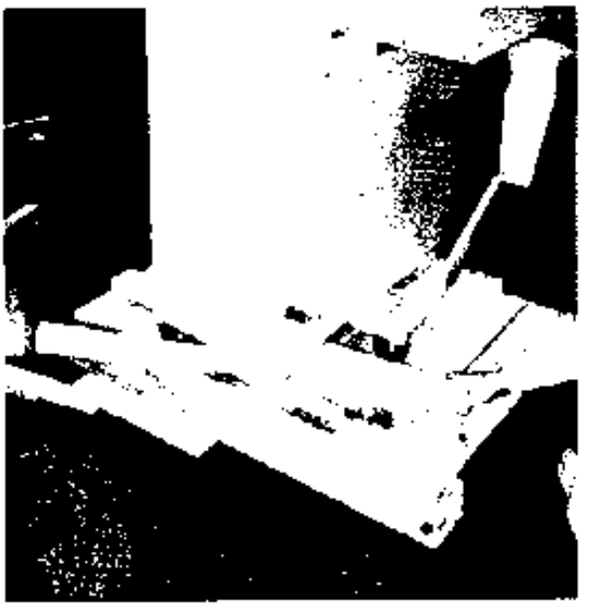
Your cutter has been carefully packaged to prevent damage during shipping. Inspect all shipments as soon as they are received. Note any damage on the freight bill and notify the claims department of the carrier within 15 days. All claims for damage are the responsibility of the receiver, so remember to inspect promptly. Check the contents of the crate against the packing list at the front of this manual.

The Titan 200 weighs approximately 755 lbs (342kg). DO NOT risk personal injury or damage by attempting to move machinery with makeshift equipment or inadequate manpower. This machine is shipped on a wooden skid and enclosed in a protective, corrugated top. The skid is designed to allow the machine to be rolled off without any special lifting equipment. The machine is held in place by two, 2x4 braces lag bolted to the skid. All accessories are shipped inside of the machine.

Remove the carton by removing the nails or staples holding it to the skid and lift it straight up over the cutter. If you don't have the ceiling clearance to do this, carefully slit the carton down the side and then unwrap it from around the cutter.

Remove all lag screws from the skid. Remove the lower front cover of the Titan 200 and remove the two lag screws in the base. Remove the accessories.

Using the rear bumper board, pry one side of the machine up, and slide out the top layer of the support riser (fig. 1-1). Do the same on the other side.



(fig. 1-1)

(fig. 1-2)

Use the flat board provided as a ramp and position as shown in fig 1-2. Hold the ramp in place with the nails provided. Make sure the casters are not locked and very carefully roll the machine down the ramp.

The cutter may now be rolled into position.

1.2 CLEANING

After unpacking, wipe down all machine panels and clean the table surface.

1.3 FITTING THROUGH NARROW DOOR

The Titan 200 cutter will not fit through an opening less than 36" (91 cm) without the table being removed. With the table removed, the Titan 200 will fit through a 35" (89 cm) opening. With the table, front guard, and foot treadle removed, it will fit through a 28" (71 cm) opening.

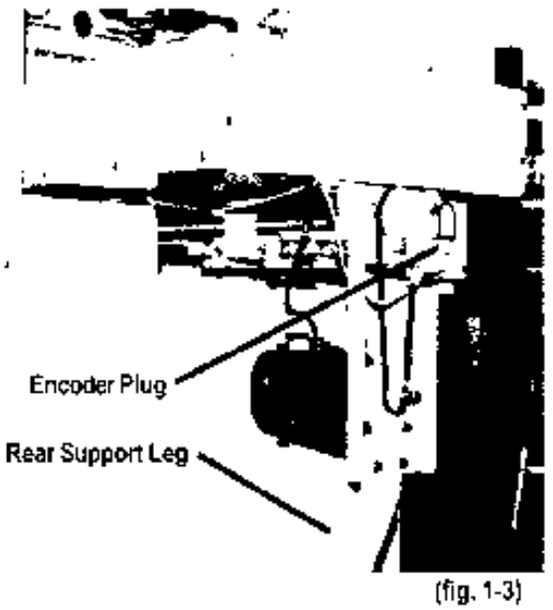
1.3.1 Removing the Table

Make sure the knife and clamp are in the "up" position. If they are not, read the Power Hookup section (section 1.7) to connect power to the machine. Turn on the power using the red and yellow main power switch, close the front guard, and press the CLEAR button. This will preset the backgauge and send the knife and clamp up.

Turn off the machine and unplug the power cord.

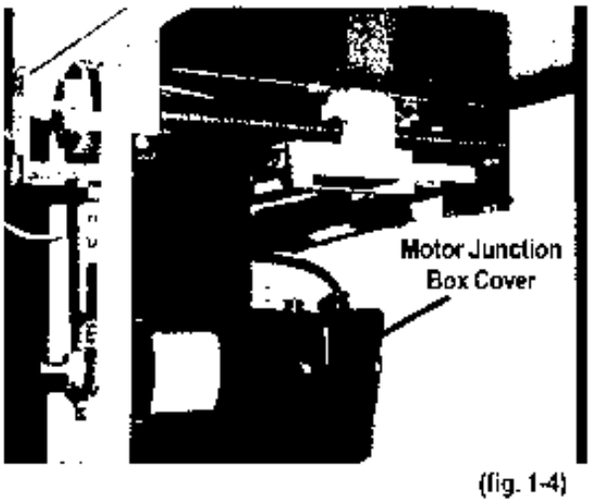
Remove the plexiglass cover and the three sheet metal covers on the rear of the table. Remove the backgauge motor cover, the rear table support leg, the lower back panel, and the lower front cover of the machine.

Unplug the cable to the motor encoder at the back of the machine (fig. 1-3).



(fig. 1-3)

Remove the motor junction box cover and disconnect the wires to the motor (fig. 1-4). Remove the leadscrew cover and the nylon tyraps that are attached to the bottom of the table. The motor wires and encoder wires should now be free from the table.

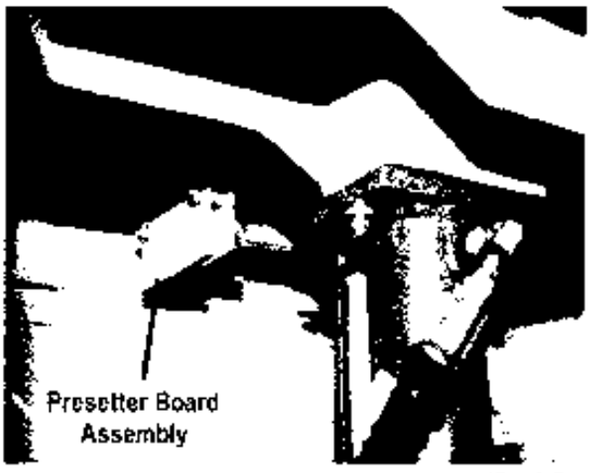


(fig. 1-4)

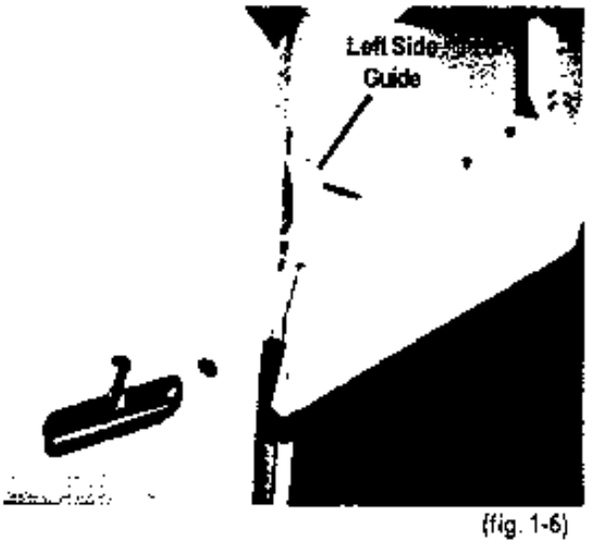
From the rear of the machine, remove the presetter board assembly from the table (fig. 1-5).

Open the front guard, open the top cover and remove the left and right side guides and the cut stick stops as shown in figures 1-6 and 1-7.

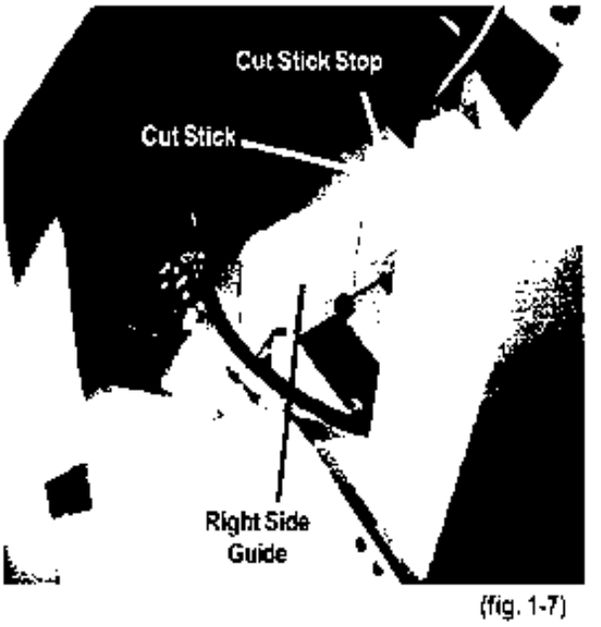
Next, remove the cut stick from the table using the cut



(fig. 1-5)



(fig. 1-6)



(fig. 1-7)

stick removal tool and tap out the two taper pins from the bottom side of the table. Then remove the four screws that mount the table to the base. NOTE: the table assembly is very heavy and requires two people to remove. Pull the table out from the back of the machine. Locate the four round spacers that were between the table and the base - you will need them

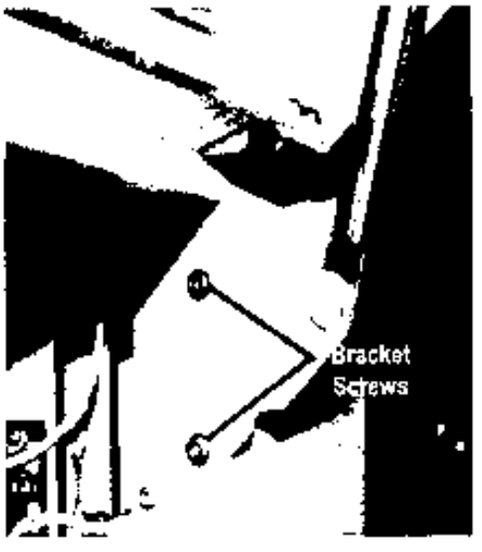
later for mounting the table.

1.3.2 Removing the Foot Treadle

Make sure the power is off and the power cord is disconnected. Remove the lower front cover. Use an open-end wrench to remove the two cables attached to the base, which hold up the foot treadle. Carefully, remove the springs. Now remove the pins at the rear pivot points of the foot treadle. Remove the treadle.

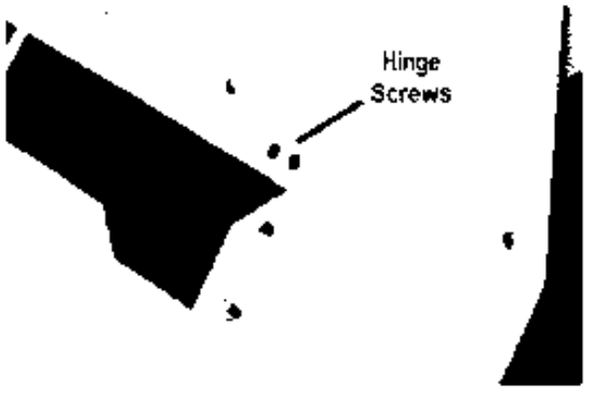
1.3.3 Removing the Front Guard (If Equipped)

Make sure the power is off and disconnect the power cord. Open the front guard. Remove the cylinder bracket screws (fig. 1-8).



(fig. 1-8)

Then open the top hood and remove one set of hinge screws (fig. 1-9). Slide the front guard out of the other hinge.

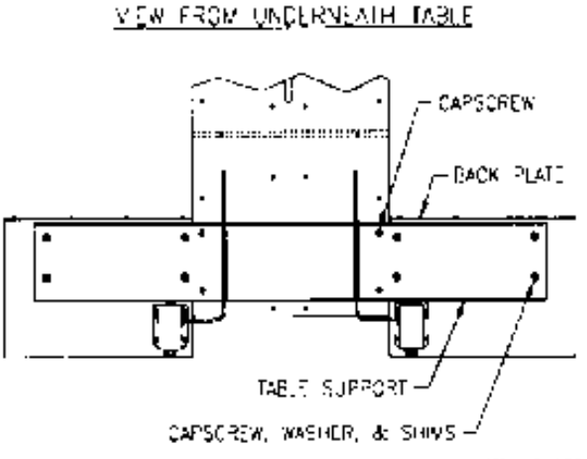


(fig. 1-9)

1.3.4 Reattaching the Table

Set the table in position. Lift the table from the front and set the two front spacers in place. Insert the front two socket head screws, but do not tighten. Lift the table from the rear and set the two rear spacers in place. Start the rear two socket head screws. Reinsert the two taper pins, and tap into position so they are below bottom of the slot. Tighten all four screws. Attach the right and left side guides (fig. 1-6 & 1-7) the presetter board assembly (fig. 1-5), the motor and encoder wires (fig's. 1-3 & 1-4), and all guards and panels. Once the table is installed, the backgauge squareness and accuracy will have to be reset. See sections 2.12.2.4 Accuracy Adjust and 4.7.2 Squaring the Backgauge.

1.4 INSTALLING EXTENSION TABLES



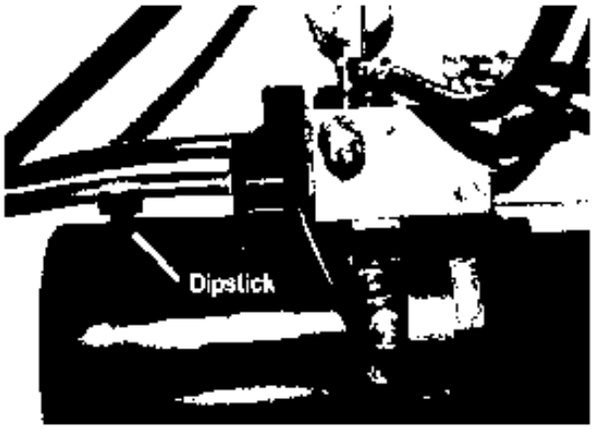
(fig. 1-10)

Using the wood screws provided, attach a back plate to each extension table. Using (4) 3/8-16 capscrews, attach the table support to the under side of the main table as shown in fig. 1-10. If the machine is equipped with 2-hand cut buttons, route each cut button wire through the slots in the bracket and relocate the cut buttons to the extension tables (as shown). Place the provided flat washers on the table support above each slot receiving a screw to mount the extension table on the support. Lay the table extension on top of the spacers and insert the screws. Slide the table extension tight to the table. Shim the extension tables as necessary to make the tables flush using the provided shims.

1.5 HYDRAULIC SYSTEM CHECK

The cutting/clamping mechanism of the Titan 200 is powered by a hydraulic system consisting of an electric motor coupled directly to a hydraulic pump.

The hydraulic reservoir holds 4 quarts (1 gallon) of hydraulic fluid. It is filled with Rykon 100 hydraulic fluid at the factory but should be checked before operation. Remove the lower rear panel cover and unscrew the cap on top of the tank (fig. 1-11). Fluid level should be at 1/8" from the end of the dip stick (check with dip stick cap screwed in). Add fluid if necessary but avoid



(fig. 1-11)

overfilling as this could cause leakage when hot. Replace the rear panel when finished. For more information about checking and changing the hydraulic fluid including a cross reference chart of approved fluids, see section 4.5 of this manual.

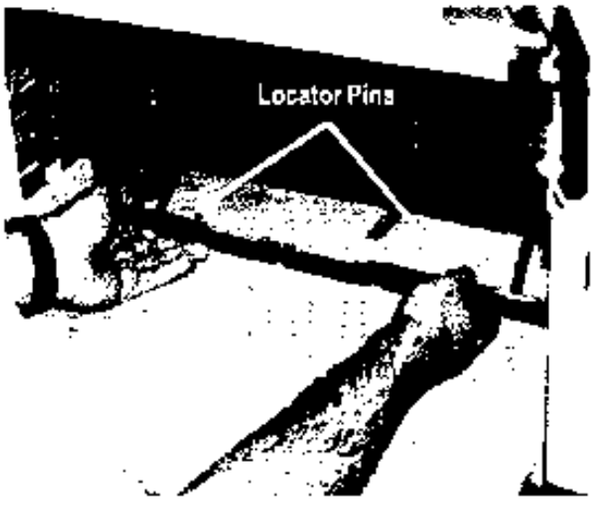
The hydraulic fluid should be checked weekly and changed **AT LEAST ONCE-A-YEAR** or after every 1,000 hours of operation.

1.6 FALSE CLAMP PLATE (OPTIONAL)

To prevent marking on pressure sensitive jobs, a false clamp plate is available as an optional item for your machine. This plate attaches to the bottom of the clamp. It is secured with wing nuts on studs that pass through the top of the clamp.

To install:

1. Make sure the knife and clamp are in the up position. If they are not, turn on the power using the red and yellow main power switch, close the front guard, and press the CLEAR button. This will preset the backgauge and send the knife and clamp up.



(fig. 1-12)

2. Turn the power off and disconnect the power cord.

3. Open the front guard and slide the false clamp plate under the knife and clamp (fig. 1-12), and slide the plate up into position with the locator pins toward the front of the machine. The locator pins insert into holes in the bottom front of the clamp.

4. Hold the plate in position and secure with the wing nuts provided.

5. Change the false clamp setting of the machine to ON to **prevent the backgauge from crashing into the false clamp plate.** This is done in the Maintenance Mode/Parameters/False Clamp screen. For more details on how to do this, see section 2.12.2.1.

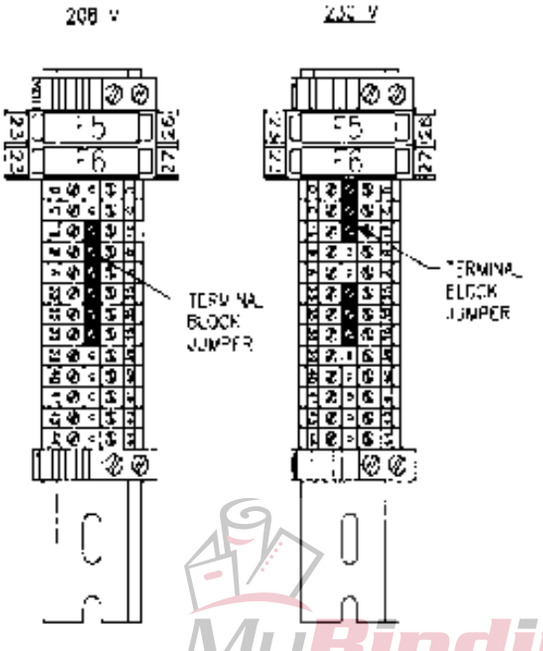
NOTE: The minimum cut with the false clamp plate attached is 1-3/4".

1.7 POWER HOOK-UP

CAUTION: NEVER CUT THE GROUND LUG OFF of a 3-prong plug to fit a 2-prong socket! You run the risk of electrical shock which could cause personal injury or death.

It is the customer's responsibility to provide a properly grounded receptacle that meets the power requirements specified on the name plate of this machine, as well as all local electrical codes. Have a qualified electrician install one if your location is not so equipped.

Check incoming voltage and position the voltage selection jumper in the proper location as shown below:

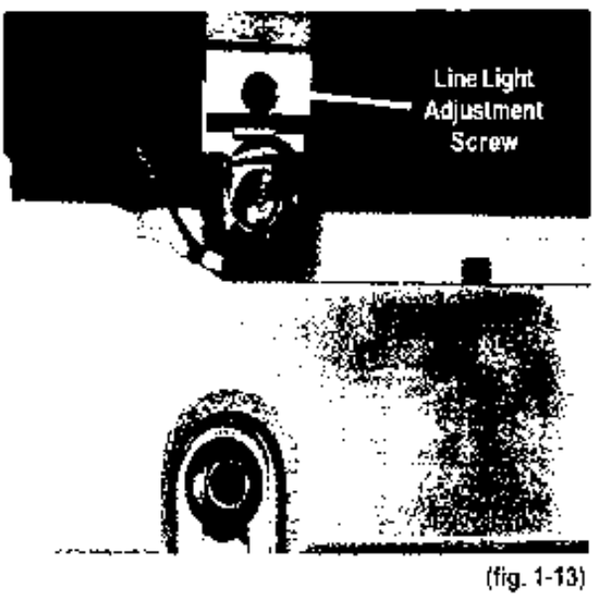


NOTE: The terminal block jumper must be set to the correct location according to the supply voltage of the machine. Failure to set the terminal block jumper will cause damage to the machine!

Connect the power cord into a grounded, 3-prong receptacle only! (Recommended receptacle: 208-230 Volt, NEMA 6-15R, or NEMA 6-20R.)

1.8 LINE LIGHT

The Titan 200 is equipped with two lights which provide a line of light on the paper in the approximate location of where the paper will be cut. The lights come on when power to the machine is turned on. The light from each bulb reaches the table after passing between the knife and clamp. Each light is focused with a socket head capscrew (fig. 1-13).



(fig. 1-13)

1.8.1 Adjustment

1. Place a wide sheet of paper on the cut stick to view the line light.

2. Using a 3/16" hex allen wrench, turn one of the cap screws until you see a 1/16-1/8" beam. Note: it is best to start by turning the screw clockwise. If the screw turns all the way in before a line appears, begin turning the screw counterclockwise.

3. Similarly, turn the adjustment screw of the other bulb, until one continuous beam is seen across the cut stick.

1.8.2 Bulb Replacement

1. Make sure power is off and unplug the machine (see power lockout procedure, pg. viii).

2. Open the front guard.

3. Remove the old bulb by lightly pushing the bulb into the socket and turning it counterclockwise. CAUTION! If the bulb is still hot, allow a few minutes for it to cool.

4. Insert the new bulb into the socket and twist it clockwise until the bulb locks into place.

5. Reconnect power and turn the main power switch on. Readjust the line if necessary.

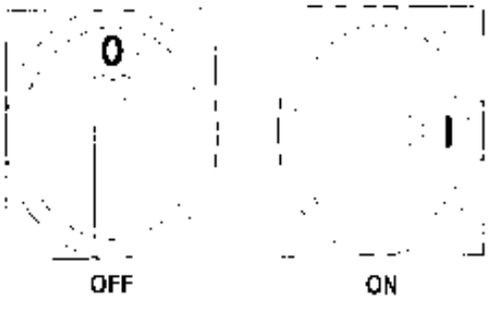
NOTES

2.0 OPERATION

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

2.1 POWER - MAIN SWITCH

Power is brought to the machine when the main power switch is turned to the "ON" position (fig. 2-1). The display and line lights are turned on at this time. The hydraulic motor will not be activated until a cut cycle is initiated, and it will shut off after the completion of the cut cycle.



(fig. 2-1)

The display and line lights will shut off after 5 minutes without any activity. This shut-off time can be changed in the Parameters screen of the Maintenance Mode (see section 2.12.2.2). To restore power to the display and line lights, press any button on the keyboard or lift up the front guard (if equipped).

2.2 START UP

Once power has been turned on, the Titan 200 will show the following display:

55.000 in
Backgauge must move to be preset.
Please clear the table and close guard
Warning! Clamp and Knife may move.
Revision 1.0

Press clear to start
A) Maint
B) Job

When the CLEAR key is pressed the clamp and knife will move up if they are not already in the up position (provided the front guard is closed). Then the backgauge will move to coordinate the true position into the computer. When finished, the machine will be in "Send Mode" and the display will appear similar to the display shown below.

5.000 in
>

A) Maint
B) Job

The backgauge may now be sent to a desired position by simply typing the dimension and pressing SEND (see section 2.11 Send Mode for more details).

2.3 MAKING A CUT (Using OPTIONAL Two-Hand Cut Buttons)

Place the paper against the backgauge and left side guide. Note: if the cut will leave strips of paper less than 1/2" wide, place the paper against the right side guide. This will prevent the strips from getting caught in the small opening near the left side guide.

To make a cut simply press both cut buttons (located beneath the front face of the table) within 1/2 second of each other. Hold the buttons in until the knife reaches the table. Releasing the cut buttons at any time during the cut cycle will immediately send the knife and clamp to the up position.

2.4 MAKING A CUT (Using Front Guard)

Open the front guard and place the paper against the backgauge and left side guide. Note: if the cut will leave strips of paper less than 1/2" wide, place the paper against the right side guide. This will prevent the strips from getting caught in the small opening near the left side guide.

To make the cut, close the front guard and press the cut button. If the guard is raised at any time during the cut cycle, the knife and clamp will immediately return to the up position.

Note: The guard must be opened and closed each time a new cut is made.

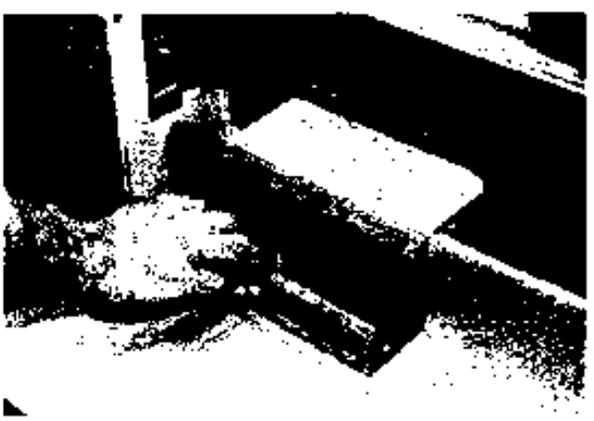
2.5 JOGGING AID

A jogging aid is included as standard equipment with the Titan 200. This tool allows the operator to load and align paper without the need to place hands or arms under the knife or clamp.

To use, load the paper against the side and backgauge using the jogging aid (figs. 2-2 & 2-3). Remove the jogging aid from the table, close the guard, and make the cut.

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

(fig. 2-2)



(fig. 2-3)

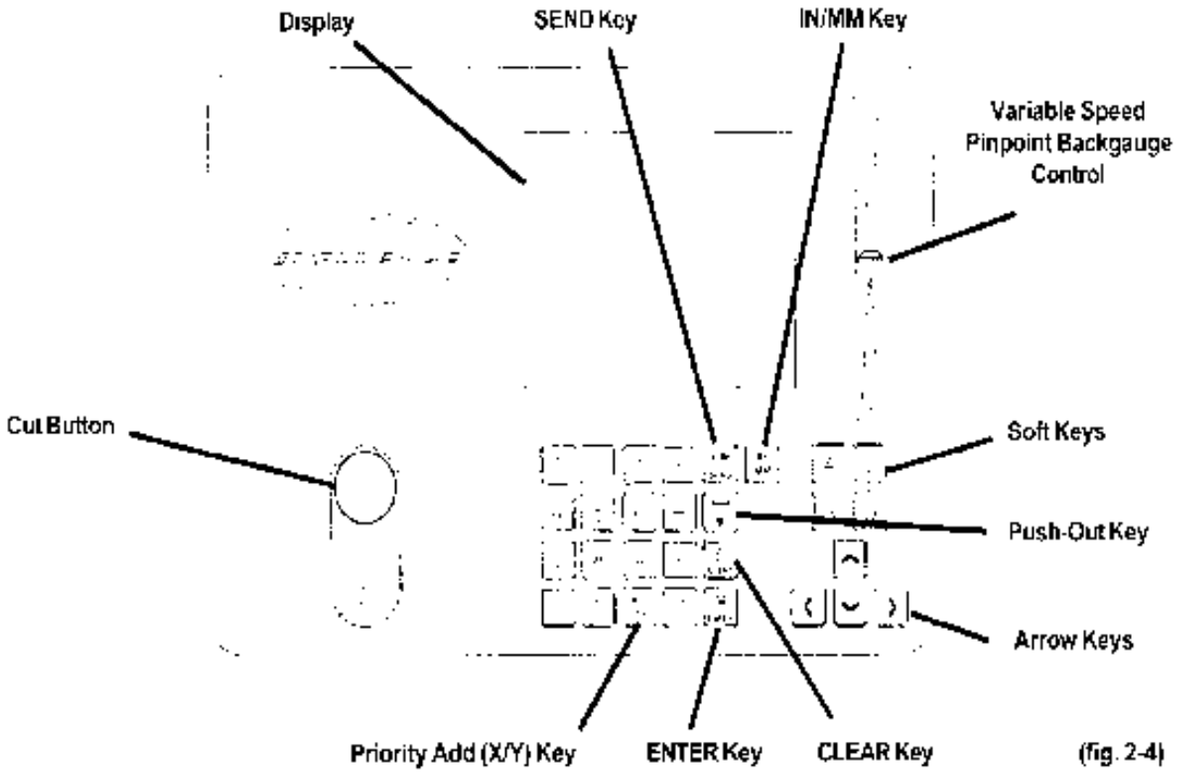
2.6 KNIFE CHANGE ALARM AND LUBRICATION ALARM

Titan 200 has two built in alarms that will be displayed after a certain number of cuts. The knife alarm displays a message to remind the operator to change the knife. The lube alarm displays a message to remind the operator to have the machine lubricated. The lube alarm will also display the name and phone number of the Challenge dealer from which the machine was purchased. For instructions on how to reset either alarm or to change the knife alarm value, see section 2.12.2.5 Knife Count. The lube alarm value is factory set at 2,500 cuts and cannot be changed.

2.7 MANUAL CLAMPING (Using the Foot Treadle)

The Titan 200 is equipped with a manual clamping feature which allows the operator to manually clamp paper before beginning the cut cycle. To use this feature, press down on center of the foot treadle until the clamp comes down on the paper. While holding the foot treadle down, close the guard and press the cut button. Release the foot treadle once the cut has been completed.

2.8 DISPLAY PANEL



(fig. 2-4)

2.9 DEFINITION OF KEYS

2.9.1 Variable Speed Pinpoint Backgauge Contol

The backgauge control is used to manually position the backgauge. The speed of the backgauge will depend upon where the actuator is pressed. Press farther from center for a faster speed. Press toward the operator for forward direction and away from the operator for reverse direction.

2.9.2 IN/MM Key

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

2.9.3 SEND Key

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

2.9.4 Push-Out Key

The push-out key will move the backgauge forward 5 inches (or to the most forward position) and then return it to its previous position. This allows paper to be removed from the cutter without putting hands under the knife and clamp.

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

2.9.5 Clear Key

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

2.9.6 Enter Key

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

2.9.7 Priority Add (X/Y) Key

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

2.9.8 Soft-Keys

The soft-keys are labeled as A, B, C, and D. The definition for these keys change depending on the operating mode. The function of the key can be found on the bottom of the display screen.

2.9.9 Arrow Keys

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

2.9.10 Contrast Control

The contrast of the display can be adjusted by using the contrast control knob, which is located directly behind the display panel, sticking out of the display panel cover. To access, open the front guard, reach in with your left hand until you feel the knob, and adjust the contrast as necessary.

2.10 MANUAL BACKGAUGE CONTROL

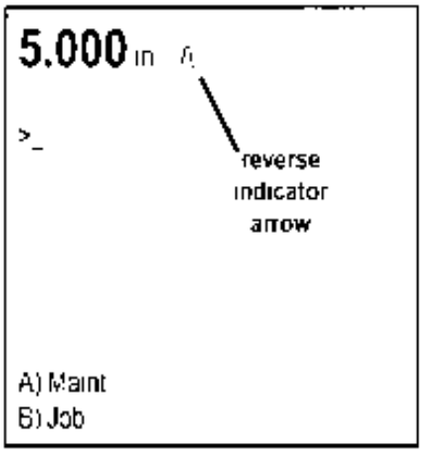
2.10.1 Backgauge Glide Control

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

2.10.2 Backlash Indicator

To insure accurate cuts, the backgauge must be brought to the cut position from the rear of the table. In the display, to the right of the backgauge positon, there is a small arrow to indicate reverse travel (fig. 2-5). This arrow should be off when making a cut. Moving back past your cut position, then forward to it, compensates for any play in the backgauge nut and leadscrew.

2.11 SEND MODE



(fig. 2-5)

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

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

2.11.1 Entering Math

In the simple send mode, the Titan 200 is capable of calculating an entire math string such as: 10-5+5x6+2_3/4. However the result is limited to 29999.000 and the result cannot be a negative value. In the job mode, and during a send, the result of the calculation must be less than the backgauge limit of 20.000 inches.

2.11.2 Entering Fractions

Fractions are entered with the priority add key X/Y. The symbol displayed when this key is pressed is the underline symbol "_". This instructs the computer to add the fractional portion of the entry before performing the remaining math. This key is useful when entering a formula as follows: 3x2_3/4 = 8_1/4. If a simple plus had been used instead, the result would be as follows: 3x2+3/4 = 6_3/4.

2.11.3 Upgrading Power Backgauge Models to Programmable Models

In Send Mode power backgauge models will display "B) Upgrade" instead of "B) Job". Call your authorized Challenge dealer if you wish to purchase the upgrade code that will upgrade your machine to a programmable model.

If you have purchased the code and wish to upgrade your machine, press the soft-key B to go to the upgrade screen. Type in the upgrade code and press ENTER. If the code is correct, the machine will be upgraded to a programmable model and the display will return to the Start Up screen. Soft-key B should now read "Job" instead of "Upgrade".

NOTE: Upgrade codes can only be obtained from The Challenge Machinery Co. through authorized Challenge dealers. Each machine has a unique upgrade code that will not work on other machines. Please have the machine serial number (as displayed in the lower left corner of the display, or on the machine nameplate) ready when calling, as it is necessary to obtain the code.

2.12 MAINTENANCE MODE

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

2.12.1 Knife Adjust

The knife adjust function provides a way for the service technician to change the knife. In the Knife Adjust screen, use the up and down arrow keys to toggle to the up or down status as desired, and press ENTER. Close the front guard and press ENTER to send the knife to the desired position. Note: To exit the knife down screen and return to the knife adjust screen, press the cut button.

2.12.2 Parameters

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

2.12.2.1 False Clamp

The false clamp plate is an optional attachment which reduces the creasing of paper caused by the clamp. The disadvantage of using the false clamp plate is that it limits the smallest cut dimension. **The computer must know when the false clamp plate is installed on the machine to prevent the backgauge from crashing into it.** In the false clamp screen, use the up and down arrow keys to toggle between ON or OFF to indicate the presence of the false clamp plate, and press ENTER.

2.12.2.2 Time-out

The time-out parameter allows the operator to set the amount of idle time before the display and line lights turn off. The choices are 2, 5, 10, 20, and 30 minutes. In the time-out screen, use the up and down arrow keys to toggle to the desired time-out, and press ENTER.

2.12.2.3 Push-out

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

2.12.2.4 Accuracy Adjust

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

2.12.2.5 Knife Count

The knife count parameter allows the operator to reset

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

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

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

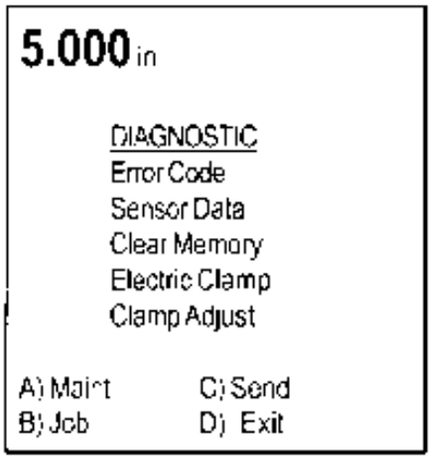
Select **Knife Alarm** to enter or change the knife stroke alarm value. When this value is reached, the display will alert you to change the knife and reset the knife counter. Knife alarm values for the Titan 200 are factory set at 2,500 cuts. However, you may want to change this value based on your specific machine applications. See the "Knife Tips" section 3.3 for help in choosing a knife alarm value for your machine.

Select **Clear lube** to reset the lube alarm after performing the lubrication requirements as shown in the maintenance section 4.6. Note: The alarm will activate after 2,500 cuts. This value is set at the factory and cannot be changed.

2.12.2.6 Machine count:

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

2.12.3 Diagnostic



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

2.12.3.1 Error Code

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

2.12.3.2 Sensor Data

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

2.12.3.3 Clear Memory

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

2.12.3.4 Electric Clamp

This function turns the optional electric clamp pressure control on or off.

2.12.3.5 Clamp Adjust

This function allows for the adjustment of the electric clamp function. (See section 4.7.4 Hydraulic Adjustments)

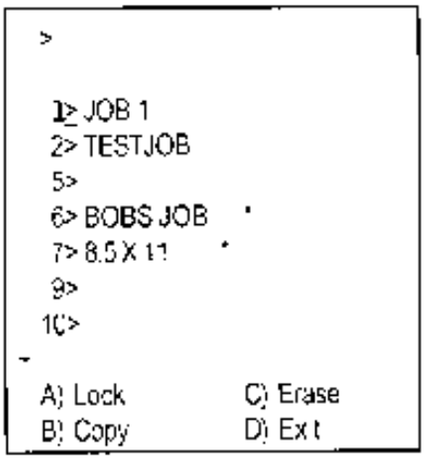
2.12.4 Language

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

2.13 JOB MODE (Programmable Models Only)

The Titan 200 can be programmed for up to 99 different jobs or channels. A job is used for making a sequence of cuts using the send (or cut) values of the job as the backgauge positions for each cut. Each job can hold up to 35 send values. If 2 channels are linked, up to 70 send values can be accessed from one job. When the job mode is entered, all previously programmed jobs will be displayed along with their name and lock status. Locked jobs will be indicated

by an asterisk "*". A plus "+" sign at the bottom of the screen indicates there are more jobs programmed than what are displayed. An example of a job mode screen display is shown below.



2.13.1 Lock/Unlocking a Job

In the Job Mode screen, the soft-key "A" will display "Lock" or "Unlock" depending on the current status of the job. If a job is locked, an asterisk "*" will be displayed to the right of the job name. To change the lock status of a job, simply move the cursor to the desired job using the up and down arrow keys, and press the soft-key "A" (Lock/Unlock).

2.13.2 Copying a Job

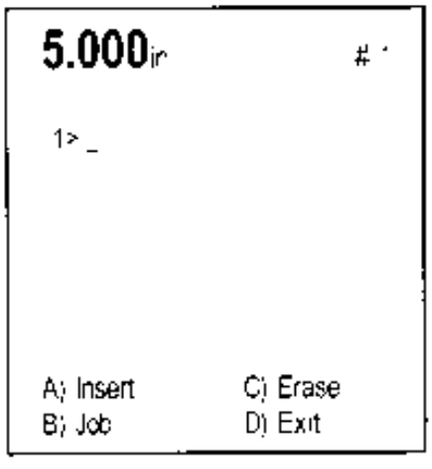
First, select a job to copy by moving the cursor up or down to the desired job number and press the soft-key "B" (Copy). "Select Copy to #" will be displayed at the bottom of the screen. Enter a job number for the new job or move the cursor to an existing job and press ENTER. If the new job is locked, the copy will not be allowed. NOTE, if the new job is not locked, but contains data, the old data WILL BE LOST.

2.13.3 Erasing a Job

Select a job to erase by moving the cursor to the desired job. Press The soft-key "C" (Erase). "Clear channel #" will be displayed, followed by YES or NO. Use the up and down arrow keys to toggle to YES or NO. YES will erase the job. NO will leave the job unchanged. NOTE: locked jobs can be erased!

2.13.4 Creating a New Job

To create a new job, type in a number that is not already assigned to a job and press ENTER (entering a job number greater than 99 will create job #99). The cursor will move to the line corresponding to the number you typed in, prompting you for a job name. If no job name is desired, simply press ENTER again to begin entering send values (see below). To name the job, press the right arrow key to move the cursor to the first character position. Enter a character of the alphabet by using the up and down arrow keys to toggle to the desired character. The numeric keys can be used to enter numbers directly into the job name. When the desired character is in place, use the right arrow key to move to the next character position. The job name can be up to 10 characters long. A letter can be removed from the job name by moving the cursor to the undesired character and pressing the CLEAR key. When finished, press ENTER to save the name and to begin entering send values. The screen should now look similar to the one shown next:



2.13.4.1 Entering Send Values

Now enter send values by using any of the following methods: 1) Type in the desired value and press ENTER. 2) Press ENTER at a blank line - this will enter the current position of the backgauge as a send value, or 3) Use the "Cut and Record" feature as described below.

When finished entering send values you may exit the current job by pressing soft-key "B" (Job) to go back to the job mode screen or soft-key "D" (Exit) to exit to send mode. Or you may use the current job for cutting by pressing the down arrow at the last line and following the instructions in the "Running a Job" section (pg. 23).

2.13.4.2 Cut and Record

To use this feature, send the backgauge to a desired position using the backgauge glide control or by using SEND, then make a cut. The current backgauge position will automatically be entered into the job as a send value. This can be very convenient for setting up a program when the actual cut positions are not known.

2.13.4.3 Channel Linking

If more than 35 cut values are needed, 2 channels can be linked together into one job providing up to 70 cut values. This is done automatically when a job is at 35 cuts and an attempt is made to add another value. At this point, a screen is displayed asking: do you want to link to the next channel? Use the up or down arrow key to select yes or no. If no is selected, the last cut will be discarded and the new value will be inserted. If yes is selected, the last cut will be pushed into the first value of the next channel, although it will be displayed as value 36 of the current channel. If the next channel is locked, linking will not be allowed. NOTE: If the next channel is not locked, but contains data, the old data WILL BE LOST After 2 jobs have been linked, the linked job will be displayed as "^^^^^^^^" and will be locked.

To unlink a job, use the up or down arrow key to point to the linked job name and press soft-key "C" (Erase).

When finished entering send values you may exit the current job by pressing soft-key "B" (Job) to go back to the job mode screen or soft-key "D" (Exit) to exit to send mode. Or you may use the current job for cutting by pressing the down arrow at the last line and following the instructions in the Running a Job section 2.13.6.

2.13.5 Editing an Existing Job

2.13.5.1 Editing the Job Name

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

2.13.5.2 Editing Send Values

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

Send values can now be edited by moving the cursor up or down to the desired send value and then typing over the existing value.

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

2.13.5.3 Inserting Send Values

To insert a send value, press the soft-key "A" (Insert). This moves all send values down and provides a blank line after the current send value. If more than 35 send values are needed the job can be linked (see Channel Linking under Creating a New Job, section 2.13.4.3).

2.13.5.4 Erasing Send Values

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

2.13.6 Running a Programmed Job

To use an existing job for cutting, you must first open it by using one of two methods: move the cursor to the desired job with the arrow keys and press ENTER, or enter the job number with the keypad and press ENTER. Once a job has been opened, the current job number will be displayed in the upper right corner. Now press SEND to move the backgauge to the first programmed position (or send value). Close the front guard and make a cut. Once the cut is made, the backgauge will automatically push out the paper (if "push-out" is enabled) and move to the next programmed position. After the last cut in the job is made, the backgauge will move to the first cut position of the current job. Pressing SEND at any time during the job will send the backgauge to its next programmed position without making a cut. A plus "+" sign will be displayed at the bottom of the screen if more cuts remain in the current job.

2.13.7 Exiting a Job

To exit an open job, press the soft-key "B" (Job) to return to the job mode screen, or press the soft-key "D" (Exit) to exit to the send mode screen.

2.14 AN EXAMPLE JOB

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

1. Turn on the machine and press CLEAR to preset the backgauge. Press the soft-key "B" (Job) to go to job mode.

2. Type in a new job number and press ENTER. Note: It must be a number that does not correspond to an existing job. All existing jobs will be displayed on the screen (you may have to scroll through them to see them all). If you wish to replace an existing job with the new job, first erase the existing job by moving the cursor to it and press the soft-key "C" (Erase). Now type in the new number and press ENTER. In this example, job #'s 1, 2, 5, and 6 already exist. We will use job # 7 for our new job. Press "7" and ENTER.

3. The cursor will move down to the new job number. At this point, press the right arrow key once to move the cursor to the first character position. Now name the job "8.5 X 11". To do this, press "8" on the number key pad. Then press the decimal "." key and so on. To enter the spaces and the letter "X", use the up and down arrow keys to toggle through the alphabet and press the right arrow key to move to the next character position. When the last character has been typed in, the display should look similar to the one shown below:

```
>

1> JOB 1
2> TESTJOB
5> BOBS JOB
6>
7> 8.5 X 11


A) Lock          C) Erase
B) Copy          D) Exit
```

Now press ENTER to begin programming the job. The display should now look similar to the one shown next:

```
5.000in                    # 7

1> _


A) Insert        C) Erase
B) Job           D) Exit
```

4. To enter the first send value of 8.5", simply type in 8.5 and press ENTER. The cursor will move to the second line. Now type "11 and press enter.

```
5.000in                    # 7

1> 8.500
2> 11.000
3> _


A) Insert        C) Erase
B) Job           D) Exit
```

At this point, you could exit and save the job by pressing the soft-key "D" (Exit) to exit to send mode, or the soft-key "B" (Job) to exit back to the job mode screen. However, lets use this job to cut paper.

5. Press the down arrow key once. This will remove the blank line 3 and move the cursor to the first send value (8.5"). Now press SEND. This will move the backgauge to the 8.5" position. Place the paper to be cut against the backgauge, close the front guard, and press the cut button. Once the cut cycle is complete, the backgauge will push out the paper and move to the next send value (11"). Now position the paper again, close the guard, and make another cut. After the cut is made, the backgauge will push out the stock and return to the first cut position, ready to repeat the current job.

6. Now lets lock the current job so it cannot be edited. First, exit back to job mode by pressing soft-key "B" (Job). Now move the cursor down to the new job using the down arrow key. Now press the soft-key "A" (Lock) to lock the job. An asterisk will

appear indicating the job has been locked.

7. To exit back to send mode, press the soft-key "D" (Exit).

2.15 OPERATING TIPS

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 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 paper and cause uneven cutting. Increased clamp pressure will not eliminate draw caused by a dull knife.

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

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

Measure printed paper to check for shrinkage or expansion of the paper from humidity. You may have to disregard the printed cut lines and make your own.

When cutting business cards or narrow strips of paper, place lifts of equal height on opposite sides of the table to prevent wear of the clamp guides.

2.16 NOTE TO DEALER

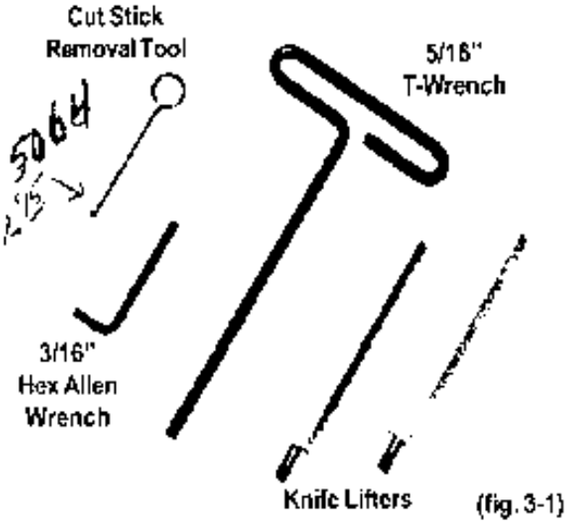
2.16.1 Entering the Dealer Name and Phone Number

To enter or change the dealer name and phone number that will be displayed when the lubrication alarm is displayed and when the upgrade screen is displayed, you must first enter the "Dealer Mode" screen. To do this, turn off the power, then simultaneously hold the left and right arrow keys while turning on the power. Continue to hold the arrow keys for a few seconds after the machine turns on. Now enter the desired dealer information by using the up and down arrow keys to toggle through the characters (similar to naming a job). Use the right arrow key to move to the next character and to move to the 2nd line. When finished, turn off the power.

3.0 KNIFE INSTALLATION/ CHANGING

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, see instructions following.**
- **Keep handling of unprotected knives to an absolute minimum.**
- **Clear off cutter table 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.**



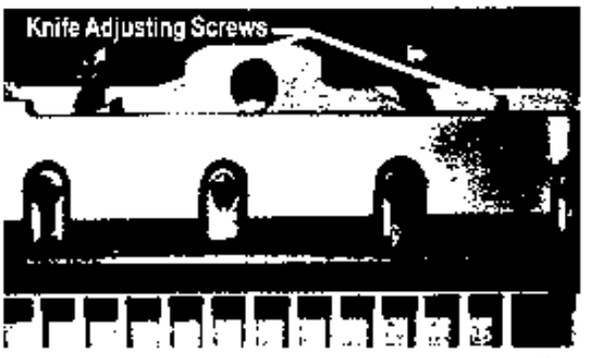
(fig. 3-1)

The knife changing equipment shown in fig. 3-1 is included in the cutter tool kit. The following instructions show how to remove and install a new or resharpened knife. Read through these instructions AT LEAST ONCE before attempting to actually change or install any blades.

3.1 KNIFE REMOVAL

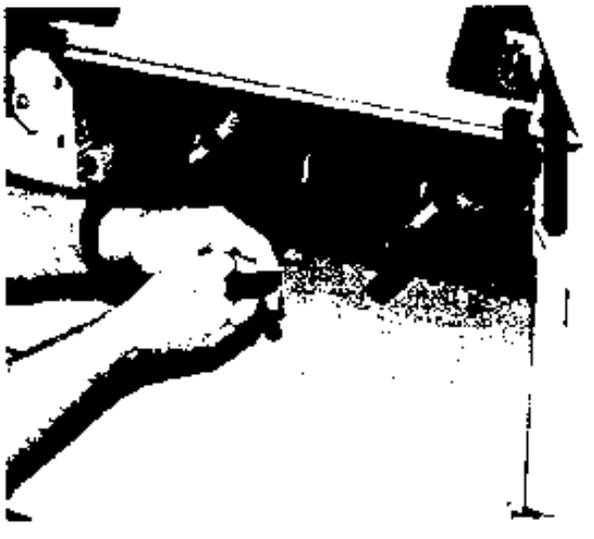
1. Make sure the knife and clamp are in the "up" position. Turn the main power switch to the "OFF" position and disconnect the machine power cord to prevent accidental power-up while servicing the cutter.

2. Back off the knife adjusting screws on top of the knife bar several turns (fig. 3-2). A new knife will cut deeper than one that has been ground several times. Failure to back off the screws could damage the knife and/or the cutting stick.



(fig. 3-2)

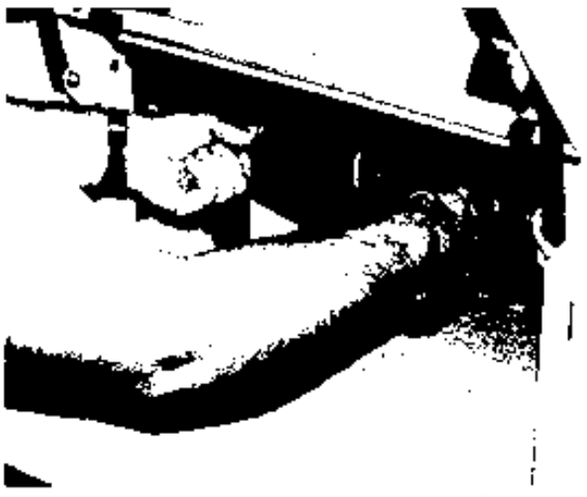
3. Remove the knife bolts from the two slotted knife bar holes and replace with the knife lifters (fig. 3-3). Tighten the lifters to hold the knife in place, then remove the remaining knife bolts.



(fig. 3-3)

4. Clear the table surfaces and place the empty knife scabbard on the table. Remove the scabbard's knife retaining screws.

5. Grasp the knife lifters firmly and, at the same time, turn them counterclockwise to release the knife from the knife bar (fig. 3-4). Lower the left end first, then lower the right end as you shift the knife sideways to the left. Bring the right end of the knife around the knife bar guide frame. Maneuver the right end into the space between the guide frame and the shroud as the left end is brought clear of the left guide frame. Move the knife to the right then bring the knife out of the cutter, left end first. Put the blade in the scabbard immediately and secure the knife retainer screws.



(fig. 3-4)

3.2 KNIFE INSTALLATION

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

1 Make sure the knife and clamp are in the up position. If they are not, turn on the power using the red and yellow main power switch, close the front guard, and press the CLEAR button. This will preset the backgauge and send the knife and clamp up.

2 Turn off the machine and unplug the power cord.

3. Pull out the cutting stick using the cut stick removal tool and turn it to a new surface. If the cutting stick is not level or flush with the table, 1/2" strips of paper can be placed in the table slot under the cutting stick to shim it.

4. Remove the left retainer screw from the new blade and screw the knife lifters into the new blade. Screw the lifters all the way in and then back them out 3/4 turn).

5. Remove the other scabbard retainer screw.

6 Double check to make sure the knife adjusting screws have been backed out all the way (step #2, Knife removal). Lift the blade and insert it into the knife bar slot. Guide the blade, right edge first, into the space between the shroud and the knife bar guide frames. Tip to clear the table side guides, then move the left end of the blade into the knife bar slot dropping the left end as the right end is brought around the right knife bar guide frame and up into the knife bar slot. Raise the knife into the knife bar slot as high as it will go and tighten the lifters.

NOTE: If the blade will not go in, either the lifters are screwed into the blade too far, or the end of the blade is hitting the cylinder bracket at the right end of the knife slot. In this case, drop the left end when inserting the knife.

7. Insert the knife bolts with washers and snug to hold the knife, but don't tighten them yet.

8. Remove the knife lifters one at a time and replace with bolts and washers.

9. Place a few sheets of paper over the cut stick, covering the stick end-to-end.

10. Plug in the power cord and turn the power on.

11 Go to the MAINTENANCE screen and choose KNIFE ADJUST. Choose KNIFE DOWN, close the guard, and press the cut button to send the knife to the down position (for more details on how to do this, see section 2.12.1).

12. Turn the power off and disconnect the machine power cord.

13. Turn the knife adjusters down evenly, a little at a time, until the knife cuts through the bottom sheet of paper the entire length of the cutting stick (fig. 3-5). Turning the screws down evenly prevents uneven wear on the knife and cutting stick.

(fig. 3-5)

14. Plug in the power cord and turn the power on.

15. Close the front guard and press CLEAR. This will raise the knife and clamp to the up position.

16. Turn the power off and disconnect the machine power cord.

17. Tighten all knife bolts securely.

18. Plug in the power cord and turn the power on. Make a test cut through a full lift of paper and make minor adjustments if necessary by repeating steps 9 through 17. **NOTE:** If the knife ends cut but the middle doesn't, you could have dips or uneven spots in the knife and/or cutting stick. These can be eliminated by placing 1/2" strips of paper in the table slot beneath the cutting stick to shim it.

19. Send the dull knife to a knife grinder. Do not attempt to sharpen your own knives! See the Knife Tips section 3.3 to determine the knife bevel angle.

3.3 KNIFE CARE TIPS

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

3.3.1 Knife Blade Life

Knife blade life, or the time between sharpenings, can be affected by many factors. One important factor is the type of paper being cut. Abrasive paper, such as recycled paper, soft paper such as newsprint paper, and bound books can all significantly shorten knife blade life. Also, if the knife depth is set too deep, the knife will cut too deep into the cutting stick and can dull the knife blade.

A knife can last anywhere between 2,000 and 5,000 cuts before it needs to be sharpened. Cutting soft paper (such as newsprint paper) or paper with high post-consumer recycled content can cause the knife to need sharpening after only 2,000 to 3,000 cuts. Cutting pure paper, such as bond paper with no recycled content, or hard paper can allow the knife to be used for as many as 5,000 cuts before it needs to be sharpened. In all cases, the operator should continually check the quality of the cut to determine when the knife blade needs to be sharpened. Some characteristics that indicate a blade needs sharpening are:

- The knife hesitates or stalls while making a cut.
- The sheets are not all cut to the same length (usually the top few sheets are longer than the rest of the sheets - this is sometimes called "draw").
- Cut marks appear on the cut face of the paper.
- The profile of the cut (side view) is not perpendicular to the table.
- The cut does not appear straight when viewed from the top.
- The knife makes a "rougher" sound as it passes through paper.
- Nicks are visible on the cutting edge of the knife.

3.3.2 Cutting Stick

A worn cutting stick can affect the cut quality of the bottom sheets. When this happens, the cut stick can be rotated. Usually, the stick should be rotated one or two times between knife sharpenings.

There are 8 possible cut stick positions. The stick can be rotated 4 times, then turned end to end, and rotated 4 times again.

3.3.3 Bevel Angle

Challenge recommends that bevel angles for the Titan 200 knives be in the range of 21° to 23°. In general, a 21° bevel angle will provide a better cut quality when cutting soft paper (such as newsprint), recycled paper, or bound books. However, 21° angle knives can become dull sooner than 23° knives, which results in shorter knife blade life. A knife with a 23° bevel angle, on the other hand, will not cut as easily, and can provide satisfactory results when cutting most types of paper. Knives shipped with the Titan 200 from the factory have a bevel angle of 23°.

3.3.4 Helpful Suggestions

- If your shop is large enough to purchase more than one set of knives, have one set beveled at 21° and the other at 23°. Note: A set consists of 3 knives: one in the machine, one as a back up, and one at the grinder.
- If the machine seems to strain but the cut quality is still good, reduce the pile height. You may also

carefully apply glycerin to the bevel when cutting hard, coated paper. Tie a cloth to the end of a stick; dip the stick in glycerin, and apply. Never apply by hand! In lieu of glycerin you may lightly rub white bar soap along the bevel. Lubrication will prolong the life of your machine and reduce maintenance.

3.3.5 Knife Care

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

4.0 MAINTENANCE

⚠ NOTICE ⚠

The instructions on the following pages are for the use of trained service personnel only!

Attempting to perform repair and replacement procedures without proper training may cause machine damage or operator injury!

PARTS CUSTOMERS: The Challenge Machinery Company provides parts with the express understanding that they are to replace parts found missing or no longer serviceable on equipment designed and/or manufactured by Challenge. The Challenge Machinery Company assumes no liability for any modification or alteration to any Challenge products, and any such modification or alteration to any Challenge products is not authorized by The Challenge Machinery Company. Any modification or alteration of any Challenge product will void any remaining warranty.

4.1 TROUBLESHOOTING

WON'T START
Fuse Blown.
Power cord disconnected
Main power switch not turned on.

BACKGAUGE DISPLAY INACCURATE
Preset circuit board malfunction.
Encoder malfunction
Main circuit board malfunction.
Thrust washers are loose

BACKGAUGE DISPLAY INACCURATE - BY CONSTANT AMOUNT
Backgauge needs accuracy adjustment
Presetter malfunction.

CUT BUTTON PUSHED - WON'T CUT
Check error codes.
Guard open
Guard hasn't been opened since last cut.
Hydraulic fluid low.
Main relief valve setting off.
Secuence pressure set wrong.
Button defective.
Motor relay defective
Knife latch solenoid defective
Knife down coil defective.
Cylinder or hose(s) leaking.
Cylinder disconnected from cylincer bracket.
Knife bar dirty or dry. lubricate knife guideways.
Dirt in hydraulic system

CLAMP STARTS UP BEFORE KNIFE IS UP
Clamp Up Sequence Valve setting incorrect.

CONCAVE CUTTING - ENDS WIDE, CENTER NARROW
Excessive moisture at ecges of paper.

CONCAVE CUTTING - VARIATION FROM TOP TO BOTTOM
Soft paper not firmly clamped.
Knife dull or incorrectly grounded.

ERRATIC OPERATION-POWER LOSS
Hydraulic fluid low.
Dirt in hydraulic system.
Cylinder or hoses leaking
Voltage supply is low.

KNIFE DRIFTS DOWN
Knife latch not engaging or damaged

KNIFE HESITATES OR STALLS
Dull knife.
Main relief valve setting off
Paper clamped too tight - lower clamp pressure reducer setting.
Cylinder seals worn - leaking pressure.
Hydraulic fluid low.
Voltage supply is low.

KNIFE STARTS DOWN BEFORE CLAMP REACHES TABLE
Knife down secuence valve setting incorrect.

KNIFE WON'T RETURN UP
Solenoid defective.
Limit switch out of adjustment.
Cylinder disconnected from bracket.

PUMP-MOTOR WON'T SHUT OFF
Knife/Clamp Up Limit switch not activated - readjust
Motor relay contacts welded.

4.2 ERROR MESSAGES AND DESCRIPTIONS

Message	Description	Test
Knife Latch Failure	Latch failed to disengage knife bar within .6 seconds.	Loose solenoid wire; mechanical bind; knife up prox. switch out of adjustment; defective prox. switch
Clamp Up Failure	Clamp failed to retrun to up position within 7 seconds	Clamp up sequence valve; solenoid (cut) valve
Knife Down Failure	Knife failed to come down within 4 seconds	Low main pressure; low voltage; knife down sequence valve
Knife Up Failure	Knife failed to return within 1.17 seconds	mechanical bind; solenoid (cut) valve
Clamp or Knife Down	Clamp or knife stayed down	No main pressure; stuck solenoid valve
Sequence Error	Timing error in either up or down cycle	Low main pressure; any sequence valve
Knife at Both Limits	Knife up and down prox. switches are on at the same time	Prox. switches; broken knife bar components
Send Canceled	Console key was pressed while backgauge was moving	Operator error; key board failure
Number Outside of Limit	Selected cut position beyond	Operator error; false clamp limit
Positioning Error	Backgauge failed to move to programmed position within +/- .005	Mechanical bind, encoder failure; main pcboard; leadscrew thrust washers loose
Hydraulic Latch Failure	Hydraulic latch holding relay failed to pull in	Defective relay; safety hood switches defective or need acjusting
Backgauge Failure	Backgauge doesn't move	Mechanical bind; encoder failure; main pcboard; blown fuse
Shorted Key Error	Console key held in for over 90 seconds	Operator error; defective keyboard

NOTE: ERRORS CAN ONLY BE RESET BY TURNING THE POWER OFF AND ON

4.3 SENSOR DATA ABBREVIATIONS

Abbreviations	Standby	Description	Location
RHSAFE	0	Right Safety Switch	Inside right of front cover
LHSAFE	0	Left Safety Switch	Inside left of front cover
KNFLAT	1	Knife Latch Proximity Switch	Left side of cutter opening
HYDLAT	1	Hydraulic Latch Relay	Main pcb board
KNFDWN	1	Knife Down Proximity Switch	Inside of cutter opening, right side
PRESET	1	Preset Sensor	Rear of cutter, under left side of table
CUTSOL	0	Cut Valve	Solenoid Valve on left side of Manifold
UNLOAD	0	Unload Valve	Solenoid Valve 7 (not in use yet)
KNLATSOL	0	Knife Latch Solenoid	Inside of cutter opening, left side
CLAMPUP	1	Clamp up Proximity Switch	Inside rear of cutter opening, left side
HYDUP	1	Hyd. Clamp Up Proximity	At bottom of clamp cylinder
KNFUP	1	Knife Up Proximity Switch	Inside of cutter opening, left side
CUTBTN	0	Cut Button	On display console
N.C.	0	No Connection	
HYDMOT	0	Hydraulic Motor Relay	Top right side of main pcb
N.C.	0	No Connection	
LTLINE	1	Line Light Output	Inside rear cutter opening, left side
CBTNLIT	0	Cut Button Light	In display console

4.4 ROUTINE MAINTENANCE

CAUTION: DISCONNECT POWER before making any adjustments or lubricating. See page 4, SAFETY PRECAUTIONS, for Power Lockout Procedure.

Place this machine on your plant maintenance schedule. A clean, lubricated machine will run longer, smoother, cut more accurately, with less downtime and fewer costly repairs. Schedule lubrication 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. The following guidelines will help you set up a regular maintenance schedule:

4.4.1 Weekly

Clean — Clean off old, dirty excess grease. Remove the front panel cover and clean accumulated dust off valves, hoses and connections. Built-up dust increases operating temperatures which causes premature wear to all hydraulic components.

Hardware — Remove front panel cover, rear panel cover, and top hood to check all nuts and bolts for tightness. Loose hardware is the cause of most component wear and in the electrical area could cause short circuits and/or shock.

Hydraulic Fluid — Low fluid level causes excessive heat and wear on the system. Check the fluid level as described in section 4.5 below.

Oil and Grease — See section 4.6

4.4.2 Monthly

Proximity Switch Adjustment — See section 4.7.3.

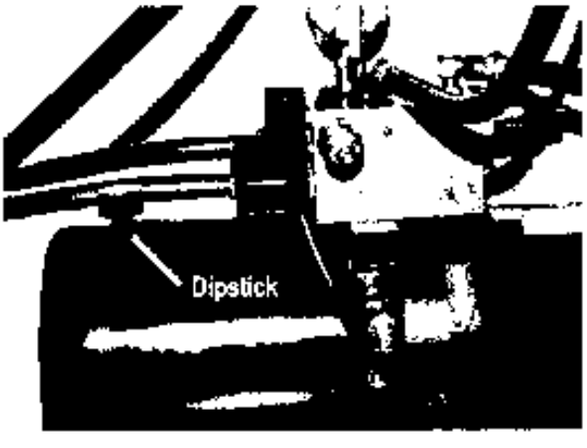
Backgauge Squaring — See section 4.7.2.

4.4.3 Yearly

Change Hydraulic Fluid — See section 4.5.

4.5 CHECKING/CHANGING THE HYDRAULIC FLUID

The hydraulic fluid level should be checked weekly. To check, remove the lower rear cover and unscrew the cap on top of the tank (fig. 4-1). Fluid level should be at 1/8" from the end of the dip stick (check with dip stick cap screwed in). Add fluid if neccessary but avoid overfilling as this could cause leakage when hot. Replace the rear panel when finished.



(fig. 4-1)

The hydraulic fluid should be changed **AT LEAST ONCE-A-YEAR** or after every 1,000 hours of operation. **NOTE**: Failure to change oil when needed can damage seals in the cylinders, pump, and valves.

Empty the hydraulic tank and refill with 1 gallon of International Standards Organization Viscosity Grade 100 (ISO VG 100) rust, oxidation, and foam inhibiting hydraulic fluid (Challenge part no. **S-1991**).

NOTE: NEVER use automatic transmission fluid or brake fluid as a substitute for the correct hydraulic fluid. A table of various manufacturers and their equivalents is listed below.

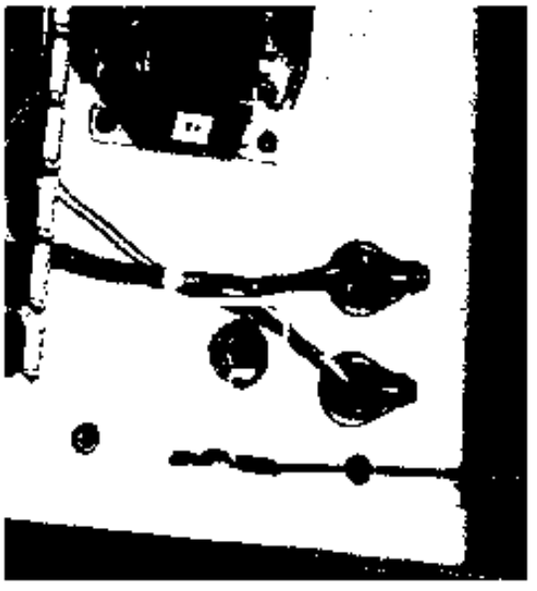
4.5.1 Recommended Hydraulic Oils

CAUTION: Use one of the recommended oils or an ISO VG 100 Hydraulic Fluid equivalent only. Oils other than the recommended type will cause seals and O-rings to deteriorate. Unsafe operating conditions will result.

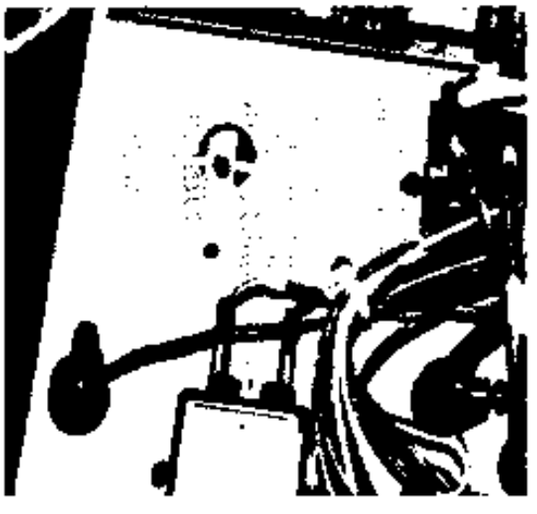
Oil Name	Distributor
Rykon No. 100	AMOCO
Duro AW Oil 465	Arco
AW Machine Oil 100	Chevron
Pacemaker XD No. 100	Citgo
Super Hydraulic 100	Conoco
Nuto H-100	Exxon
Harmony 100 AW	Gulf
HO 2A Hydraulic Oil	Lubriplate
DTE No. 18	Mobil
Pennzoil AW 100	Pennzoil
Magnus A Oil 215	Phillips
Tellus 100	Shell
Energo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

4.6 OIL AND GREASE

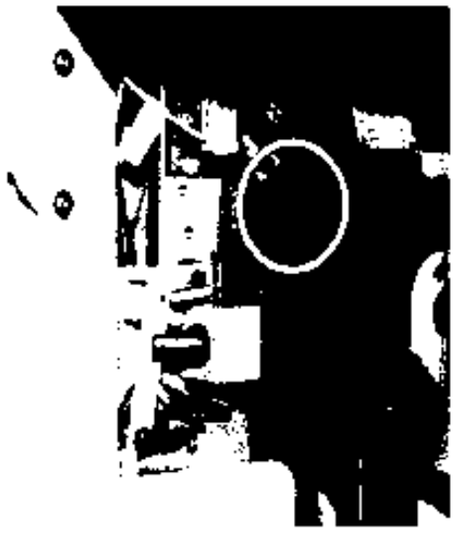
Turn the power off and disconnect the power cord. Open the front guard (if equipped) and open the top hood for access. Parts requiring oiling are marked with red paint. See figures 4-2 to 4-9 for oil and grease locations. Figures 4-2 to 4-4 require the knife and clamp be in the up position. Figures 4-5 to 4-9 require the knife and clamp be down. Wipe off any old or excess grease. Use any brand-name type of grease or light oil to lubricate. It may be necessary to use the supplied grease brush to access some locations. Note: the leadscrew may be lubricated with grease or oil. Oil has a tendency to run off and must be lubricated more frequently; grease tends to collect paper dust and must be cleaned off periodically.



Knife Bar Link - Left Hand Side, Upper (fig. 4-2)

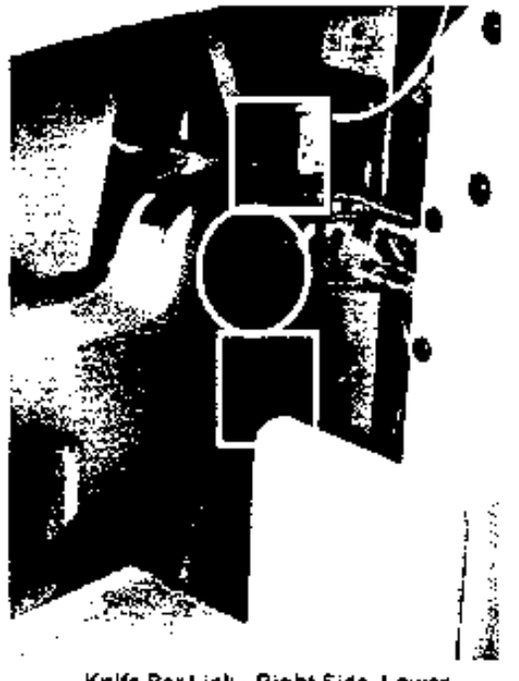


Knife Bar Link - Right Hand Side, Upper (fig. 4-3)



Knife Bar (fig. 4-4)

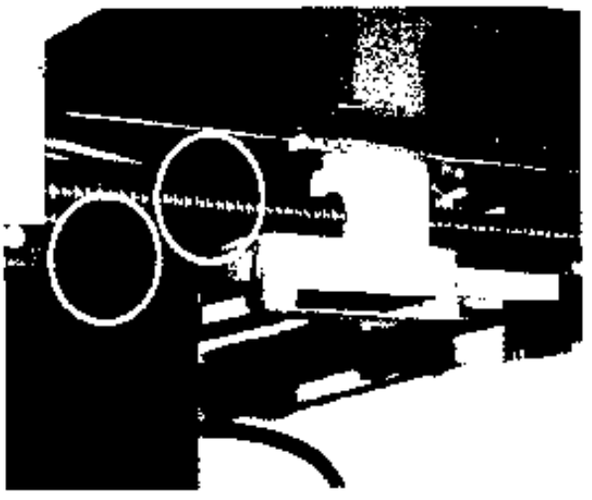
Knife Bar Link - Left Hand Side, Lower (fig. 4-5)



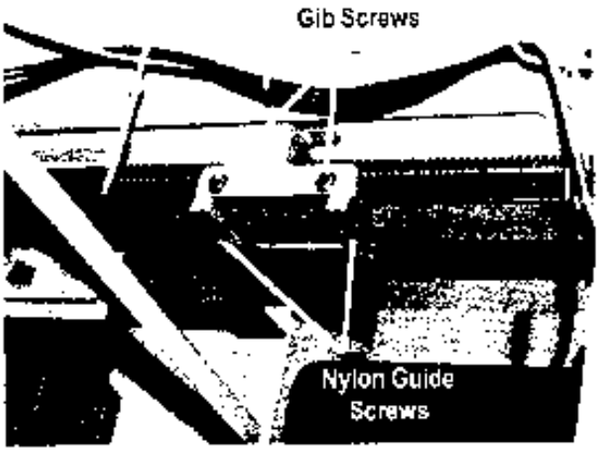
Knife Bar Link - Right Side, Lower
Knife Bar
Knife Cylinder Bracket, Upper (fig. 4-6)

Clamp Guide (fig. 4-7)

Clamp Guide (fig. 4-8)



Leadscrew and Backgauge Guide (fig. 4-9)



(fig. 4-10)

4.7 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. Whenever working on the machine, disconnect the power and lock it out (see SAFETY PRECAUTIONS, page viii) unless the directions specifically require the machine to be powered.

4.7.1 Backgauge Gib Adjustments

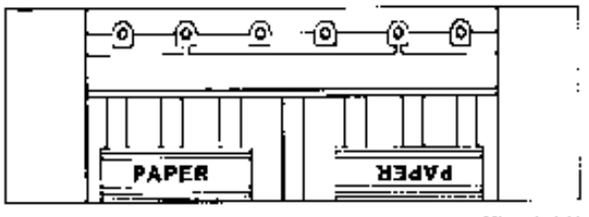
If the backgauge does not stay squared or jumps up and down when jogging paper against it, the backgauge gib screws are probably loose or worn.

To Adjust:

1. Send the backgauge near the rear of the table.
2. Turn off the power and disconnect the power cord.
3. Remove the leadscrew cover under the table.
4. Loosen the two side gib screws and the bottom nylon guide screws (fig. 4-10).
5. Tighten the bottom nylon guide screws until they just touch the guide. Do not overtighten or they could cause the backgauge to bind.
6. Similarly, turn the side gib screws in until they just touch the guide. Lock in position with the jam nuts.
7. Run the backgauge back and forth the length of the table using the backgauge glide control. Check for any binding. Readjust if necessary

NOTE: The screws should be tightened to hold the backgauge square against the guide rail. Excessive tightening will cause the backgauge to bind and cause premature wear of all components.

4.7.2 Squaring the Backgauge



(fig. 4-11)

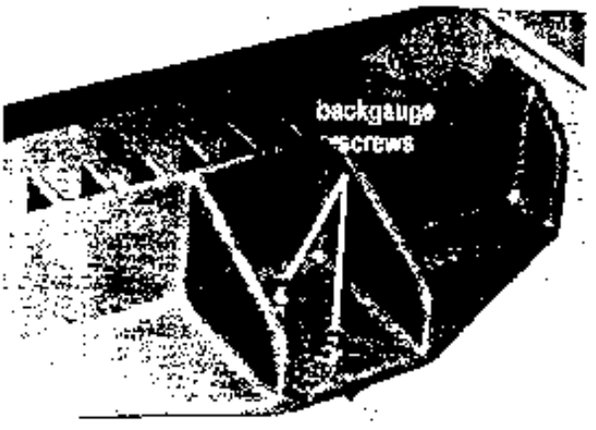
To test if the backgauge is square, place a small lift of paper against the left side of the backgauge (but not against the side guide) and make a cut. Now, leave the backgauge in the same position, flip the lift over and push it against the right side of the backgauge (but not against the side guide). Make another cut to see if any of the paper 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. If paper is trimmed in either sequence, the backgauge is out of square.

1. Make sure the backgauge gibs are set properly (see section 4.7.1).

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

2. Remove the rear plexiglass table cover
3. Loosen the two backgauge screws (fig. 4-12).
4. Place a 90° square or triangle against the backgauge and left side guide. Square the

backgauge. hold it in place, and tighten the two screws



(fig. 4-12)

Note: Once the backgauge is square, restore power to the machine and check the backgauge accuracy (see section 2.12.2.4) to make sure it is accurate.

4.7.3 Proximity Switches

Proximity switches are used to inform the computer of the up and down positions of the knife and clamp. They do not determine the stopping positions of the knife and clamp, and therefore rarely need to be adjusted. However, if a proximity switch is not sensing the knife or clamp position correctly, it may need adjustment.

To check if the four proximity switches are sensing correctly, go to Maintenance Mode and select Diagnostic. Then select Sensor Data, and a list of abbreviations for several inputs and outputs will be listed, along with their status (0 for open, 1 for closed). The four proximity switches should have the following status during the various knife and clamp positions

	Knife Up Clamp Up	Knife Up Clamp Down (Manually)	Knife Up Clamp Down (Hydraulically)	Knife Down Clamp Down
Knfdwn	1	1	1	0
Clampup	1	0	0	0
Knfup	1	1	1	0
Hydup	1	1	0	0

If any of the four proximity switches has a status of 0 when it should be 1, adjust the switch as described below.

Knife Down Proximity Switch (Knfdwn)

Make sure the clamp and knife are in the up position. Turn the power switch off and disconnect the power cord. Open the front guard and the top hood

(fig. 4-13)

Adjust the knife down proximity switch (fig. 4-13) by loosening the two mounting screws and sliding the switch closer to the knife bar. The gap between the proximity switch and the knife bar should be 1/32" to 1/16" (0.5 to 1.5 mm). No vertical adjustment is necessary.

Clamp Up Proximity Switch (Clampup)

Make sure the clamp and knife are in the up position. Turn the power switch off and disconnect the power cord. Open the front guard, the top hood, and the upper rear cover

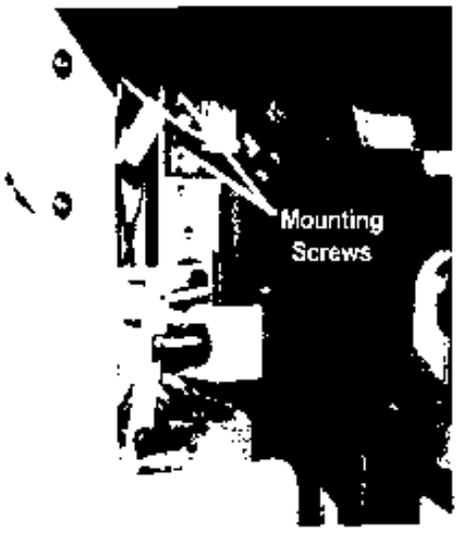
(fig. 4-14)

Adjust the clamp up proximity switch (fig. 4-14) by loosening the two actuator mounting screws and sliding the actuator up or down. The gap between the actuator and the proximity switch should be 1/32" to 1/16" (0.5 to 1.5 mm).

Knife Up Proximity Switch (Knfup)

Make sure the clamp and knife are in the up position.

Turn the power switch off and disconnect the power cord. Open the front guard and the top hood

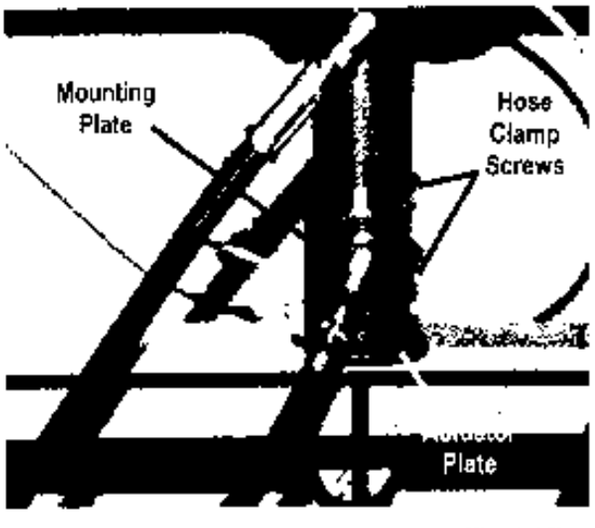


(fig. 4-15)

Adjust the knife up proximity switch (fig. 4-15) by loosening the two mounting screws and sliding the actuator up or down. The switch should be adjusted such that it senses the knife bar at the very top of its stroke only. The gap between the switch and the knife bar should be 1/32" to 1/16" (0.5 to 1.5 mm).

Hydraulic Clamp Up Proximity Switch (Hydup)

Make sure the clamp and knife are in the up position. Turn the power switch off and disconnect the power cord. Remove the lower front panel.



(fig. 4-16)

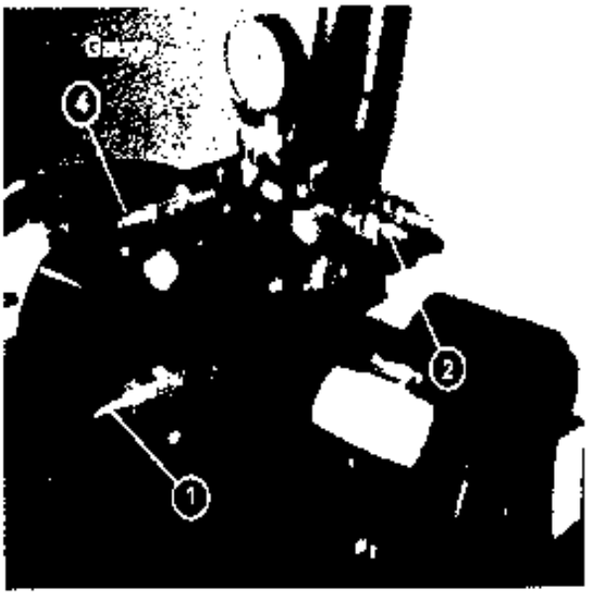
Adjust the hydraulic clamp up proximity switch (fig. 4-16) by loosening the two hose clamp screws and sliding the switch plate up or down. The gap between the switch and the actuator plate should be 1/32" to 1/16" (0.5 to 1.5 mm)

4.7.4 Hydraulic Valve Adjustments

Note: When adjusting valves, first loosen the jam nut around the stem, then use a hex allen wrench to turn the stem clockwise to increase pressure, or counterclockwise to decrease pressure.

4.7.4.1 Pressure Settings:

1. Main System Relief Pressure — 1,400 psi.
2. Knife Down Sequence Pressure — 900 psi.
3. Clamp/Knife up Sequence Pressure — 600 psi.
4. Clamp Pressure Reducer — 400-800 psi



(fig. 4-17)

4.7.4.2 Adjustment Procedure:

1. Remove the lower front cover panel.

2. Loosen the locknut and turn the clamp pressure reducer valve (item 4, fig. 4-17) all the way in (clockwise). (Note: if your machine is equipped with the optional electronic clamp control valve you will have to enter the Maintenance Mode and chose Knife Adjust, Knife Down. This will close the electronic valve allowing you to read the Main Sys and Knife Down pressures.)

3. MAIN SYSTEM RELIEF PRESSURE: Make a cut and read the pressure on the gauge when the knife is bottomed on the table. Adjust the main system relief valve (item 1, fig. 4-17) if necessary to obtain a 1,400 psi reading.

4. KNIFE SEQUENCE PRESSURE: Begin a cut cycle and read the pressure from the gauge as the knife is traveling down (after the clamp reaches the table). The pressure should read 900 psi. If necessary,

adjust the knife sequence valve (item 2, fig. 4-17) to obtain the proper reading.

5 CLAMP/KNIFE UP SEQUENCE PRESSURE: Activate a cut cycle and read the pressure after the knife has returned up and while the clamp is moving up. The pressure should read approximately 600 psi. If necessary, adjust the clamp up sequence valve (item 3, fig. 4-17) to obtain this pressure. If, during a cut cycle, the clamp will not stay down until after the knife returns completely to the up position, re-adjust the clamp up sequence valve until this happens.

6. CLAMP PRESSURE: Adjust the clamp pressure reducer (item 4, fig. 4-17) to the desired setting. It is factory preset at 800 psi. Read the gauge with the clamp down and as the knife begins to move down.

Note: When cutting pressure sensitive paper, you may want to reduce the clamping pressure **(400 psi minimum)** to prevent marking the paper.

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.

4.7.4.3 Optional Electronic Clamp Pressure Control Adjustment

The electronic clamping control option allows the convenience of changing the clamp pressure at the control console. The pressure is controlled by use of the up and down arrow keys, 0 being the lowest - 15 the highest, and is indicated in the upper right hand corner of the display.

Note: To turn the electronic clamp control option on or off, enter the Maintenance Mode and choose Diagnostic. Then choose Electric Clamp and select "ON" or "OFF".

To adjust the actual clamp pressure maximum and minimum, first make sure the Electric Clamp option is set to "ON" (see above paragraph). Enter the Maintenance Mode and choose Diagnostic. Then choose Clamp Adjust, and the following screen should be displayed:

```
5.000
Set Maximum
>

Press [A] to Increase

Press [V] to Decrease



A) Main          C) Send
B) Job           D) Exit
```

Now perform a cut cycle. After the clamp has contacted the table and while the knife bar is coming down, read the pressure on the right hand pressure gauge. It should read 800 psi. If it does not, correct by using the up and down arrow keys. When finished, press soft-key "D" to exit and go to the minimum pressure set up screen shown below:

```
5.000
Set Minimum
>

Press [A] to Increase

Press [V] to Decrease



A) Main          C) Send
B) Job           D) Exit
```

Perform a cut cycle. After the clamp has contacted the table and while the knife bar is coming down, read the pressure on the right hand pressure gauge. It should read 400 p.s.i. If it does not, correct by using the up and down arrow keys. When finished, press soft-key "C" to return to Send Mode, or soft-key "D" to return to Diagnostics.

4.8 CLEANING

Before cleaning inside machine, turn off and lockout power, pg. viii.

Hydraulics

1. The vent fan should be wiped off weekly to maintain maximum cooling of the hydraulic system.

2. The hydraulic manifold, fittings, and hoses should be wiped off weekly to maintain maximum cooling. Remove then replace panels as necessary

Table

1 The front table should be wiped down periodically Use a non-abrasive cleaner along with a protective wax.

2. The rear table cover and front guard may be cleaned with glass cleaner or a mild water based detergent. Some petroleum based solvents may damage the plex glass.

Console

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

Machine Exterior

1. The machine's exterior should be cleaned with a non-abrasive water based detergent applied to a damp cloth.

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

NOTES

POWER PANEL LABEL
S-1781-54 REV. C

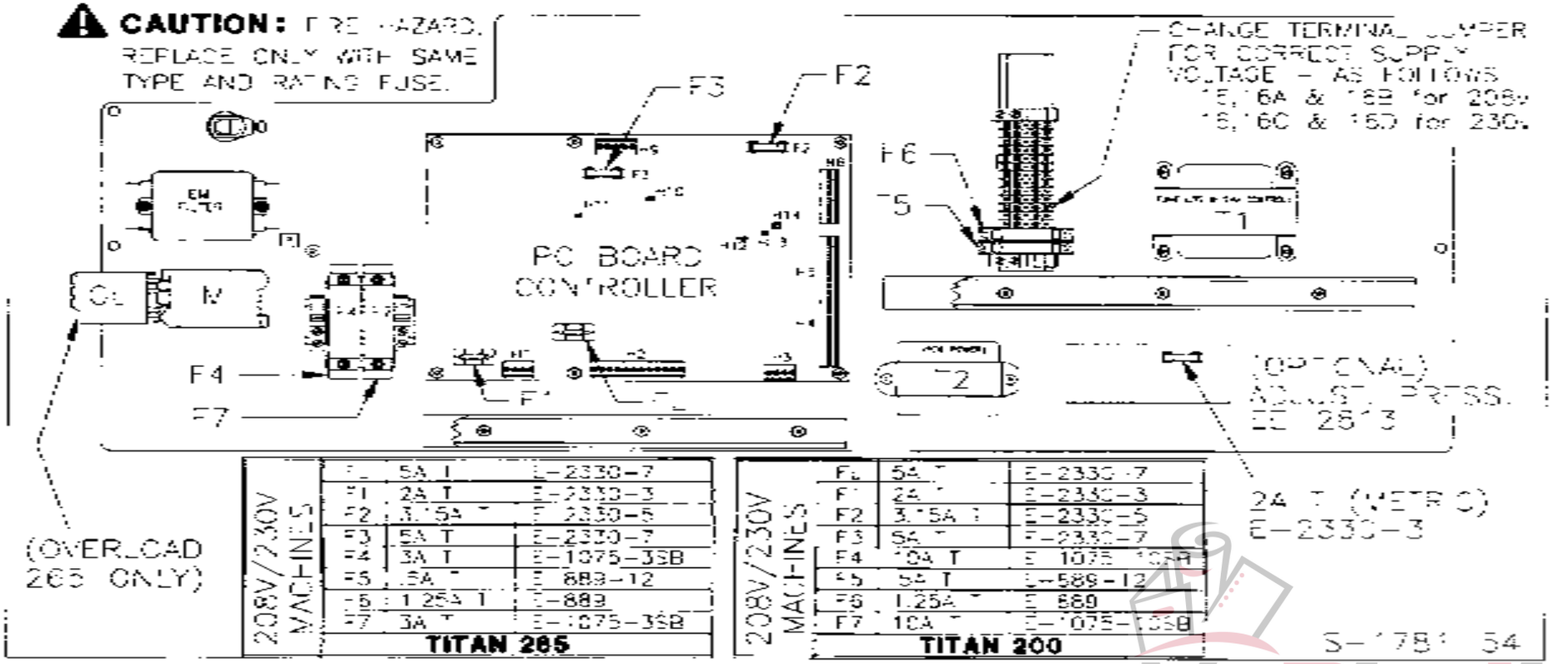
TITAN 200 & 265

!! NOTICE !!

⚠ 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 IN THE INSTRUCTION AND PARTS MANUAL.

INCORRECT POWER HOOK-UP WILL DAMAGE YOUR MACHINE.

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



208V/230V MACHINES		
F1	5A T	E-2330-7
F1	2A T	E-2330-3
F2	3.15A T	E-2330-5
F3	5A T	E-2330-7
F4	3A T	E-1075-3SB
F5	3A T	E-883-12
F6	1.25A T	E-883
F7	3A T	E-1075-3SB

TITAN 265

208V/230V MACHINES		
F1	5A T	E-2330-7
F1	2A T	E-2330-3
F2	3.15A T	E-2330-5
F3	5A T	E-2330-7
F4	10A T	E-1075-10SB
F5	5A T	E-589-12
F6	1.25A T	E-883
F7	10A T	E-1075-10SB

TITAN 200

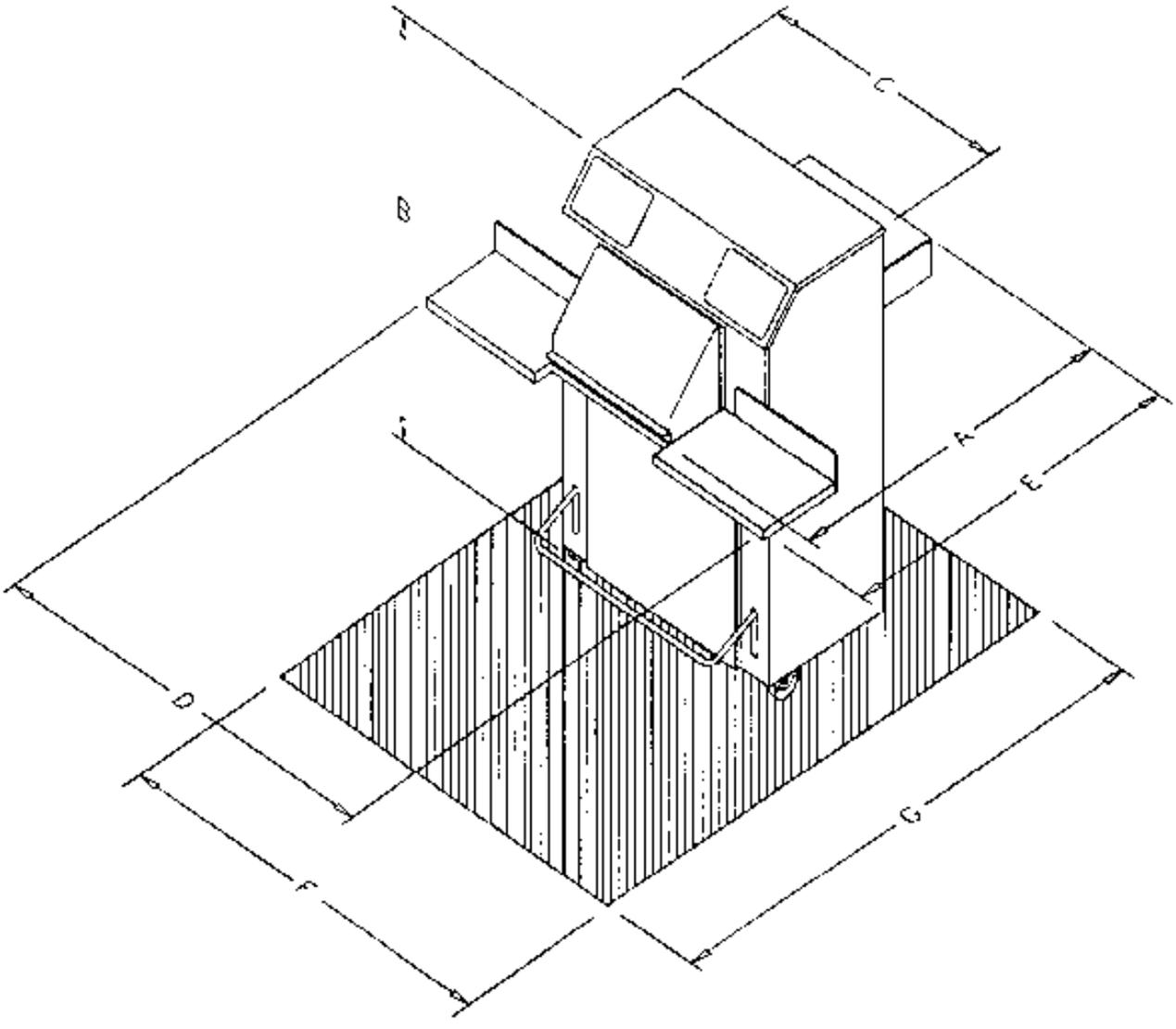
Fuse Value and Function

Location	Fuse Value/Type	Circuit	Transformer/Voltage	Dimension
F1	2A - T	Backgauge motor	230 VAC	5mm x 20mm
F2	3.15A - T	Pcb output	T1. Secondary	5mm x 20mm
F3	5A - T	Line lights	12 VDC	5mm x 20mm
F4	10A - T	Main - Hot	230 VAC	13/32" x 1 1/2"
F5	.5A T	5V - logic, preset, encoder/15v - prox.	T2 Primary	1/4" x 1 1/4"
F6	1.25A-T	12v, 24v Pcb outputs	T1 Primary	1/4" x 1 1/4"
F7	10A - T	Main - Neutral	230VAC	13/32" x 1 1/2"
FL	5A - T	Backgauge motor	230 VAC	5mm x 20mm

T= Time Delay Fuse

NOTE: Titan 200 cutters s/n 991733 and below do not have FL fuse.

TITAN 200 FLOOR PLAN
43000-FP



Symbol	Inch	cm
A	49.0	124
B	53.0	135
C	36.0	91
D	58.0	147
E	53.0	135
F	58.0	147
G	74.0	188
Net Wt.	755 lb.	342 kg

MACHINE DIMENSIONS: AxBxC

MACHINE DIMENSIONS WITH SIDE TABLE EXTENTIONS: DxBxE

OPERATING AREA: FxG

OVERALL MAINTENANCE AREA: FxG

SAFETY SYSTEM TESTS

Machine manufacturer CHALLENGE Model TITAN 200

Serial Number

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

Turn the power on and press CLEAR to preset the backgauge. Make sure the knife and clamp are in the up position (if they are not, follow the instructions in this manual to send them up).

Test #1: With the front guard open, press the cut button. Nothing should happen. If the knife and/or clamp comes down with the front guard open, do not use the machine. Repair or acjustment is neeced.

Test #2 Close the front guard and press the cut button. While the clamp or knife is coming down open the front guard. The knife and clamp shoulc immediately return to the up position. If they do not, do not use the machine. Repair or adjustment is needed.

Please enter date and initials for both tests.

Date

Test 1

Test 2

Date

Test 1

Test 2

Date

Test 1

Test 2

Repairs	Initials of Repairer	Date