

Welcome to the Weldotron Family!

Weldotron is a recognized leader in the industrial packaging industry. Whether you own or lease your Weldotron packaging system you are assured the highest quality in design, workmanship and performance of any packaging system available.

The purpose of this manual is to familiarize you with the Model 1602B Wrapper and to provide instructions for the operation, maintenance and, if necessary, repair of the system. This manual also includes a complete set of parts lists and assembly drawings to facilitate maintenance and repair.

If certain unique installation requirements arise, or if there are any questions concerning your Weldotron packaging system which are not answered by this manual, one of our courteous customer service representatives will be happy to assist you. Contact your local distributor.

CAUTION

Safety is our prime concern. Weldotron systems include many features to protect personnel. Effectiveness of these features depends largely on the strict observance of proper safety precautions and procedures in the workplace. We strongly recommend a safety program that includes procedures of O.S.H.A., A.N.S.I. and applicable state and local codes.

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1. INTRODUCTION

The Model 1602B Wrapper is a continuous motion, horizontal form, fill, seal machine capable of packaging consumer and industrial products in any type of shrink (and some types of non-shrink) film at a maximum rate of 80 packages per minute.

This Wrapper consists of four major sections: infeed conveyor, film forming, longitudinal seal and cross seal.

The Model 1602B Wrapper when used in conjunction with a shrink tunnel forms a shrink packaging system of unparalleled versatility and utility.

2. SPECIFICATIONS

Overall Dimensions

Width	48 inches (1219 mm.)
Height	68 inches (1727 mm.)
Length	117 inches (2972 mm.)
Weight	3000 lb. (1350 kg.) approx.
Infeed Conveyor Height	32 inches (813 mm.)
Area	60 square feet (5.4 sq m.)

Electrical Requirements

230 VAC, 60 Hz, 3 Phase, 30 Amps

Pneumatic Requirements

80 psig, 8 SFCM dry air

Package Size

Height - 4 inches (102 mm.) max. depending on height; 4 inches (102 mm.) min.
Length - 24 inches (610 mm.) max.
Width - 3 to 16 inches (76 to 406 mm.) max.

Film Width

34 inches (864 mm.) max.

Film Speed

80 fpm (24 mpm.) max.

Package Speed

80/min. max.

Bag Length

4 to 24 inches (102 to 610 mm.)

3. DESCRIPTION

3.1 GENERAL

Product is placed onto the flighted infeed by customer which feeds the packages to the film forming section where the vacuum belt and traveling belt transport the packages through the sealing sections and onto the outfeed section of the wrapper.

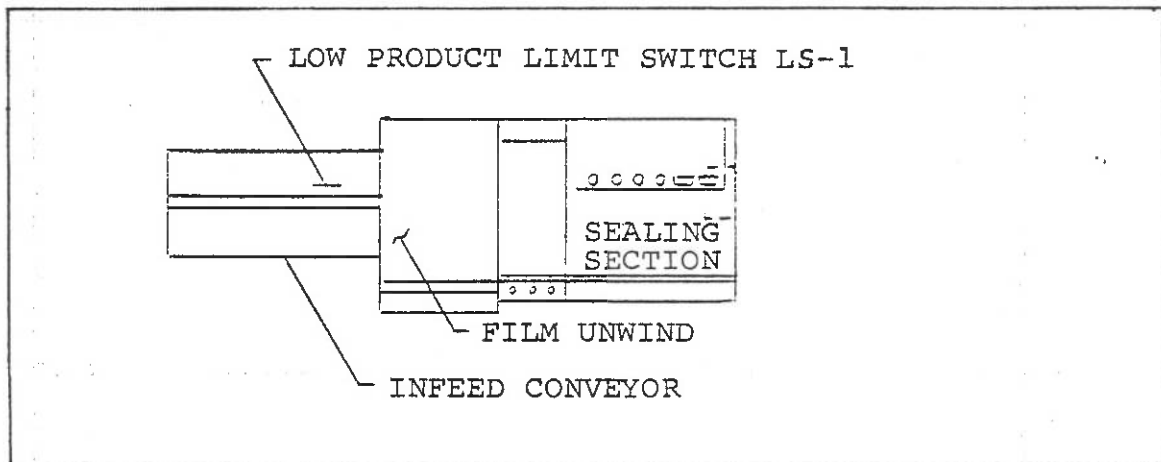


Figure 3-1. Identification Drawing

3.2 SEQUENCE OF OPERATION

The flighted infeed is equipped with a limit switch for detecting product presence.

When product is present at the limit switch LS1, the Wrapper will start automatically if the package reset mode has been selected and the CYCLE START pushbutton has been pressed.

When product is absent at the limit switch LS1, the infeed will feed the last package and the Wrapper will stop in the normal stop mode.

When product is again present at the limit switch LS1, the process will start again.

3.3 COVER INTERLOCKS

There is one hinged plastic cover that guards the seal head, a hazardous area. It is protected by an interlock.

WARNING

Weldotron has provided a safety interlock on the cover on the hazardous area of the Wrapper to protect persons involved in operation and maintenance. Should the interlock be modified, removed or otherwise not maintained in proper operating condition, a dangerous condition would be caused to exist for persons involved in maintaining the equipment for which Weldotron disclaims responsibility.

Weldotron disclaims responsibility for any damage or injury resulting from the failure of proper maintenance.

If cover is lifted, the seal head safety cylinder will be released, releasing the seal head. The Wrapper may be operated in Jog mode only. The seal head will not be actuated. To reactuate seal head, reinstall cover. Turn mode selector switch to JOG. Press and hold CYCLE START pushbutton. Main drive will go on. Main drive will stop when seal head engages. To continue jogging, release, then press CYCLE START pushbutton. Main drive will continue to operate as long as CYCLE START pushbutton is pressed.

3.4 AIR PRESSURE SETTINGS

Seal Bar Safety Mechanism: 80 psi (See Drawing C-1600-0100, Sheet 2 of 2).

Seal Bar Cooling: 5-8 psi max.

4. OPERATION

4.1 STARTUP

1. Before starting the Wrapper, be certain the circuit breaker is connected to the proper voltage, phase and frequency. See Specifications, Section 2. Also, connect the air source to the Wrapper. The pressure guages must read 80 psig.
2. Move the circuit breaker to ON. The main motor drive brake, programmable controller and POWER ON light LTI will be activated.
3. Turn VACUUM PUMP selector switch to ON. Vacuum pump will start. Set vacuum level at eight to twelve inches Hg. Adjust as needed.

CAUTION

Vacuum level over twelve inches Hg. may damage the Wrapper.

4. Turn HEATING ELEMENT selector switch to ON. The heaters will be on.
5. Select desired setting on the temperature controller dials.
6. To synchronize the seal head:
 - a. Turn MODE SELECTOR switch to JOG.
 - b. Press and hold the CYCLE START pushbutton on the operator's control station on the front of the Wrapper. The main drive motor will be on, and the longitudinal seal will be activated, but the main motor drive brake will be off.

NOTE

The Wrapper will run until the vertical cam has been phased in; then the Wrapper will stop. The main motor drive brake and safety cylinder solenoid (SOL1) will be on. To continue to jog Wrapper, release CYCLE START pushbutton and press CYCLE START pushbutton again. The Wrapper will continue to run as long as the CYCLE START pushbutton is held down.

4.2 OPERATING MODES

The Wrapper has three modes of operation: Jog, Run and Package Reset

4.2.1 Jog Mode

1. Turn the MODE SELECTOR switch to JOG.
2. Press and hold CYCLE START pushbutton. Main drive will go on and longitudinal seal will be activated. Drive brake will go off.

4.2.2 Run mode.

1. Turn MODE SELECTOR switch to RUN.
2. Press and release CYCLE START pushbutton. Main drive will go on and longitudinal seal will be activated. The main drive brake will go off.

4.2.3 Package Reset mode

1. Turn MODE SELECTOR switch to PKG. RESET.
2. Place package on accumulating conveyor until packages actuate limit switch LS1.
3. Press and release CYCLE START pushbutton. Main drive and static seal go on and longitudinal seal will be active. Main drive brake will go off.

NOTE

Any time LS1 is not actuated due to shortage of packages, Wrapper will stop through timing switch CS5. Wrapper will restart as soon as packages actuate LS1.

4.3 SHUTDOWN

4.3.1 Normal Shutdown

Push CYCLE STOP button. Wrapper will stop through timing switch CS5.

4.3.2 Emergency Shutdown

Push EMERGENCY STOP at operator's panel or at infeed conveyor. Safety solenoid will de-energize. Sealing head will come up immediately as latching mechanism of head and cam detach. Wrapper will be out of phase. To restart, follow paragraph 4.1, step 6.

4.3.3 Other Shutdown

Wrapper stops because of obstruction of any object at seal bar. See Paragraph 4.3.2. In this case, LS2 opens before CS4 closes.

NOTE

For normal operation, CS4 closes before the film clamp on the sealing head touches the pressure pad. CS4 should close when clamp, on downward stroke, is 1/2-inch or less from the pressure pad and remain closed until seal head has completed its upward motion. LS2 will open when the film clamp has been deflected 1/16-inch or more. LS2 opens each time it strikes the pressure pad, but seal head release is prevented by bypassing action of LS4.

4.4 INFEED ASSEMBLY

The Model 380A infeed conveyor (see P/L 380A-0020 & drawing 1602-0020) consists of a chain attachment points located so pushers can be attached at 9-inch, 12-inch, 18-inch or 24-inch centers. The pushers can easily be changed by simply pulling them from one socket and pushing them into another.

When the pusher spacing is changed, a gear must also be changed in the infeed conveyor gearbox. (See Figure 4-1). 36T, 48T, 72T, and 96T gears are available for the 9-inch, 12-inch, 18-inch and 24-inch spacings.

To change gears, loosen the two screws holding the idler gear arm and swing the idler gear out of mesh with the drive gear being changed. Then remove the drive gear and replace it with the proper gear for the new pusher spacing. Bring the idler gear back into mesh and lock it into place by tightening the two screws on the idler gear arm.

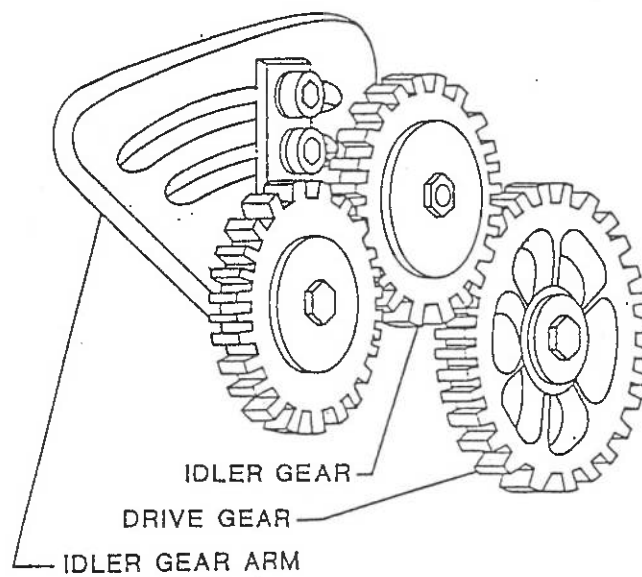


Figure 4-1. Infeed Conveyor Gearbox

It is important to note that when the proper gear is installed for the corresponding pusher spacing, the conveyor advances one pusher for each package (for each revolution of the cam shaft, and for each full cycle of the cross seal Bars). It is possible to run a short package in a wide pusher spacing by putting the pusher at the maximum spacing your products require, and running all products at that spacing, thereby minimizing change-over time. This will be suitable for many types of products. However, bear in mind that at the maximum spacing, the pusher (and the product) moves at a speed of 24 inches per cycle. This means that for any bag length less than 24 inches, the product and the film are move at different speeds at the time the product is entering the film. This may disturb the position of certain products such as reams of paper or other stacked items. In such cases, it may be necessary to have the pusher spacing approximately equal to the actual bag length being run.

Timing of the product into the film and into the cross seal bars is accomplished by moving the idler gear out of mesh (Figure 4-1), moving the pusher chain forward or backward as required, remeshing the idler gear, and locking it into place.

The side guides on the indexing infeed assembly are constructed so that they can be rapidly moved across the conveyor; laterally to suit the product width, and longitudinally to guide the product directly into the film folder.

The entire indexing infeed assembly may be adjusted towards or away from the main Wrapper to allow the pusher to push the product as far as possible into the folder. If a high or wide pusher is installed, it may be necessary to position the conveyor away from the folder to avoid pusher-folder collision. Always jog the Wrapper slowly after changing pushers to make certain that there is clearance.

To position the infeed, loosen two screws on the operator's side and one opposite these which clamp the conveyor onto the unit. These screws are accessible through windows cut into the conveyor side frame. Loosen the idler sprocket on the infeed conveyor drive chain. The conveyor may now be moved toward or away from the folder. After reaching the desired position, reclamp the conveyor in place and tighten the drive chain.

4.5 FILM FOLDER

The film folder for the Wrapper is custom-made to suit the product and is suitable for one product width and height. Of course, it is sometimes possible to run smaller packages in a given folder since many shrink films have a broad shrink capability.

It may also be possible to run one package lengthwise, and another widthwise (for example 1"H x 16"L x 8"W and 1"H x 8"L x 6"W products can be run in a folder sized for 1"H x 8"W.)

The folders are held in by two screws, one on each side, and can be quickly changed.

4.6 FILM UNWIND ASSEMBLY

The film unwind assembly (Dwg R-1602-0031 & P/L-1602-0032) is a constant tension unwind. The spring tension of the dancer roll provides the desired tension.

As the dancer roll rises, it releases the brake and allows the film unwind to accelerate to match the speed of the vacuum belt. This belt then advances the film through the Wrapper.

The proper threading of the film is shown on Figure 4-2.

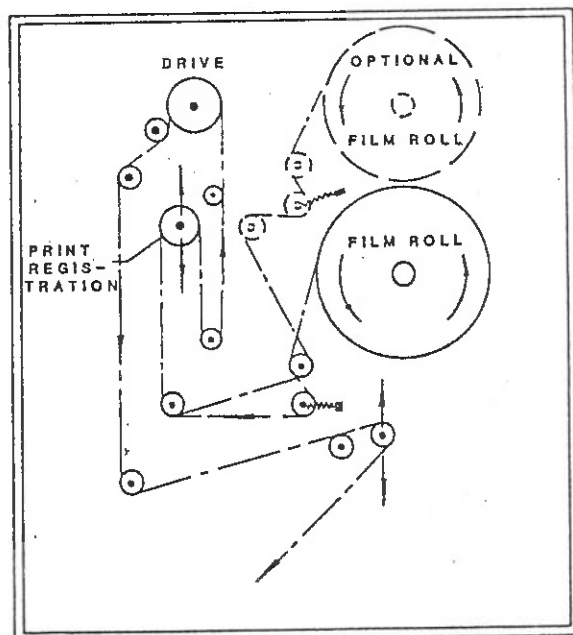


Figure 4-2. Film Threading Diagram

4.7 FILM ADVANCE

The film is advanced by a continuously moving vacuum belt (Dwg. D-1602-0041). The vacuum chamber under the belt is divided into five lengthwise sub chambers. The center sub-chamber is always under vacuum. The subchambers immediately adjacent to it may be deactivated by the valve on the left and the outer two subchambers may be deactivated by the valve on the right.

The choice of vacuum width is dictated by the product width. Wide products require the full vacuum belt, narrower products the center three rows, and very narrow products can use optional arrangements.

The vacuum chamber is adjustable along the drive shaft the end of the vacuum belt nearest the folder is vertically adjustable by means of adjusting screws (Item 36, D-1602-0041).

Vacuum belt tracking is accomplished by a V-belt section bonded inside, with grooves in both pulleys and in the vacuum plate under the belt. Tension is maintained by two adjusting screws which move the two ends of the take up pulley. These screws must be adjusted evenly so as not to put excessive side load on the V-belt.

CAUTION

If pulley and chamber grooves are not in line, the vacuum belt may be damaged.

4.8 CROSS SEAL ASSEMBLY

The cross seal assembly (Dwg. R-1611-0071) is cam operated. Separate cams for vertical and horizontal movement give a high degree of control over the time that the seal bars are closed, thus ensuring adequate time for creating strong seals.

The vertical motion or total stroke of the two seal bars is six inches. The bars are adjustable on the carrier chains so that they will meet at center of package above the conveyor level in quarter-inch increments. To move the seal bars, loosen the clamp screw (Item 59, R-1611-0071) on either side, raise or lower the seal bar as desired, and retighten the clamp screws. The quarter-inch detents will be felt during this adjustment due to the spring-loaded plunger on each side of the seal bar. Both the upper and lower seal bars must be moved the same number of increments, and the six-inch stroke is constant.

Horizontal movement of the cross seal carriage is accomplished by adjusting two levers, one on each side of the carriage.

The pivot point of these levers is vertically adjustable by a crank placed on the square end of the shaft (Item 50, R-1600-0010 & P/L-1602-0015).

The lower ends of the levers are connected by connecting links and levers to a fixed stroke cam. Since the lower end of the levers travels a fixed amount in a given time, the velocity of the upper ends of the levers, and hence the seal bar carriage to which they are attached, is dependent on the position of the pivot. The lower the pivot position, the greater distance the carriage travels in the fixed time. Since the carriage travels further in a given time, its velocity is greater. The cam is designed so that the travel of the carriage is at constant velocity and so that the seal bars move at a desired constant speed equal to that of the film and package traveling through the Wrapper. A scale and pointer on the front of the Wrapper provide this adjustment.

The cross seal bars are equipped with a safety feature that causes them to open automatically and the Wrapper to stop if anything is caught between them. A safety limit switch, located on the upper seal bar, initiates the safety action if it is opened prematurely (when the seal bars are closed on the film between packages). A safety override limit switch, in the cam-operated limit-switch box located at the exit end, controls the time when the safety switch is inoperative. If the upper seal bar closes on a package, the safety switch will open sooner than normal, which will cause the seal bars to open and the Wrapper to stop. If this should happen, clear the obstruction, empty the Wrapper of packages, and jog it until it stops. To continue jogging Wrapper, release CYCLE START pushbutton and then press CYCLE START pushbutton. Wrapper will operate as long as CYCLE START pushbutton is pressed.

WARNING

Test the safety feature every shift before operating the Wrapper by deliberately inserting a double layer of corrugated cardboard between the seal bars while the Wrapper is running. The adjustment of the screw which operates the safety switch, the correct operation of the limit switch itself, and the correct timing of the override switch are factors which could affect the safety action.

4.9 TRAVELING BELT SYSTEM

A traveling belt system (Dwg. R-1662-0052) carries the packages through the seal-bar section to the tunnel conveyor. It is designed so the length of the belt remains constant as the carriage travels. One side expands exactly the same amount that the other side contracts. The belt is run at the same speed as the film and product.

4.10 MAIN DRIVE ASSEMBLY

The main drive (Dwg. R-1600-0011) of the Wrapper consists of a DC Motor with SCR controller, motor brake, speed reducer, and PIV drive mechanism.

The input shaft of the PIV drives the vacuum belt and the outfeed conveyor. The variable speed shaft of the PIV drives the infeed conveyor and cross seal assembly. The relative speed variation between the infeed conveyor and vacuum belt determines bag length.

An important feature of the Wrapper is that an adjustment of the length varies only the bag length, not the Wrapper speed. A speed adjustment varies everything in unison. It is therefore possible to precisely synchronize the Wrapper with the Wrapper feeding it.

The Wrapper is provided with Jog, Run, and Package Reset modes. The first two are self explanatory. The third is an automatic mode, with a photocell, PC3 on the infeed conveyor controlling the starting and stopping of the Wrapper.

4.11 LONGITUDINAL STATIC SEAL

The static seal fuses the plastic shrink film by high voltage. The ionizing points should be adjusted so that when film is properly sealed in the seal area, a faint violet glow forms with no arc occurring. If film is removed from seal area, an arc may occur. If static seal is inoperative, check for blown fuse in static seal box.

NOTE

Excessive arcing of the static seal points may cause main drive irregularities and shorten static seal generator life. If excessive arcing occurs, readjust film & ionizing points until a good seal is obtained without arcing.

GAP BETWEEN FILM PLATE & ARC PINS $\frac{1}{2}''$ TO $\frac{5}{8}''$

5. MAINTENANCE

5.1 LUBRICATION

5.1.1 Pillow Blocks & Bearings

All lubricatable pillow blocks and bearings are furnished with a hydraulic grease fitting and prelubricated with a lithium base grease conforming to a NLGI Grade-2 consistency. The bearings must be relubricated periodically to assure long life. The time interval between greasings is dependent on the running speed and atmospheric conditions. It is recommended that bearings be lubricated every two weeks to one month (or more frequently if necessary). The grease should be free of alkali, dust, rust, metal particles and abrasives.

For best results, lubricate the bearings during Wrapper operation. Pump the grease in slowly until a slight bead forms around the seals. This bead, in addition to acting as an indicator of adequate lubrication, provides further protection against the entry of foreign matter.

A total of 73 prelubricated bearings are supplied with the Wrapper.

QTY.	LOCATION
10	Inside frame by cam area.
5	Inside frame by PIV unit.
2	Inside frame by vacuum belt.
3	On linkages under cross seal bar.
2	On idlers by PIV unit (inside frame).
7	Outside frame and inside chain guard (bearings -2; idlers - 5)
2	Inside frame, rear of infeed conveyor gear box.
2	Inside of infeed conveyor.
24	On film unwind frame
2	On cross seal bar housing.
4	On cross seal bar housing on shaft's needle bearings
10	On traveling belt assembly.

5.1.2 Link Belt P.I.V. Drive Unit

Fill unit to oil level with AGMA No.7 oil. Change the oil after 150 hours of operation or six weeks and refill with clean oil. Thereafter, under normal operating conditions, change the oil every 2500 hours. If unit is operated in an extremely dirty, high or low temperature environment, change oil more often. Use AGMA No. 3 oil in ambient temperatures between 0 and 40 degrees F. Use an AGMA No. 7 (Mobil Oil DTE-AA oil) in ambient temperatures between 40 and 100 degrees F. and use an AGMA NO. 8 (Mobil Oil DTE-HH oil) in ambient temperatures between 100 and 150 degrees F.

5.1.3 Rotary Vane Vacuum Pump

The oil reservoir is filled with SAE No. 10 oil. Refill reservoir as often as needed. Oil reservoir should never be allowed to run dry.

5.1.4 Motor Drive Worm Gear Reducer

Refer to drive assembly R-1611-0111. Reducer is filled to proper level at factory with AGMA No. 8 compounded oil (for ambient temperatures of 50 to 125 degrees F.). Change oil after two weeks of operation or 100 hours, whichever occurs first. Drain out initial oil, flush out case with an approved non-flammable non-toxic solvent and refill. Thereafter, change oil after at least 2500 operating hours or every six months, whichever occurs first. If unit is operated in an extremely dirty, high or low temperature environment, change oil more often.

5.1.5 General

Twice a week, lubricate with SAE-10 oil, all bearings on the film unwind rollers, and Thomson bushings on the seal bar.

Once a week or more often if necessary grease chains.

To maintain proper oil levels at the air lines lubricators, use a light #10 oil.

5.1.6 Differential Unit (Only with Film Registration)

Unit is filled to oil level with SAE #20 motor oil. The oil should be changed after 100 hours of operation or four weeks and refilled with clean oil. Thereafter under normal operating conditions the oil should be changed every twelve months.

5.1.7 Von Ruden Right Angle Gear Box (Only with Print Registration)

Unit is filled, to oil level, with SAE 90 gear oil. The oil should be changed after 150 hours of operation or six weeks and refilled with clean oil to proper oil level. Do not overfill, as this can cause excessive heat. Use an SAE 80 gear oil with an anti-foaming agent for operation in ambient temperatures between 0 - 40 degrees F, use SAE 90 gear oil with an anti-foaming agent between 40 - 100 degrees F and SAE 140 gear oil with an anti-foaming agent between 100 - 150 degrees F.

5.2 FILM INSTALLATION/REPLACEMENT

To install or replace film on the Wrapper, refer to Figure 5-1 and proceed as follows:

1. Slip brake strap off brake drum.
2. Move up retainer on opposite side.
3. Pull out shaft handles and lift off the film unwind roller assembly.
4. Slip the core adapter, core nut and used film core off the roller.
5. If replacing same-sized film, slip film on roller so it will unwind as indicated and replace core adapter and core nut.
6. If installing a different width film:
 - a. Loosen stationary ring.
 - b. Slip film on roller so it will unwind as indicated.
 - c. Move film roll so its center line is on the Wrapper centerline.
 - d. Tighten stationary ring.
 - e. Slip on core adapter and core nut and tighten against film roll.
7. Using a lifting device or two people, lift film unwind roller and film assembly onto Wrapper.

WARNING

This assembly may weigh in excess of 150 pounds. To avoid injury, use proper lifting practices.

8. Push in shaft handles, replace brake strap and slide down re-tainer.
9. Make fine adjustment by turning film adjustment screw.

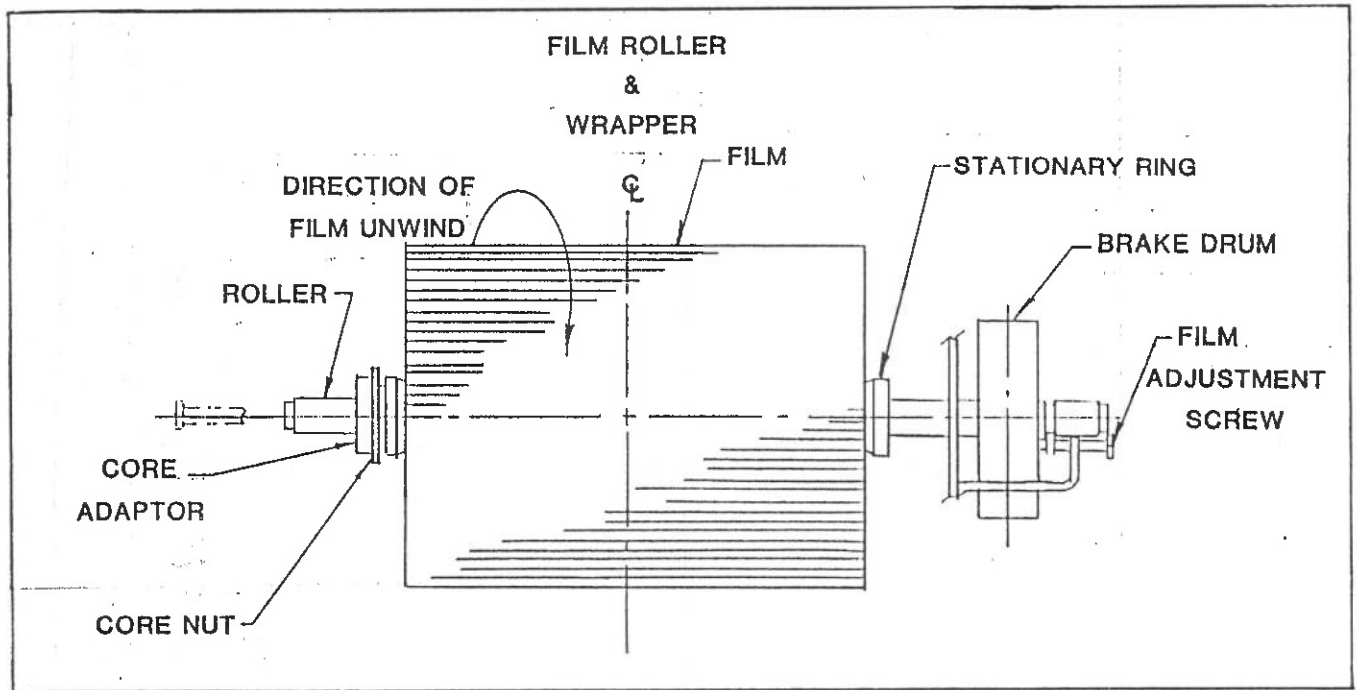


Figure 5-1. Film Unwind Roller Assembly

5.3 PTC BAR CLEANING

To clean film accumulated on the PTC bar, proceed as follows:

1. Bring temperature of bar to 500 degrees F. (260 degrees C.).
2. With a cotton rag, wipe off excess.

CAUTION

Do not use a wire brush or any abrasive material to remove film from bar. Bar will be damaged.

5.3.1 General

To maintain a reliable seal, the teflon sponge rubber and tape on the pressure pad seal bar, should be replaced as needed.

5.4 SAFETY LATCH MECHANISM ADJUSTMENT

The safety latch mechanism (Dwg. 1600-0100) is factory adjusted. However, if adjustment becomes necessary, proceed as follows:

1. Loosen hex nut (29, Dwg. 1600-0100) and back off set-screw (7).
2. Jog Wrapper until lower arm (13) is up and off positive stop bumper bushing (21).
3. Press EMERGENCY STOP pushbutton and disengage plunger and anvil (9 and 10).
4. Jog Wrapper until plunger and anvil are positively engaged again. A "click" will be heard during engagement.
5. Continue jogging Wrapper until roller support assembly (1) is at upper position.
6. Bring set screw (28) up until it touches bottom surface of lever (8).
7. Jog Wrapper until roller support assembly (1) is at the lowest position. (Sealing jaws are fully open and cam follower runs on largest radius of cam.)
8. Adjust bumper stop upward until bumper (26) touches the bottom surface of roller support assembly (1).
9. Jog Wrapper so roller support assembly (1) compresses bumper stop approximately 1/16 inch to 1/8 inch maximum.

6. TROUBLESHOOTING

The following troubleshooting chart is provided for the Wrapper operator to attempt problem solution without calling for maintenance. If a problem occurs that is not listed or a listed remedy does not solve a problem, contact maintenance.

PROBLEM	PROBABLE CAUSE	REMEDY
Wrapper does not go on.	Circuit breaker not turned to on.	Turn circuit breaker to on.
	No power to Wrapper.	Correct Wrapper power supply.
Wrapper does not operate.	Air not being supplied.	Correct air supply to provide 80 psig.
	Vacuum pump is off.	Turn on Vacuum Pump
	Programmable controller halted run light out.	Set 'RUN-HALT' switch on programmable controller to 'RUN'.
Wrapper will not reset.	Safety cover not closed.	Close safety cover.
Unsatisfactory cross seal.	Heat too low or too high.	Correct heat adjustment (paragraph 4.1, step 5).
Unsatisfactory longitudinal seal.	Overlap not properly placed.	Correct overlap.
No longitudinal seal	Fuse blown in static seal box.	Replace fuse.
Package jam.	Distorted or misplaced packages.	Clear jam. Reset timing chain by pulling on pusher pin until chain moves and clutch snaps in place.
No holes or holes too small.	Hole burner temperature set too low.	Increase hole burner temperature.
	Insufficient contact of burner element with film.	Bend element to improve contact.

TROUBLESHOOTING

<u>PROBLEM</u>	<u>PROBABLE CAUSE</u>	<u>REMEDY</u>
Machine stops for unknown reasons.	Lack of product at detect.	Provide product.
	Safety switch on seal bar is improperly adjusted or the seal bar has broken or loose springs.	Check and adjust any broken springs or loose locknuts on switch. To adjust safety switch refer to Section 5.4, Seal Bar Safety Features Adjustment, pages 5-4 through 5-6.
	Two pins in a row do not carry product (377/378 options only).	Clear area at side pusher and restart.
	Interlocks on seal bar covers diverter gate and/or side transfer covers (377/378) are improperly adjusted.	Readjust interlocks
	Product is jammed at infeed.	Clear jam. Reset timing chain by pulling on pusher pin until chain moves and clutch snaps in place.
	The "Fault" light on the programmable controller is on.	Turn circuit breaker off and leave off for sixty seconds. Then turn circuit breaker on, programmable controller should reset.

7. DRAWINGS AND PARTS LISTS

7.1 ASSEMBLY DRAWINGS AND PARTS LISTS

<u>ASSEMBLY</u>	<u>DRAWING NO.</u>	<u>PARTS LIST NO.</u>
Cam Shaft Assembly	R-1600-0010	P/L-1602-0015
Vertical Linkage Mechanism	R-1600-0100 (Sheet 1 of 2)	P/L-1600-0100
Vertical Linkage Mechanism - Pneumatic Assembly	C-1600-0100 (Sheet 2 of 2)	P/L-1600-0118
Pivot Mechanism Assembly	D-1602-0073	P/L-1602-0073
Main Drive Assembly	R-1600-0011 (3 Shts.)	P/L-1602-0011
Drive Assembly	R-1611-0111	P/L-1611-0111
Guard & Covers	D-1602-0013	P/L-1602-0013
Flighted Infeed Conveyor	R-1602-0020	P/L-380A-0020
Mian Electrical Assembly	C-380-0082	P/L-380-0082
Infeed Conveyor Gearbox Assy.	R-1611-0021	P/L-1611-0021
Film Unwind Assembly	R-1602-0031	P/L-1602-0032
Hole Burner Assembly	D-421 -0010	P/L-421A-0010
Vacuum Belt Assembly	D-1602-0041	P/L-1602-0041
Rotary Vacuum Pump		P/L-386A-0001
Vacuum Pump Assembly	A-1600-0403	P/L-1600-0403
Aux. Panel Assy.- Rotary Vacuum Pump		P/L-386 -0840
Front Door Assembly- Rotary Vacuum Pump		P/L-386 -0841
Main Panel Assembly- Rotary Vacuum Pump		P/L-386 -0843
Traveling Belt Assembly	R-1602-0052	P/L-1602-0052
Cross Seal Assembly	R-1602-0071	P/L-1602-0071
PTC Seal Bar System	D-438D-0010	P/L-438D-0010

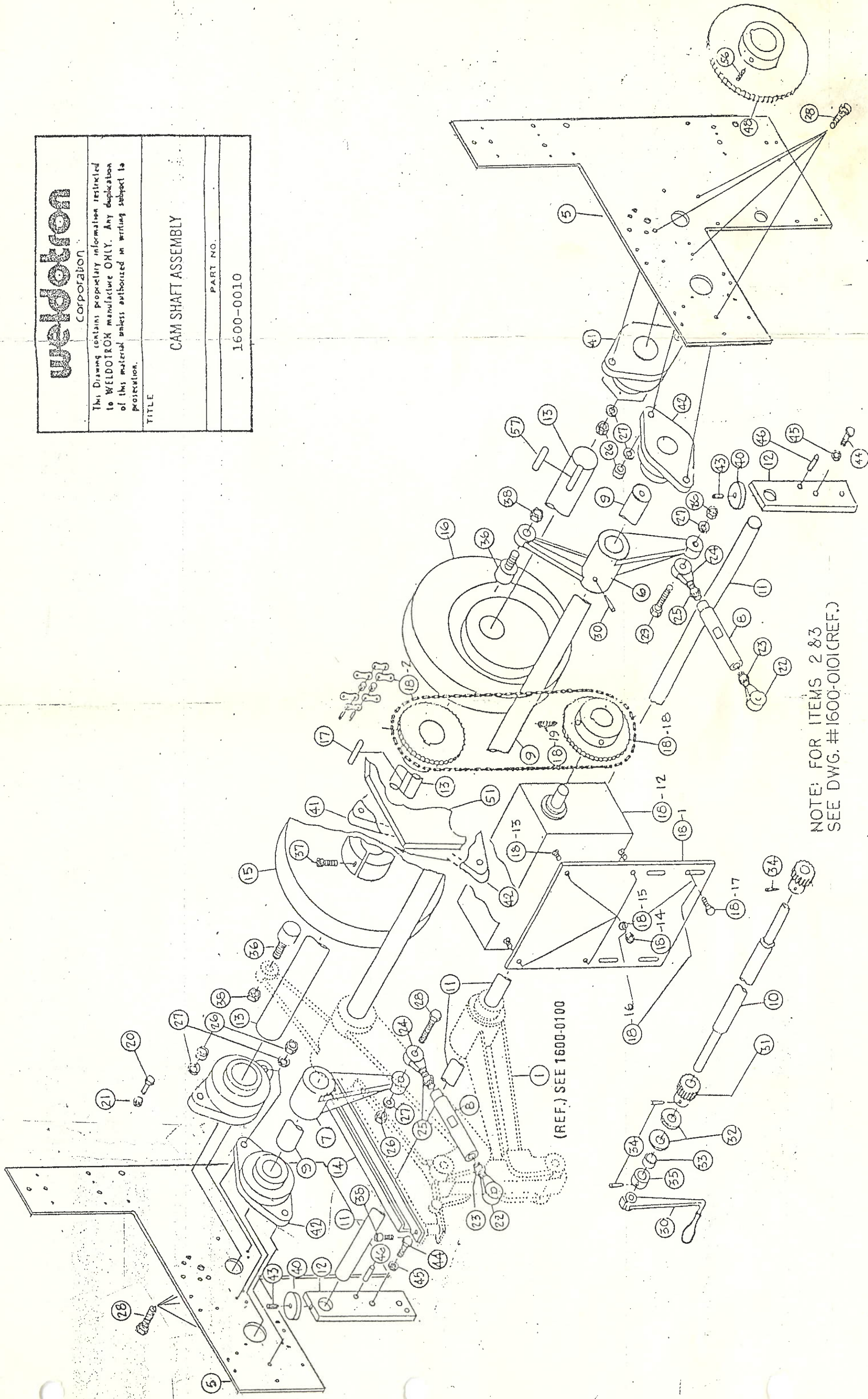
7.1 ASSEMBLY DRAWINGS AND PARTS LISTS (CONTINUED)

<u>ASSEMBLY</u>	<u>DRAWING NO.</u>	<u>PARTS LIST NO.</u>
Seal Bar Assembly, P.T.C.	D-438 -0026	P/L-438 -0026
Lower Pressure Bar Assembly	A-438 -0025	P/L-438 -0025
Pneumatic Assembly	D-438 -0085	P/L-438 -0085
Electrical Assembly		P/L-438 -0084
Main Panel Assembly	D-1602-0897	P/L-438 -0841
Front Door Assembly	C-1602-0895	P/L-438 -0842
Conduit Layout	D-438 -0033	P/L-438 -0033
Junction Box Assembly, LH	B-438-0115	P/L-438-0115
Junction Box Assembly, RH	B-438-0117	P/L-438-0117
Static Seal Assembly	B-400B-0003	P/L-400B-0003
Main Electrical Assembly	D-1602-0089	P/L-1602-0089
Electrical Controls Assembly	C-1602-0891	P/L-1602-0891
Terminal Box #2 Assembly	C-1602-0894	P/L-1602-0894
Terminal Box #2 Plate - Electrical	B-1602-0898	P/L-1602-0898
Operator Station Assembly	B-1662-0818	P/L-1602-0890
Oper. Station Wiring Dia.	A-1602-8900	
Cam Switches & Term, Box #1 Assembly	B-1611-0893	P/L-1611-0893
Cable Routing	D-1602-0892	P/L-1602-0892
Main Elec. Encl. Comp. Assy.	C-1602-0893	P/L-1602-0893
Front Door Assembly - Elec.	C-1602-0895	P/L-1602-0895
Front Door Wiring Diagram	C-1602-8033	

7.1 ASSEMBLY DRAWINGS AND PARTS LISTS (CONTINUED)

<u>ASSEMBLY</u>	<u>DRAWING NO.</u>	<u>PARTS LIST NO.</u>
Aux. Panel Assembly	B-1602-0896	P/L-1602-0896
Aux. Panel Wiring Diagram	C-1602-8023	
Main Panel Assembly	D-1602-0897	P/L-1602-0897
Main Panel Wiring Diagram	D-1602-8907	
Mounting Assembly, Electrical Enclosure	C-1602-0809	P/L-1611-0809
Electrical Schematic	D-1602-8020	
Program Diagram	B-1660-8081	
Spare Parts Kit 1602BK	TD #1038-3	
Spare Parts Kit 380K/380AK	TD #1710	
MODEL 440 -6FT EXTENSION CONVEYOR	R-440-0001	P/L-440-0001
RAIL ASSY-CHAIN RETURN	B-440-0102	P/L-440-0102
CROSS SEAL ASSY-5½ HEIGHT	B-23927-0070	P/L-23927-0070

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TITLE	
CAM SHAFT ASSEMBLY	
PART NO.	
1600-0010	



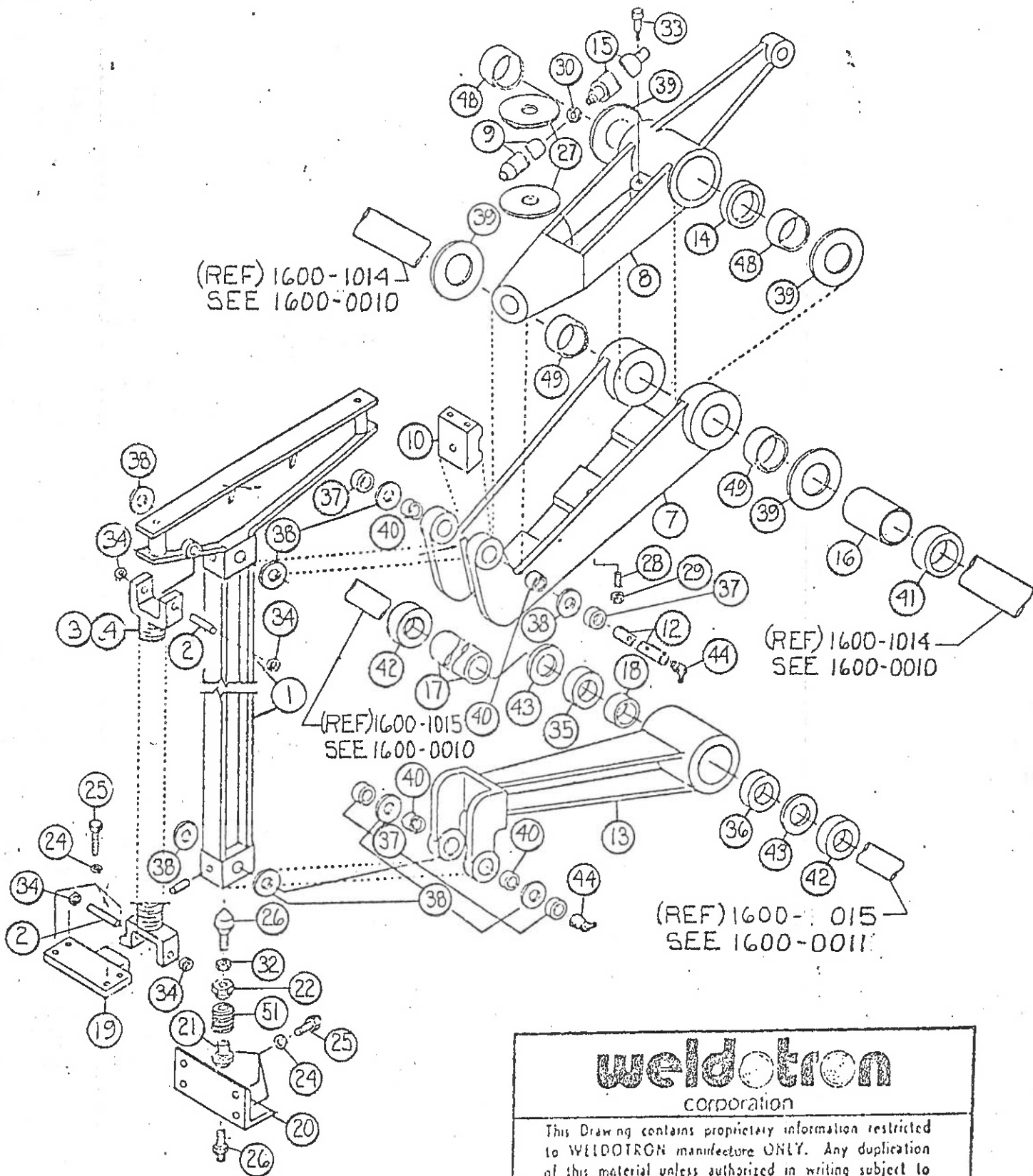
NOTE: FOR ITEMS 2 & 3
SEE DWG. #1600-0101(REF.)

(REF.) SEE 1600-0100

PART NO.		NOTE:		MODEL USED ON		1602	
PL 1602-0015		ITEM NO. PRECEDED BY "A" INDICATES SEPARATE PARTS LIST.		ASSY. USED ON		PL 1002 0001	
SHEET 1 OF 3				NO. REQ'D PER ASSY.		1	
R		16000010		CAMSHAFT ASSEMBLY		P/N	
ITEM	SIZE	PART NUMBER		REV	DESCRIPTION	FINISH	QTY
A 1	PL	16000100			VERT. LINKAGE MECH.		1
A 2	D	16020073 P1			PIVOT MECH. ASS'Y L.H.		1
A 3	D	16020073 P2			PIVOT MECH. ASS'Y R.H.		1
4							
5	D	16111079			BEARING MTS PLATE L.H.	FH-2865	1
6	C	16001029			ARM, FOLLOWER & HORIZ. MOTION		1
7	B	16001028			ARM, HORIZ. MOTION		1
8	A	16001043			ROD, TURNBUCKLE		2
9	A	16001014			SHAFT, UPPER ARM		1
10	A	16001012			SHAFT, GEAR		1
11	A	16001015			SHAFT, LOWER ARM		1
12							
13	A	16001013			CAM SHAFT	BLACK OXIDE	1
14	B	16111026			GUIDE, ROLL	BLACK OXIDE	1
15	B	16111019 F1			CAM, VERT	FH-2865	1
16	B	16111052 F1			CAM, HORIZ	FH-2865	1
17	A	16001061			KEY	BLACK OXIDE	1
A 18	D	16110102			CAM OPER. LIM SWITCH ASS'Y		1
19							
20		554333			SCREW HEX. HD		10
21		WA0981			WASHER LOCK		10
22		BG7364			ROD END MALE		2
23		NT4515			NUT HEX. JAM		4
24		BG7365			ROD END, MALE		2
25		NT4537			NUT HEX. JAM L.H.		2
26		NT1918			NUT HEX		14
27		WA1919			WASHER LOCK.		14
28		554340			SCREW HEX HD.		12
REV	ECO	BY	DATE	REV	ECO	BY	DATE
1	4481	PAS	10-21-86				

PART NO.		NOTE:		MODEL USED ON		
PL 1602-0015		ITEM NO. PRICED BY "A" INDICATES SEPARATE PARTS LIST.		ASSY. USED ON		
SHEET 2 OF 3				NO. REQ'D PER ASSY.		
R		16000010		CAM SHAFT ASSEMBLY		
ITEM	SIZE	PART NUMBER	REV	DESCRIPTION	FINISH	QTY
29	A	16111083		MOUNTING BOLT		2
30		PM7353		PIN TAPER		2
31		GR7354		GEAR		2
32		BG1521		THRUST WASHER		2
33	A	16021000		BUSHING		2
34		PM7352		PIN TAPER		2
35		CL14338		COLLAR		1
36		BG7307		CAM FOLLOWER		2
37		SS5022		SCREW SOC. HD.		4
38		NT5508		NUT HEX		2
39		SS3621		SCREW SOC. HD.		2
40						
41	A	16001099		BEARING, REWORK		3
42	A	16001098		BEARING REWORK		3
43		SS2112		SCREW SOC. SET		2
44						
45						
46						
47	A	16001080		SPROCKET		1
48	A	16001048		SPROCKET MODIFICATION		1
49		SS2452		SCREW SOCKET SET NYLOR		2
50	B	16001090	E1	HANDLE - CRANK	FH2865	1
51	C	16001059		PLATE, SHAFT-BRG.		1
52		PM8769		PIN TAPER		2
53		SS8797		SCREW, SOC. SET		2
54		PM5932		GROOVE PIN TYPE-B		3
55		SS8098		SCREW, SOCKET SET DUP PT.		1
56		SS9016		SCREW, SOCKET SET NYLOCK		4

[illegible]



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TITLE

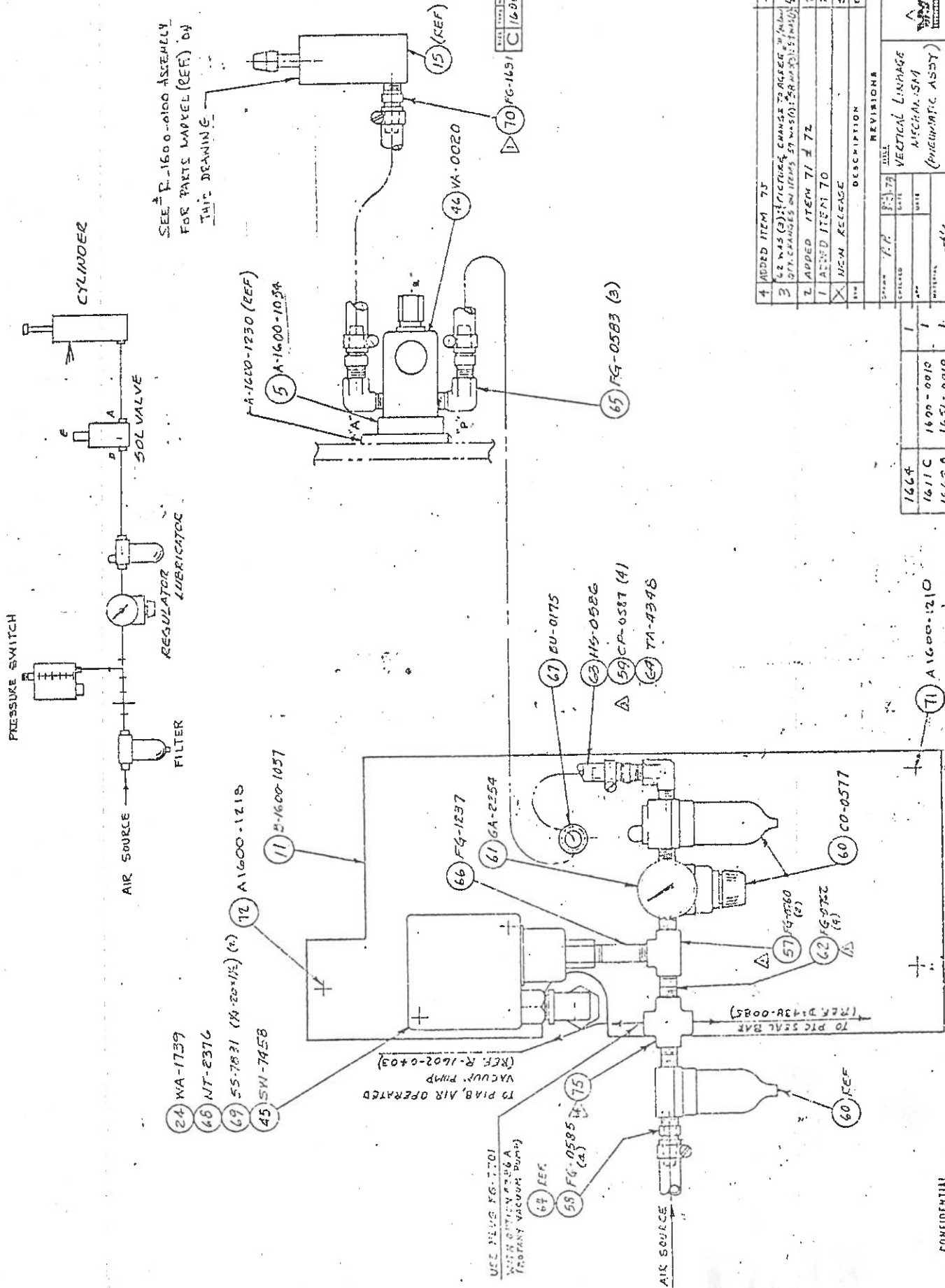
VERTICAL LINKAGE MECHANISM

PART NO.

1600-0100

R		1600-0100		VERTICAL LINKAGE MECHANISM		P/N	
ITEM	SIZE	DWG. NO. LET.		REV.	DESCRIPTION	FINISH	P/N QTY
A.		1600	-0108		SUB ASSEMBLY		1
A		1600	-0109		SUB ASSEMBLY		1
A	P/L	1600	-0118		SUB ASSEMBLY - PNEUMATIC ASSY.		1
A		1600	-0119		SUB ASSEMBLY		1
A		1600	-0120		SUB ASSEMBLY		1
9	B	1600	-1016	10	PLUNGER		1
23		SS	-3607		HEX HD SCR 1/4-20x1" LG		4
28		SS	-3628		SET SCR 5/16-18x1"		1
29		N T	-0199		HEX NUT 5/16-18		1
30		N T	-5517		HEX NUT-JAM 5/16-24		1
31		SS	-7679		SOC. HD. CAP. SCR. 1/4-20x1 1/2 LG		2
33		SS	-7650		SHOULDER SCREW 5/16 DIA x 1/2 LG		1
35		SS	-8633		SOCKET HD. CAP. SCR. 5/16-18x5/8 LG		3
38		W A	-7346		THRUST WASH (HDN'D) BOSTON 18830		8
39		W A	-7349		THRUST WASH (HDN'D) BOSTON 18916		4
43		W A	-7348		THRUST WASH (HDN'D) BOSTON 18898		2
68		SS	-7891		SCREW HEX HD 1/4-20x1 1/4 LG SS		2
69		N T	-2376		NUT HEX 1/4 SS		2
A		1600	-0121		SUB ASSEMBLY		1
72		P N	-12235		PIN GROOVE TYPE "E" STN. STL. 3/32 DIA x 5/8 LG		1

[illegible]



REV	DESCRIPTION	ECO NO	DATE
1	ADDED ITEM 75		
2	12 WAS (3) PICTURE CHANGE TO AGREE WITH P. 1600-0100		
3	12 WAS (3) PICTURE CHANGE TO AGREE WITH P. 1600-0100		
4	ADDED ITEM 71		
5	ADDED ITEM 70		
6	NEW RELEASE		

REV	DESCRIPTION	ECO NO	DATE
1	ADDED ITEM 75		
2	12 WAS (3) PICTURE CHANGE TO AGREE WITH P. 1600-0100		
3	12 WAS (3) PICTURE CHANGE TO AGREE WITH P. 1600-0100		
4	ADDED ITEM 71		
5	ADDED ITEM 70		
6	NEW RELEASE		

REV	DESCRIPTION	ECO NO	DATE
1	ADDED ITEM 75		
2	12 WAS (3) PICTURE CHANGE TO AGREE WITH P. 1600-0100		
3	12 WAS (3) PICTURE CHANGE TO AGREE WITH P. 1600-0100		
4	ADDED ITEM 71		
5	ADDED ITEM 70		
6	NEW RELEASE		

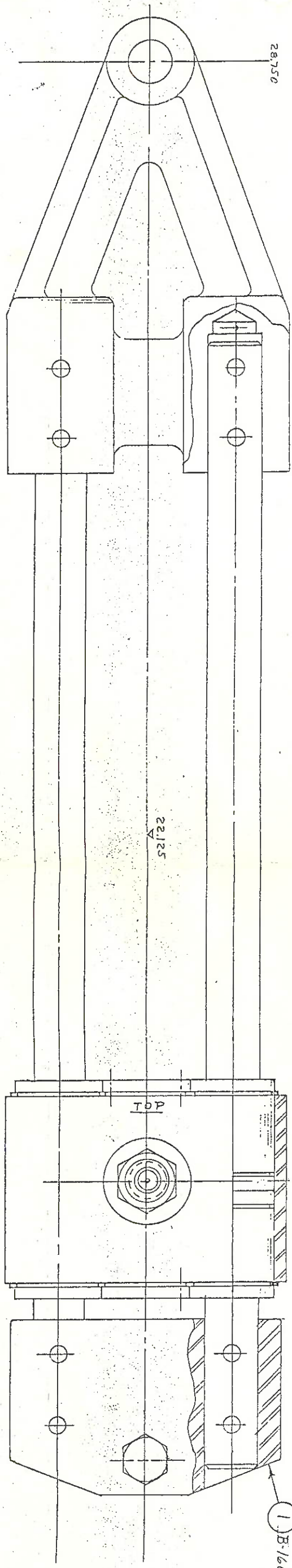
REV	DESCRIPTION	ECO NO	DATE
1	ADDED ITEM 75		
2	12 WAS (3) PICTURE CHANGE TO AGREE WITH P. 1600-0100		
3	12 WAS (3) PICTURE CHANGE TO AGREE WITH P. 1600-0100		
4	ADDED ITEM 71		
5	ADDED ITEM 70		
6	NEW RELEASE		

REV	DESCRIPTION	ECO NO	DATE
1	ADDED ITEM 75		
2	12 WAS (3) PICTURE CHANGE TO AGREE WITH P. 1600-0100		
3	12 WAS (3) PICTURE CHANGE TO AGREE WITH P. 1600-0100		
4	ADDED ITEM 71		
5	ADDED ITEM 70		
6	NEW RELEASE		

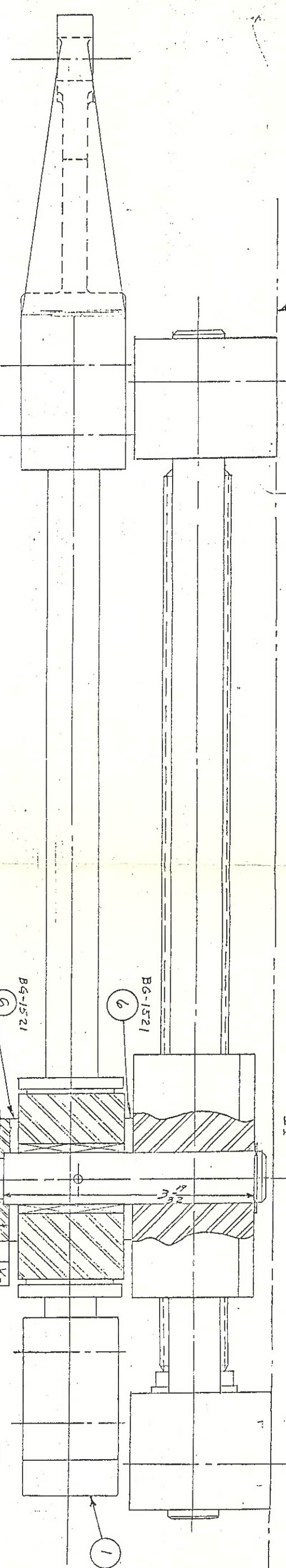
REV	DESCRIPTION	ECO NO	DATE
1	ADDED ITEM 75		
2	12 WAS (3) PICTURE CHANGE TO AGREE WITH P. 1600-0100		
3	12 WAS (3) PICTURE CHANGE TO AGREE WITH P. 1600-0100		
4	ADDED ITEM 71		
5	ADDED ITEM 70		
6	NEW RELEASE		

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WHITE-HIGGINS
BH-02 BEARING LOCKNUT
MT-101714
3 1/2"
5 Fg-9882
3
GRIND SURFACE "K" OF THIS SPACER AT ASSY
AND IN SUCH A WAY SO WILL ALLOW FREE ROTATION
OF ITEM #1 & MIX CLEARANCE OF .001 TO .003"
WHEN ITEM #4 LOCKNUT IS TORQUED
AT FINAL ASSEMBLY



MOUNTING SURFACE



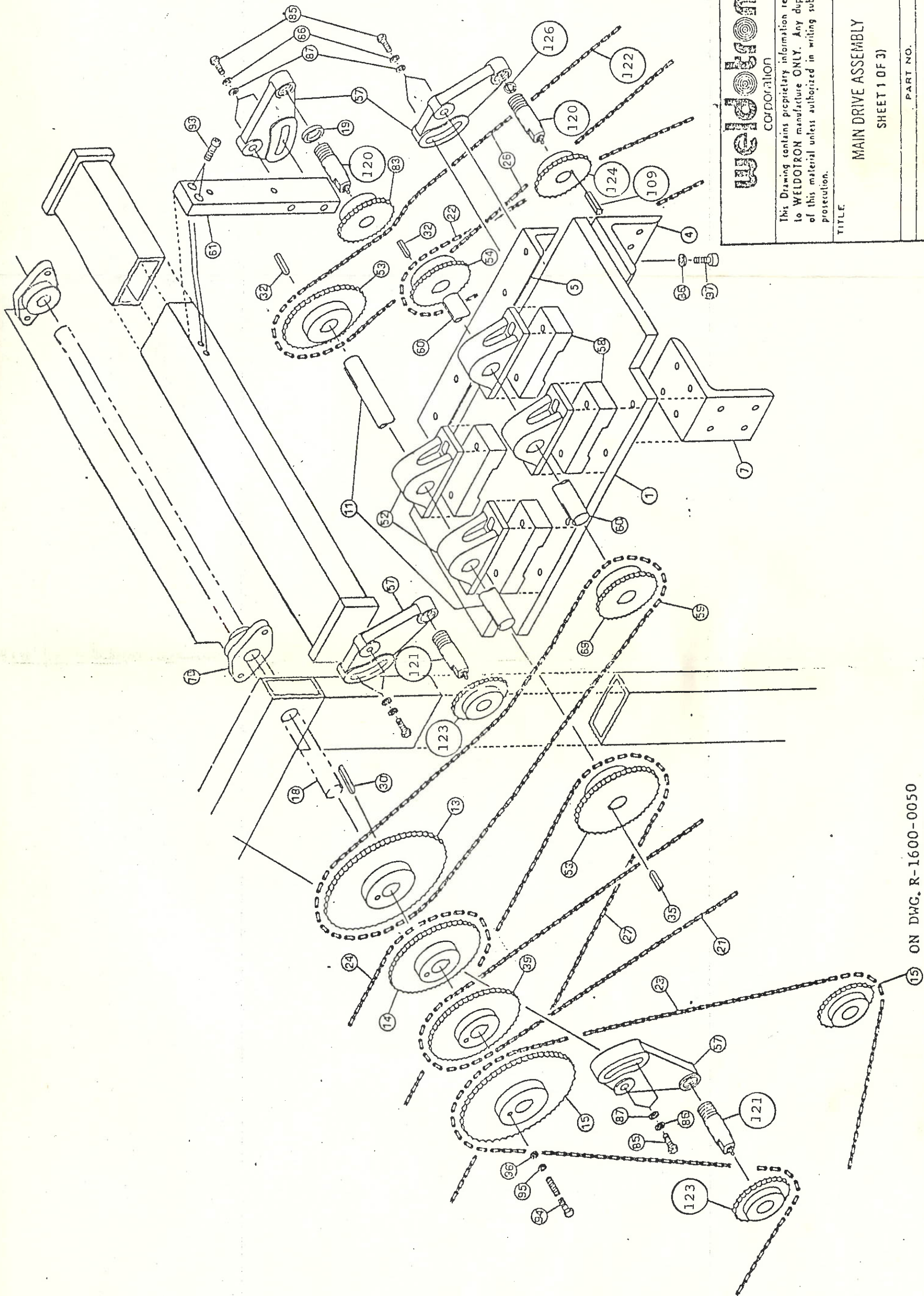
P1 L.H. AS SHOWN
P2 R.H. OPPOSITE

P2	16
P1	1
P2	1
P1	1
P2	1
P1	1

PARTS LIST FOR
D-1602-0073 PIVOT MECHANISM ASSEMBLY

<u>ITEM NO.</u>	<u>SIZE</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
A1	B	1600-0130 P1	OSCILLATING LEVER ASSEMBLY	1
	B	1600-0130 P2	OSCILLATING LEVER ASSEMBLY	1
A2	D	1602-0131 P1	PIVOT SLIDE ASSEMBLY	1
	D	1602-0131 P2	PIVOT SLIDE ASSEMBLY	1
3	A	1600-1077 P1	WASHER	1
	A	1600-1077 P2	WASHER	1
4		NT-10171 P1	NUT, SELF-LOCK	1
		NT-10171 P2	NUT, SELF-LOCK	1
5		FG-9822 P1	GREASE FITTING	1
		FG-9822 P2	GREASE FITTING	1
6		BG-1521 P1	WASHER, THRUST	2
		BG-1521 P2	WASHER, THRUST	2
7	A	1611-1058 P2	POINTER	1
8		SS-2647 P2	SCREW, BINDING HEAD	2

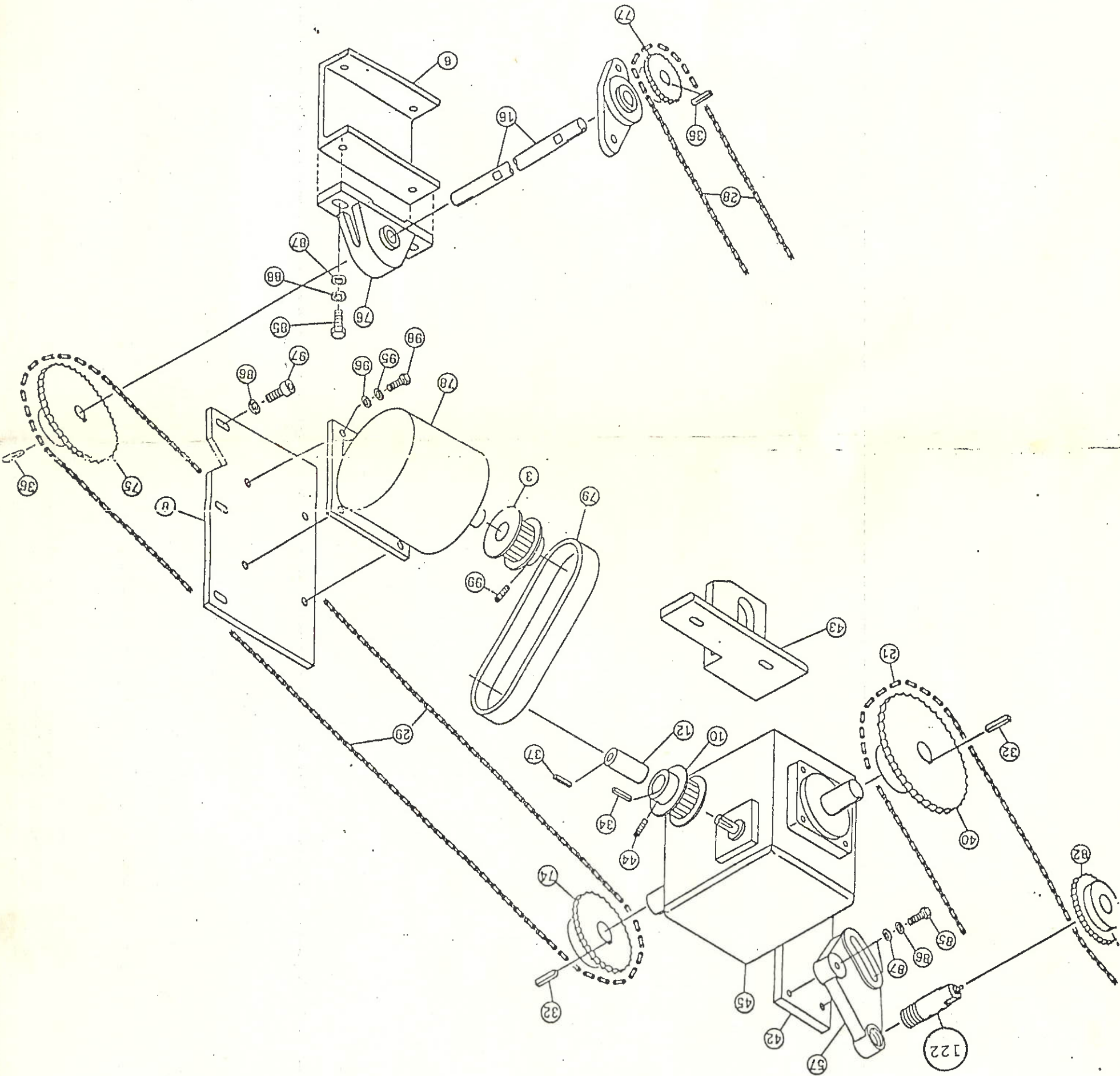
REVISED: SEPTEMBER 1986



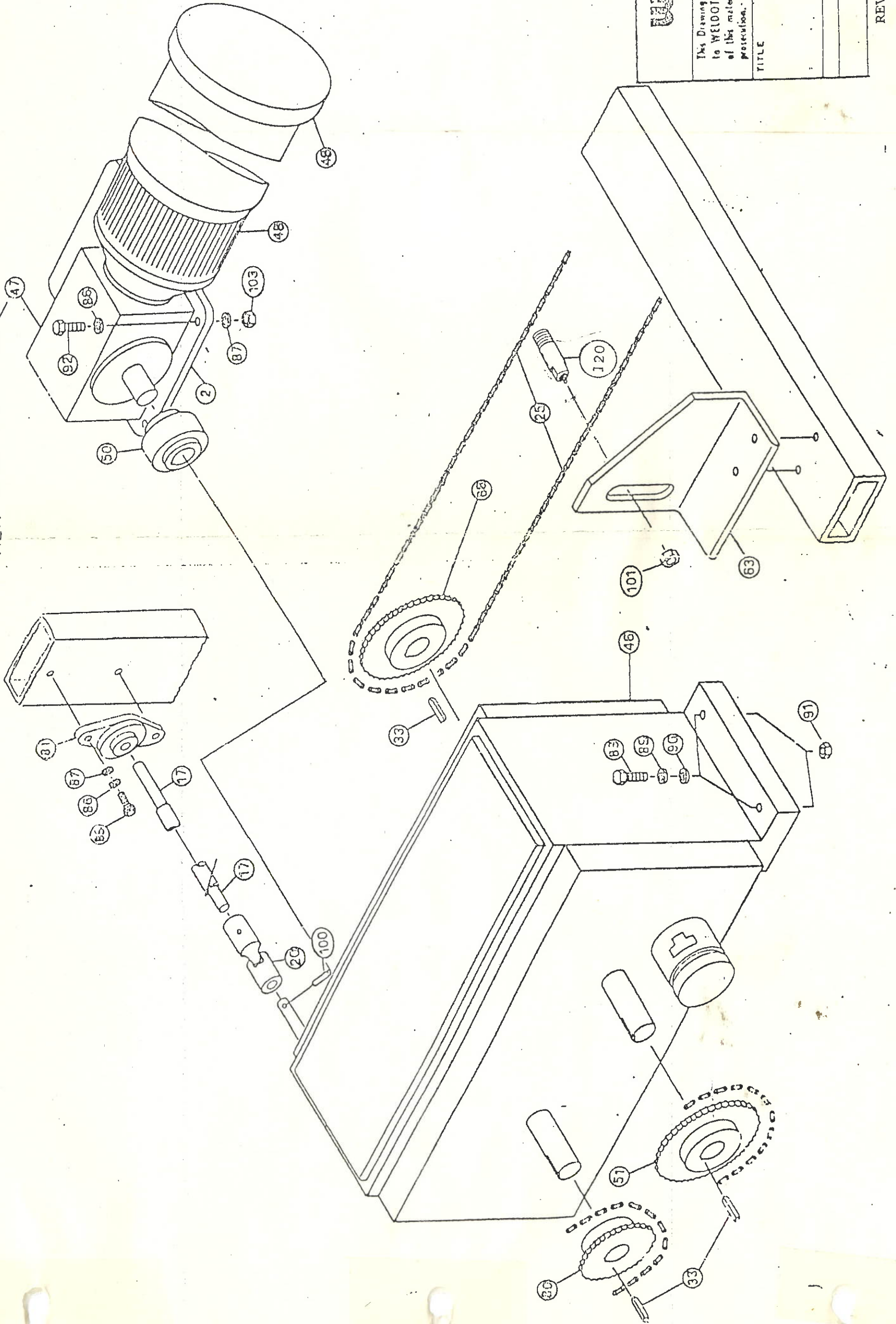
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TITLE	MAIN DRIVE ASSEMBLY
	SHEET 1 OF 3
PART NO.	1600-0011

ON DWG. R-1600-0050
REF. ONLY

	
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TITLE MAIN DRIVE ASSEMBLY (SHEET 2 OF 3)	
PART NO.	
1600-0011	
REVISED: AUGUST 1988	



REF. R1611-0111 DWG.



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TITLE

MAIN DRIVE ASSEMBLY

(SHEET 3 OF 3)

PART NO.

1600-0011

REVISED: AUGUST 1988

PARTS LIST FOR
1602-0011 MAIN DRIVE ASSEMBLY
(REFERENCE DRAWING R-1600-0011)

<u>ITEM NO.</u>	<u>SIZE</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	C	1600-1100	PLATE - MTG.	1
2	B	1600-0110	SUPPORT - REDUCER	1
3	A	1600-1105	PULLEY TIMING BELT	1
4	B	1600-1106	SUPPORT - MTG. PLATE R.H.	1
7	B	1600-1109	SUPPORT - MTG. PLATE L.H.	1
10	A	1600-1112	PULLEY - TIMING BELT	1
11	A	1600-1113	SHAFT - SPROCKET	1
13	A	1600-1115	SPROCKET	1
14	A	1600-1116	SPROCKET	1
15	A	1600-1117	SPROCKET	1
17	A	1600-1119	SHAFT - SPEED DIAL	1
19	A	1600-1121	SPACER - IDLER SHAFT	1
20	A	1600-1134	SPEED DIAL	1
A22	A	1600-1123	CHAIN	1
A23	A	1600-1124	CHAIN	1
A24	A	1600-1125	CHAIN	1
A25	A	1600-1126	CHAIN	1
A26	A	1600-1127	CHAIN	1
A27	A	1600-1128	CHAIN	1
30	A	1600-1131 P1	KEY	1
32	A	1600-1131 P3	KEY	2
33	A	1600-1131 P4	KEY	3
35	A	1600-1131 P6	KEY	1

REVISED: MARCH 1986
REVISED: MAY 1986

PARTS LIST FOR
1602-0011 MAIN DRIVE ASSEMBLY (CONTINUED)
(REFERENCE DRAWING R-1600-0011)

<u>ITEM NO.</u>	<u>SIZE</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
39	A	1662-1141	SPACER	1
41	A	1600-1143	ARM - IDLER TAKE-UP	1
43	A	1662-1145	SPROCKET - TAKE-UP MTG. ANGLE	1
44		SS-8820	SCREW, SET	1
46	A	MP-6928	P.I.V. DRIVE	1
47	R	1611-0111	DRIVE ASSEMBLY	1
48		CE-6959	BRAKE	1
49		MR-6960	MOTOR - DC	1
50		CN-6961	COUPLING - CHAIN	1
51	A	1600-1086	SPROCKET	1
52		BG-6967	PILLOW BLOCK	4
53	A	1600-1087	SPROCKET	2
54	A	1600-1083	SPROCKET	1
57	A	1600-1104	ARM - IDLER TAKE-UP	5
58	A	1600-1135	SPACER - BRG.	4
A59	A	1600-1136	CHAIN	1
60	A	1600-1137	SHAFT - SPROCKET	1
61	B	1600-1138	SUPPORT - BEARING & IDLER	1
63	A	1600-1149	IDLER MTG. BRACKET	1
68	A	1600-1152	SPROCKET	1
69	A	1600-1153	SPROCKET	1
70		BG-3324	BEARING UNIT	1
71		SS-8799	SCREW, SET	1
73		SS-9016	SCREW, SET KNURLED CUP POINT	4

REVISED: MAY 1986

PARTS LIST FOR
1602-0011 MAIN DRIVE ASSEMBLY (CONTINUED)
(REFERENCE DRAWING R-1600-0011)

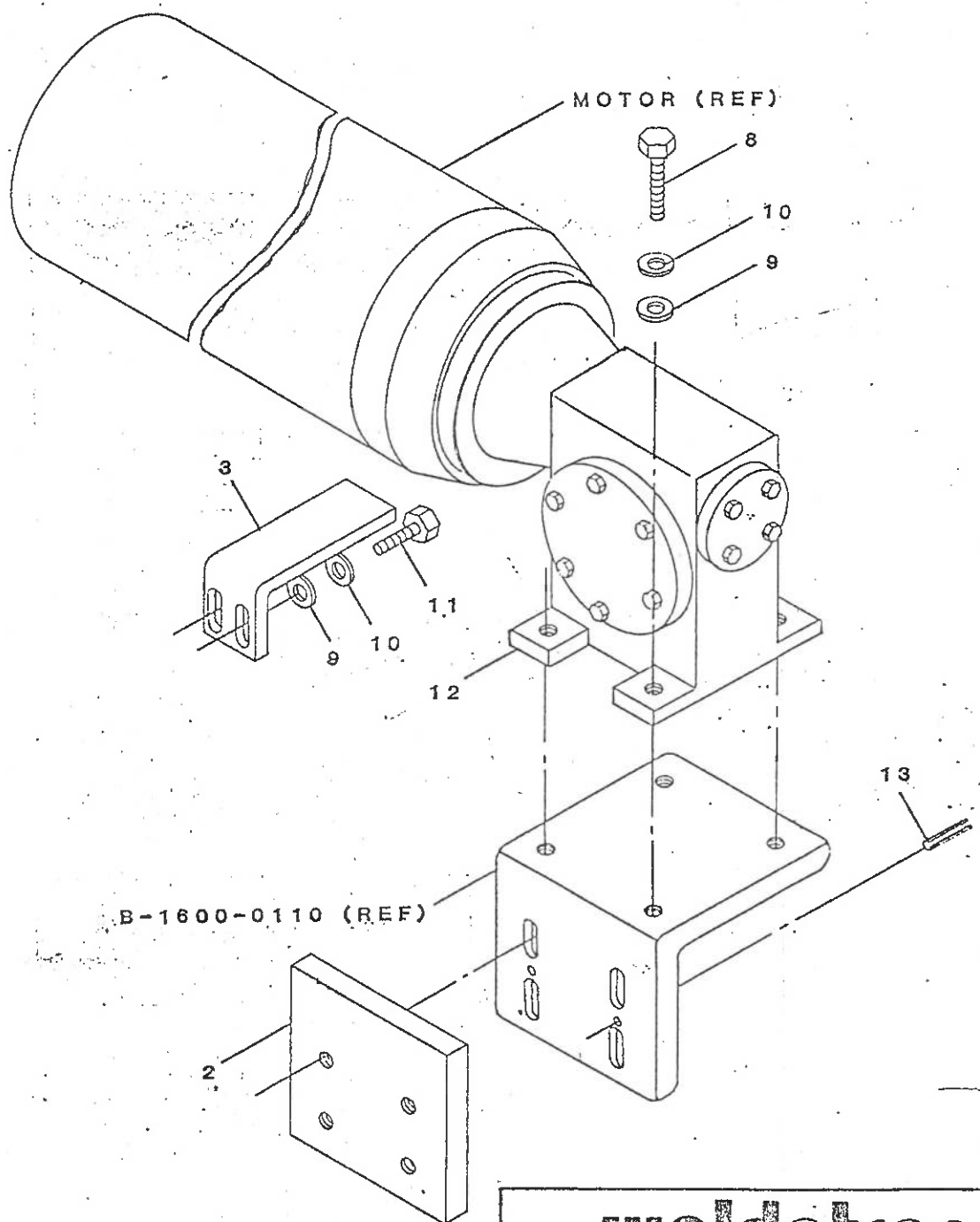
<u>ITEM NO.</u>	<u>SIZE</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
79		BL-2515	BELT, TIMING	1
80	A	1600-1154	SPROCKET	1
81		BG-7236	BEARING UNIT	1
82		SK-7023	SPROCKET IDLER	1
85		SS-2189	SCREW, HEX. HD.	34
86		WA-0981	WASHER, LOCK	56
87		WA-0260	WASHER, FLAT	46
88		SS-10963	SCREW, HEX. HD	4
89		WA-1375	WASHER, LOCK	4
90		WA-2649	WASHER, FLAT	4
91		NT-3055	NUT, JAM HEX	4
92		SS-2405	SCREW, HEX. HD.	12
93		SS-1289	SCREW, SOC. HD.	2
94		SS-2588	SCREW, HEX. HD.	1
95		WA-0352	WASHER, LOCK	4
96		WA-0361	WASHER, FLAT	4
97		SS-0622	SCREW, SOC. HD.	14
100		PN-5313	PIN, GROOVE	2
101		NT-2391	NUT, JAM HEX.	2
102		WA-4329	WASHER, LOCK	2
103		NT-0709	NUT	4
104		SS-9017	SCREW, SOC. SET KNURLED CUP POINT	2
105		SS-9016	SCREW, SOC. SET KNURLED CUP POINT	14
109		PN-7906	PIN, GROOVE	5

REVISED: MAY 1986

PARTS LIST FOR
1602-0011 MAIN DRIVE ASSEMBLY (CONTINUED)
(REFERENCE DRAWING R-1600-0011)

<u>ITEM NO.</u>	<u>SIZE</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
110		SS-0273	SCREW, SET	2
A112	R	1611-0111	DRIVE ASSEMBLY	1
120	A	1600-1161	SHAFT - CHAIN IDLER	3
121	A	1600-1163	SHAFT - CHAIN IDLER	2
122	A	1600-1162	SHAFT - CHAIN IDLER	3
123		SK-9445	SPROCKET - IDLER	5
124		SK-13877	SPROCKET - IDLER	2
125		CL-0069	COLLAR	6
126		RG-2706	RING, RETAINING	1
127	A	1662-1150	BRACKET, PNEUMATIC SUPPORT	1

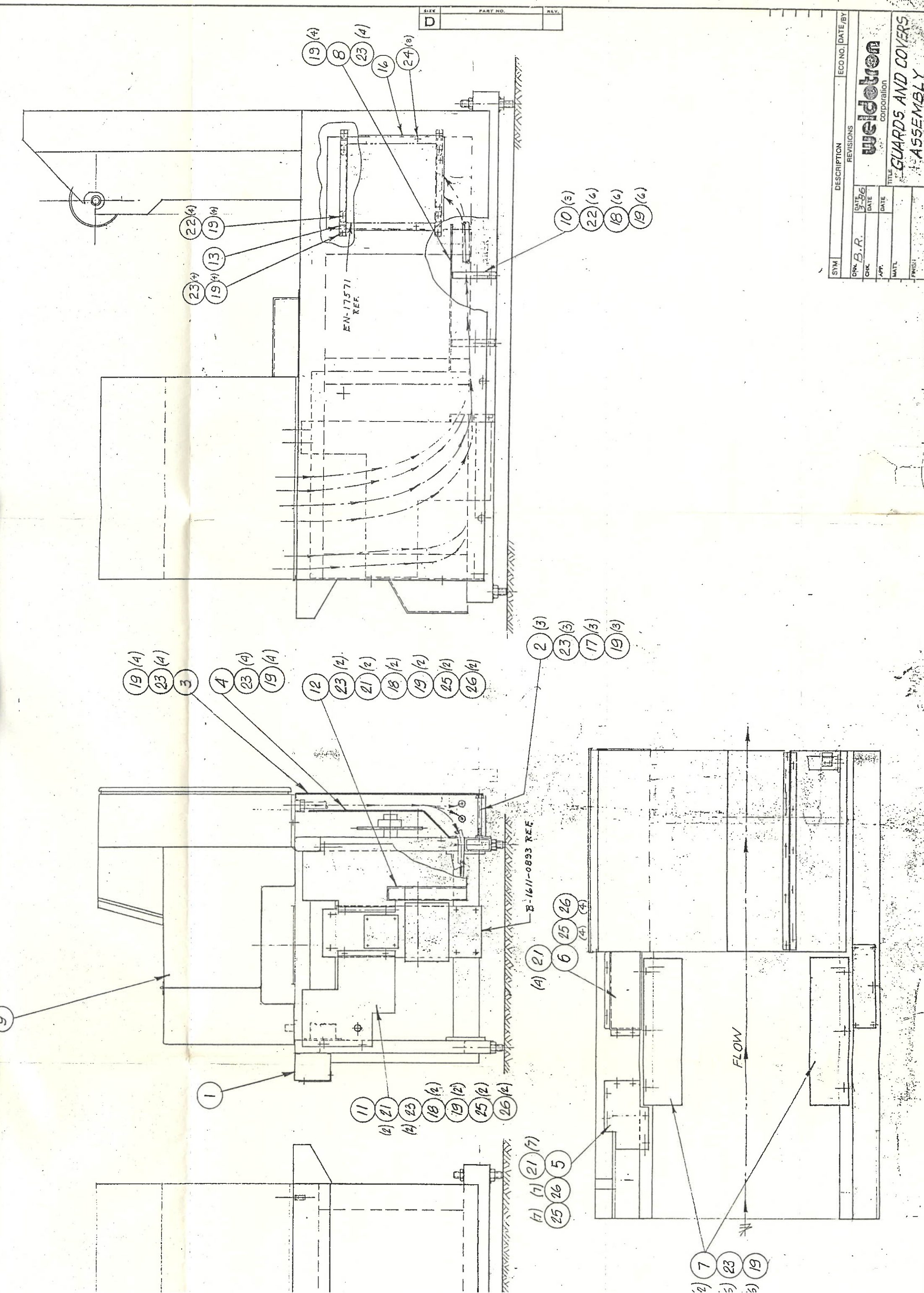
REVISED: MAY 1986



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TITLE		
DRIVE ASSEMBLY		
SCALE	PART NO.	REV.
—	1611-0111	

PARTS LIST FOR
1611-0111 DRIVE ASSEMBLY

<u>ITEM NO.</u>	<u>SIZE</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
2	A	1611-1160	SPACER, GEAR REDUCER	1
3	A	1611-1161	MOTOR SUPPORT	1
8		SS-7442	SCREW, HEX. HD.	4
9		WA-0837	WASHER, FLAT	6
10		WA-0195	WASHER, LOCK	6
11		SS-2185	SCREW, HEX. HD.	2
12	A	1611-1150	REDUCER (ALTER)	1
13		PN-10028	PIN, GROOVE TYPE A	2

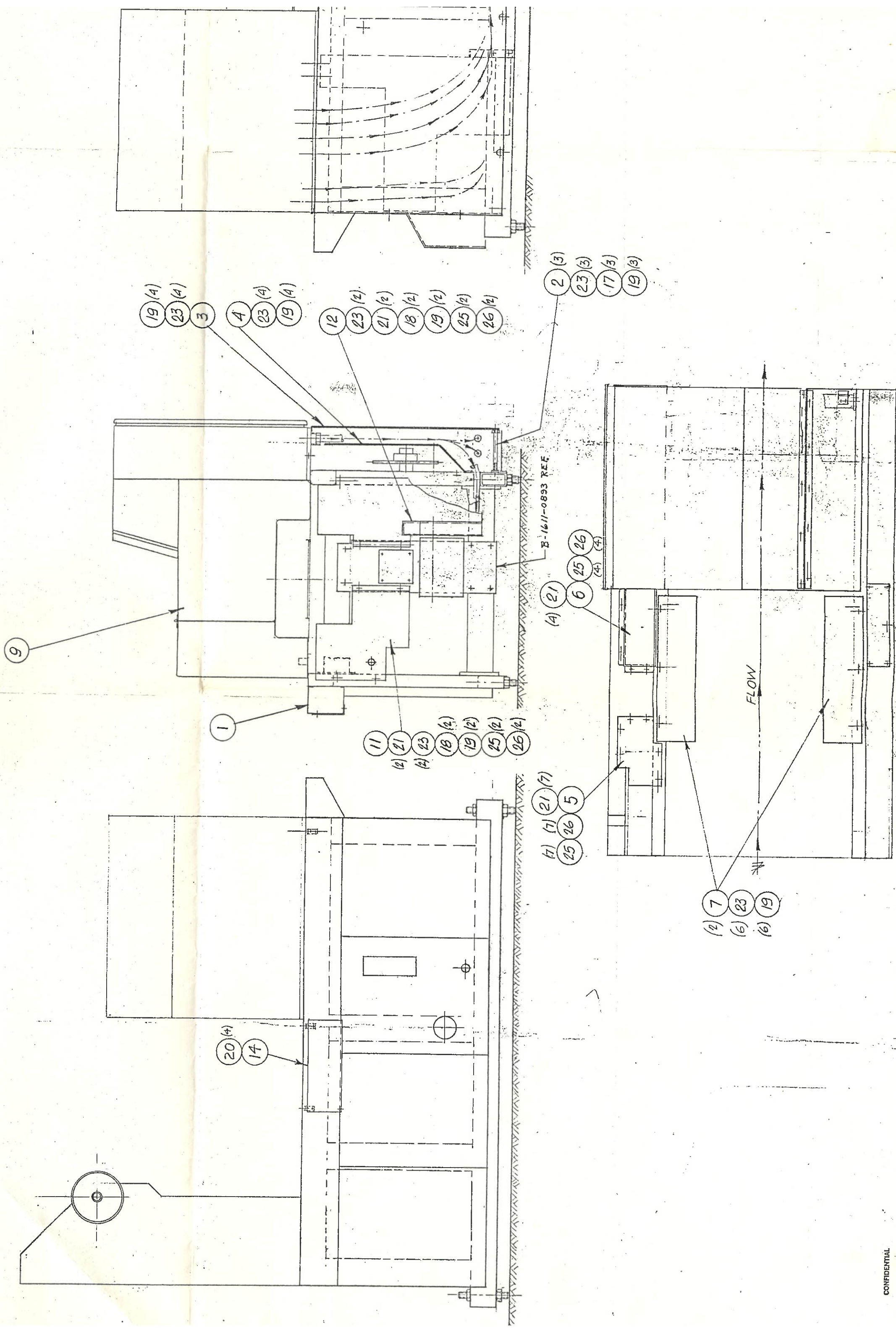


SIZE	PART NO.	REV.
D		

SYM	DESCRIPTION	ECON. NO. DATE / BY	
		DATE	BY
DRN	B.R.	DATE	BY
CHK		DATE	BY
APP		DATE	BY
MATL		DATE	BY
FINISH		DATE	BY

weidolon
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TITLE: **GUARDS AND COVERS ASSEMBLY**



SHEET 1 OF 1

ITEM NO. PRECEDED BY "A"
INDICATES SEPARATE PARTS
LIST.

1602

P/L

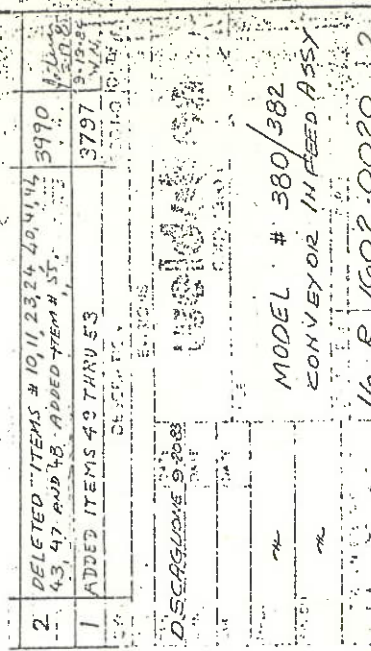
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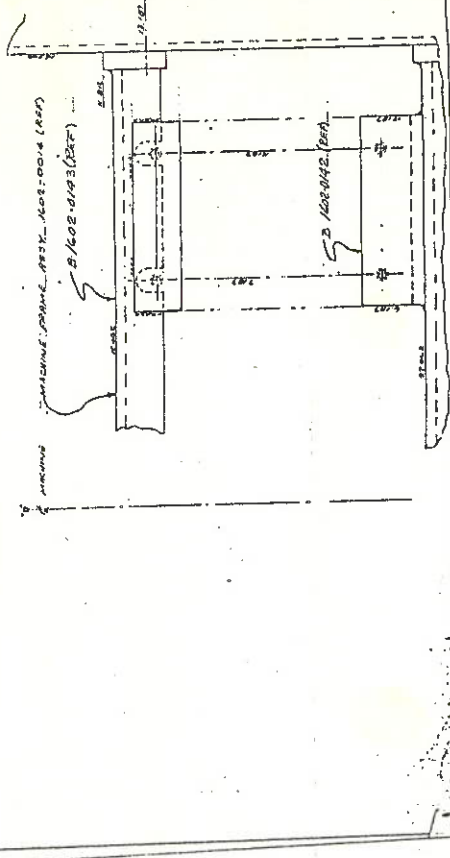
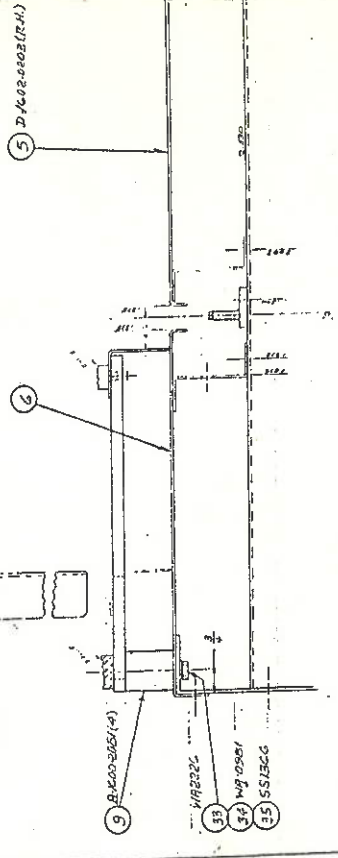
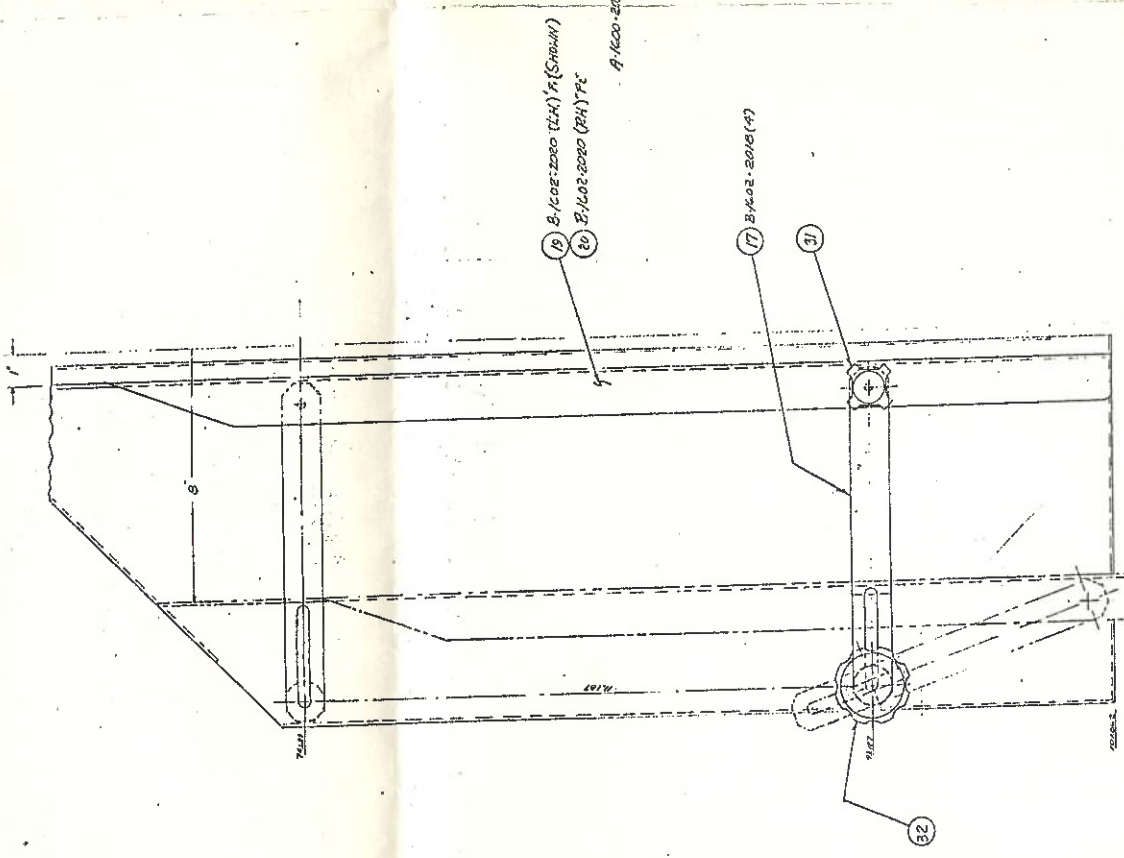
1602

2004

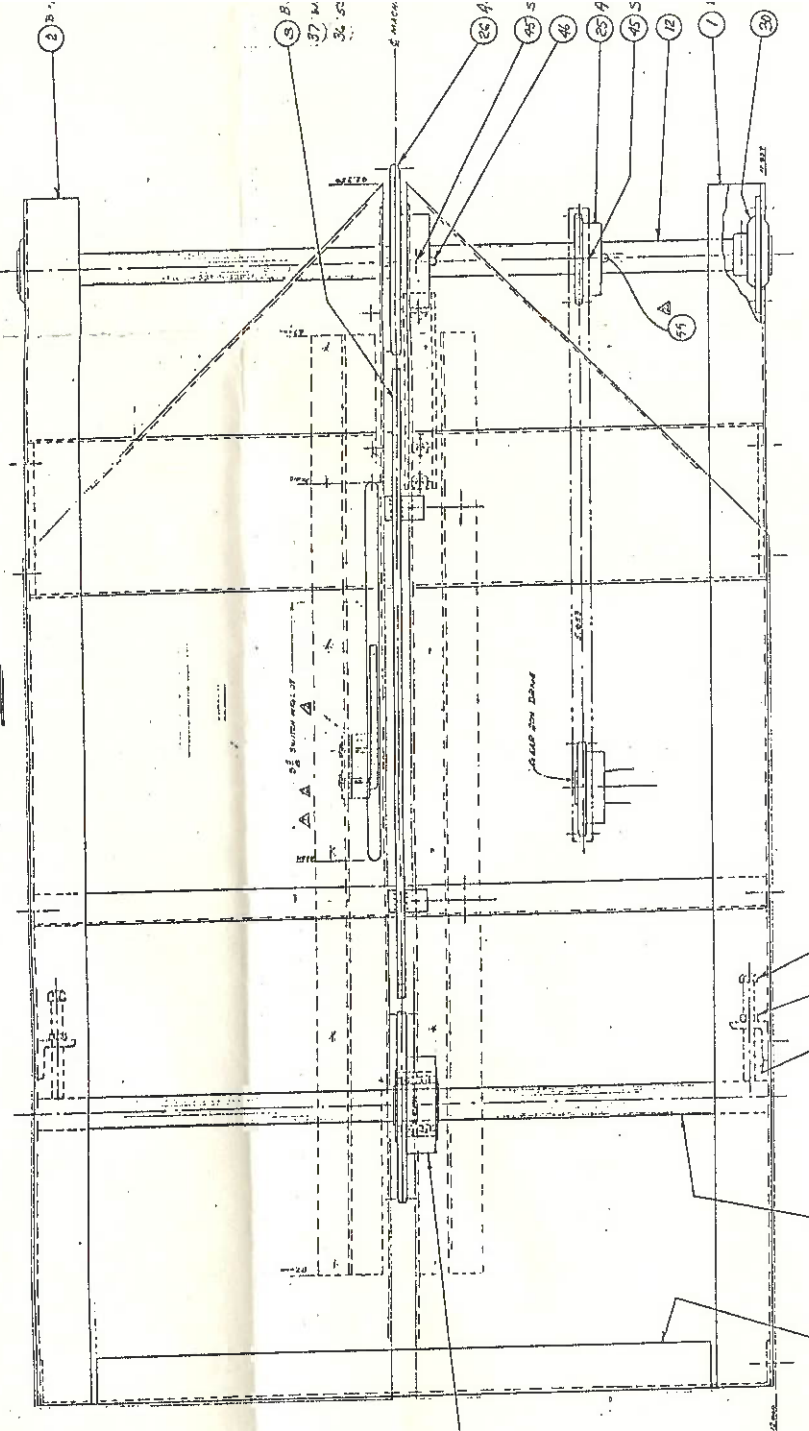
/

NO. REQ. & PER ASSY															1
D		16020013						GUARD AND COVERS ASS'Y				P/N			
ITEM	SIZE	PART NUMBER				REV	DESCRIPTION				FINISH	QTY			
A1	R	16020121					COVERS R.H. ASSEMBLY					1			
2	A	16001213					HEX BOLT					3			
A3	D	16020133				1	COVER FAR SIDE				PAINT FH 2865	1			
4	C	16111315				1	COVER-WIRE GUARD				PAINT FH 2865	1			
5	B	16021210					COVER, TOP				PAINT FH 2865	1			
6	B	16021209					COVER, CHAIN				PAINT FH 2865	1			
7	B	16021211					COVER,				PAINT FH 2865	2			
8	B	16111318				2	COVER WIRE PROTECTION				PAINT FH 2865	1			
A9	R	16020120					LEXAN COVER-GUARD					1			
10	A	16111316				1	BRACKET-CABLE SUPPORT				BLACK OXIDE	3			
11	C	16021301					COVER OUTFEED L.H.				PAINT FH 2865	1			
12	C	16021302					COVER OUTFEED R.H.				PAINT FH 2865	1			
13	A	16021303					BRACKET-ENCL. MOUNTING				PAINT FH 2865	2			
14	B	16111201					COVER ACCESS R.H.				PAINT FH 2865	1			
15															
16	A	16021305					COVER, ACCESS (ELECT. BOX)					1			
17		MT 1918					NUT HEX					3			
18		WA-2224					WASHER FLAT 1/4					14			
19		WA-2231					WASHER LOCK 1/4					33			
20		SS 2368					SCREW BINDING HEAD					4			
21		SS-0121					SCREW HEX. HEAD					15			
22		SS 0067					SCREW HEX. HEAD					10			
23		SS-0188					SCREW HEX HEAD					37			
24		SS 0272					SCREW BINDING HEAD					8			
25		WA-2223					WASHER FLAT #10					15			
26		WA-2230					WASHER LOCK #10					15			
27															
28															
REV	ECO	BY	DATE	REV	ECO	BY	DATE	REV	ECO	BY	DATE	REV	ECO	BY	DATE

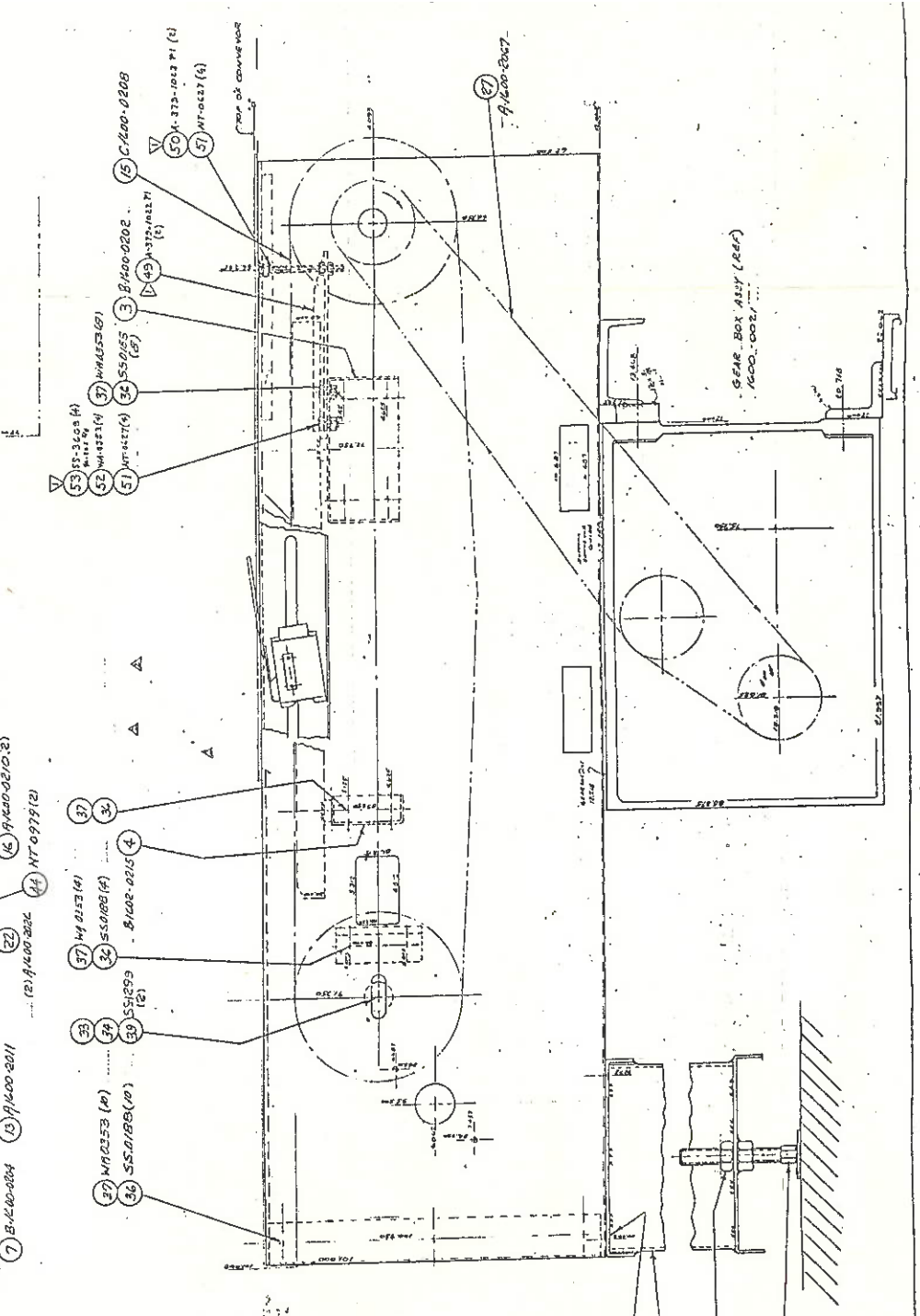




L.H.



R.H.



GEAR BOX ASSY (REF)

PART NO.		NOTE:		MODEL USED ON		1602	
PL 380A-0020		ITEM NO. PRECEDED BY "A" INDICATES SEPARATE PARTS LIST.		ASSY. USED ON		PL 1602 0001	
SHEET 1 OF 3				NO. REQ'D PER ASSY.		1	
ITEM	SIZE	PART NUMBER	REV	DESCRIPTION	FINISH	QTY	
INFEED CONVEYOR ASSEMBLY							
A1	B	16020200	P1	CONVEYOR SIDE (R.H.) WELD.	FH-2865	1	
A2	B	16020200	P2	CONVEYOR SIDE (L.H.) WELD.	FH-2865	1	
A3	B	16000202		CONVEYOR STIFFNER WELD.	FH 2865	1	
A4	B	16020215		CONVEYOR STIFFNER WELD.	FH 2865	1	
A5	D	16020203		CONVEYOR TOP R.H. WELD.		1	
A6	PL	16020209		CONVEYOR TOP L.H. WELD.		1	
A7	B	16000204		COVER WELD. END.	FH 2865	1	
A8	B	16020205		CHAIN GUIDE WELD.	BLACK OXIDE	1	
9	A	16002031		ANCHOR BLOCK	CLEAR CHROMATE	4	
10							
11							
12	C	3791014	P1	DRIVE SHAFT	BLACK OXIDE	1	
13	A	16002011		SHAFT TAKE UP	BLACK OXIDE	1	
A14	C	16110207		CONVEYOR LEG, WELD.	PAINT FH-2865	1	
A15	C	16000208		CHAIN ASSEMBLY (18" SECTION)		4	
A16	A	16000210		SCREW TAKE-UP WELD.	BLACK OXIDE	2	
17	B	16022018		GUIDE ARM	CLEAR CHROMATE	4	
A18	B	72210305		LEVELING PAD WELD. ASS'Y		2	
19	B	16022020	P1	GUIDE RAIL		1	
20	B	16022020	P2	GUIDE RAIL		1	
21	A	16002038		SPROCKET (40B36)	BLACK OXIDE	1	
22	A	16002026		ANGLE TAKE UP	BLACK OXIDE	2	
23							
24							
25	A	16001083		SPROCKET	BLACK OXIDE	1	
26	A	16001082		SPROCKET	BLACK OXIDE	1	
A27	A	16002067		CHAIN	40	1	
28		BG7170		BEARING	1" I.D.	2	

PART NO.
PL 380A-0020
SHEET 2 OF 3

NOTE:
ITEM NO. PRECEDED BY "A"
INDICATES SEPARATE PARTS
LIST.

MODEL USED ON

1602
B

ASSY. USED ON

P/L 1602E
0001

NO. REQ'D PER ASSY.

1

R		16020020										INFEED CONVEYOR ASSEMBLY										P/N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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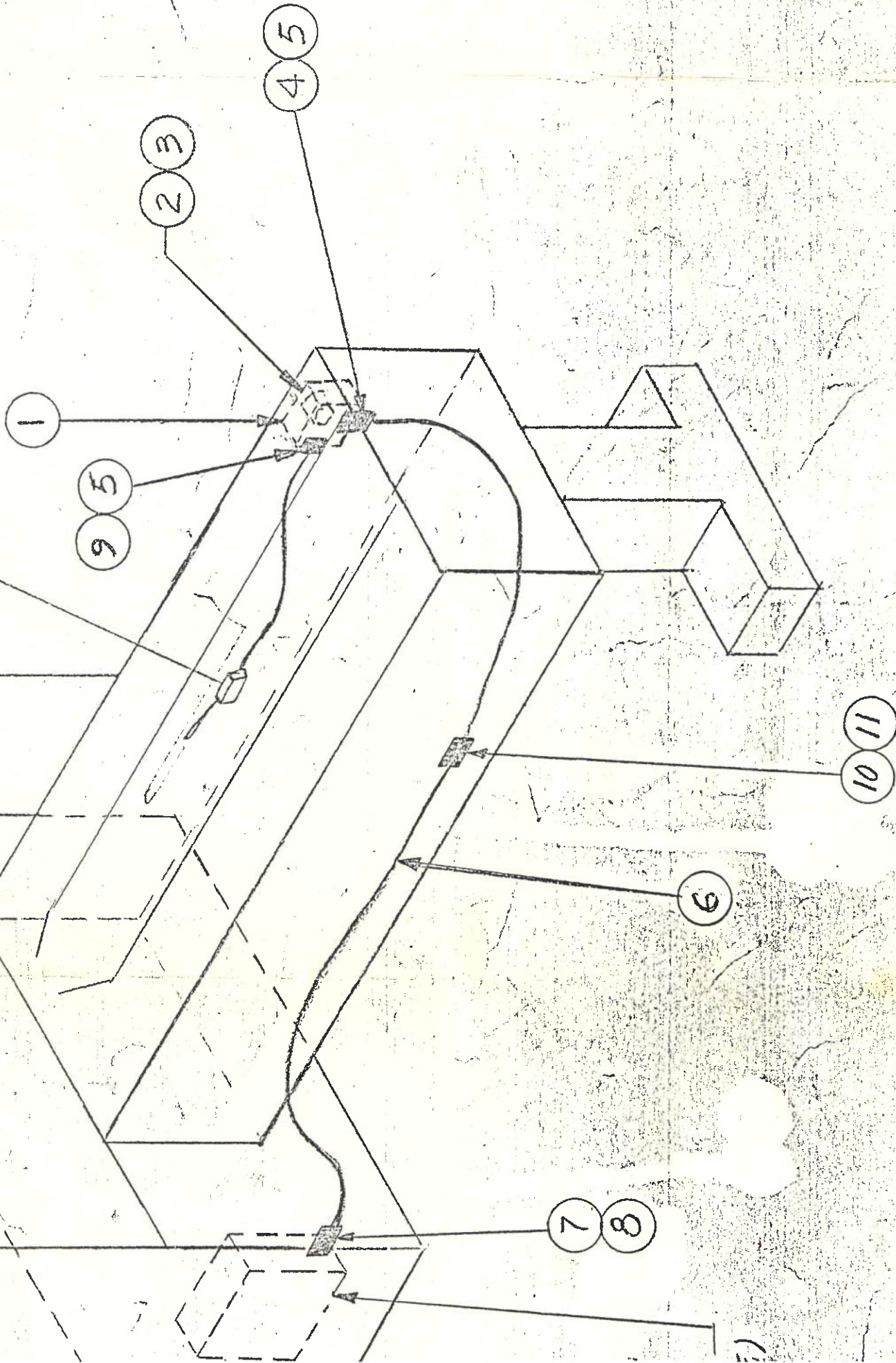
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	C		3800082				MAIN ELECTRICAL ASSY.	P/N				
ITEM	SIZE	PART NUMBER					REV	DESCRIPTION	FINISH	QTY	QTY	C
1	B		3808200				ENCLOSURE DRILL DETAIL	—	1			
2			SW5967				MUSHROOM HD P/B, RED (PB2)	—	1			
3			LB6986				NAMEPLATE "E-STOP"	—	1			
4			CD4384				CORD CONNECTOR 1/2"	—	1			
5			CD3412				LOCKNUT 1/2"	—	2			
6	A		3808201				16/4 SJ CORD	—	1			
7			CD17569				CORD CONNECTOR 3/4"	—	1			
8			CD3840				LOCKNUT 3/4"	—	1			
9			CD6489				CORD CONNECTOR 1/2"	—	1			
10			CP5122				TY-CLAMP, SELF ADHESIVE	—	6			
11			WE3291				CABLE TY-RAP	—	6			

[illegible]

INFED INDEXER 380A

LS4 (REF)



NOTES:

1. LOCATE AND UTILIZE ITEMS 10&11 AS REQUIRED TO SUPPORT ALL FLEXIBLE CORDS.

SIZE	PART NO.	REV.
C		

SYM	DESCRIPTION	ECONO	DATE/BY	REVISIONS			
				DATE	CHK	APP	MATL
				202	3-7-86		
				weldotron corporation			
				MAIN			

SEE NOTE 4

SYM					
DRN	66				
CHK					
APP.					
MATL					
FINISH					

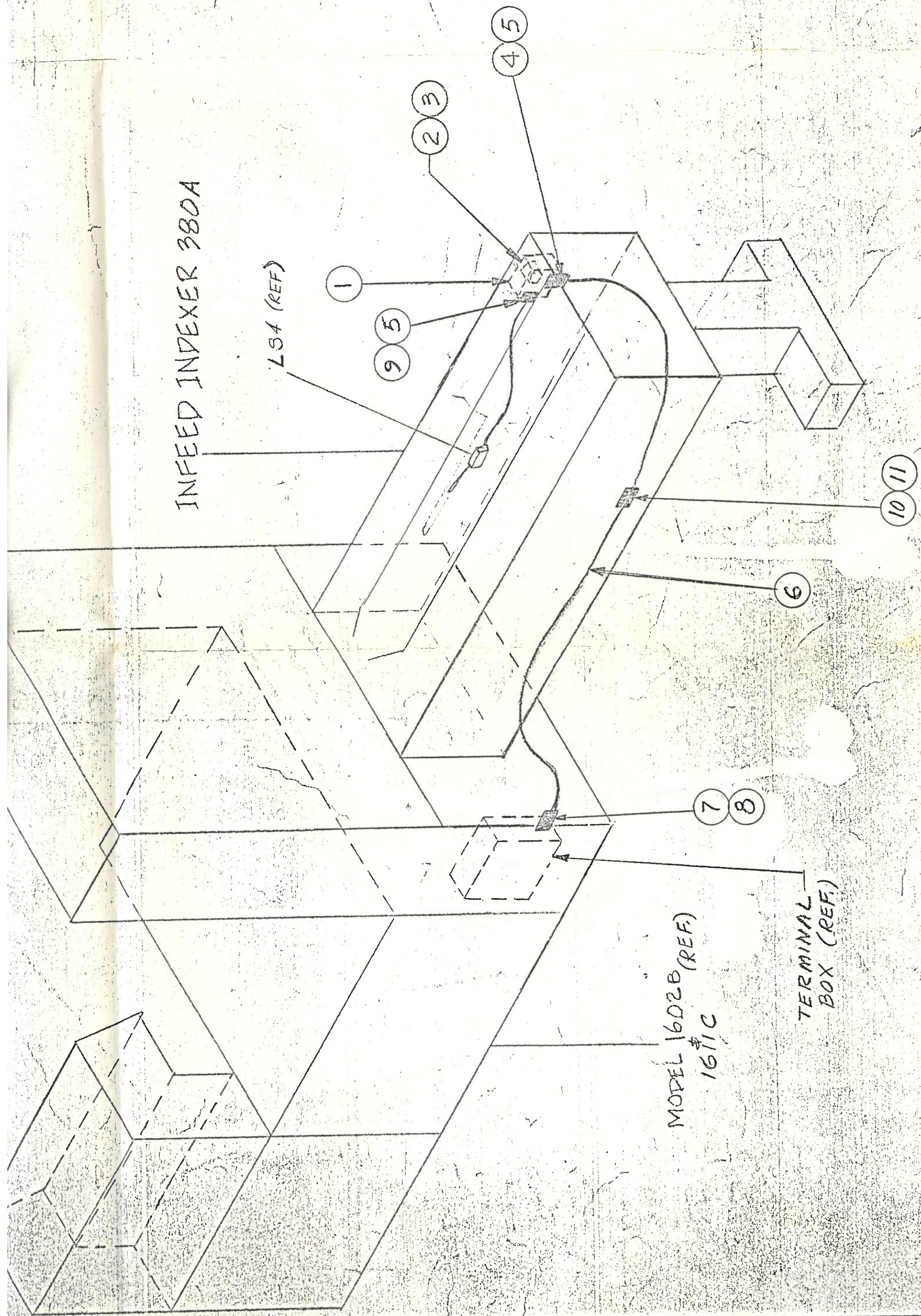
INFED INDEXER 380A

LS4 (REF)

MODEL 1602B (REF)
1611C

TERMINAL
BOX (REF.)

SEE NOTE #1

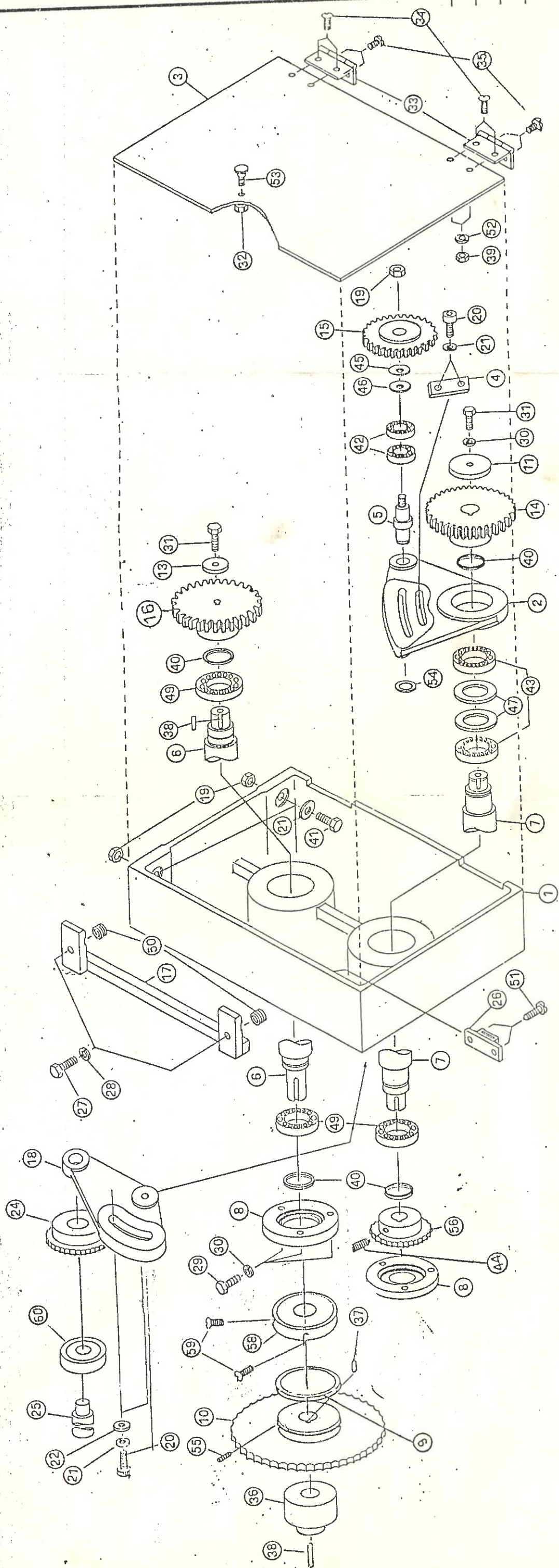


PARTS LIST

NOMENCLATURE

NO.
REQ.

ITEM
NO.



weldotron
corporation

TITLE

INFEED CONVEYOR BOX ASSEMBLY
FOR MANUAL ONLY

SCALE	SIZE	PART NO.	REV.
	B	1611-0021	

KMB 10/24/86

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PART NO.				NOTE:				MODEL USED ON				
PL 1611-0021				ITEM NO. PRECEDED BY "A" INDICATES SEPARATE PARTS LIST.				1611B				
SHEET 1 OF 3								ASSY USED ON. 1611B 0001				
								NO. REQ'D. PER ASSY. 1				
R 1611-0021 1				INFEED CONVEYOR GEARBOX				P/N				
ITEM	SIZE	DWG. NO.	LET.	REV.	DESCRIPTION				FINISH	P.N.	QTY	P.N.
1	D	1600	-	2101	INFEED CONV. GEARBOX HOUSING				FH2865	PI	1	
2	C	1600	-	2102	LEVER, IDLER GEAR				PAINT FH2865		1	
A 3	C	1600	-	2103	COVER, GEARBOX						1	
4	A	1600	-	2104	LOCK PLATE				BLACK OXIDE		1	
5	A	1611	-	2105	SHAFT, IDLER				BLACK OXIDE		1	
6	B	1611	-	2106	SHAFT, DRIVE				BLACK OXIDE		1	
7	B	1611	-	2107	SHAFT, DRIVEN				BLACK OXIDE		1	
8	A	1600	-	2108	RETAINER BEARING				CLEAR CHROMATE		2	
9		RG	-	9238	RETAINING RING				~		1	
10	A	1600	-	2110	SPROCKET, DRIVE				~		1	
11	A	1600	-	2111	SPACER, GEAR				BLACK OXIDE		1	
12	A	1600	-	1161	SHAFT, IDLER SHORT				BLACK OXIDE	F	1	
13	A	1600	-	2113	SPACER, GEAR				BLACK OXIDE		1	
14	B	1600	-	2114	GEAR, OUTPUT				~		1	
15	B	1600	-	2115	GEAR, IDLER				~		1	
16	A	1600	-	2119	GEAR DRIVER FOR 24" INF. SPACING				~		1	
A 17	B	1600	-	2117	CLAMP WELDMENT				BLACK OXIDE		1	
18	A	1600	-	1104	ARM-IDLER TAKE UP				PAINT FH2865		1	
19		NT	-	2752	NUT, HEX 3/8-16						5	
20		SS	-	5022	SCREW, SOC. HD 3/8-16 x 1 1/2				CAD. PLATE		4	
21		WA	-	0981	LOCKWASHER, SPLIT 3/8				CAD. PLATE		8	
22		WA	-	0260	WASHER, FLAT 3/8				CAD. PLATE		3	
23		KB	-	5743	KNOB, STUD 1/4-20				~		1	
24		SK	-	9445	SPROCKET, IDLER BROWNING #HB-40A17				~		1	
25		ST	-	6978	SHAFT, BROWNING #N2				~		1	
26		LA	-	6271	MAGNETIC LATCH				~		2	
27		SS	-	1316	SCREW, HEX HD MACH. 5/16-18 x 1 1/4				CAD. PLATE		2	
28		WA	-	0195	LOCKWASHER, SPRING 5/16				~		2	

FILE NO. PRECEDES BY
INDICATES SEPARATE PAGE

L157-01-1

Index

1611B
0001

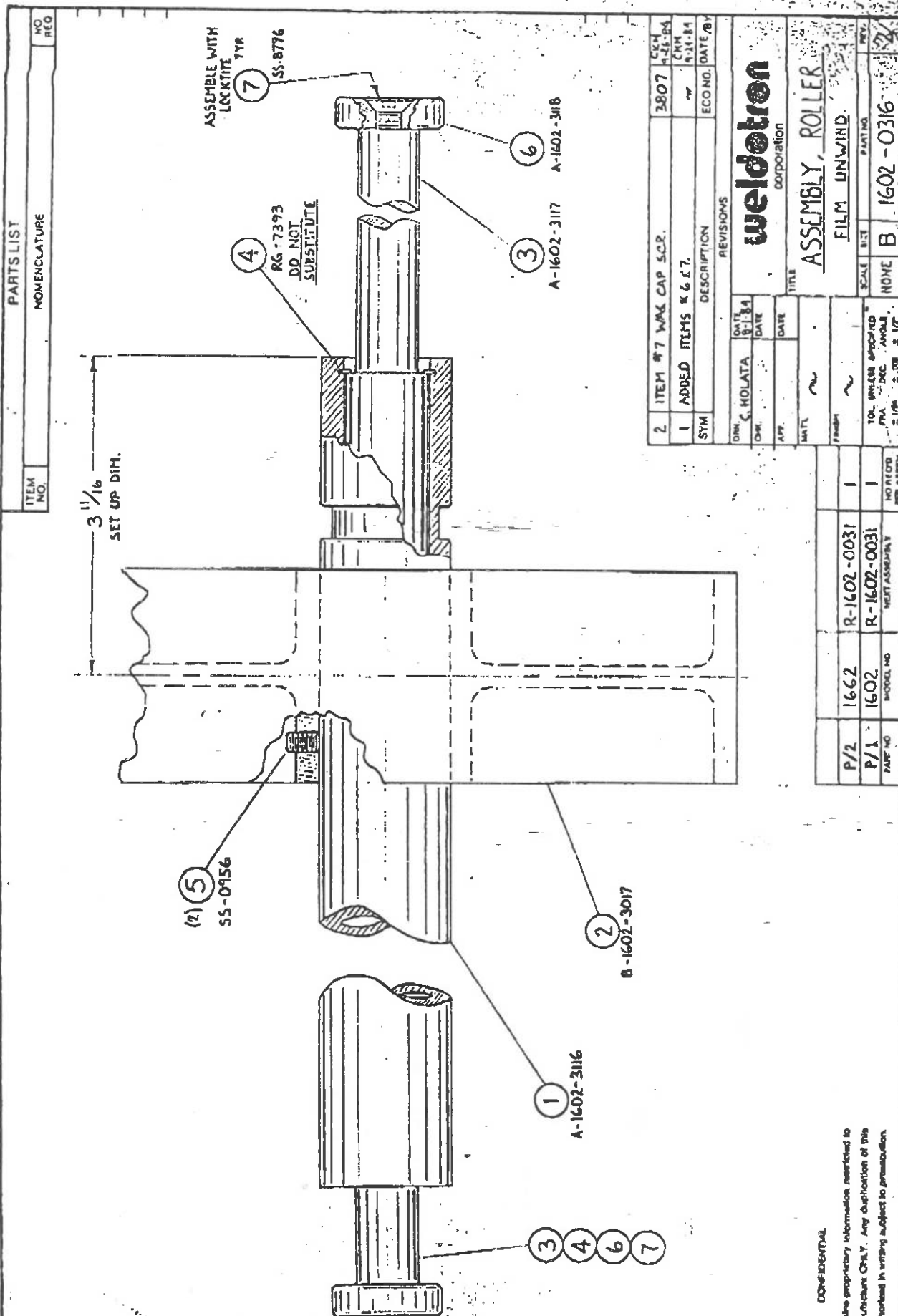
11

R 1611 - 0021										P/N									
ITEM	SIZE	TWG	NO	LET	DESCRIPTION	FINISH	QTY	QTY	QTY										
29			S	S-0067	SCREW, HEX HD, MACH. 1/4-20X3/4		1												
30			W	A-0353	LOCKWASHER, SPRING, 1/4	CAD. PLATE	1												
31			S	S-7058	SCREW, HEX HD, MACH. 3/8-16X5/8		1												
32			H	A-6887	STEEL KEY, 3/16 SQ. X 5/8 LG.		1												
33			H	I-6311	HINGE	SEE DWG	2												
34			S	S-11674	SCREW, PAN HD, #8-32X3/8		8												
35			S	S-0332	SCREW, FL. HD, #8-32X3/8	CAD. PLATE	4												
36			C	E-3927	TORQ. TENDER, HELLAND TT2X		1												
37			H	A-7048	STEEL KEY, 3/8 SQ. X 7/8 LG.		1												
38			H	A-6887	STEEL KEY, 3/16 SQ. X 7/8 LG.		3												
39			N	T-0356	NUT, HEX, #8-32		4												
40			R	G-7049	RETAINING RING, TRUARC #5100-118		3												
41			S	S-7327	SCREW, HEX HD, MACH. 3/8-16X1 1/2		4												
42			B	G-7051	BEARING, NEW DEPART. #24993L03		2												
43			B	G-7052	BEARING, NEW DEPART. #2093L06		1												
44			S	S-9016	SET SCREW, 5/16-18 X 1/2, KNURL. CUP PT. NYLOCK		2												
45			S	G-7054	DISC SPRING, NAT. #A1-683827		1												
46			W	A-0260	WASHER, 3/8 FLAT		1												
47			S	G-7055	DISC SPRING, NAT. SERIES AK D. 2145, d. 1.594		2												
48			P	N-7057	PIN DOWEL 3/16 DIA. X 3/4 LG.		2												
49			B	G-7649	BEARING, NEW DEP. #24993L06		4												
50			S	G-7061	SPRING COMPRESSION, LEE LG-042F-1	CAD. PLATE	2												
51			S	S-2312	SCREW, PAN HD, #6-32 X 1/4		4												
52			W	A-1384	LOCKWASHER, #8	CAD. PLATE	8												
53			N	T-3202	1/4-20 WELD NUT #XNY-2115		1												
54	A		R	G-5393	RING RETIG. WILDA #5100-66 17MM BORE		3												
55			S	S-9017	3/8-16X1/2 SOCR. SET SCREW - NYLOCK KNURLED CUP POINT		2												
56	A	J	G	O-2143	SPROCKET, MODIFIED 18T X 7/8 BORE BOST. AKS-18-2		1												
REV	E.C.O.	BY	DATE	REV	E.C.O.	BY	DATE	REV	E.C.O.	BY	DATE	REV	E.C.O.	BY	DATE	REV	E.C.O.	BY	DATE
1		JK	11/8																
2	1921	JM	3-21-77																
	1988	P.A.	9-16-77																

1

CONFIDENTIAL

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PARTS LIST

ITEM NO.

NOMENCLATURE

NO
REQ

2	ITEM #7 WAS CAP SCR.	3807	CHN	4-21-84
1	ADDED ITEMS #6 & 7.	~	CHN	9-21-84
SYM	DESCRIPTION	ECONO.	DATE	BY

REVISIONS

weldotron
corporation

ASSEMBLY, ROLLER

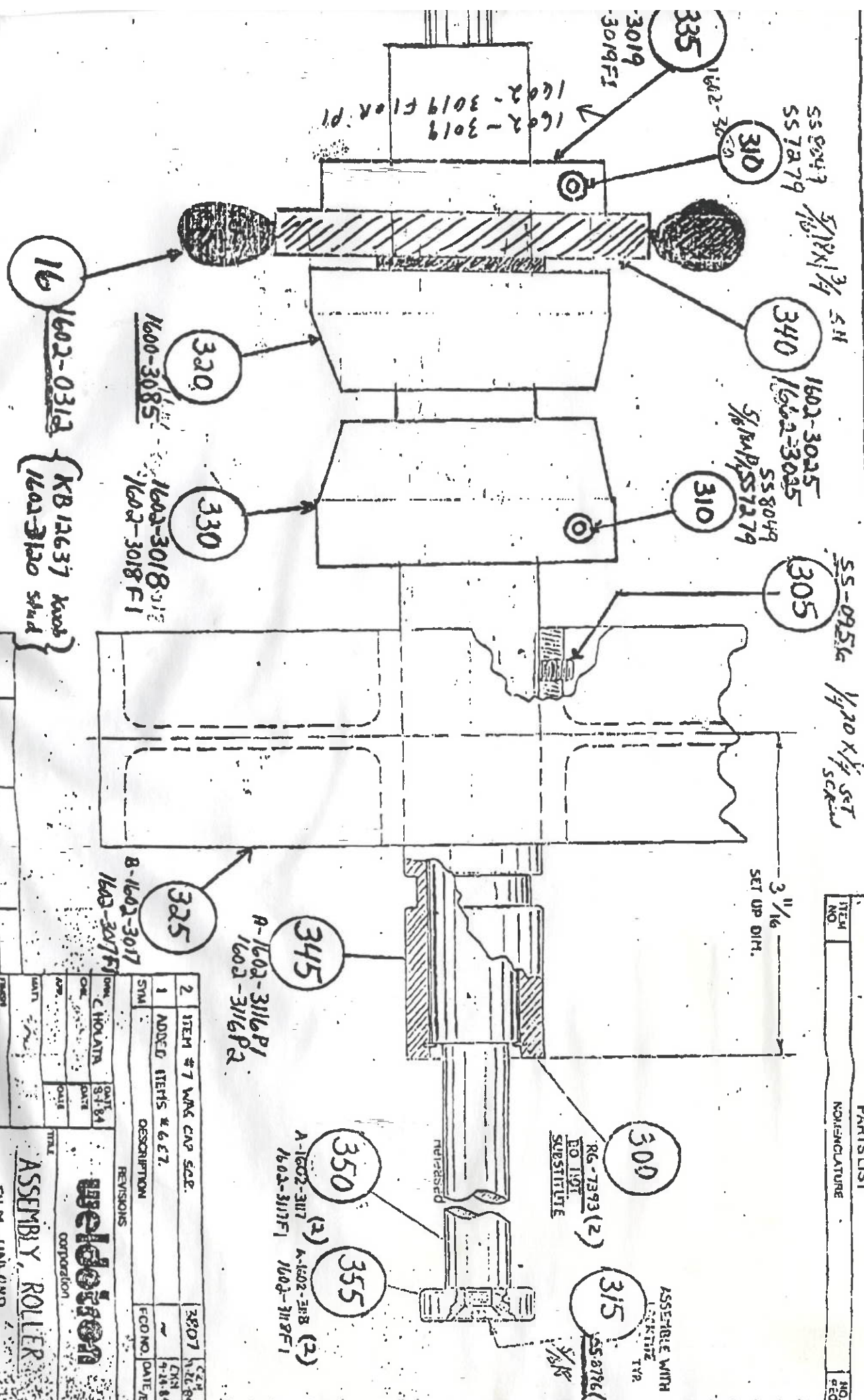
FILM UNWIND

DATE	DATE	DATE	DATE	DATE
CHN	CHN	CHN	CHN	CHN
APP	APP	APP	APP	APP
MATL	MATL	MATL	MATL	MATL
FINISH	FINISH	FINISH	FINISH	FINISH
TOL	TOL	TOL	TOL	TOL
UNC	UNC	UNC	UNC	UNC
INC	INC	INC	INC	INC
ANGLE	ANGLE	ANGLE	ANGLE	ANGLE
2.104	2.104	2.104	2.104	2.104
2.107	2.107	2.107	2.107	2.107

P/2	1662	R-1602-0031	1
P/1	1602	R-1602-0031	1
PART NO	MODEL NO	TEST ASSEMBLY	NO PHOTO AND ASSEMB

SCALE	SIZE	PLANT NO	REV
NONE	B	1602-0316	2

PARTS LIST		NO
ITEM	NO	NO
NOMENCLATURE		EO



ITEM #7 WAG CAP SCE.		3807	424
1	ADDED ITEMS # 6 & 7.	~	EXN
2	DESCRIPTION	FCO NO.	DATE/R
1	DATE	DATE	DATE
2	DATE	DATE	DATE
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SHEET / OF 4

1602
H

P/L

1602-B
2004

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[illegible]

PART NO.		NOTE:		MODEL USED ON		1602	
PL 1602-0032		ITEM NO. PRECEDED BY "A" INDICATES SEPARATE PARTS LIST.		ASSY. USED ON		7/L 1602-0001	
SHEET 2 OF 4				NO. REQ'D PER ASSY.		1	
ITEM	SIZE	PART NUMBER	REV	DESCRIPTION	FINISH	QTY	
29	A	16623037		TAKE UP BLOCK		4	
30	A	16023038		IDLER ROLLER	CLEAR CHROMATE	4	
31	A	16023039		IDLER ROLLER	CLEAR CHROMATE	1	
32	A	16023040		IDLER ROLLER	CLEAR CHROMATE	1	
33							
34	A	16623042	1	IDLER ROLLER SHAFT		4	
35	A	16623043		REGISTRATION ROLLER SHAFT		1	
36	A	16023044		WASHER		1	
37	A	16623045		DRIVE SHAFT		1	
38		ST 15698		IDLER STUD, .500 Ø		5	
39	A	16623047		SIDE FRAME SPACER		1	
40	B	16623048 F 2		SUPPORT ANGLE (R.H.)	PAINT FH 2865	1	
41	B	16623049 F 2		SUPPORT ANGLE (L.H.)	PAINT FH 2865	1	
42	C	16023050		SUPPORT ANGLE (L.H.)	PAINT FH 2865	1	
43	C	16023051		SUPPORT ANGLE (R.H.)	PAINT FH 2865	1	
44	D	16023253		SIDE PLATE (R.H.)	PAINT FH 2865	1	
45	D	16023252		SIDE PLATE (L.H.)	PAINT FH 2865	1	
46	A	16023054		SPROCKET	BLACK OXIDE	1	
47	A	16623004		ROLLER SHAFT		1	
48	A	16023115		ADJUSTMENT SCREW, FILM		1	
49		SS 14794		HEX HD. SCREW		1	
50		WA 0981		WASHER, SPRING LOCK		27	
51		WA 0260		WASHER FLAT		25	
52		NT 1980		HEX NUT, JAM		1	
53		BG 7597		BEARING, FLANGE UNIT (SEALMASTER LET 10)		2	
54		SS 3610		HEX HD. SCREW		2	
55		WA 0352		WASHER, SPRING LOCK		13	
56		SS 0189		SOCKET SET SCREW		3	

P. 602-0032

SHEET 4 OF 4

ITEM NO. PRECEDED BY "A"
INDICATES SEPARATE PARTS
LIST.

1602
B

ASSY. USED ON

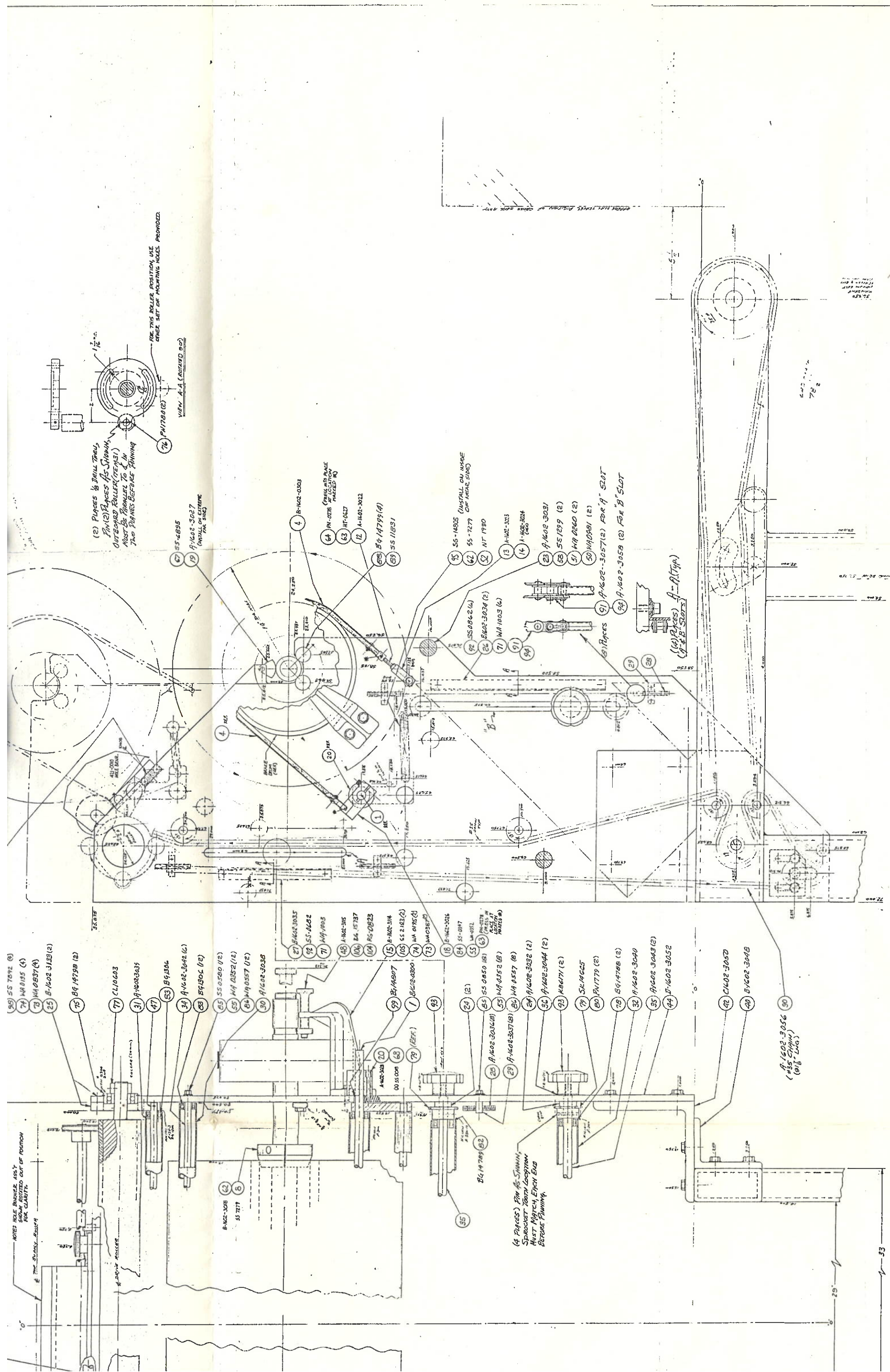
HL 1202-B

NO. REQ'D PER ASSY.

1

P		16020031		FILM UNWIND ASSEMBLY		P/N			
ITEM	SIZE	PART NUMBER		REV	DESCRIPTION	FINISH	QTY	QTY	QTY
85		SS	0580		HEX HD. SCREW		16		
86		WA	0557		WASHER FLAT		16		
87		SK	7289		SPROCKET (#35-3/8 P. 9/16 NEARLY B.R.G. 13 P. 1.567 P.D.)		5		
88		BG	1479	9	BEARING, BALL (NTN # R6)		4		
89		SS	1183	1	HEX HD. SCREW		4		
90	A	16020321			DRIVE CHAIN ASSEMBLY #35		1		
91									
92		SS	0562		SOCKET HD. SCREW		8		
93		KB	6171		KNOB (REID #DK3)		1		
94	A	16020322			CHAIN ASSEMBLY (#35)		2		
95		SG	1480	5	SPRING, EXTENSION (LEE NE 055F6 .055 WIRE - 5100.2 X 3/4)		1		
96		RG	5394		RETAINING RING - (TRUARC-5100-78)		1		
97	D	421A0010			HOLE BURNER ASSEMBLY		1		
98		SS	7892		SOCKET HD. SCREW, SHLDR.		4		
99		BG	1480	7	BOSTON PLASTIC (BOSTON # 56902 NF 810-5 NYLON FLANGED 1/16 X 3/8 X 1/16 X 3/4)		2		
100	A	16023070	PI		SPROCKET #40 19 TEETH TYPE B	BLACK OXIDE	1		
101	A	16023063	PI		KEY		1		
102	B	-16020316			FILM UNWIND ROLLER ASS'Y		1		
103	A	-16023067			"T" - NUT		1		
104		RG	4282		RET RING 3/8" EXTERNAL		1		
105		SS	2183		HEX HD SCREW		10		
106		BG	1573	7	BEARING, 10mm B X 30mm OD X 9mm W		1		
107	A	-16023069			SPROCKET #35 B 17	BLACK OXIDE	1		
108	D	-16023259			SIDE COVER	PAINT FH 2865	1		
109	B	16023073			R.H. BRACKET	PAINT FH 2865	1		
110	B	16023074			L.H. BRACKET	PAINT FH 2865	1		
111	A	16023075			SHIM	PAINT FH 2865	8		
112		SS	1298		HEX. HD. SCR. 5/16-13 X 1/2		6		

[illegible]



SYM	DESCRIPTION	ECO NO.	DATE	BY
DRN	SCAGLIONE	4	DATE	
CHK			DATE	
APP			DATE	
MATL			DATE	
FINISH			DATE	

REVISIONS

4

DATE

DATE

DATE

DESCRIPTION

ECO NO.

DATE

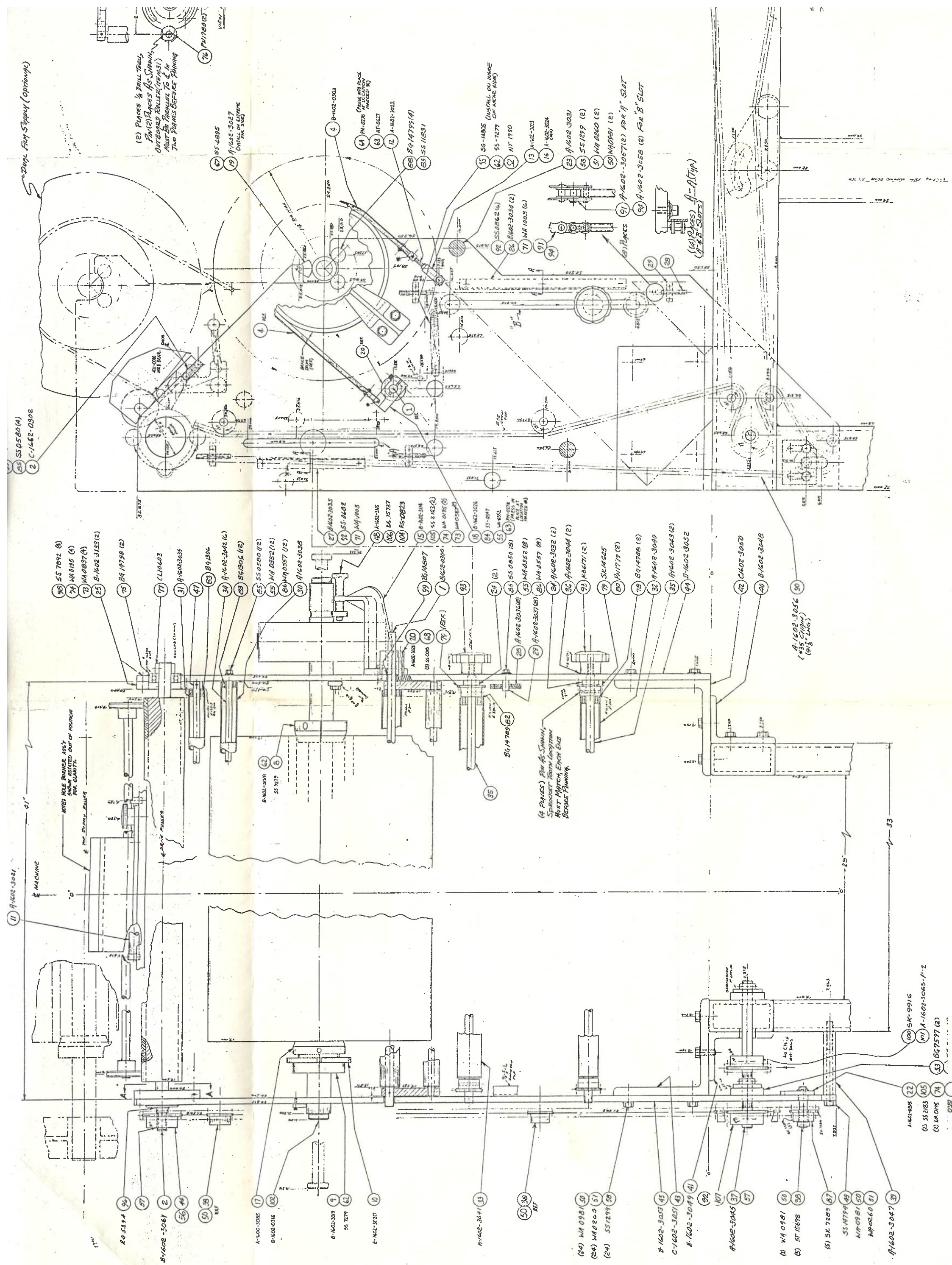
BY

weldotron

CORPORATION

TITLE

FILM UNWIND ASSEMBLY



2-DUAL FILM SUPPLY (OPTIONAL)

SS 05.80 (4)
C-11-E 2-0303

1205.20014 (1)

22 105 74 53 867597 (2) 101 A-1602-3063-P-2 100 SK-9916

PART NO.
PL 421A-0010

SHEET 1 OF 1

NOTE:
ITEM NO. PRECEDED BY "A"
INDICATES SEPARATE PARTS
LIST.

MODEL USED ON

1632
E

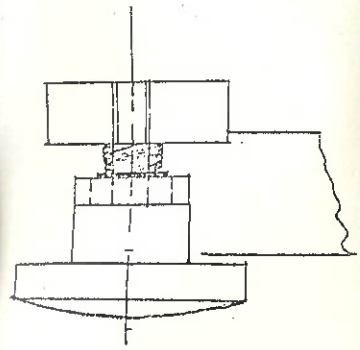
ASSY. USED ON

P/L 1632
0032

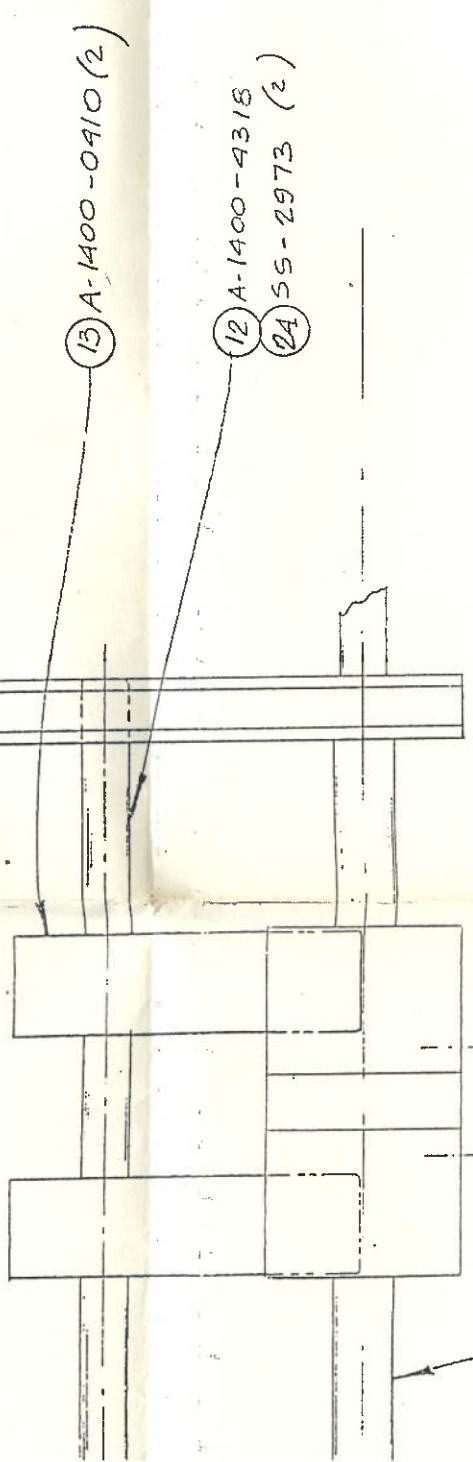
NO. REQ'D PER ASSY.

1

ITEM	SIZE	PART NUMBER										REV	DESCRIPTION	FINISH	QTY
	D	4	2	1	0	0	1	0					HOLE BURNER ASSY.	1 2/N	
1	A	4	2	1	1	0	0	1					TIE BAR	CLEAR CHROMATE	1
2	A	1	4	0	0	4	2	0	5				HEATER ELEMENT		3
A3	PL	4	2	1	0	0	8	2					HOLE BURNER ELECTRICAL		1
4															
5	B	4	2	1	1	0	0	4					DRIVE WHEEL	CLEAR CHROMATE	2
A6	A	1	4	0	0	4	3	0	9				SIDE FRAME ASSY.		2
7															
A8	A	1	4	0	0	4	3	1	2				COMMUTATOR ASSY.		1
9	C	4	2	1	1	0	0	2					COVER		1
10	A	4	2	1	1	0	0	3					DRIVE SHAFT		1
11															
12	A	1	4	0	0	4	3	1	8				BRUSH MOUNTING SHAFT		1
A13	A	1	4	0	0	0	4	1	0				BRUSH HOLDER ASSY.		2
14	A	1	4	0	0	4	3	2	2				COMMUTATOR SPACER	CLEAR CHROMATE	2
15															
16															
17															
18															
19															
20															
21													KNOB 5/16-18 x 2		1
22													SCREW		4
23															
24													SOC. SET SCR. #8-32 x 1/4		2
25													"O" RING		2
26													SPRING		1
27													WASHER 3/8 I.D. x 1 3/16 O.D.		1
REV	ECO	BY	DATE	REV	ECO	BY	DATE	REV	ECO	BY	DATE	REV	ECO	BY	DATE

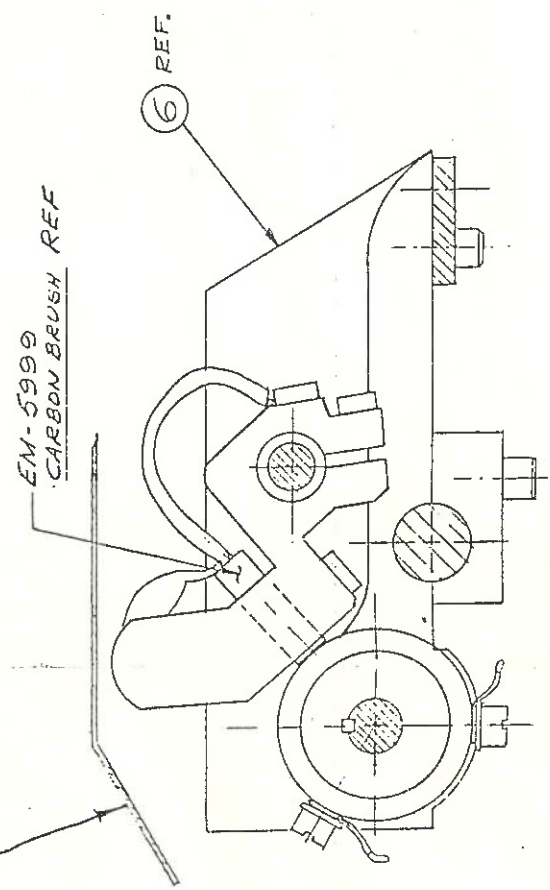
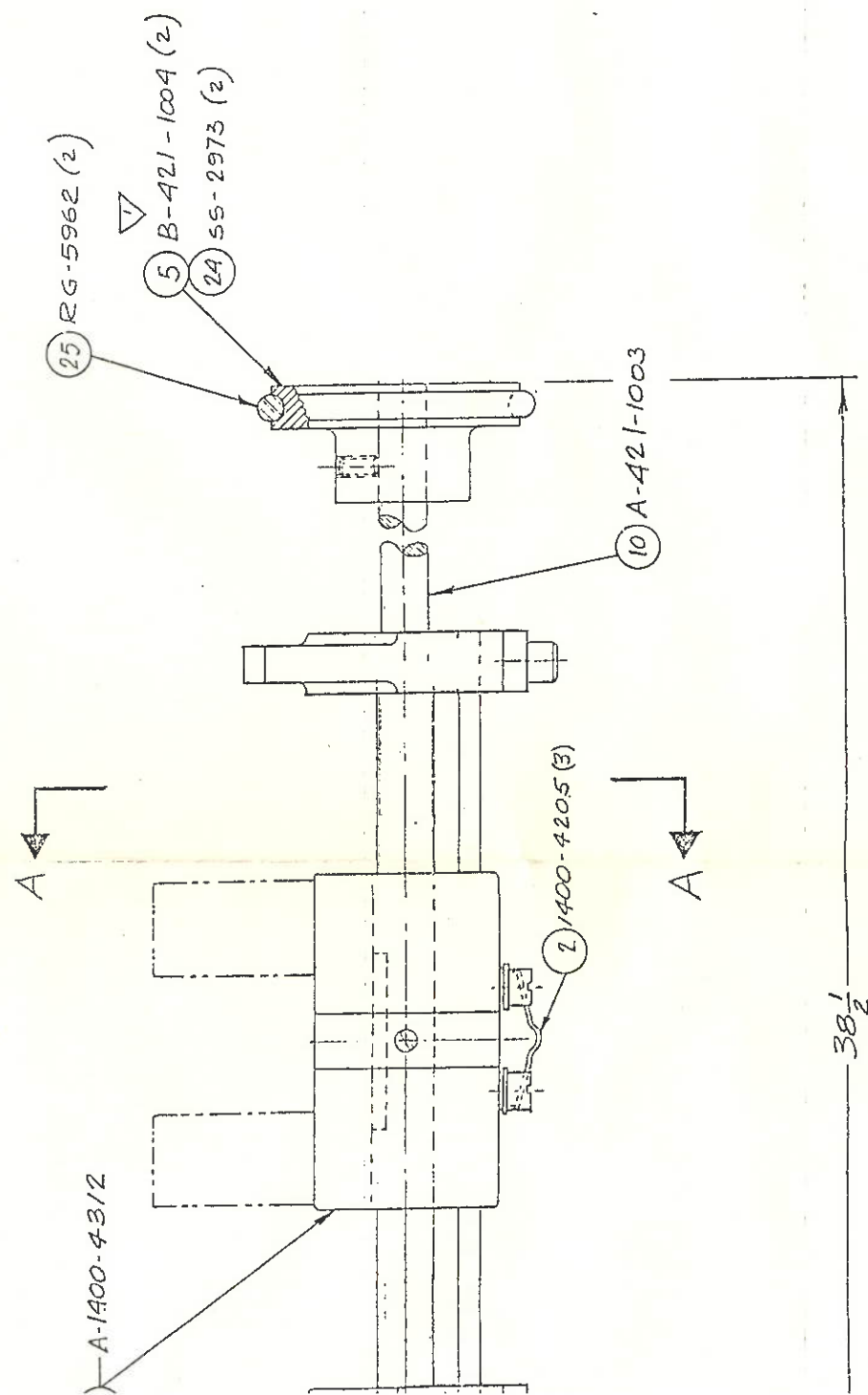


SECTION A-A



23 SS-0930 (4)
9 C-421-1002
COVER IS NOT SHOWN
COMPLETE

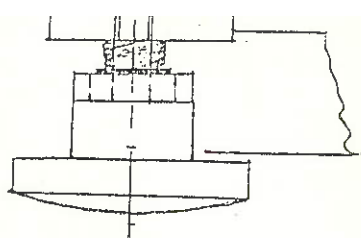
3(2)



SECTION A-A

SIZE	PART NO.	REV.
D		

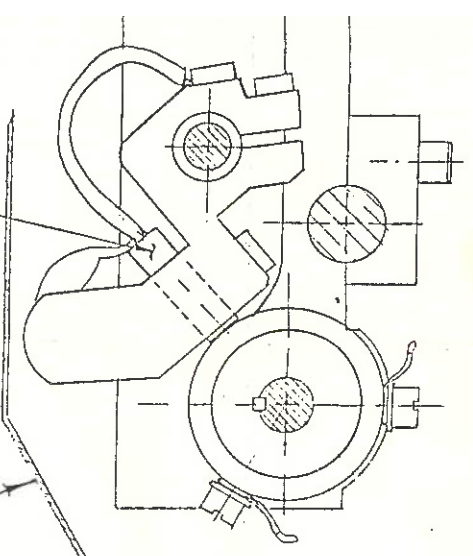
1	ITEM # 21 WAS KB-10755 ADDED ITEM # 26, 27, ITEM # 5 WAS A-1400-4318	B, R.	3
SYM	DESCRIPTION	ECONO.	DATE / BY
DRN	B, R.	DATE	2/1/84
CHK		DATE	
APP.		DATE	
MATL	~		
FINISH	~		
REVISIONS			
weldcon corporation			
HOLE BURNER ASSY (FOR 1602 # 1662)			
1662	2-1602-0030	SCALE	SIZE
1600	2 1/2" DIA	PART NO.	REV.



SECTION

23 SS-0930 (4)
9 C-421-1002
COVER IS NOT SHOWN
COMPLETE

EM-599
CARBON 8



SECTION A-A

13 A-1400-0410 (2)

12 A-1400-4318
24 SS-2973 (2)

14 A-1400-4322 (2)

6 A-1400-4309 (2)

25 RG-5962 (2)

5 B-421-1004 (2)
2A SS-2973 (2)

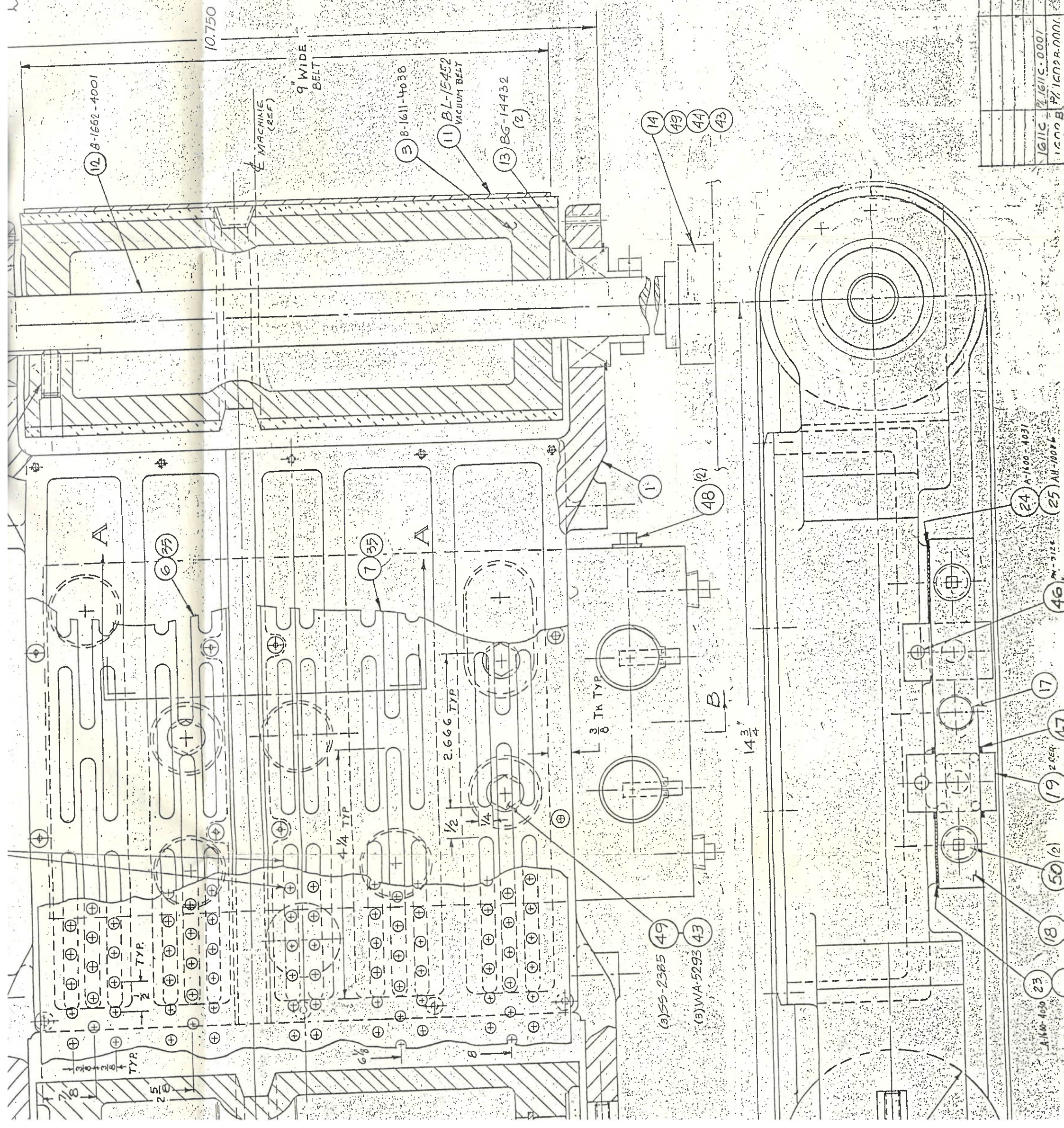
10 A-421-1003

2 A-1400-4205 (2)

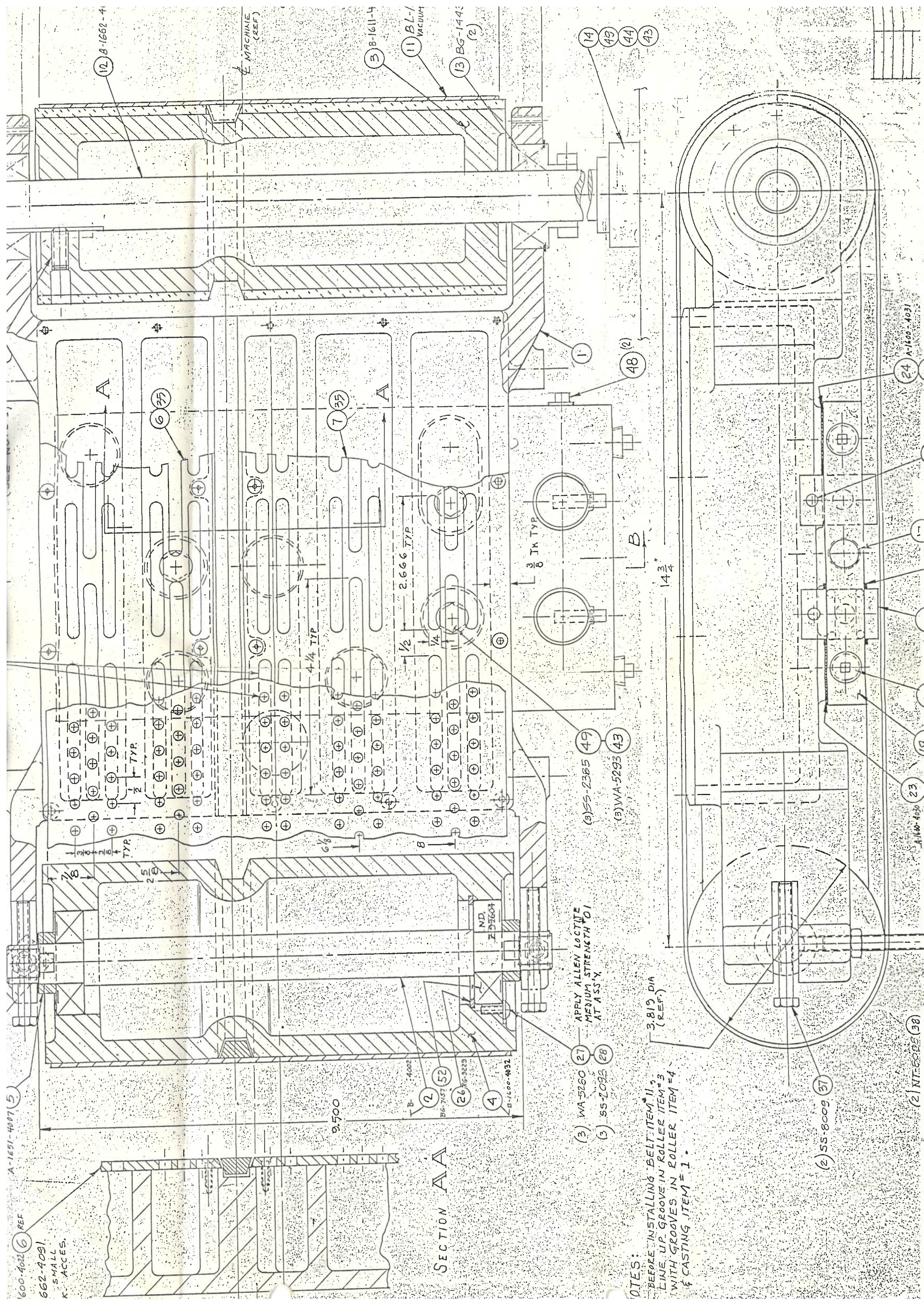
8 A-1400-4312

38 1/2

COVERS ARRANGEMENT
IN B-B VIEW



SYN	DESCRIPTION	ECO NO	DATE
DM7	B.R.	4.86	DATE
CHK.	DATE		
APP.	DATE		
MATL	DATE		
PATTERN NO.			
FINISH			
TITLE		PART NO.	PAY
VACUUM BELT ASS'Y			



PART NO.		MODEL USED ON		1602/	
PL 1602-0041		ASSY. USED ON		8	
SHEET 1 OF 2		NO. REQ'D PER ASSY.		1	
D 16020041		VACUUM BELT ASS'Y		P/N	
ITEM	QTY	PART NUMBER	DESCRIPTION	PL	QTY
1	D	16004001	3 VACUUM CHAMBER	FH-2865	1
2	B	16004002	IDLER SHAFT		1
3	B	16114039	DRIVE ROLLER	URETHANE RUBBER	1
4	B	16004032	IDLER ROLL		1
5	A	16514007	IDLER COLLAR		2
6	C	16004022	TOP PLATE	HARD CHR. PLATING	1
7	C	16624092	TOP PLATE	HARD CHR. PLATING	1
8					
9					
10					
11	B	B/L-15452	BELT, VACUUM		1
12	B	16024001	DRIVE SHAFT	BLACK OXIDE	1
13		BG 14432	BEARING EN-16C		2
14		BG 3324	BEARING SFT-16C		1
15	A	16001132 P3	KEY	BLACK OXIDE	1
16					
A17	1/4	386A-0001	VACUUM PUMP ASS'Y		1
18	C	16004018	VACUUM MANIFOLD		1
19	A	16004019	VALVE		2
A20	A	16001216	TOP COVER PLATE BRACKET	FH 2865	4
21	C	16024090	TOP COVER PLATE R.H.		1
22	C	16024091	TOP COVER PLATE L.H.		1
23	A	16004030	GASKET		6
24	A	16004031	GASKET		1
25		AH-10006	GASKET CEMENT 'PERMATEX-2'		302
26		RG-9229	RETAINING RING		1
27		WA-0692	WASHER FLAT		3
28		SS-9228	SCREW BUT. HD. 50C.		3
REV	ECO	BY	DATE	REV	ECO
1	A525	RAM	12/22/86		

PART NO.		MODEL USED ON	
PL 1602-0041		1602 14	
SHEET 2 OF 2		B C	
NOTE: ITEM NO. PRECEDED BY "A" INDICATES SEPARATE PARTS LIST.		ASSY. USED ON	
		0001 01	
		NO. REQ'D PER ASSY.	
		1 1	
D 16020041		VACUUM BELT ASS'Y	
ITEM	REV	PART NUMBER	DESCRIPTION
29	A	16117076	RETAINING BRACKET
30	A	16003107	SCREW THUMB
31		WA-0361	WASHER FLAT
32		SS-9016	SCREW SET
33		WA-0353	WASHER LOCK
34			
35		SS-8764	SCREW FLAT HD.
36		SS-2099	SCREW HEX. HD.
37		SS-2538	SCREW HEX. HD.
38		NT-1980	NUT JAM
39		SS-2363	SCREW FLAT HD.
40		SS-3609	SCREW HEX. HD.
41			
42			
43		WA-0260	WASHER FLAT
44		WA-0981	WASHER LOCK
45			
46		PN 9124	PIN ROLL
47		RG 7700	RETAINING RING
48		FG 7701	PLUG-BRASS "SQ HD."
49		SS 0051	SCREW HEX HD.
50		FG 1199 B	PLUG - BRASS
51			
52		BG 7157	BEARING
53		RG 7794	"O" RING 3/4 I.D.

PART NO.
PL 386A-0001

NOTE:
ITEM NO. PRECEDED BY "A"
INDICATES SEPARATE PARTS
LIST.

1602
B

PIL	1602 B 0001
-----	-------------------

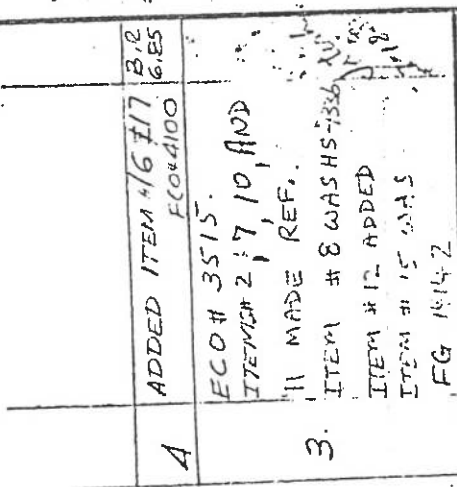
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P/L	3	8	6	A	0	0	0	1
-----	---	---	---	---	---	---	---	---

ROTARY VACUUM PUMP MODEL=386A, P/N

ITEM	SIZE	PART NUMBER	REV	DESCRIPTION	FINISH	QTY
A1	A	16000403		VACUUM PUMP ASSEMBLY		1
A2	P/2	3860084		ROTARY VACUUM PUMP, ELECTRICAL		1

[illegible]



MATERIAL SEE P/L	1602	P/L 386-0001				1		NO. REQ'D PER MACH.	DRN. 9/23 JEX 7/2	CHECK BY	APP.	SCALE None	REV.	PART NO.	SIZE	TITLE	ECO	BY
																VACUUM PUMP ASSY. MODEL # 386		
FINISH	1600	1600-0040				1										A	1600-0403	4
																MODEL NO.		

1600-0403

1 1

1600 160

1600- P/L 31
0040 -000

1 1

A 1600 - 0403 VACUUM PUMP ASSEMBLY

1 P U - 7298 PUMP VACUUM, GAST NO.2565-V203-T336
COMPLETE WITH PUMP, BASE, MOTOR, COUPLING,
COUPLING GUARD, LUBRICATOR, MUFFLER AND
FILTER WITH PLASTIC TARS AND TWO ELBOWS
FOR MOUNTING MUFFLER AND FILTER

2 P U - 7334 INTAKE FILTER, GAST NO. AA900D, 3/4"
IN PLASTIC JAR NO. AF-245

3 V A - 6283 RELIEF VALVE, GAST AA308

4 G A - 5957 VACUUM GAGE, GAST AA640

5 P I - 6287 NIPPLE, 3/4 CLOSE

6 P I - 6286 REDUCER BUSHING, 3/4 TO 1/4

7 P I - 4140 NIPPLE, 3/4 x 2

8 H S - 6353 VACUUM HOSE 5/8 I.D. 2PLY, 7FT, 8" LG

9 P I - 6288 CROSS, 3/4

10 P I - 3694 ELBOW - 90°

11 P I - 3697 BLACK PIPE 3/4 x 4 LG

12 P I - 6285 REDUCER BUSHING 3/4 x 3/8

13 P I - 3551 NIPPLE 3/8 x 2

14 L U - 1076 OIL, S.A.E. NO. 10, GALLON

15 F G - 10342 TSETS, 3/8 MALE PIPE THREAD x 3/8 HOSE I.D.

16 P I - 3551 PIPE NIPPLE 3/8 NPT x 2

17 C P - 8780 HOSE CLAMP (FOR VACUUM HOSE)

18 F G - 7701 PLUG 1/4 NPT

1 2429 WN 7-79

2 3449 V.B.K. 5-19

3 3515 Jatin 7-83

4 4100 B.R. 6-85

5 — WN 7-24

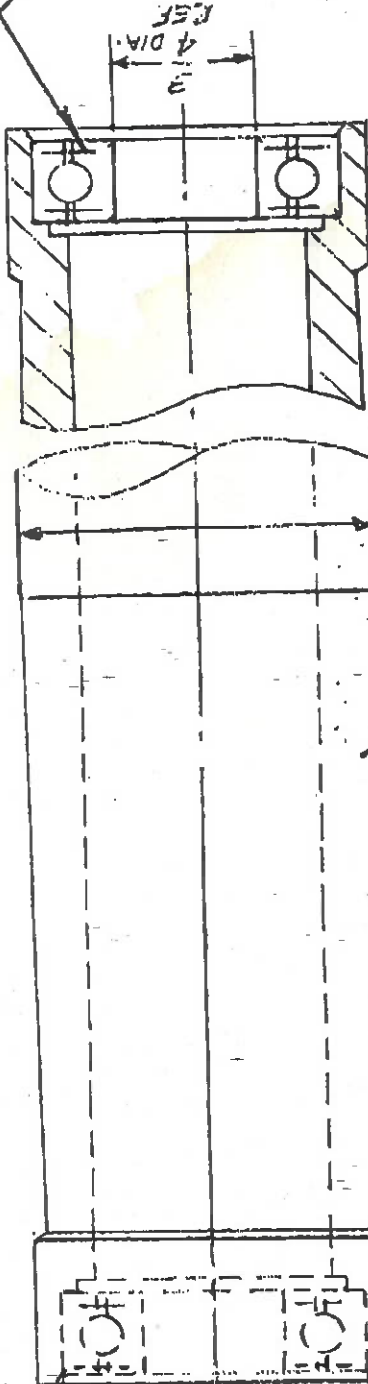
6 4869 SB 5-27

88

SIZE	PART NO.	REV.
A		

11" REF.

2 (2) BG-0058
(FAFNR "SBPP")
(2) SEALS
(SEE NOTE 1)



1 7/8 DIA REF.

B-1602-5205

NOTE:

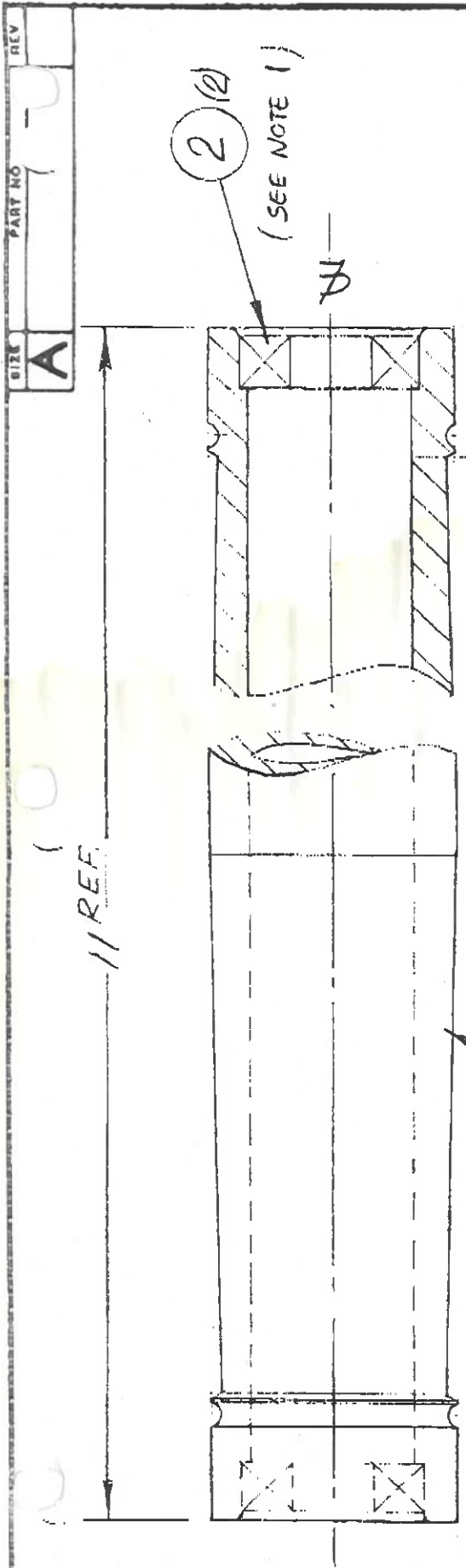
PRESS IN BOTH BEARINGS UNTIL THEY
ARE SEATED FIRMLY AGAINST
THE SHOULDER CONCENTRIC TO
EACH OTHER WITHIN .002 T.I.R.

1	ADDED MODELS # 1662 & 1663	45.24	PR 1787
SYM	DESCRIPTION	ECONO.	DATE/BY
REVISIONS			
DRN. B.R.	DATE	DATE	
CHL	DATE	DATE	
APP.	DATE	DATE	
MATL	DATE	DATE	
FINISH	DATE	DATE	
weldotron corporation			
TITLE			
ROLLER ASSEMBLY			
PART NO.			
1602-0521			
SCALE			
1:1			
TOL. UNLESS SPECIFIED			
FRA DEC ANGLE			
1/16 1/32 1/64 1/8 1/4 1/2 1			
NO REQD PER ASSEM			
NEXT ASSEMBLY			
MODEL NO.			
1662 P/L 1662-0070			
1663 R-1602-0052			
1662 P/L 1611C-0071			
1602B R-1602-0071			
1602B/1611C R-1602-0052			
PART NO.			

PART NO: 16020521
DESCRIPTION: ROLLER ASSY

REV: 08/04/86
ACT: ROUTE: 1

ITEM	P/N	DESCRIPTION	QTY	U/M	RV	ACT	MD
1	16025205	ROLLER	1.0	EA			
2	BG0058	ABA,0.750 ID X 1.625	2.0	EA			
9000	DWG16020521	DWG,ROLLER ASSEMBLY	1.0	EA	01		A



NOTE:
PRESS IN BOTH BEARINGS UNTIL THEY ARE SEATED FIRMLY AGAINST THE SHOULDER CONCENTRIC TO EACH OTHER WITHIN .002 T.I.R.

SYN		DESCRIPTION		ECO NO.		DATE /BY	
DRN. B.R.		DATE 4-86		weldotron corporation		OUTFEED ROLLER ASSY "C"	
CHK		DATE		TITLE		SCALE 1:1	
APP		DATE		PART NO.		1602-0522	
MATL		FINISH		TOL. UNLESS SPECIFIED		REV. 1	
FRA ± 1/64		DEC. ± .005		ANGLE ± 1/2°		NO RECD PER ASSEM.	
1664		R-1664-0052		1		1	
1602B/1611C		R-1602-0052		1		1	
PART NO.		MODEL NO.		NEXT ASSEMBLY		NO RECD PER ASSEM.	

PART NO: 16020522

REV: 08/04/86

DESCRIPTION: ROLLER OUTFEED ASSY

ACT: ROUTE: 1

ITEM	P/N	DESCRIPTION	QTY	U/M	RV	ACT	MD
1	16025204	ROLLER	1.0	EA			
2	BG8413	ABA,0.500X1.125X0.687	2.0	EA			
9000	DWG16020522	DWG,OUTFEED ROLLER ASSEMBLY	1.0	EA			A

PART NO: 16020523

REV:

08/04/86

DESCRIPTION: ROLLER INFEEED ASSY

ACT:

ROUTE: 1

ITEM	P/N	DESCRIPTION	QTY	U/M	RV	ACT	MD
1	16025200	ROLLER	1.0	EA	02		
2	BG8413	ABA,0.500X1.125X0.687	2.0	EA			
9000	DWG16020523	DWG,ROLLER INFEEED ASSEMBLY	1.0	EA			A

PART NO.		NOTE:		MODEL USED ON	
PL 1602-0052		ITEM NO. PRINTED BY "A" INDICATES SEPARATE PARTS LIST.		1602 B	
SHEET 2 OF 2				ASSY. USED ON	
				0001	
				NO. REQ'D PER ASSY.	
				1	
R		16020052		TRAVELING BELT ASSEMBLY	
ITEM	REV	PART NUMBER	REV	DESCRIPTION	QTY
29	A	16025207		SPACER	
30	A	16025206		SPACER	
31		CL-10945		COLLAR	
32		CL-10955		COLLAR	
33	B	16625130		ROLLER - IDLER	
34		SS-1299		SCREW HEX. HD.	
35		SS-1298		SCREW HEX. HD.	
36		SS-0272		SCREW BINDING HD.	
37		SS-0982		SCREW SOC. HD.	
38		SS-2973		SCREW SET CUP POINT	
39		SS-1213		SCREW SET FLAT POINT	
40		SS-0315		SCREW SET CUP POINT	
41		RG-1320		GRIP RING 1/2 SHAFT	
42		MT-0199		NUT	
43		NT-0287		NUT	
44		SS-1366		SCREW, HEX. HD.	
45		WA-0837		WASHER FLAT	
46		WA-0351		WASHER FLAT	
47		WA-0195		WASHER LOCK	
48	A	16025211		BRACKET, BRIDGE	
49					
50	A	16020525		BRIDGE WELD.	
51		SS9030		SCREW HEX. HD.	
52		WA2230		WASHER LOCK	
53		SS0006		SCREW, SET CUP POINT	
54					
55		WA0981		WASHER LOCK	

PART NO: 16020052
DESCRIPTION: TRAVELING BELT ASSY

REV:08 05/31/91
ACT: ROUTE: 1

ITEM	P/N	DESCRIPTION	QTY	U/M	RV	ACT	MD
2	16020522	ROLLER OUTFEED ASSY	1.0	EA			AS
3	16020521	ROLLER ASSY	1.0	EA			AS
4	16020523	ROLLER INFEEED ASSY	1.0	EA			AS
5	16625201	BLOCK-ROLLER MOUNT	2.0	EA			
6	16026102	DRIVE ROLLER LONG SHAFT	1.0	EA			
7	16026101	DRIVE ROLLER SHORT SHAFT	1.0	EA			
8	16025208	SHAFT, INFEEED	1.0	EA	01		
9	16025209	SHAFT	1.0	EA			
10	16025203	BLOCK	2.0	EA			
11	16020514	TAKE UP WLD	2.0	EA			
12	16025121	SHAFT TIE BAR	2.0	EA	02		
13	16025122	SHAFT TAKE UP	1.0	EA			
14	16025113	SHAFT GAP ROLLER	1.0	EA			
15	16625114	ROLLER GAP	1.0	EA			
16	16025202	SUPPORT ARM	2.0	EA			
17	16006001	KEY	2.0	EA	01		
18	BG1518	ABD,0.750 BORE	4.0	EA			
19	BG17854	ABA,0.500IDX1.125ODX 0.375W	4.0	EA			
20	BG14371	ABD,0.250 ID X 0.500 OD BG BALL FLANGED	2.0	EA			
21	BL8410	BELT/RND 3MM(.118 DIA) POLY CORD	1.5	FT			
22	16025126	COVER	1.0	EA			
24	16025214	SPROCKET 40B18	2.0	EA			
25	16020511	BRACKET OUTFEED	1.0	EA			
26	16020512	BRKT BED WLD	1.0	EA			
27	16620513	SLIDE BED WELD	1.0	EA			
28	16025115	COVER	1.0	EA			
29	16025207	SPACER	4.0	EA			

PART NO: 16020052

DESCRIPTION: TRAVELING BELT ASSY

REV:08

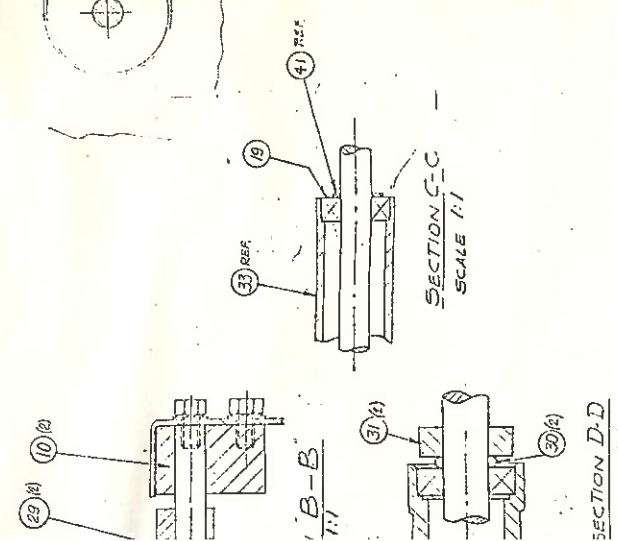
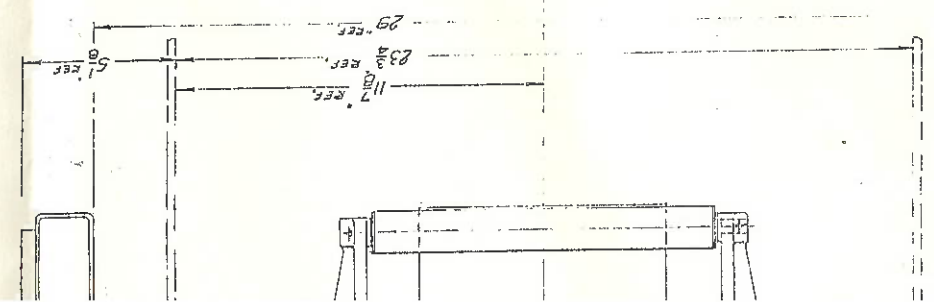
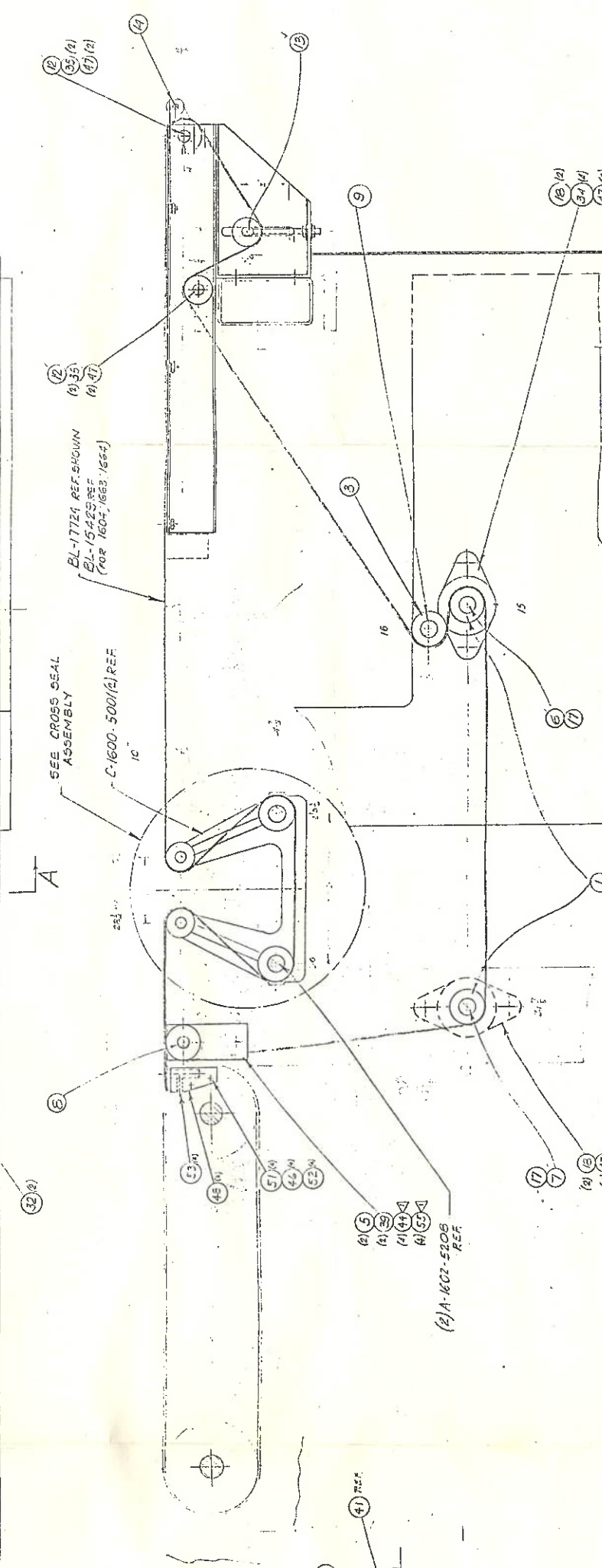
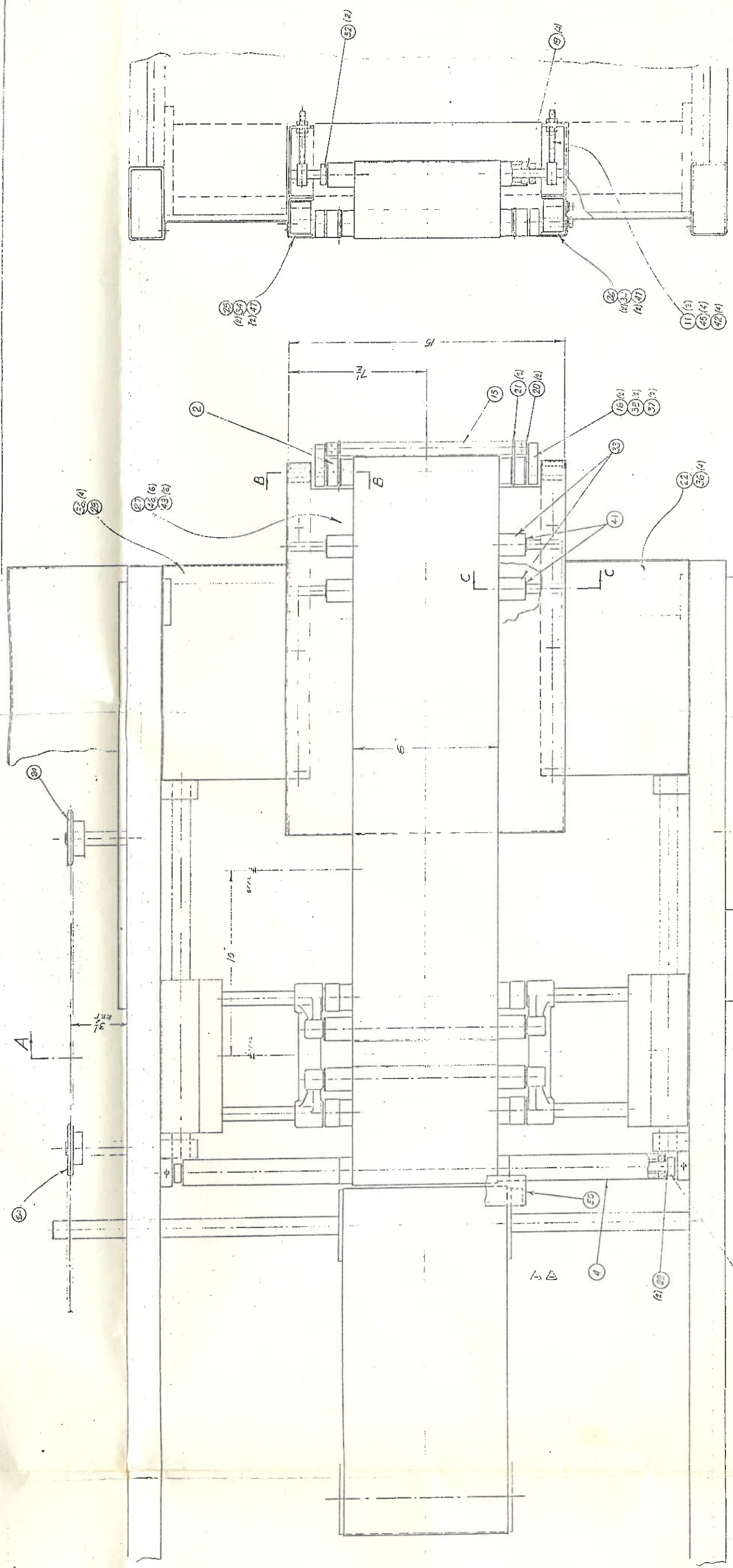
05/31/91

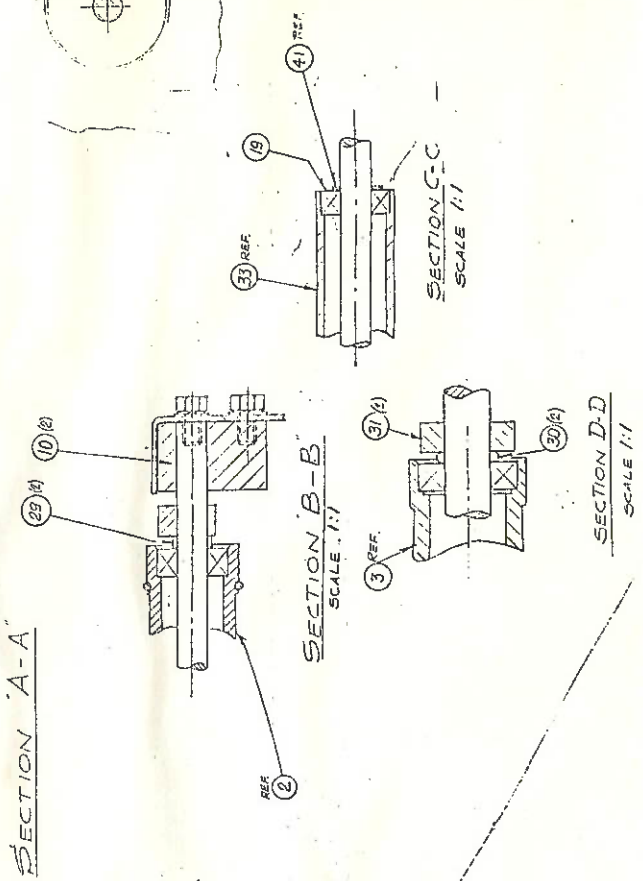
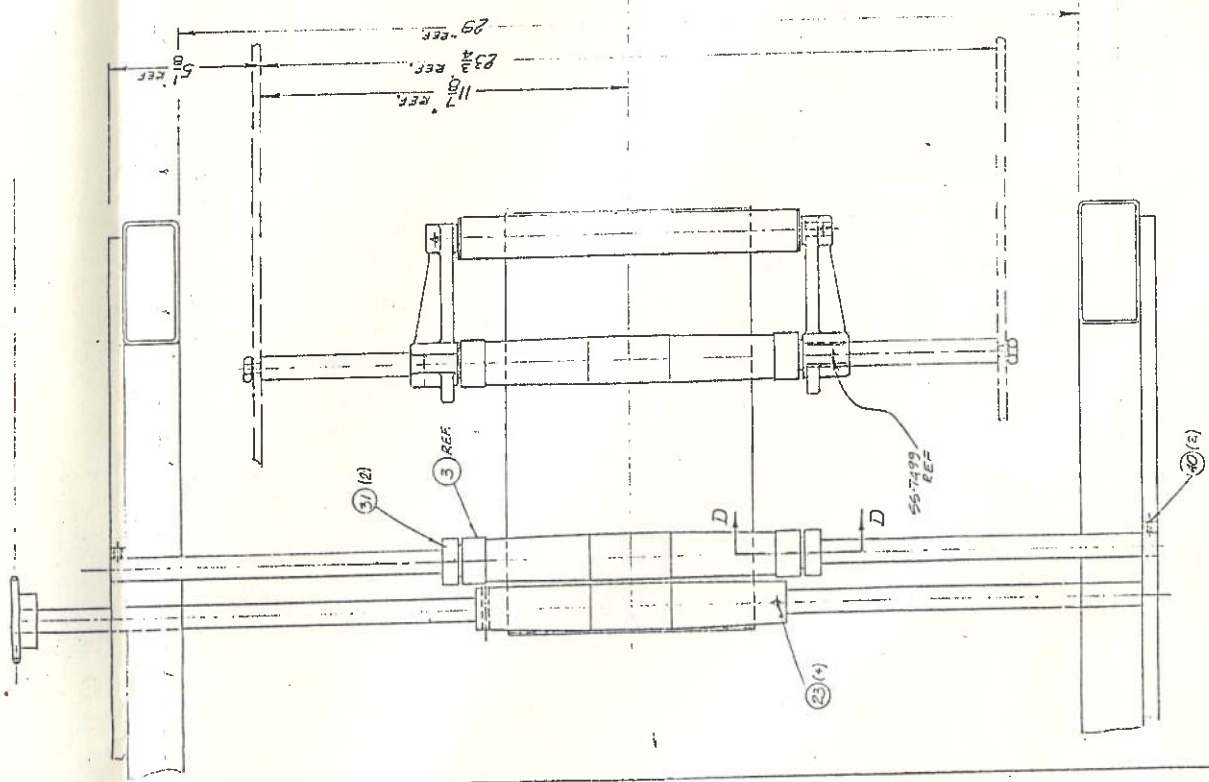
ACT:

ROUTE: 1

ITEM	P/N	DESCRIPTION	QTY	U/M	RV	ACT	MD
30	16025206	SPACER	2.0	EA			
31	CL8867	ABB,0.750ID,1.500OD,0.500 W	2.0	EA			
33	16625130	ROLLER, UPPER	2.0	EA			
34	SS1299	AAA,0.375-16X1.000 LG SCREW HEX HD CP	12.0	EA			
35	SS1298	ABA,0.312-18X0.500 LG SCREW HEX HD MACH	6.0	EA			
36	SS0272	AAG,10-32X0.375 LG SCR BIND HD MA CAD PL	8.0	EA			
37	SS0982	AAC,10-32X0.625 LG SCREW HD SOC CAP CP	4.0	EA			
38	SS2973	ABI,8-32X0.250LG SCR SOC HD CUP PT	4.0	EA			
39	SS1213	AAI,0.250-20X0.500LG SCR HD SOC FL CP	2.0	EA			
40	SS0315	AGI,0.250-20X0.250LG SCR PT SOC NYL CUP	2.0	EA			
41	RG1320	ACA,0.500 SH DIA GRIP RING EXT SST	4.0	EA			
42	NT0199	AAA,0.312-18 NUT HEX CAD PL	4.0	EA			
43	NT0287	AAA,10-32 NUT HEX CAD PL	6.0	EA			
44	SS1366	AAA,0.375-16X0.750LG SCR HD HEX CAP CAD	4.0	EA			
45	WA0837	AAA,0.312 WASHER FL SAE CP	4.0	EA			
46	WA0351	ABA,10 WASHER	10.0	EA			
47	WA0195	ABB,0.312 WASHER LOCK	22.0	EA			
48	16025211	BRACKET, BRIDGE	2.0	EA			
50	16020525	BRIDGE WELD.	1.0	EA			
51	SS9030	ABA,10-32X1.000 LG SCR HEX HD MACH	4.0	EA			
52	WA2230	AAB,10 WASHER LOCK CP	4.0	EA			
53	SS0006	ABI,0.250-20X0.375 LG SCR SOC HD CUP PT	2.0	EA			
55	WA0981	AAB,0.375 WASHER LOCK CP	4.0	EA			
56	SS8075	ACI,0.312-18X0.500 LG SCREW SOC SST	4.0	EA			
9000	DWG16020052	DWG,TRAVELING BELT ASSEMBLY	1.0	EA	02		R

PART NO.		MODEL USED ON		1602	
PL 1602-0052		ASSY. USED ON		0001	
SHEET 2 OF 2		NO. REQ'D PER ASSY.		1	
R		16020052		TRAVELING BELT ASSEMBLY	
ITEM	REV	PART NUMBER	REV	DESCRIPTION	QTY
29	A	16025207		SPACER	4
30	A	16025206		SPACER	2
31		CL-10945		COLLAR 3/4 I.D. x 1/2 O.D. 1/2 W.	2
32		CL-10955		COLLAR 1/2 I.D. x 1/2 O.D. 1/2 W.	2
33	B	16625130		ROLLER - IDLER	2
34		SS-1299		SCREW HEX. HD.	12
35		SS-1298		SCREW HEX. HD.	6
36		SS-0272		SCREW BINDING HD.	8
37		SS-0982		SCREW SOC. HD.	4
38		SS-2973		SCREW SET CUP POINT	4
39		SS-1213		SCREW SET FLAT POINT	2
40		SS-0315		SCREW SET CUP POINT	2
41		RG-1320		GRIP RING 1/2 SHAFT	4
42		NT-0199		NUT	4
43		NT-0287		NUT	6
44		SS-1366		SCREW HEX. HD.	4
45		WA-0837		WASHER FLAT	4
46		WA-0351		WASHER FLAT	10
47		WA-0195		WASHER LOCK	22
48	A	16025211		BRACKET, BRIDGE	2
49					
A50	A	16020525		BRIDGE WELD.	1
51		SS9030		SCREW HEX. HD.	4
52		WA2230		WASHER LOCK	4
53		SS0006		SCREW SET CUP POINT	2
54					
55		WA0981		WASHER LOCK	4





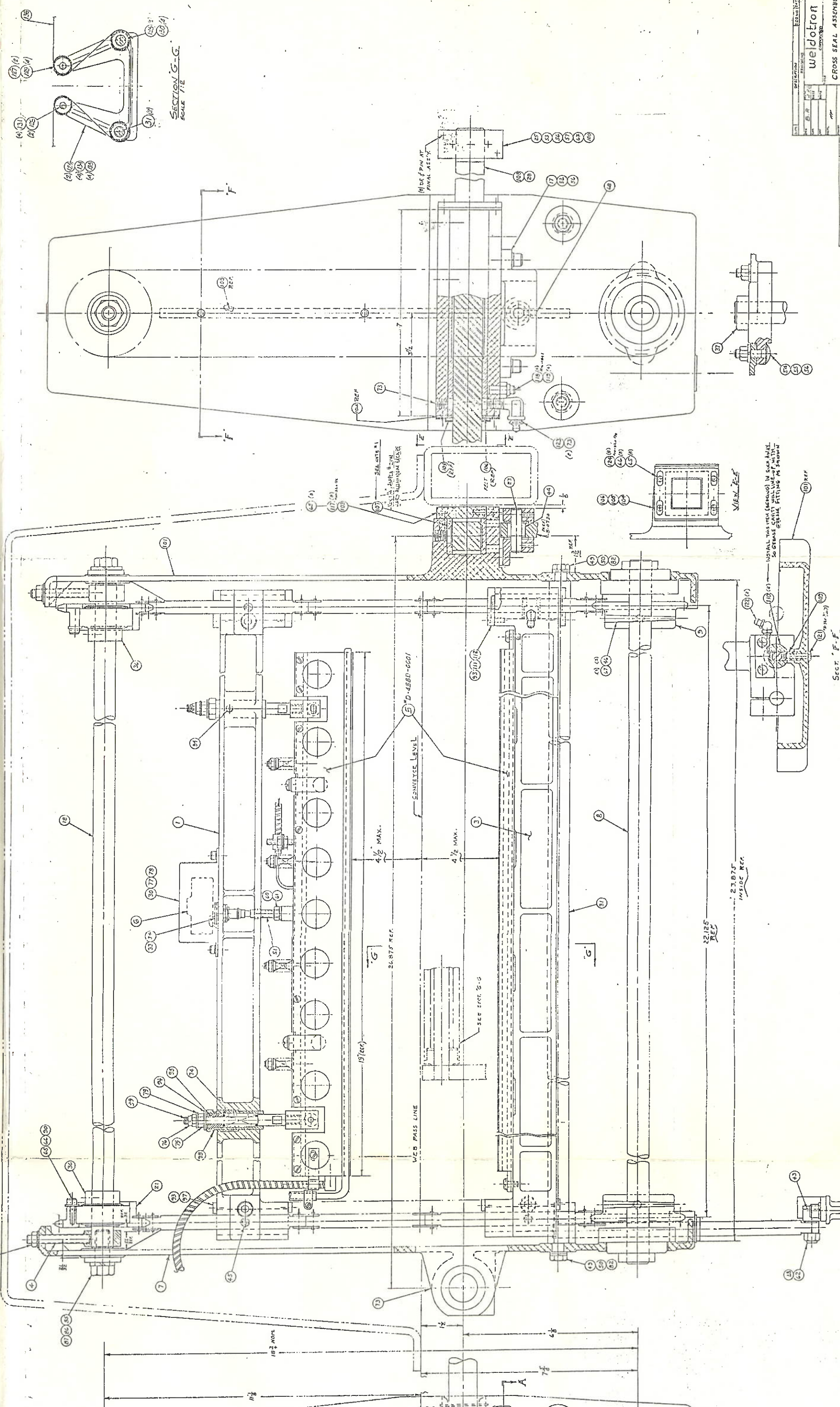
PART NO.		MODEL USED ON		1602	
PL 1602-0071		ASSY. USED ON		P/L 16023	
SHEET 1 OF 5		NO. REQ'D PER ASSY.		1	
NOTE:		ITEM NO. PRECEDED BY "A"		INDICATES SEPARATE PARTS LIST.	
R		16020071		CROSS SEAL ASSEMBLY	
ITEM	SIZE	PART NUMBER	REV	DESCRIPTION	FINISH
1	C	16027018		UPPER SEAL BAR SUPPORT	
2					
A3	P/L	16020703		SUPPORTBAR ASS'Y.	
A4	A	16000707		SPROCKET TAKE UP (WELD)	PAINT FH 2865
A5	P/L	438C0001		PTC CROSS SEAL SYSTEM	
6		SW-9031		SWITCH SAFETY (LS2)	
7	D	16027001		SUPPORT-CROSS SEAL R.H.	
8	B	16007002		SHAFT, LOWER DRIVE	BLK. OXIDE
9	B	16007003		SPROCKET LOWER LEFT	BLK. OXIDE
10					
11	A	16007005		LINK CAM SHAFT	
12					
13	B	16007007		ROD VERTICAL MOVEMENT QER.	
14	B	16007008		SHAFT, BALL BUSHING	
15	A	16007097		ROD UPPER	BLK. OXIDE
16	A	16007098		ROD LOWER	BLK. OXIDE
17	B	16007011		GUIDE, DRIVE LINK	
18	B	16117012		SHAFT UPPER DRIVE	BLK. OXIDE
19					
20					
21	B	16007016		SPROCKET-UPPER SHAFT	BLK. OXIDE
22					
23	A	16007021		PIN, DRIVE LINK	
24	A	16007028		ROD CROSS SEAL GUIDE	
25	A	16007025		BLOCK CROSS SEAL SHAFT	BLK. OXIDE
A26	A	16007024		CHAIN #40 1/2 P 36 PITCHES	
27					
28		GM1551		CUSHION GROMMET	
REV	ECO	BY	DATE	REV	ECO
1	4481	PAS	10-21-86		

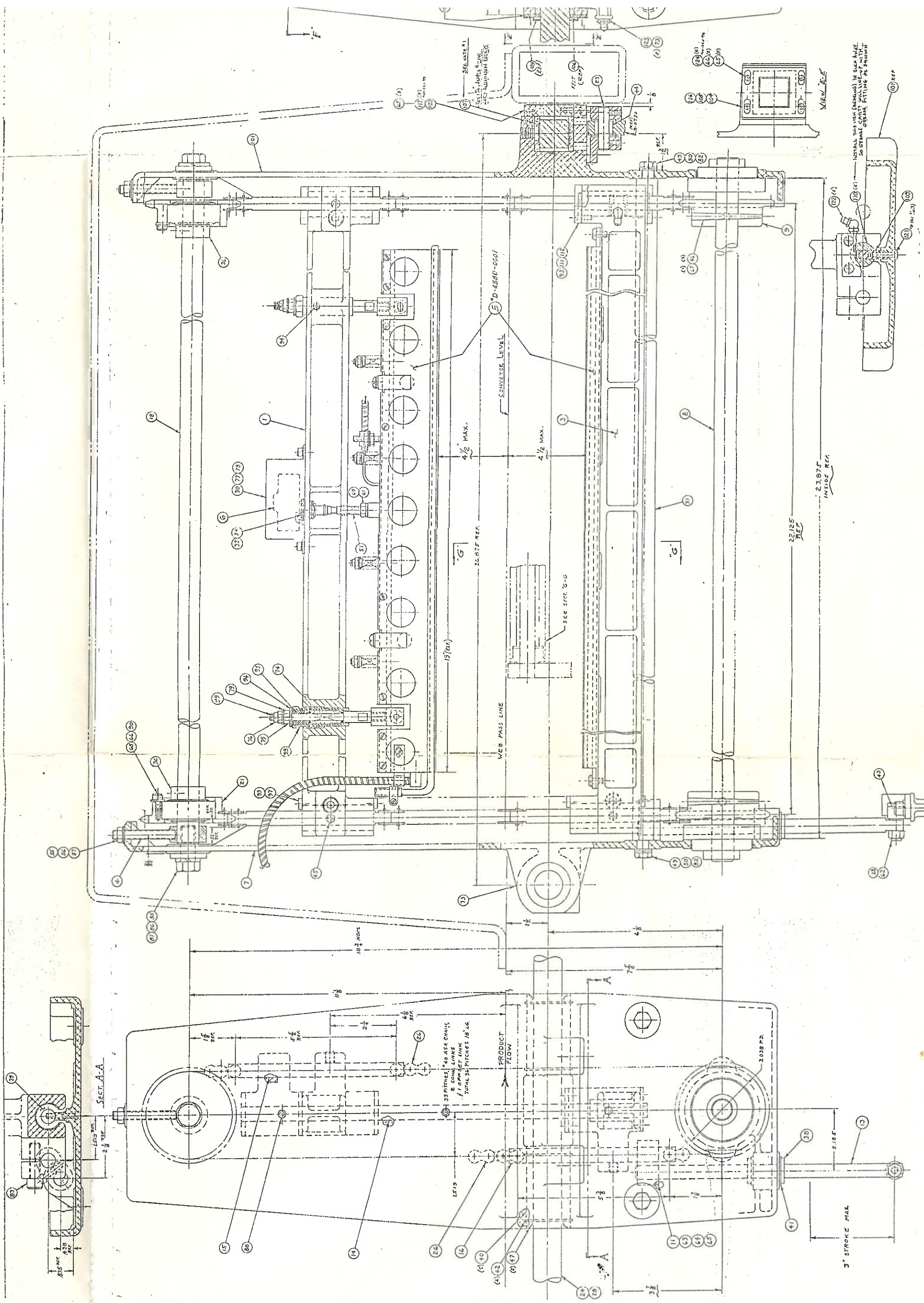
PART NO.		NOTE:		MODEL USED ON		1602	
PL 1602-0071		ITEM NO. PRECEDED BY "A" INDICATES SEPARATE PARTS LIST.				B	
SHEET 2 OF 5				ASSY. USED ON		P/L 1602B 0001	
				NO. REQ'D PER ASSY.		1	
R	16020071				CROSS SEAL ASS'Y	P/N	
ITEM	SIZE	PART NUMBER		REV	DESCRIPTION	FINISH	QTY
29							
30	A	1600	7020		COVER SAFETY LIMIT SWITCH		1
31	A	1602	7101		SHAFT, ROLLER ASS'Y SUPPORT	BLK. OXIDE	2
32							
33	A	1611	7080		WASHER REWORK		1
34	A	1611	7081		WASHER NEOPRENE		1
35							
36		BG3	653		SEALMASTER ER-12 3/4		2
37	A	1600	7037		BEARING ALTERED		2
38		BB7	745		BALL BUSH.-BARDEN #L-8-MM 1/2 BORE		1
39		BB7	746		BALL BUSH.-BARDEN #L-8-MM 1/2 BORE		4
40		BB7	088		THOMSON "SUPER-16"		2
41		RG7	646		LOCKRING "THOMSON C-500		2
42		RG1	532		LOCKRING #5000-156		4
43		BG2	197		BEARING "MCGRILL" CF-5/8-S.		1
44		BG4	462		BEARING "TORRINGTON" BH-68"		2
45		SG7	091		SPRING PLUNGER #5/16-18 X 9/16 LG.		4
46		PN6	917		PIN #4 TAPER 2 1/2 LG.		2
47		BU4	294		SEAL THOMSON 1 BORE S-1000		2
48	A	1600	7051		SPACER		1
49		WA0	981		WASHER LOCK 3/8"		4
50		WA2	755		WASHER FLAT 3/8"		4
51	A	1611	7082		SCREW SWITCH ADJ.		1
52		SS7	670		SCREW SOCKET CAP		4
53		SS2	183		SCREW HEX HD		8
54		SS7	744		BOLT CARRIAGE (SQUAR NECK)		4
55		NT1	617		NUT		8
56		WA0	195		LOCK WASHER		10

PART NO.				NOTE:				MODEL USED ON				1602			
PL 1602-0071				ITEM NO. PRECEDED BY "A"				ASSY. USED ON				P/L 16025			
SHEET 3 OF 5				INDICATES SEPARATE PARTS LIST.				NO. REQ'D PER ASSY.				1			
R 16020071				CROSS SEAL ASS'Y				P/N							
ITEM	SIZE	PART NUMBER				REV	DESCRIPTION				FINISH	QTY			
57		WA0837					WASHER FLAT					2			
58															
59															
60		WA5422					LOCK WASHER - EXT. TOOTH					1			
61		NT0627					NUT					1			
62		NT7751					NUT-LOCK-ESNA*79NE-048					1			
63		PN1780					PIN ROLL					2			
64		SS7431					SCREW SOCKET CAP.					5			
65		WA1003					LOCK WASHER					8			
66		WA0351					WASHER FLAT					6			
67		SS1232					SCREW SET					6			
68		SS0749					SCREW SET					4			
69															
70															
71															
72															
73		FG5515					FITTING, ALEMITE #1644B ¹ / ₈ P.T.F.					3			
74		SS7748					SPRING.					2			
75		NT9106					NUT JAM					2			
76		NT9108					NUT FLEX LOCK					2			
77		SS0601					SCREW SOCKET HD. CAP.					2			
78		WA1334					LOCK WASHER					2			
79		WA9109					WASHER "BELLEVILLE"					2			
80															
81															
82		SS1299					SCREW HEX. HD.					4			
83		SS7332					SCREW SOCKET HD.					4			
84		SS1291					SCREW SOCKET HD.					2			
REV	ECO	BY	DATE	REV	ECO	BY	DATE	REV	ECO	BY	DATE	REV	ECO	BY	DATE

PART NO.		NOTE:		MODEL USED ON		1602	
PL. 1602-0071		ITEM NO. PRECEDED BY "A"		ASSY. USED ON		PIL 1602 B	
SHEET 5 OF 5		INDICATES SEPARATE PARTS LIST.		NO. REQ'D PER ASSY.		1	
R - 16020071		CROSS SEAL ASSY		P/S			
ITEM	SITE	PART NUMBER	REV	DESCRIPTION	FINISH	QTY	QTY
113							
114							
115							
116							
117		SS8080		SCREW SOCKET H.D. CAP		4	
118		SS3628		SCREW DOG POINT SET		4	
119		NT7537		NUT ESNA 79 NE-058		4	
120		PN9674		GROOVE PIN TYPE "A3"		4	
121		SS2097		SCREW, BUTTON HD. SOC.		3	
122		FG10178		FITTING GREASE "ALEMITE 3010-B"		2	
123		FG0479		STREET ELBOW 1/8 NPT BRASS		1	
124		SS0982		SCREW SOCKET HD. CAP		8	
125	C	-16005001		SUPPORT ROLLER MTG.		2	
126	A	-16020521		ROLLER ASSEMBLY		2	
127	B	-16625104	1	ROLLER IDLER	CLEAR ANODIZE	2	
128	A	-16027109		SHAFT	BLACK OXIDE	2	
129		BG17854		BEARING BALL NICE 1616 DC		4	
130	A	-16025206		SPACER	CLEAR ANODIZE	4	
131		RG1320		GRIP RING 1 1/2 SHAFT		4	
132							
133							
134		SS0315		SET SCREW CUP POINT		4	
135		SS2452		SET SCREW CUP POINT		4	
136	B	BL17724		BELT 8" W X .047 TH.		1	
137							
138							
139							
140							

NOTES: 1. INSTALL ITEM 10 WITH STRIP WITH GROOVES SURFACE INSIDE AS SHOWN AND WITH 3/16 DIA HOLE TO LINE WITH GREESE FITTING.
2. ADJUST ITEM 10 & 11 (1-100-2500) & ITEM 11 (1-100-2500) TO PROPER RUN CLEARANCE AT ASSEMBLY. SEE ITEM 10 FOR CLEARANCE. SEE ITEM 11 FOR CLEARANCE.
3. ADJUST RUNNING CLEARANCE BETWEEN ITEM 10 & ITEM 11. SEE ITEM 10 FOR CLEARANCE. SEE ITEM 11 FOR CLEARANCE.





SIZE	PART NO.	REV.
A		

A-438-0116

TA-0366

TA-0467

AH-11489 (A/R)

A-438-1058



SYM	DESCRIPTION	ECO NO.	DATE /BY
REVISIONS			
DRN.	P.P.	DATE	10/31/95
CHK.		DATE	
APP.		DATE	
MATL			
FINISH			
TOL. UNLESS SPECIFIED			
FRA	± 1/64	DEC.	± .005
ANGLE			± 1/2°
TITL			
weldotron corporation			
LOWER PRESSURE BAR ASSY (PTC)			
SCALE	SIZE	PART NO.	REV.
FULL	A	438-0025	

438B	D-438B-0001	NO RECD	PER ASSEM.
PART NO.	MODEL NO.	NEXT ASSEMBLY	

PARTS LIST FOR
438-0025 LOWER PRESSURE BAR ASSEMBLY (PTC)
(REFERENCE DRAWING A-438-0025)

<u>ITEM NO.</u>	<u>SIZE</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
A1		A- 438-0116	PRESSURE BAR WELDMENT	1
2		A- 438-1058	PAD	1
3		TA-0467	TAPE, ADHESIVE BACK	2'
4		TA-0366	TAPE, ADHESIVE BACK	2'
5		AH-11489	ADHESIVE	A/R

PART NO.
PL 438-0026
SHEET 1 OF 2

NOTE:
ITEM NO. PRECEDED BY "A"
INDICATES SEPARATE PARTS
LIST.

MODEL USED ON

438
D

ASSY. USED ON

438D
0010

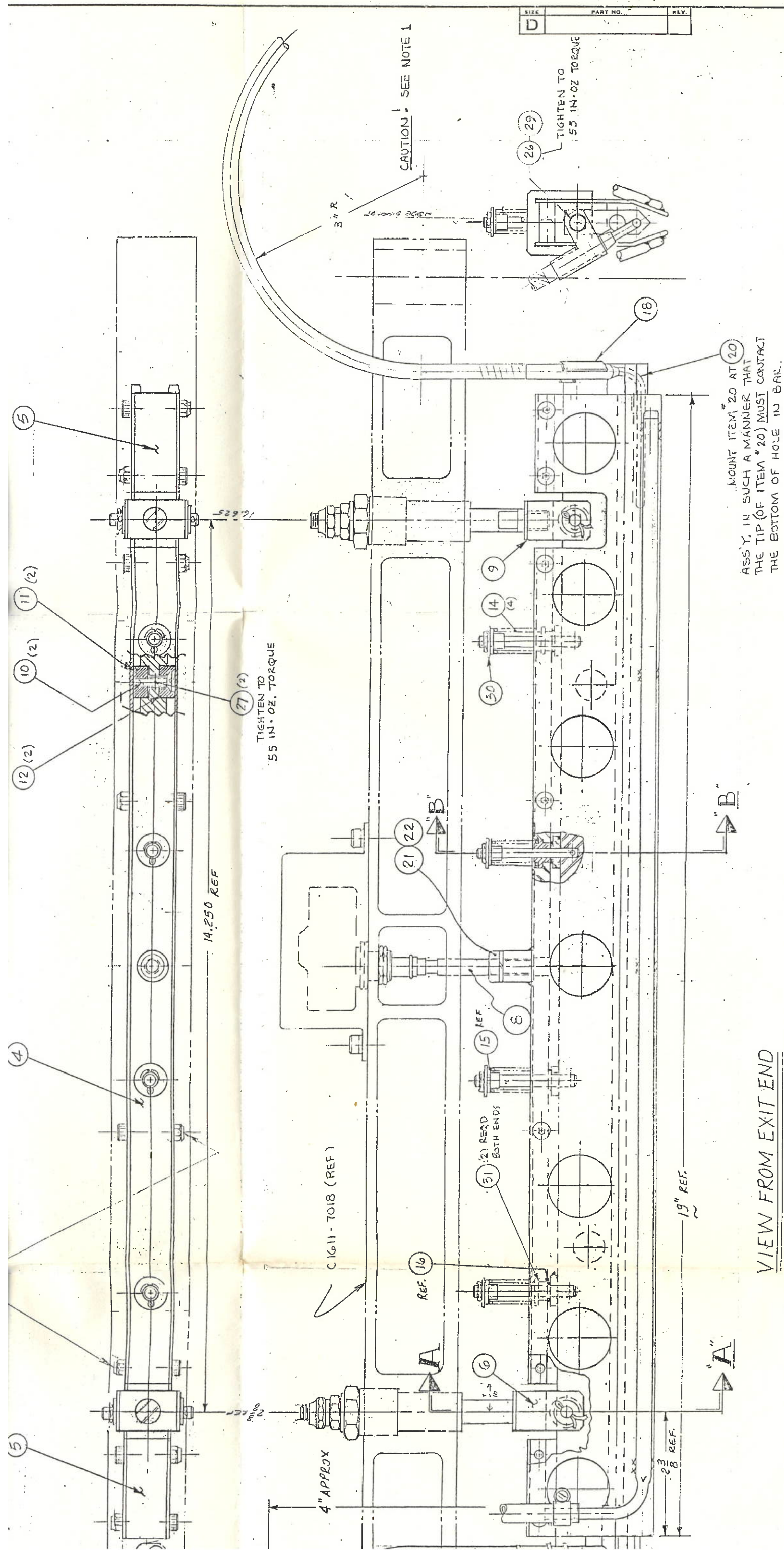
NO. REQ'D PER ASSY.

1

USE THIS #

		D	4380026						SEAL BAR ASSY.		P/N				
ITEM	SIZE	PART NUMBER				REV	DESCRIPTION				FINISH	QTY	CC		
A	1	C	438	0209			CUTTING BAR ASSY.				-	1			
A	2	C	438	0244			CLAMP PLATE ASSY. L.H.				-	1			
A	3	C	438	0243			CLAMP PLATE ASSY. R.H.				-	1			
A	4	B	438	0202			SPACER - WELDMENT				-	1			
	5	A	438	2006			SPACER - CLAMP				-	2			
	6	A	438	2087			YOKE				-	1			
	7	A	438	2059			PIN, SEAL BAR				CHROM. PL.	2			
	8	A	1611	7082			SCREW, SWITCH ADJ.				-	1			
	9	A	438	2086			YOKE - SLOTTED				-	1			
	10	A	SS	8082			SCREW - FLAT SOC. CLIP				-	2			
	11	A	447	3186			SPACER, THREADED				-	2			
	12	A	447	3187			SPACER, C SINK				-	2			
	13	A	447	3188			SPACER, SPRING STUD				-	4			
	14		SG	18365			SPRING, FILM CLAMP - ASSOCIATED # CO420-038-07505				-	4			
	15	A	447	3164			RETAINER - SPRINGS				-	4			
	16	A	447	3163			WASHER - BUMPER				-	4			
	17	A	438	2069			COVER, HEATER				-	1			
	18	A	438	2068			CLAMP, THERMOCOUPLE				-	1			
	19	B	HT	16858			CARTRIDGE HEATER 900 W.				-	1			
	20	B	TP	16088			THERMOCOUPLE				-	1			
	21		NT	2376			NUT, HEX				-	1			
	22		WA	1739			WASHER, LOCK				-	1			
	23		WA	5436			WASHER, FLAT				-	4			
	24		PN	5659			PIN, COTTER				-	8			
	25		NT	18164			NUT, LOCK - ISNA # 79 NITM-62				-	8			
	26		SS	1795			SCREW, HEX HD.				-	2			
	27		SS	8019			SCREW SET - CUP PT.				-	2			
	28		SS	18364			SCREW, SOCKET HD.				-	8			
REV	ECO	BY	DATE	REV	ECO	BY	DATE	REV	ECO	BY	DATE	REV	ECO	BY	DATE
												</			

[illegible]

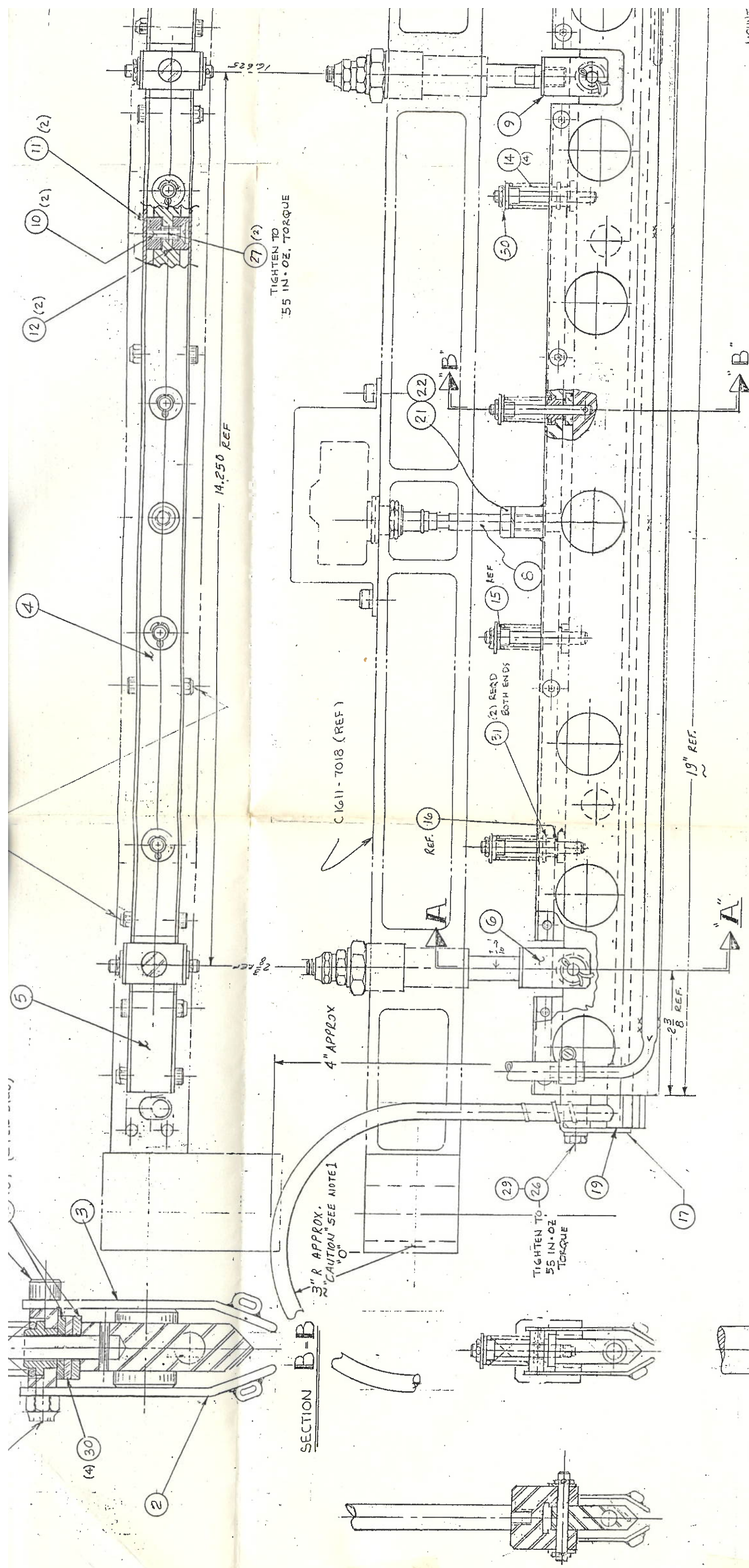


5: LOW ENOUGH CABLE LOOP TO PREVENT RUBBING OF BLE WITH ANY OTHER STRUCTURAL MEMBERS, WHEN MACHINE IS IN OPERATION.

1. 28 MUST BE ASSEMBLED AS SHOWN ON TOP VIEW. SOCKET HEAD N. NEAR SIDE EVERY OTHER SCREW.

2. HANDLE THIS SEAL BAR ASSY. WITH CARE, NO SCRATCHES OR DENT WILL BE PERMITTED.

SYN		DESCRIPTION		ECONO. DATE/BY	
NEW RELEASE					
REVISIONS					
DRN.	DATE	CHK.	DATE	APP.	DATE
1	11/12/59	1	12/2/59		
MATERIAL			FINISH		
AL			AL		
TITLE			P.T.C.		
SEAL BAR ASSY			(HORI. AIR COOLED)		
weldotron corporation					

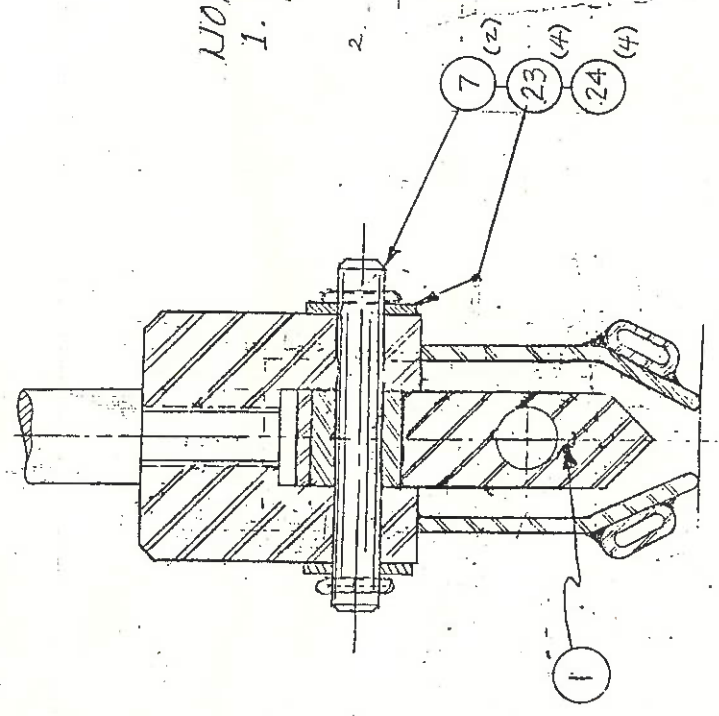


MOUNT
ASS'Y, IN SUCH A
THE TIP OF ITEM #
THE BOTTOM OF H

VIEW FROM EXIT END

NOTES:

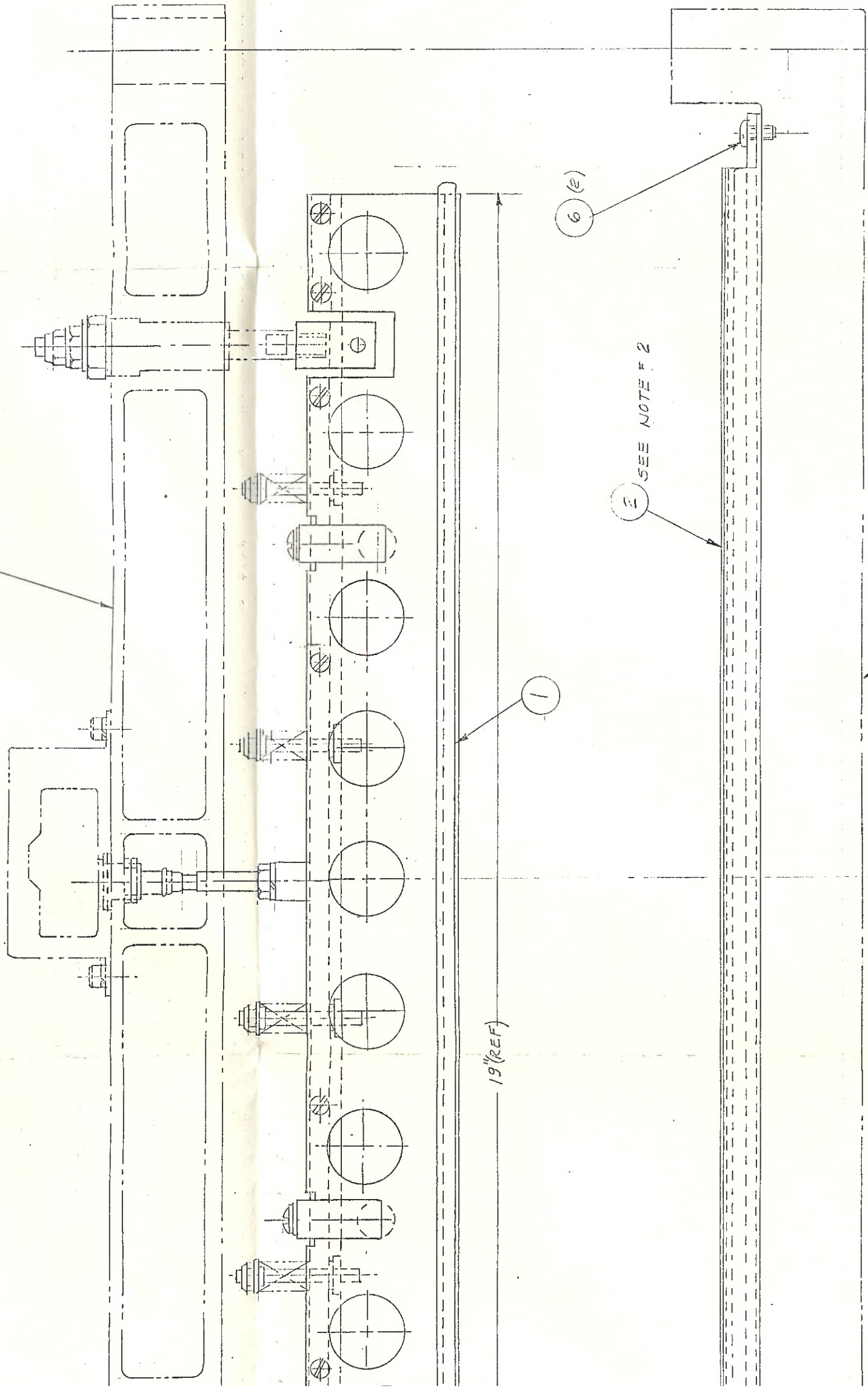
1. ALLOW ENOUGH CABLE LOOP TO PREVENT RUBBING OF CABLE WITH ANY OTHER STRUCTURAL MEMBERS, WHEN MACHINE IS IN OPERATION.
2. ITEM # 28 MUST BE ASSEMBLED AS SHOWN ON TOP VIEW. SOCKET HEAD ON NEAR SIDE EVERY OTHER SCREW.
3. HANDLE THIS SEAL BAR ASSY. WITH CARE, NO SCRATCHES OR DENT WILL BE PERMITTED.



SECTION A-A

PART NO.		NOTE:		MODEL USED ON		1502	
PL 438D-0010		ITEM NO. PRECEDED BY "A" INDICATES SEPARATE PARTS LIST.				B	
SHEET 1 OF 1				ASSY. USED ON		P/L 1602 B 0071	
				NO. REQ'D PER ASSY.		1	
D-438D0010				DTC SEAL BAR SYSTEM MODEL# 438D		P/N	
ITEM	SIZE	PART NUMBER		REV	DESCRIPTION	FINISH	QTY
A1	D	438	0026		SEAL BAR ASS'Y P.T.C.		1
A2	A	438	0025		LOWER PRESSURE BAR ASS'Y		1
A3	D	438	0085		PNEUMATIC ASS'Y		1
A4	P/L	438	0084		ELECTRICAL ASS'Y MODEL# 438D		1
A5	D	438	0033		CONDUIT LAYOUT		1
6		55	9129		SCREW, BIND. HD. NYLOCK		2
<u>OPTIONS:-</u>							
TD1809-0010		FIELD INST. OF 438D ON 1681 WRAPPER					

SUPPORT # C-1602-7018 (REF.)



19" (REF)

SEE NOTE # 2

VIEW FROM EXIT END

EXISTING PRESSURE PLD
SUPPORT # L 1602-0703 (REF.)

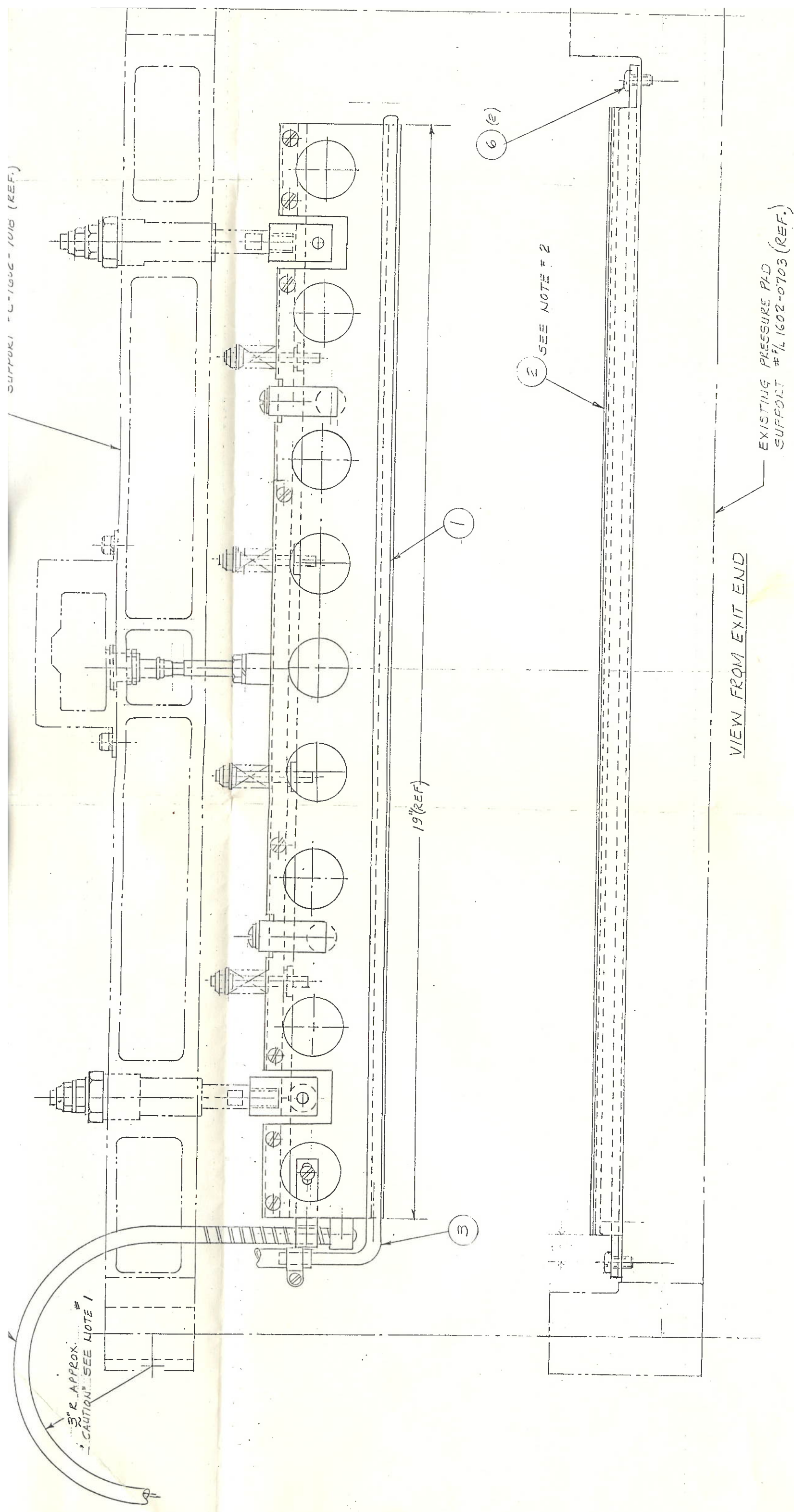
NOTES:

1. ALLOW ENOUGH CABLE LOOP TO PREVENT RUBBING OF CABLE WITH ANY OTHER STRUCTURAL MEMBERS, WHEN MACHINE IS IN OPERATION.
2. PART # TA-0366 (.010TK TAPE) OF ITEM # 2 CAN BE REMOVED FROM ASSY AS REQUIRED DEPENDING UPON VARIOUS FILMS.

SIZE	PART NO.	REV.
D		

SYM	DESCRIPTION	ECO NO.	DATE /BY
REVISIONS			
DRN.	J. D.	DATE	7-27-57
CHK.		DATE	
APP.		DATE	
MATL.		DATE	
FINISH		DATE	
weldotron corporation			
TITLE			
PTC SEAL BAR SYSTEM (FOR 1602B, 1662B)			

1602B	PL 1602B-0071	1
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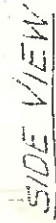


VIEW FROM EXIT END

EXISTING PRESSURE PLD
SUPPORT #1 L 1602-0703 (REF.)

NOTES:

1. ALLOW ENOUGH CABLE LOOP TO PREVENT RUBBING OF CABLE WITH ANY OTHER STRUCTURAL MEMBERS, WHEN MACHINE IS IN OPERATION.
2. PART # TA-0366 (.010 TH TAPE) OF ITEM #2 CAN BE REMOVED FROM ASSY AS REQUIRED DEPENDING UPON VARIOUS FILMS.

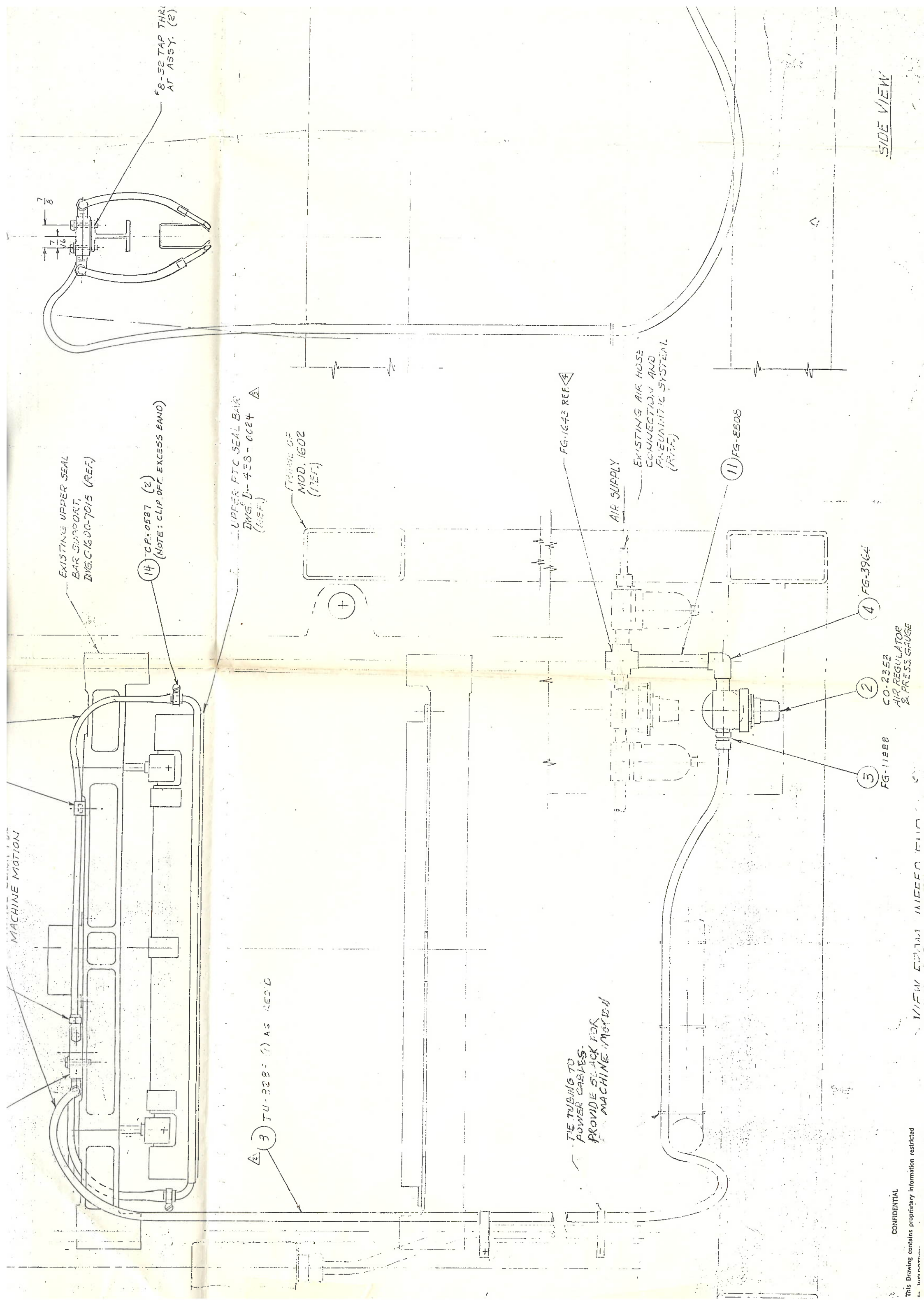


SIDE VIEW

CO-235E
AIR REGULATOR
& PRESS. GAUGE

83711-57

WFEED END



SIDE VIEW

PARTS LIST FOR
D-438-0085 PNEUMATIC ASSEMBLY, PTC BAR

<u>ITEM NO.</u>	<u>SIZE</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	A	438-1038	TUBING JUNCTION BOX	1
2		CO-2353	AIR REGULATOR & PRESSURE GAUGE	1
3		FG-8389	MALE TUBING CONNECTOR	1
4		FG-3694	STREE ELL	1
5		FG-1643	CROSS	1
6		FG-2732	90 DEG. MALE TUBING CONNECTOR	1
7		FG-8494	MALE TUBING CONNECTOR	1
8		TU-8288	TUBING	A/R
9		TU-12281	TUBING	A/R
10		FG-8491	MALE CONNECTOR	1
11		FG-8808	PIPE NIPPLE	1
12		SS-8079	SCREW, SOC. HD.	2
13		WA-1422	WASHER, LOCK	2

SHEET: / OF /

NOTE:
ITEM NO. PRECEDED BY "A"
INDICATES SEPARATE PARTS
LIST.

MODEL USED ON

ASSY. USED ON

NO. REQ'D PER ASSY.

NO DRAWING

P/M

FINISH

MAIN PANEL ASSEMBLY
FRONT DOOR ASSEMBLY

1

REV

ECO

NY:

DATE -

REV

Eco

BY

DATE _____

REV

ECO

BY

REV

100

DY

D

ET OF

ASSY. USED ON

NO. REQ'D PER ASSY.

438C	
438	84

/

D-16020897

MAIN PANEL ASSY ELECTRICAL



ITEM	SIZE	PART NUMBER	REV.	DESCRIPTION	FINISH	QTY	QTY
90		FZ9587		FUSE BLOCK (F17 & F18)	—	2	
91		FZ7083		FUSE BLOCK (F17 & F18)	—	2	
92		SW13420		SOLID STATE RELAY (SSR2)	—	1	
93		SS0335		SCREW #8-32 B.H. 1/2" C.P.		2	
94		WA0470		LOCK WASHER #8 C.P.		2	
95		WA2222		FLAT WASHER #8 C.P.		2	

3

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NO. REQ.

THERMO
SEAL
(OPTION 445A)

PRINT
- REGISTRATION
(OPTION 439A)

13 14 15 17

11 12

9

7

PRINT REGISTRATION

55

TC3

FOR PACK INDEXER
3/6

THE MOSAIC HEAT

556



HOLE
- BURNER
(OPTION 421A)

31 32 33

EXTENDED PACKAGE
OPTION *468

SIZE	PART NO	REV
------	---------	-----

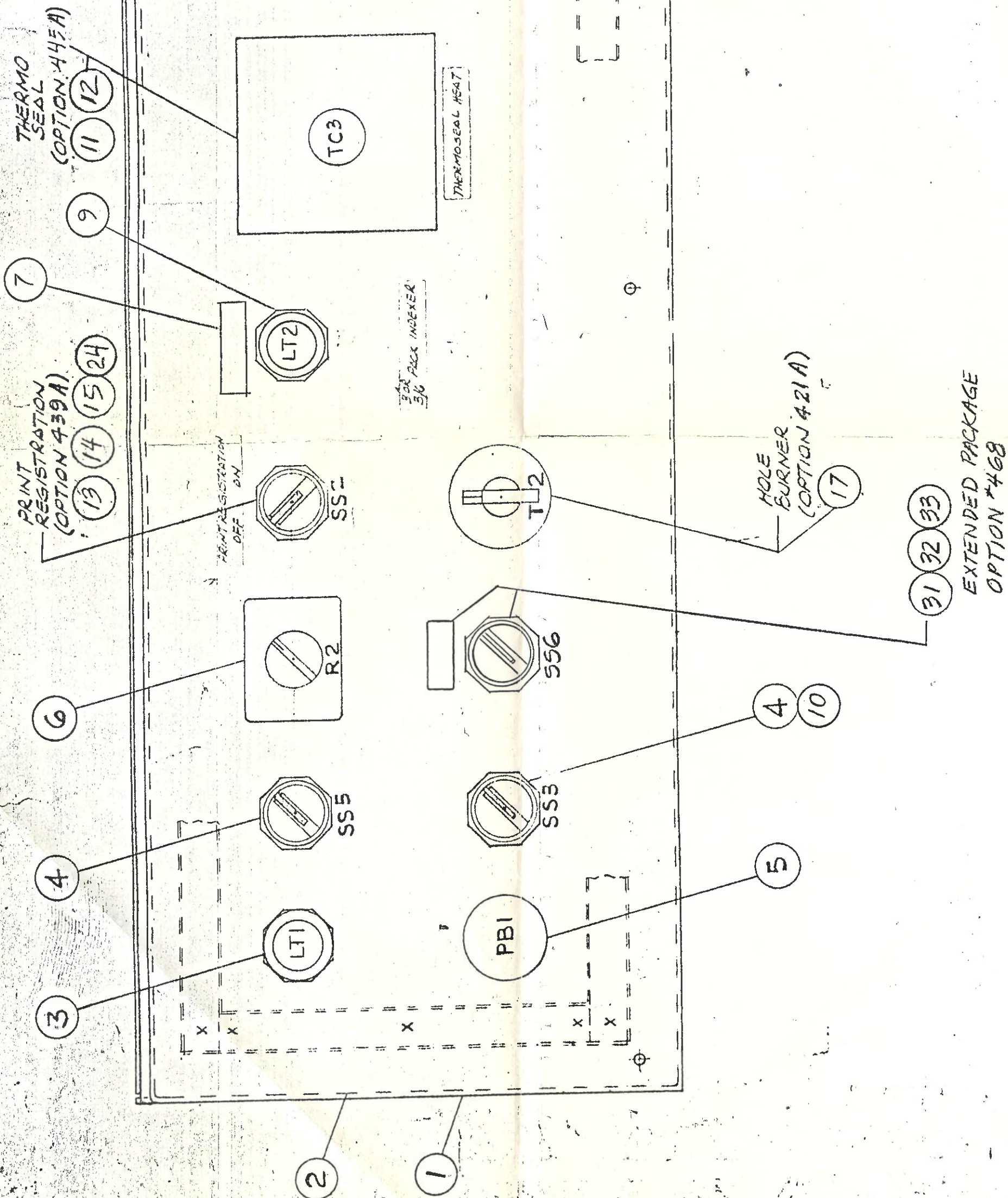
C
SIZE

PART NO.

REV

DTC

OTC CROSS SEAL BAR



PART NO.
PL 438-0842 ✓
1 OF 1

NOTE:
ITEM NO. PRECEDED BY "A"
INDICATES SEPARATE PARTS
LIST.

MODEL USED ON

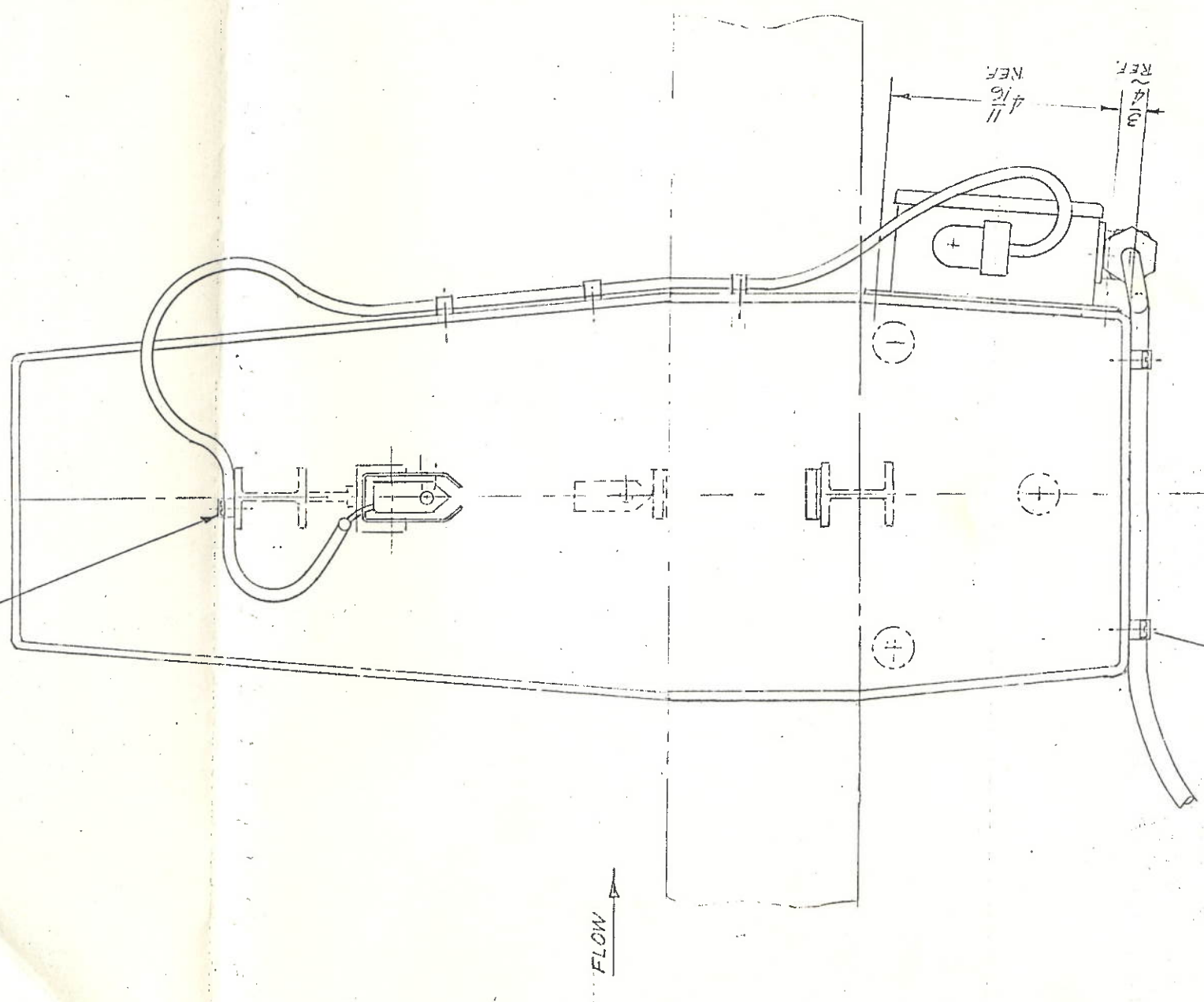
ASSY. USED ON

NO. REQ'D PER ASSY.

438
384
1

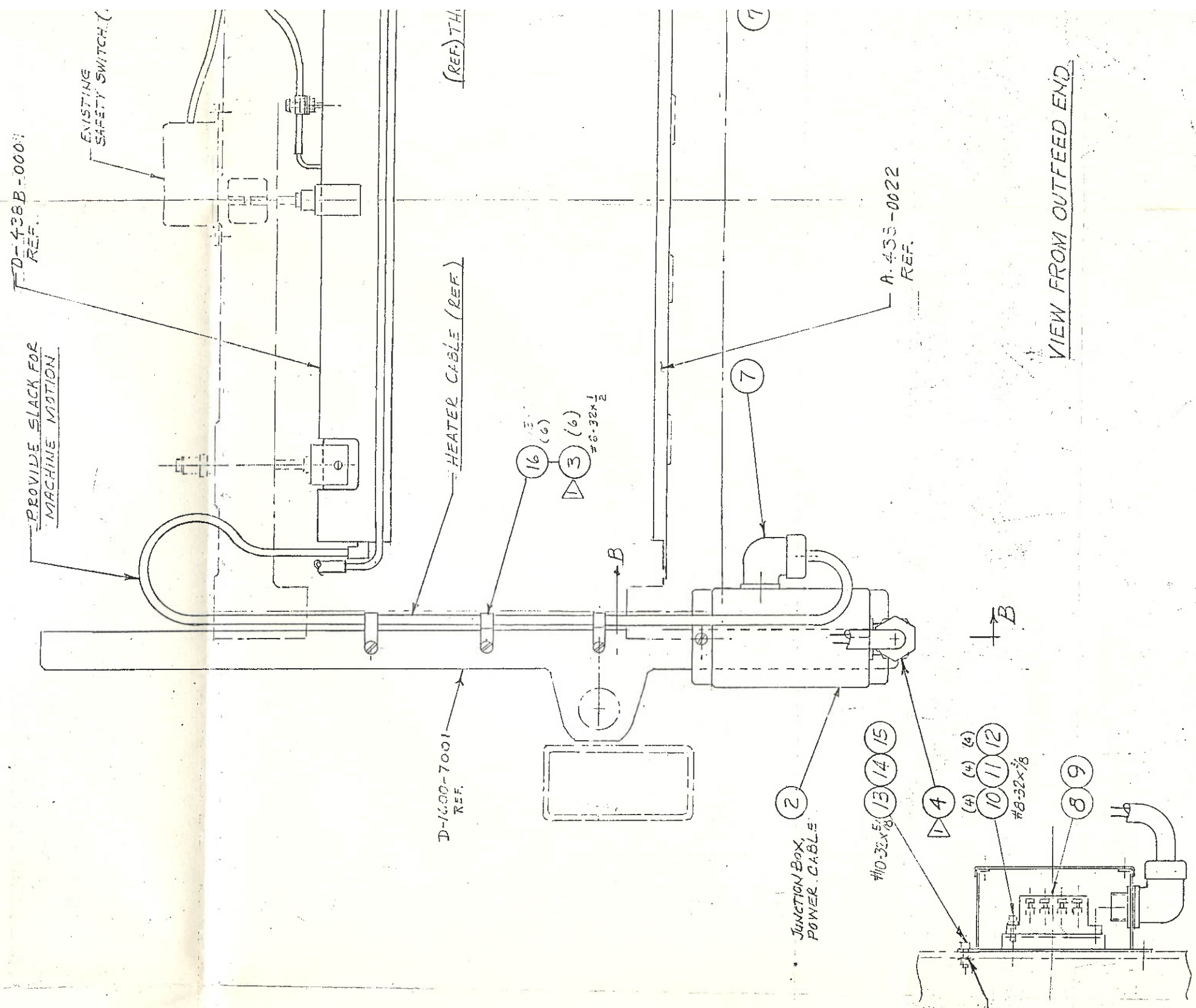
C-16020895										FRONT DOOR ASSY ELECTRICAL										P/S	QTY	QTY																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
ITEM	SIZE	PART NUMBER										REV.	DESCRIPTION										FINISH	QTY	QTY																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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16 (2)
3 (2)
#8-32 x 1/2



SECTION A-A

16 (2)
3 (2)



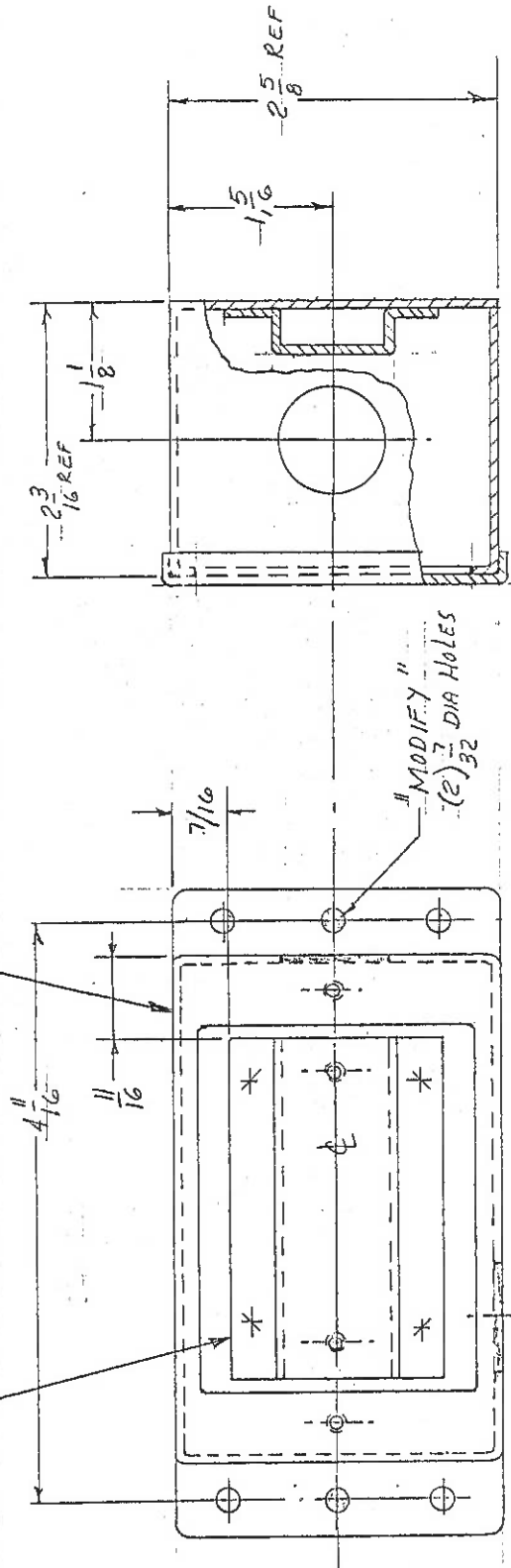
VIEW FROM OUTFEED END

PARTS LIST FOR
438-0033 CONDUIT LAYOUT ASSEMBLY
(REFERENCE DRAWING D-438-0033)

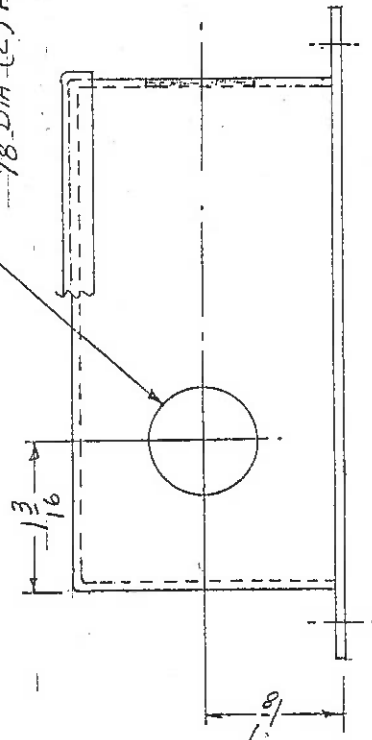
<u>ITEM NO.</u>	<u>SIZE</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
A1		B- 438-0115	JUNCTION BOX ASSY. L.H.	1
A2		B- 438-0117	JUNCTION BOX ASSY. R.H.	1
3		SS-1929	SCREW, B.H.	9
4		CD-17028	CABLE CONNECTOR 90 DEG.	1
7		CD-15863	CABLE CONNECTOR 90 DEG.	3
8		TL-0752	TERMINAL BLOCK	8
9		TL-0753	TERMINAL BLOCK END PIECE	2
10		SS-8077	SCREW, SOC. HD.	4
11		WA-5280	WASHER, FLAT	4
12		WA-1422	WASHER, LOCK	4
13		SS-7430	SCREW, SOC. HD.	4
14		WA-1423	WASHER, LOCK	4
15		NT-2380	NUT, HEX	4
16		WE-3293	TIE WRAP	9

ITEM NO.	PARTS LIST	NO. REQ.
	NOMENCLATURE	

- 1 438-0115 (THIS DWG.)
- 2 SPOTWELD IN PLACE (AS SHOWN)



"MODIFY" 7/8 DIA (2) HOLES



NOTES:
1. ELECTROLESS NICKEL PLATE
0.005 THK. (COVER, INSIDE &
OUTSIDE OF BOX.)

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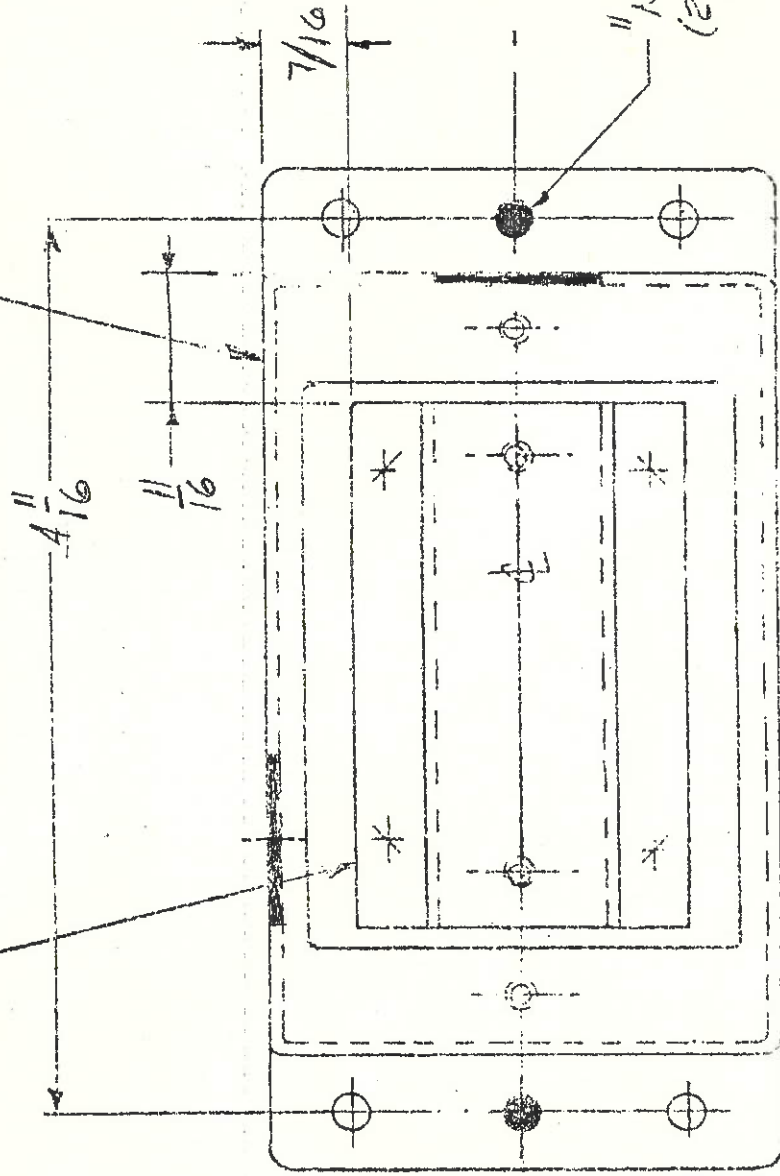
This Drawing contains proprietary information restricted to WELDOTRON manufacture ONLY. Any duplication of this material unless authorized in writing subject to prosecution.

SYM	DESCRIPTION	ECONO.	DATE/BY
REVISIONS			
DRAWN	P.P.	DATE	7/3/75
CHECK		DATE	
APP.		DATE	
TITLE			
WELDING CORPORATION			
JUNCTION BOX ASSY			
L.H.			
SCALE		SIZE	REV.
Full		B	438-0115
TOL. UNLESS SPECIFIED			
FRA. DEC. ANGLE			
± 1/64 ± .006 ± 1/2°			
NO RECD PER ASSEM.			
438C D-438-0033			
PART NO. MODEL NO.			
NEXT ASSEMBLY			

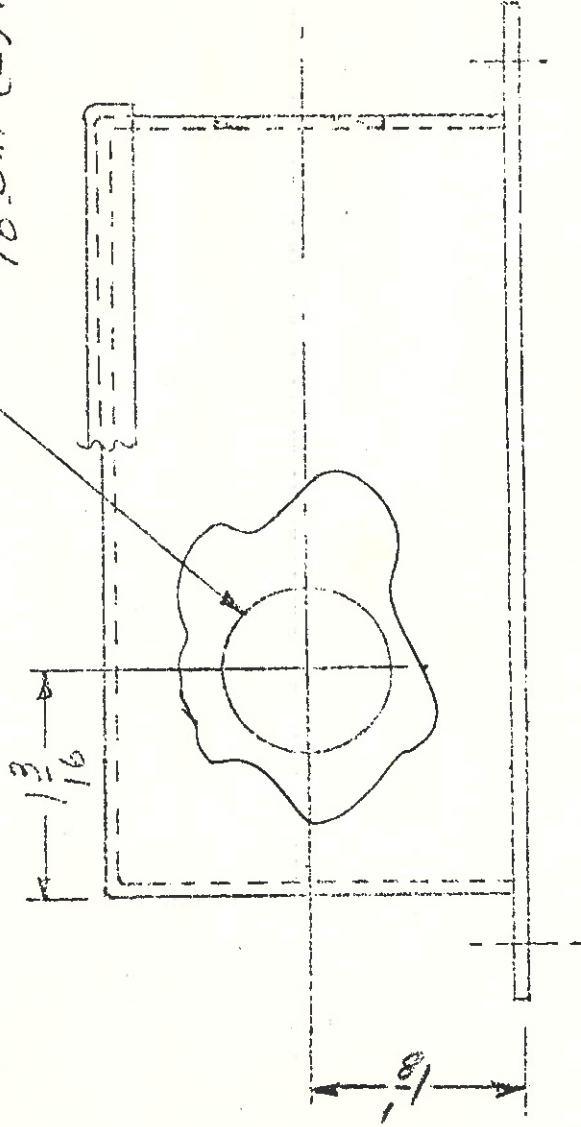
PARTS LIST	
ITEM NO.	NOMENCLATURE
NO REQ	

2 SPOTWELD IN PLACE (AS SHOWN)

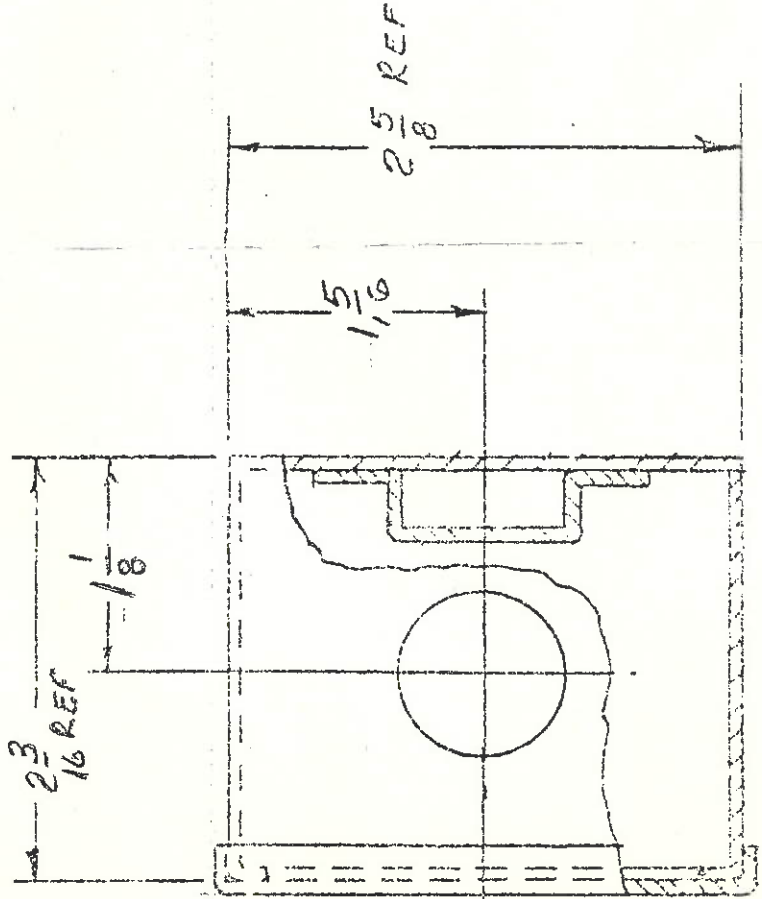
1 438-0117 (THIS DWG.)



"MODIFY" $\frac{7}{8}$ DIA (2) HOLES



NOTES:
1. ELECTROLESS NICKEL PLATE
 $\frac{.0005}{.001}$ TH. (COVER, INSIDE & OUTSIDE OF BOX.)



DESCRIPTION		ECONO	DATE
REVISIONS			
DATE	DATE	DATE	DATE
W. NASTAJ	5-30-66		
CHK.			
APP.			
MATERIAL - 15368 (APPLETON RING-1)			
FINISH			
SEE NOTE 1			
TOL UNLESS SPECIFIED			
FEA	DEC	ANGLE	
$\pm .005$	$\pm .005$	$\pm 1^\circ$	

TITLE		SCALE	SIZE	PART NO.
JUNCTION BOX ASSY				
R.H.				
CORPORATION				
FULL				
B				
438-0117				

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438-0117

REPORT OF /

MODEL USED ON

438
C

ASSY. USED ON

D-432
-0223

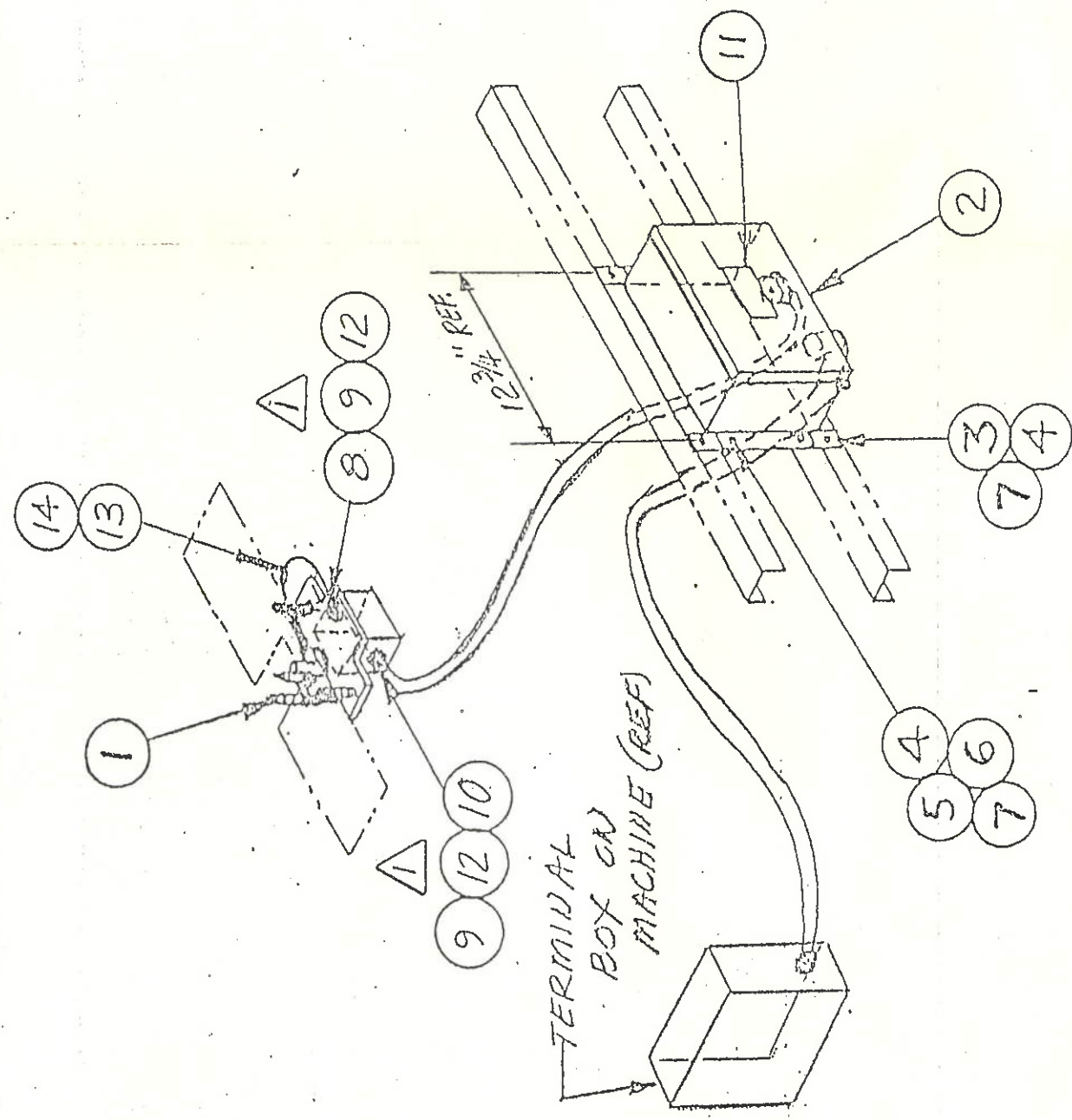
NO. REQ'D PER. ASSY.

1

[illegible]

LUM FROM P/L 438-0115

PARTS LIST		
ITEM NO.	NOMENCLATURE	NO. REQ.



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PART NO.	400B	1602B-0001	1
MODEL NO.		NEXT ASSEMBLY	NO REQD PER ASSEM.

1	ADDED WATER RESISTANT BOX AND HARDWARE	4421	602 74626	
SYM	DESCRIPTION	ECO NO.	DATE/REV	
REVISIONS				
DRN.	BR	DATE	3-86	
CHK.		DATE		
APP.		DATE		
MATL	~			
FINISH	~			
TOL. UNLESS SPECIFIED		FRA	DEC.	ANGLE
		± 1/64	± .005	± 1/2°
weldotron corporation				
TITLE				
STATIC SEAL ASS'Y				
WATER RESISTANT				
SCALE	SIZE	PART NO.	REV.	
	B	400B-0003	1	

PL 400B - 0003

SHEET 1 OF 1

2577.

ITEM NO. PRECEDED BY "A"
INDICATES SEPARATE PARTS
LIST.

MODEL USED ON

1602

ASSY. USED ON

P/L	1602
	E
	0051

NO. REQ'D PER ASSY.

1

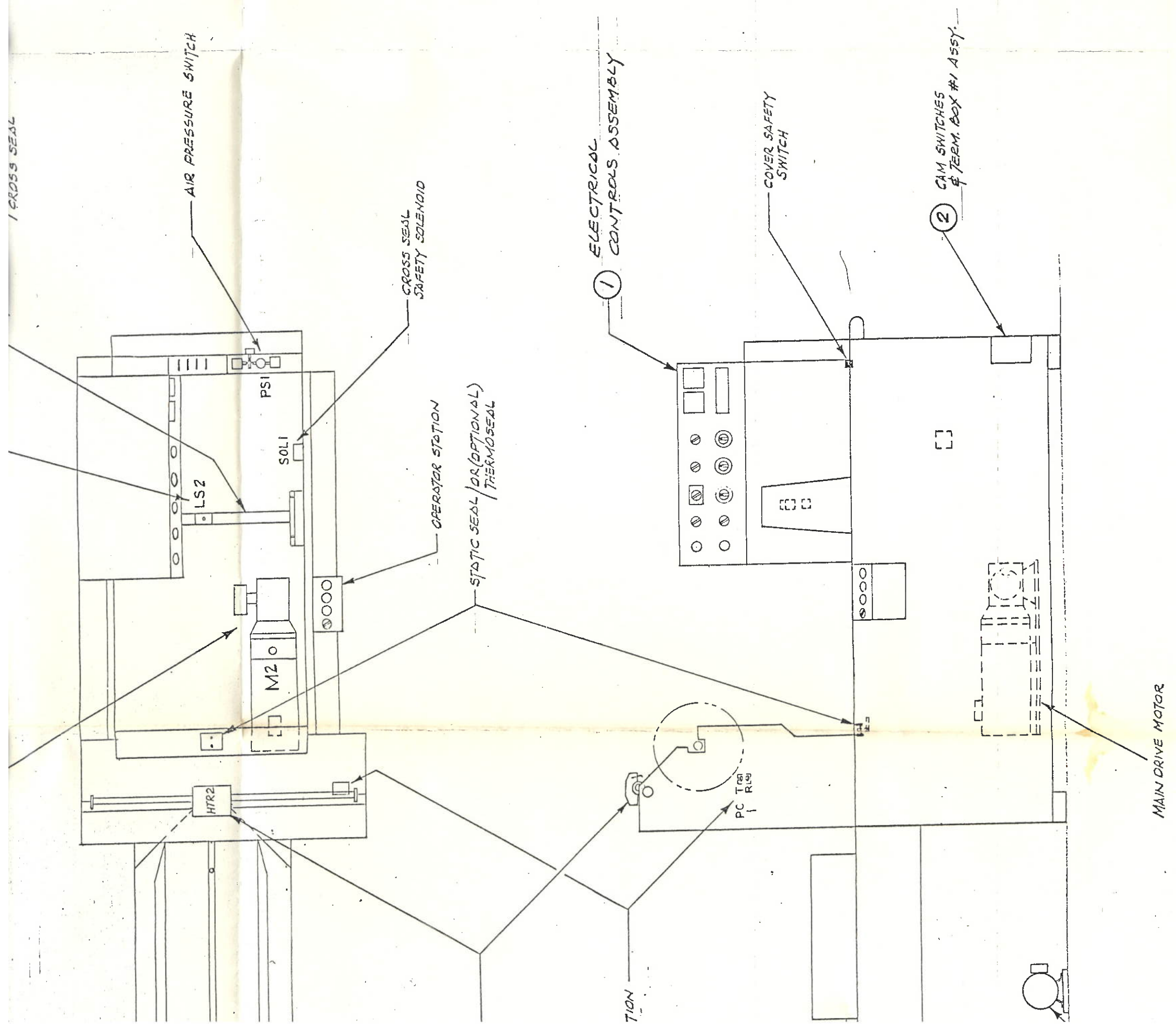
ITEM		P/N		PART NUMBER		REV		DESCRIPTION		P/N		FINISH		QTY	
		B		-400B01003				STATIC SEAL ASS'Y.							
A1		B		-400-0011				NEEDLE BRK'T. & LUG ASS'Y.						1	
A2		B		-400-0813				STATIC SEAL ELECT. ENCLOSURE ASS'Y						1	
3		A		4008070				MOUNTING BRK'T.						2	
4				SS2382				HEX. HD. SCR. 1/4-20x1/2		S.S.				8	
5				NT2376				NUT 1/4-20		S.S.				4	
6				WA2370				LOCK WASHER 1/4		S.S.				4	
7				WA5422				STAR WASHER 1/4		S.S.				12	
8				CD4098				CORD CONNECTOR 1/2"						1	
9				CD3412				LOCKNUT 1/2"						2	
10				CD6489				CONNECTOR STRAIN RELIEF 1/2"						1	
11		A		LB9004				LABEL "SHOCK HAZARD ETC."						1	
12				CD3156				SEAL "O" RING WITH RETAINER						2	
13				CP5122				CLAMP, PLASTIC TIE						1	
14				WE3290				TY WRAP.						1	

T	D	I	8	1	1
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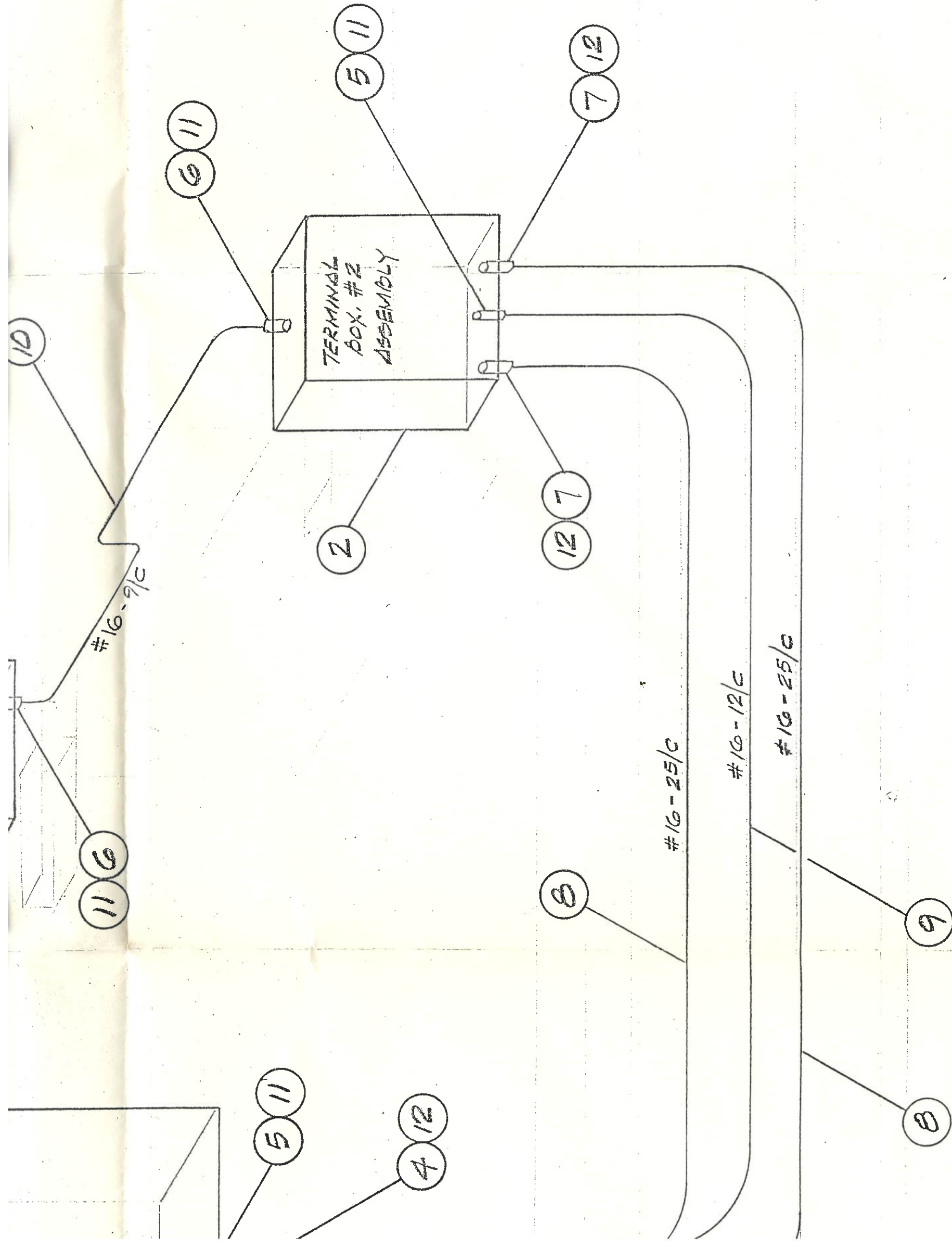
INSTRUCTION BULLETIN - FIELD

INSTALLATION OF A STATIC SEAL KIT (WATER RESISTANT) FOR MODEL 1602 WRAPPERS

[illegible]



[illegible]



SIZE	PART NO.	REV.
C		

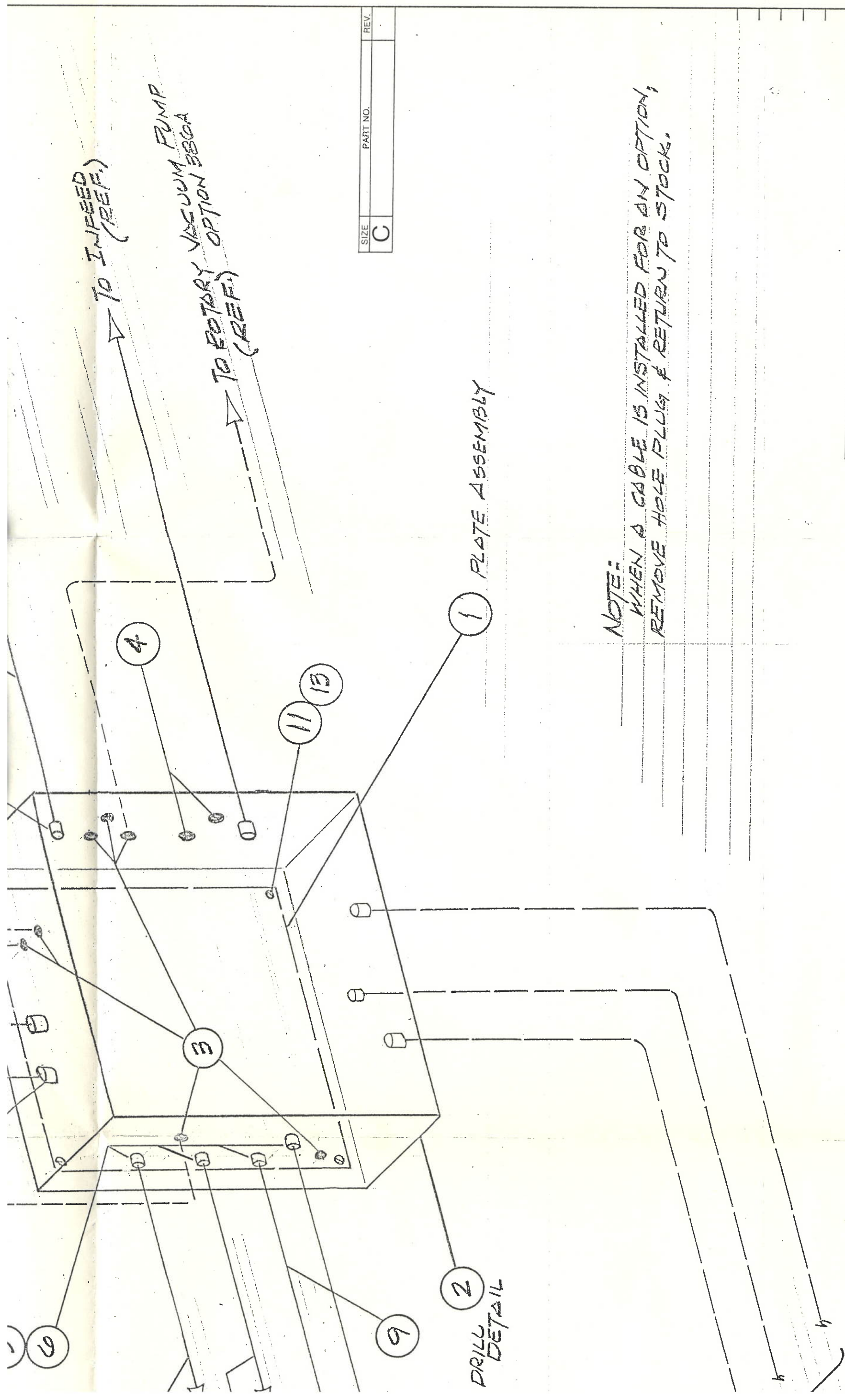
SYM	DESCRIPTION	ECO NO.	DATE / BY
REVISIONS			
DRN.	RT	DATE	5/17
CHK.		DATE	
APP.		DATE	
MAT'L	SEE P/L		
FINISH			

weldotron Corporation	
TITLE ELECTRICAL CONTROLS ASSEMBLY	

CONFIDENTIAL

1602B 1602-0891 1

PART NO.		PL 1602-0891		SHEET 1 OF 1		NOTE: ITEM NO. PRECEDED BY "A" INDICATES SEPARATE PARTS LIST.		MODEL USED ON		ASSY. USED ON		NO. REQ'D PER ASSY.			
ITEM	SIZE	PART NUMBER				REV	DESCRIPTION	FINISH							
	C	1	6	0	2	0	8	9	1	ELEC. CONTROLS ASSY.					
A1	C	1	6	0	2	0	8	9	3	MAIN ELEC. ENCL. COMPONENT ASSY.					
A2	C	1	6	0	2	0	8	9	4	TERMINAL BOX #2 ASSY					
A3	PL	1	6	0	2	0	8	9	0	OPERATOR STATION ASSY					
4						CD	1	7	0	3	7	CONNECTOR 1" STRAIN RELIEF			
5						CD	3	4	1	4	CONNECTOR 3/4" STRAIN RELIEF				
6						CD	1	7	5	B	0	CONNECTOR 3/4" STRAIN RELIEF 90°			
7						CD	1	7	5	B	1	CONNECTOR 1" STRAIN RELIEF 90°			
8	A	1	6	0	2	8	9	1	0	CABLE #16 25/COND.					
9	A	1	6	0	2	8	9	1	1	CABLE #16 12/COND.					
10	A	1	6	0	2	8	9	1	2	CABLE #16 9/COND.					
11						CD	3	8	4	0	LOCKNUT 3/4"				
12						CD	3	4	4	0	LOCKNUT 1"				



SIZE	PART NO.	REV.
C		

NOTE:
 WHEN A CABLE IS INSTALLED FOR AN OPTION,
 REMOVE HOLE PLUG & RETURN TO STOCK.

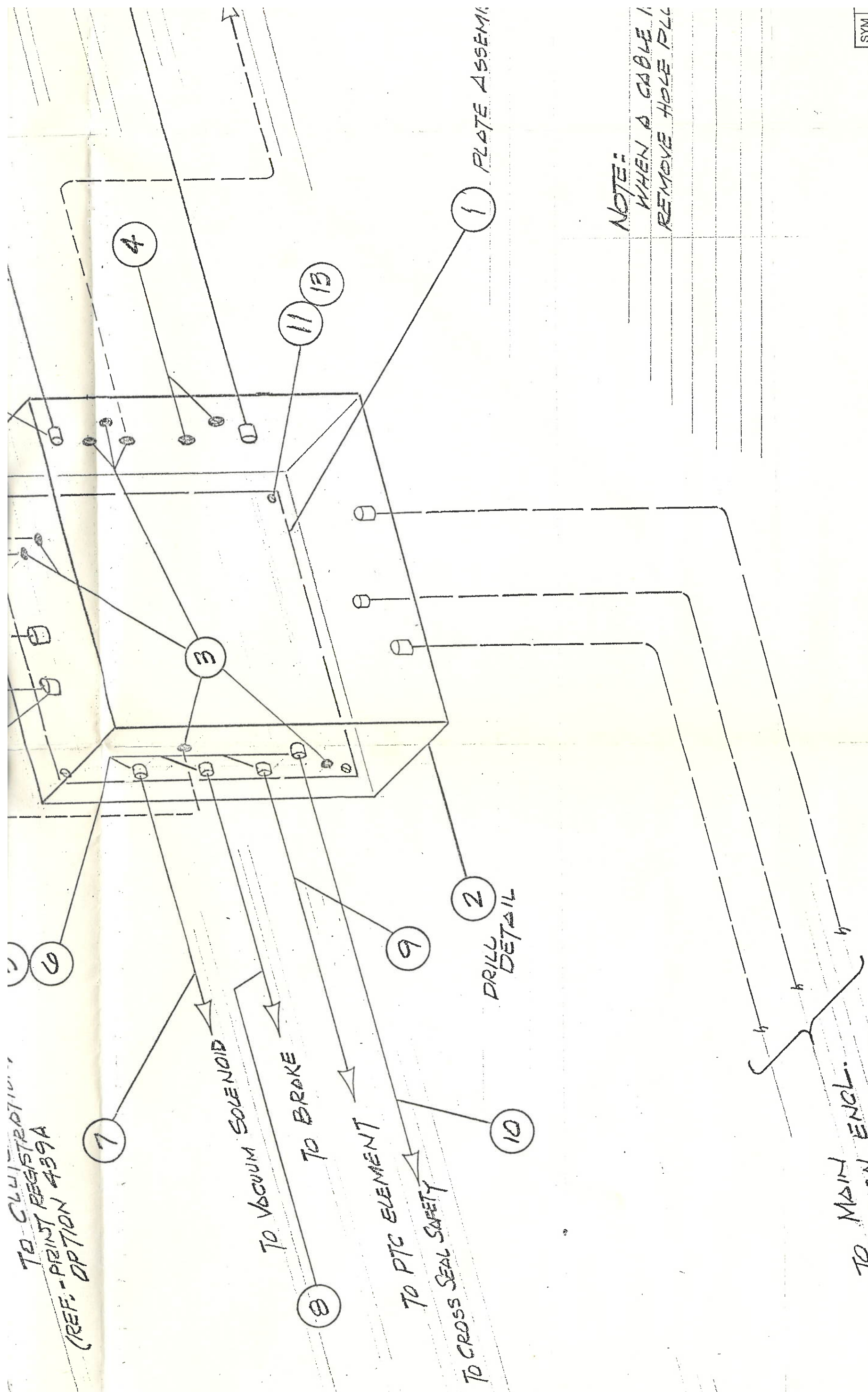
SYM	DESCRIPTION	ECO NO.	DATE /BY
REVISIONS			
DRN.	R.T	DATE	8/20
CHK.		DATE	
APP.		DATE	
MAT'L	SEE P/L		
FINISH			
TOL. UNLESS SPECIFIED		SCALE	SIZE
		PART NO.	REV.

weldot
 corporation

TITLE
 TERMINAL BOX #2
 ASSEMBLY

1602 B 1602-0891 1

TO CULI STRATION
TO PRINT REG 159A
(REF. OPTION 439A)



NOTE:
WHEN A CABLE IS
REMOVE HOLE PULL

SYM	DRN.	CHK.	APP.	MAT'L	FINISH	TOL.	FRA.
	1						

1602 B 1602-0891 1

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PART NO.

PL 1602-0894

NOTE:

ITEM NO. PRECEDED BY "A"
INDICATES SEPARATE PARTS
LIST.

MODEL USED ON

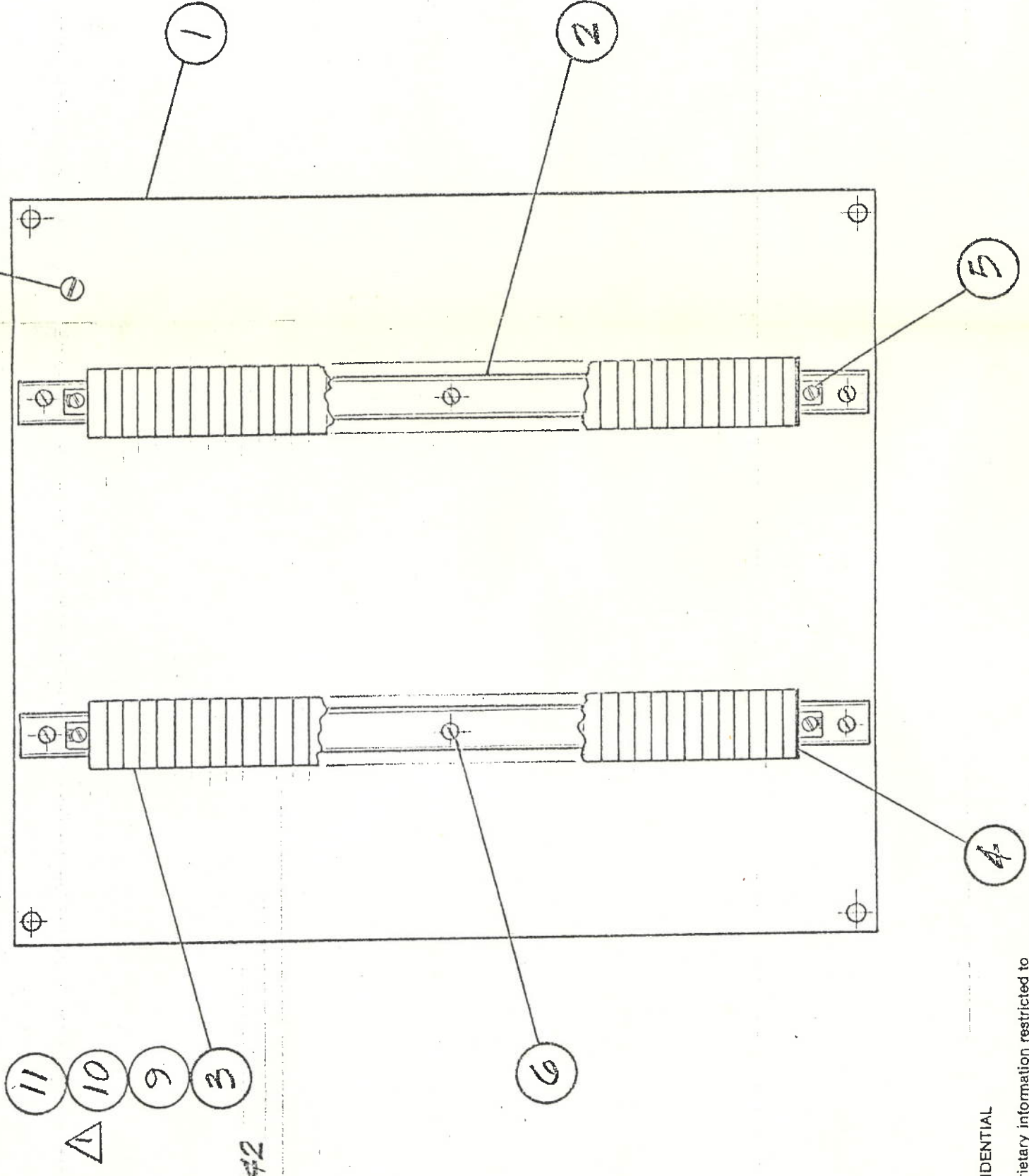
SHEET 1 OF 1

ASSY. USED ON

NO. REQ'D PER ASSY.

C		16020894				TERMINAL BOX #2 ASSEMBLY		P/N	
ITEM	SIZE	PART NUMBER		REV		DESCRIPTION		FINISH	
A	B	16020898				TERM. BOX #2 - PLATE ASSY.			
2	C	16028940				TERM. BOX #2 - DRILL DETAIL			
3		PG4146				PLUG FOR 7/8" DIA. HOLE			
4		PG4248				PLUG FOR 1 1/8" DIA. HOLE			
5		CD3145				CONNECTOR 1/2" STRAIN RELIEF			
6		CD3412				LOCKNUT 1/2"			
7	A	16028941				CABLE #10/2 COND. SJ			
8	A	16028942				CABLE #10/2 COND. SJ			
9	A	16028943				CABLE #10/2 COND. SJ			
10	A	16028944				CABLE #10/2 COND. SJ			
11		SS0272				SCREW #10-32 3/8" LG. C.P.			
12	A	16028945				CABLE #10/5 COND. SJ			
13		WA2230				LOCK WASHER #10 C.P.			
14		CD4098				CONNECTOR 1/2" STRAIN RELIEF			
15	A	16028946				CABLE - 2/C TH. PR. & 2/C TH. SH. PR.			
16		CD4384				CONNECTOR 1/2" STRAIN RELIEF			

PARTS LIST	
ITEM NO.	NOMENCLATURE
NO. REQ.	



(2) ROWS OF #2

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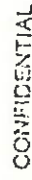
1	ADDED ITEMS 9, 10 & 11	4533	1-7-82
SYM	DESCRIPTION	ECO NO.	DATE /BY
REVISIONS			
DRN. <i>AT</i>	DATE 2/17		
CHK.	DATE		
APP.	DATE		
MATL. <i>SEE P/10</i>			
FINISH			
weldotron corporation			
TITLE			
TERMINAL BOX #2			
PLATE ASSEMBLY			
TOL. UNLESS SPECIFIED		SCALE	SIZE
FRA ± 1/84	DEC. ± .005	1/2	B
ANGLE ± 1/2°			
PART NO. 1602-0898		REV. 1	

1602-0898	1
NO REQ'D PER ASSEM.	
PART NO.	MODEL NO.
1602-0898	1602-0898
NEXT ASSEMBLY	

REV.	PART NO.	SIZE
		B

[illegible]

2007



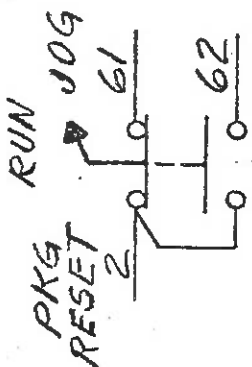
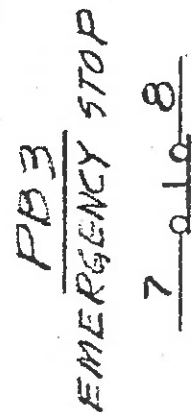
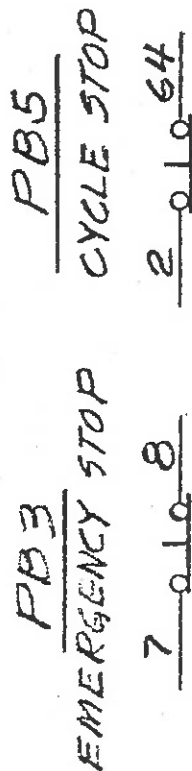
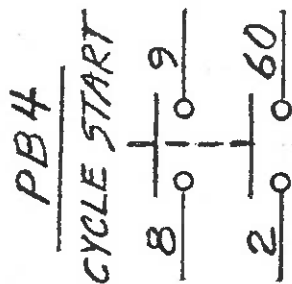
PART NO.	MODEL NO.	NEXT ASSEMBLY	NO. REQ. AND PARTS
	1602B	1602-00B1	1
	1603C	1603-00B3	1
	1602B	1602-00B3	1

2	MOREL K05B, 1662B & 1663C WERE 1662, 1662 & 1663, "NEXT 255'S WERE 1662, 1662 & 1663 - OK!"	4341	5/1/83 127
1	ADDED ITEM # 10	4077	607 4-24-83
SYM	DESCRIPTION	ECONO.	DATE / BY
REVISIONS			
DRN	DATE	 Welded Corporation	
CHK	DATE		
APP	DATE		
MATL	DATE		
FINISH		TITLE	
TOL. UNLESS SPECIFIED FRA DEC ANGLE 1/32" = .003" = 1/2"		OPERATOR STATION ASSEMBLY	
SCALE	SIZE	PART NO.	REV.
1/4"	B	1662-0818	2

[illegible]

SIZE	PART NO.	REV.
A		

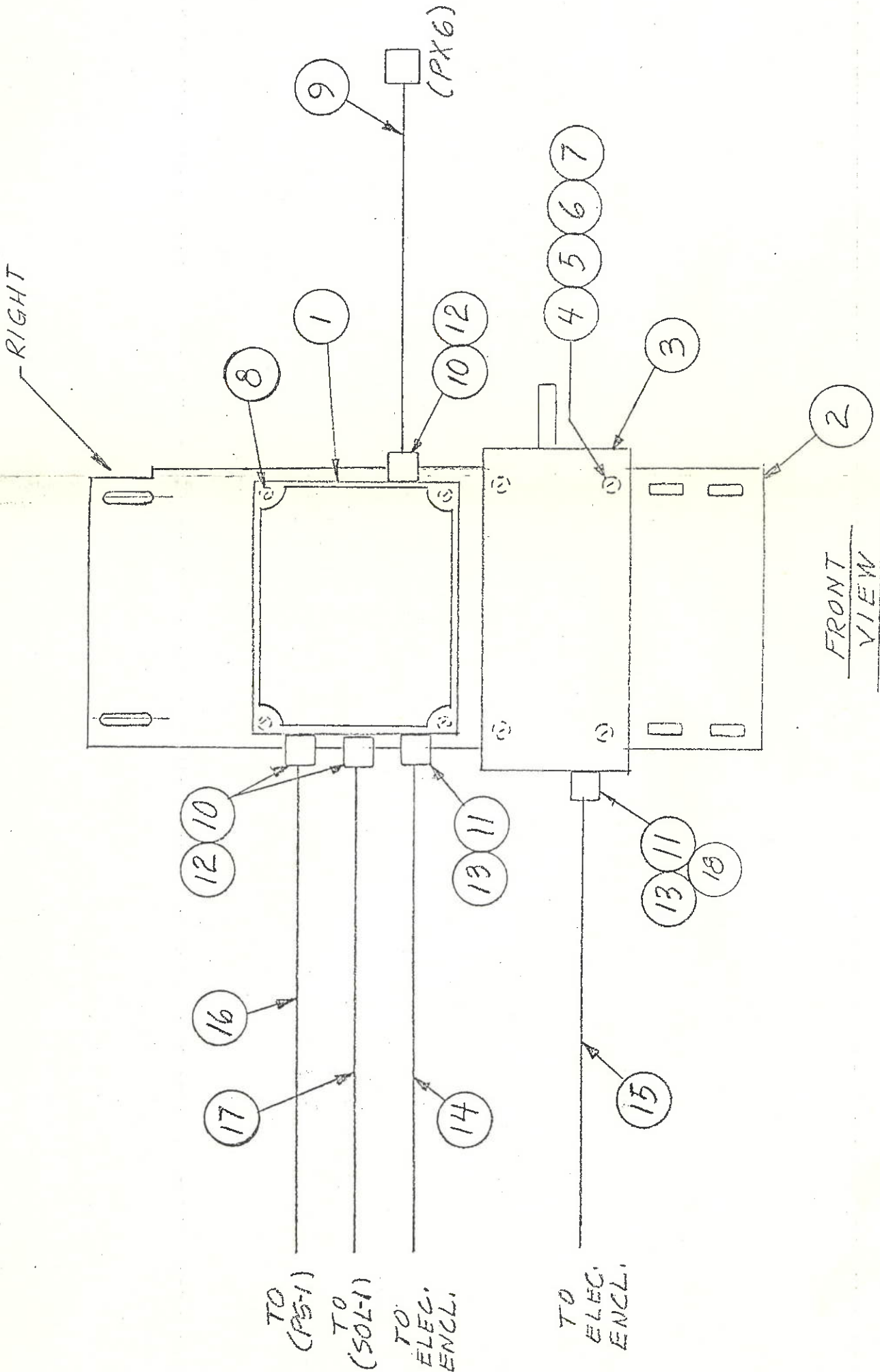
SS4
OPERATION
MODE SELECTION



SYM	DESCRIPTION		ECO NO.	DATE /BY		
	REVISIONS					
DRN.	DATE	DATE				
CHK.	DATE	DATE				
APP.	DATE	DATE				
MAT'L						
FINISH						
TITLE			SCALE	SIZE	PART NO.	REV.
OPERATOR STATION WIRING DIAGRAM			~	A	1602-0890	
TOL. UNLESS SPECIFIED						
FRA	DEC.	ANGLE				
± 1/64	± .006	± 1/2°				

1602	1602-0891	1
PART NO.	NEXT ASSEMBLY	NO REQ'D PER ASSEM.
MODEL NO.		

PARTS LIST	
ITEM NO.	NOMENCLATURE
NO. REQ.	



SYM	DESCRIPTION	ECO NO.	DATE /BY
REVISIONS			
DRN.	DATE		
CHK.	DATE		
APP.	DATE		
MAT'L			
FINISH			
weldotron corporation			
TITLE			
CAM SWITCHES AND TERMINAL BOX #1 ASSEMBLY			
TOL. UNLESS SPECIFIED	SCALE	SIZE	REV.
FRA ± 1/64 DEC. ± .005 ANGLE ± 1/2°	~	B	1611-0893

1602B	PL1602-0089	1
1611C	PL1611-0089	1
PART NO.	MODEL NO.	NO REQ'D PER ASSEM.

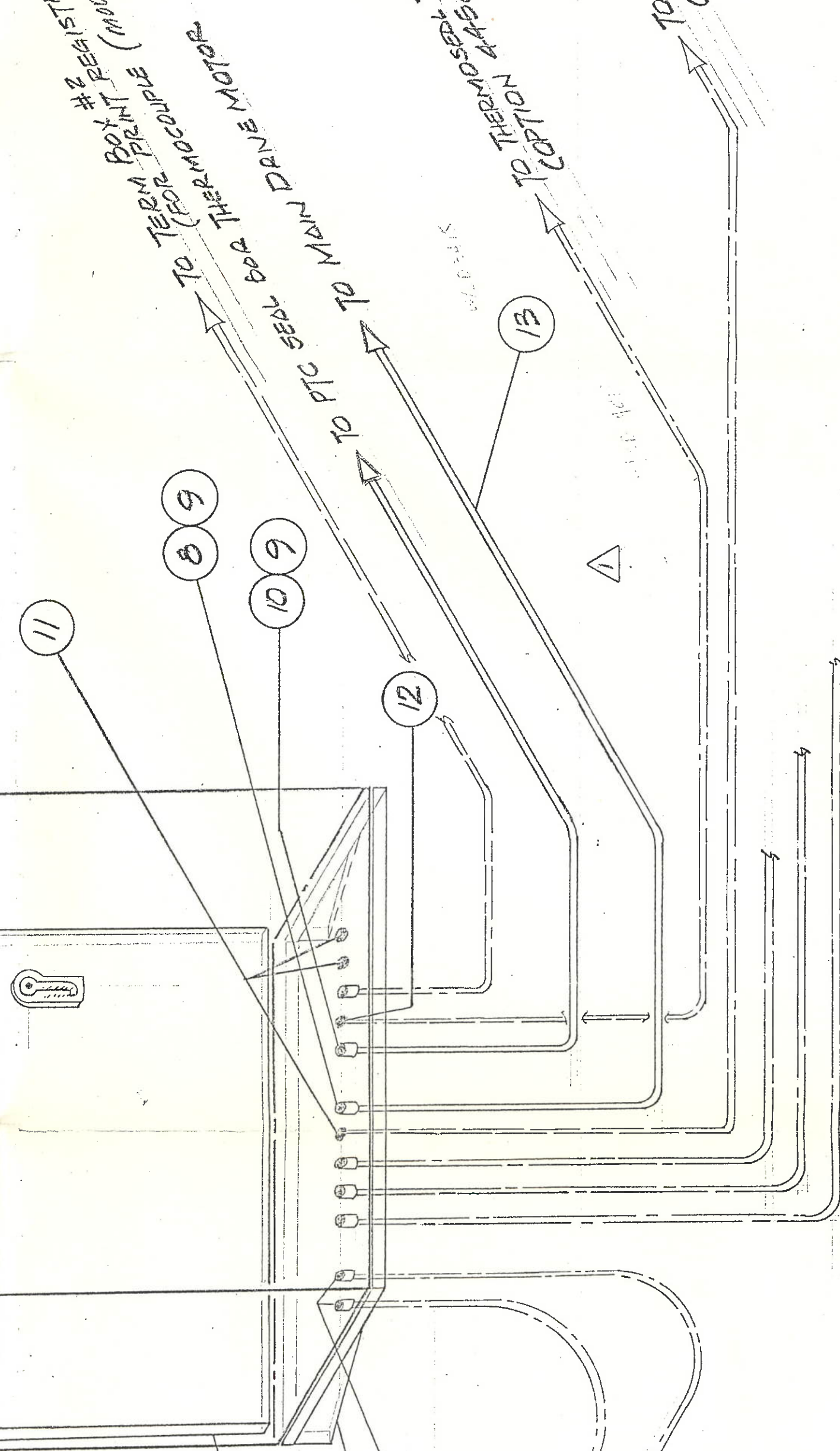
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REV	PART NO.	SIZE
		B

PART NO.		NOTE:		MODEL USED ON		1611 1611	
1611-0893		ITEM NO. PRECEDED BY "A" INDICATES SEPARATE PARTS LIST.		ASSY. USED ON		1611 1611	
SHEET 1 OF 1				NO. REQ'D PER ASSY.		1 1	
ITEM	SIZE	PART NUMBER		REV	DESCRIPTION	FINISH	QTY
A1	A	1611	0893		CAM SWITCHES & TERM BOX #1 ASSY	P/N	
2	B	1611	8930		TERMINAL BOX #1 ASSY	PAINT FH 2865	1
3			EM7437		MOUNTING PLATE DETAIL		1
4			SS1297		CAM SWITCHES & ENCL.		4
5			NT0199		FL. H.M.S. 5/16-18 X 1 1/4" LG		4
6			WA0837		HEX NUT 5/16-18		8
7			WA0195		WASHER PLAIN 5/16		8
8			SS0244		WASHER LOCK 5/16		4
9			SW15703		BD. HD. SCREW 6-32 X 1" LG		1
10			CD6489		COVER SAFETY SWITCH (PX6)		3
11			CD17580		CORD CONNECTOR		2
12			CD3412		CORD CONNECTOR 90°		3
13			CD3840		LOCK NUT 1/2"		2
14	A	1611	8931		LOCK NUT 3/4"		1
15	A	1611	8932		*16/9- CORD (TERM. BOX #1)		1
16	A	1611	8933		*16/9 CORD (CAM BOX)		1
17	A	1611	8934		*16/2 CORD (PS-1)		1
	A	1611	8021		*16/2 CORD (SOL-1)		1
	B	1611	8022		WIRING DIAG. TERM. BOX #1		1
18	A	1600	8063		WIRING DIAG. CAM SWITCHES		1
					HOLE REDUCER		

#2 REGISTRATION
 BOX PRINT (MODEL 430C)



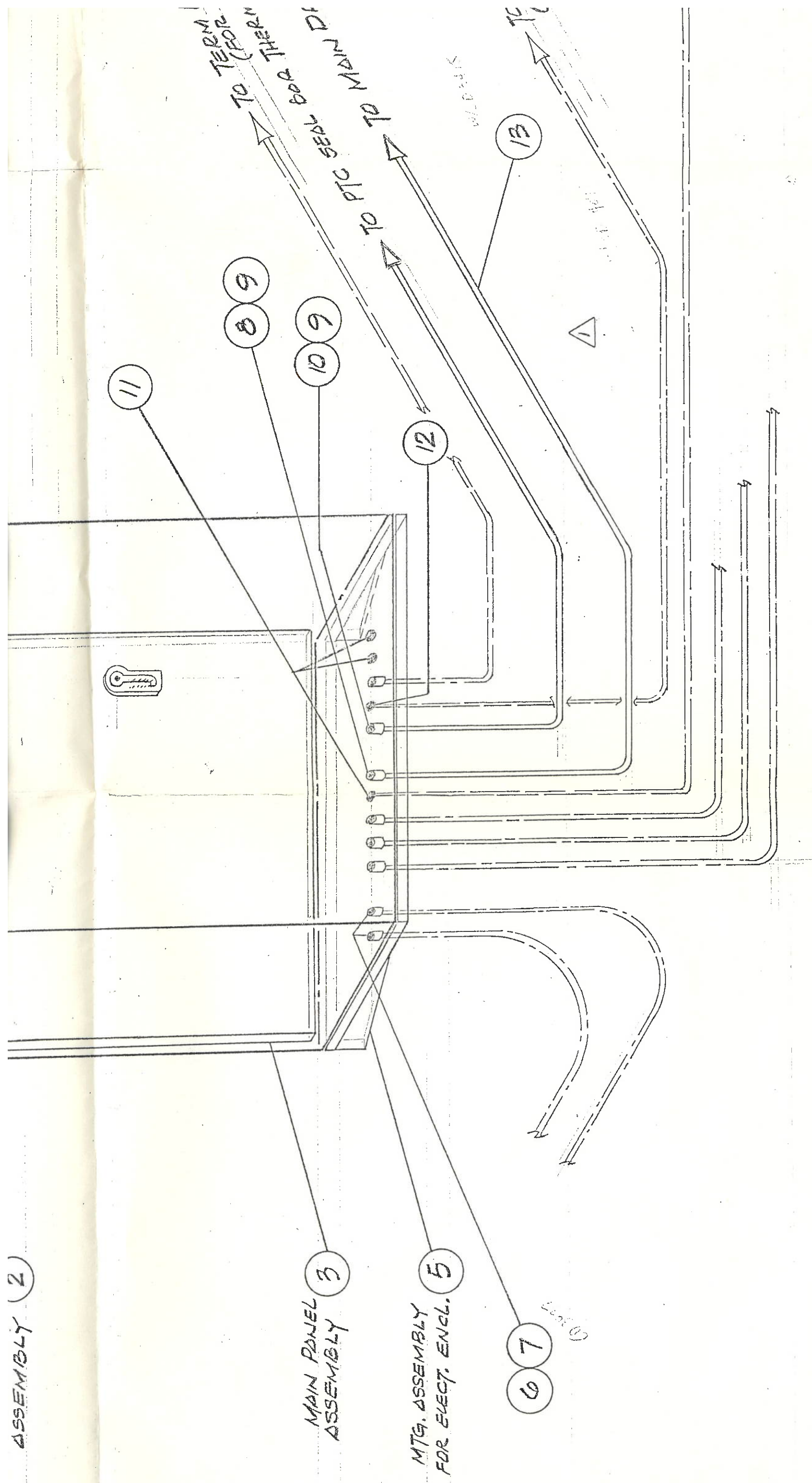
SIZE	PART NO.	REV.
C		

SYM	DESCRIPTION	ECO NO.	DATE / BY
1	DELGTER ITEM #14 ADDED MODEL 430C	4476	10-13-88 DSC

DRN. R7 DATE 3/20		REVISIONS	
CHK.	DATE		
APP.	DATE		
MATL. SEE P/L		TITLE weldotron corporation	
FINISH ---		MAIN ELECT. ENCLOSURE COMPONENT ASSEMBLY	
TOL. UNLESS SPECIFIED		SCALE	SIZE
		PART NO.	REV.

1602 B 1602-0089 1

ASSEMBLY (2)



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1602 B 1602-0089 1

PART NO. MODEL NO. NEXT ASSEMBLY NO. REQD.

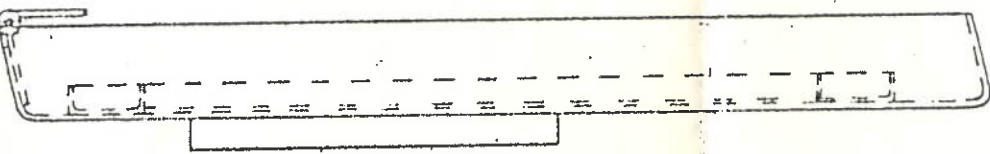
1	SYM	DRN.	CHK.	APP.	MAT'L	FINISH	TOL.	UNI.	FRA
1		R7			SEE				

PARTS LIST

ITEM NO.	NOMENCLATURE	NO. REQ.
----------	--------------	----------

PTC CROSS SEAL BAR (MODEL 438C/447)

16

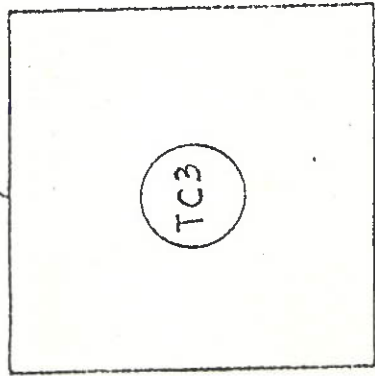


THERMO SEAL
(OPTION 445A)

11

12

9



TC3

THERMOSEAL HEAT

7

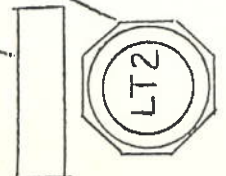
PRINT REGISTRATION
(OPTION 439A)

13

14

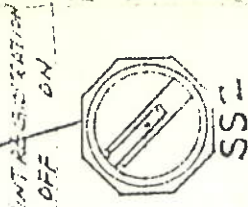
15

24



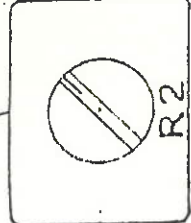
LT2

FOR PACK INDEXER
5/16

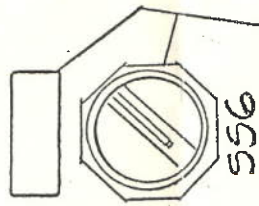


SS2

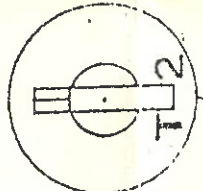
PRINT REGISTRATION
OFF ON



R2



556



T2

HOLE BURNER
(OPTION 421A)

17

4

10

31

32

33

EXTENDED PACKAGE
OPTION #468

SIZE	PART NO.	REV.
C		

ITEM NO.

PTC CROSS SEAL 244

16

THERMO SEAL
(OPTION 443A)

9 11 12

PRINT
REGISTRATION
(OPTION 439A)

13 14 15 24

6

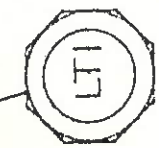
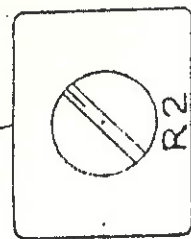
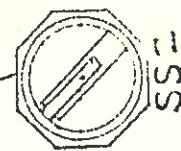
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3

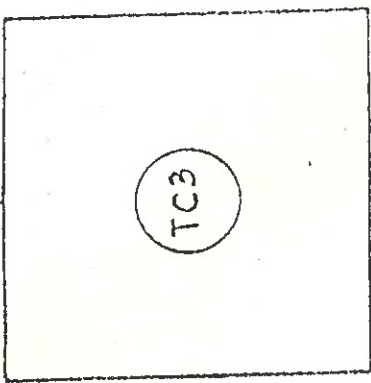
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1

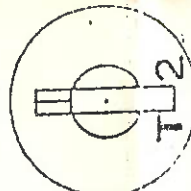
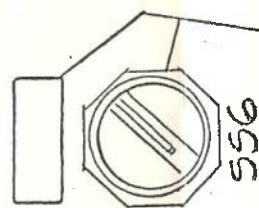
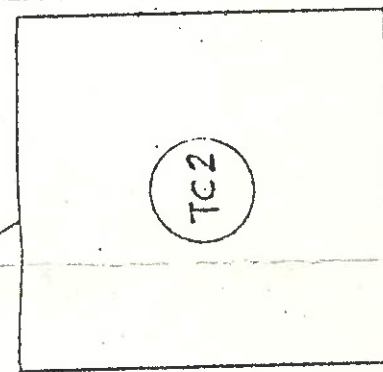
PRINT REGISTRATION
OFF ON



FOR PACK INDEXER
5/6



THERMOSEAL HEAT



HOLE
BURNER
(OPTION 421A)

17

4

10

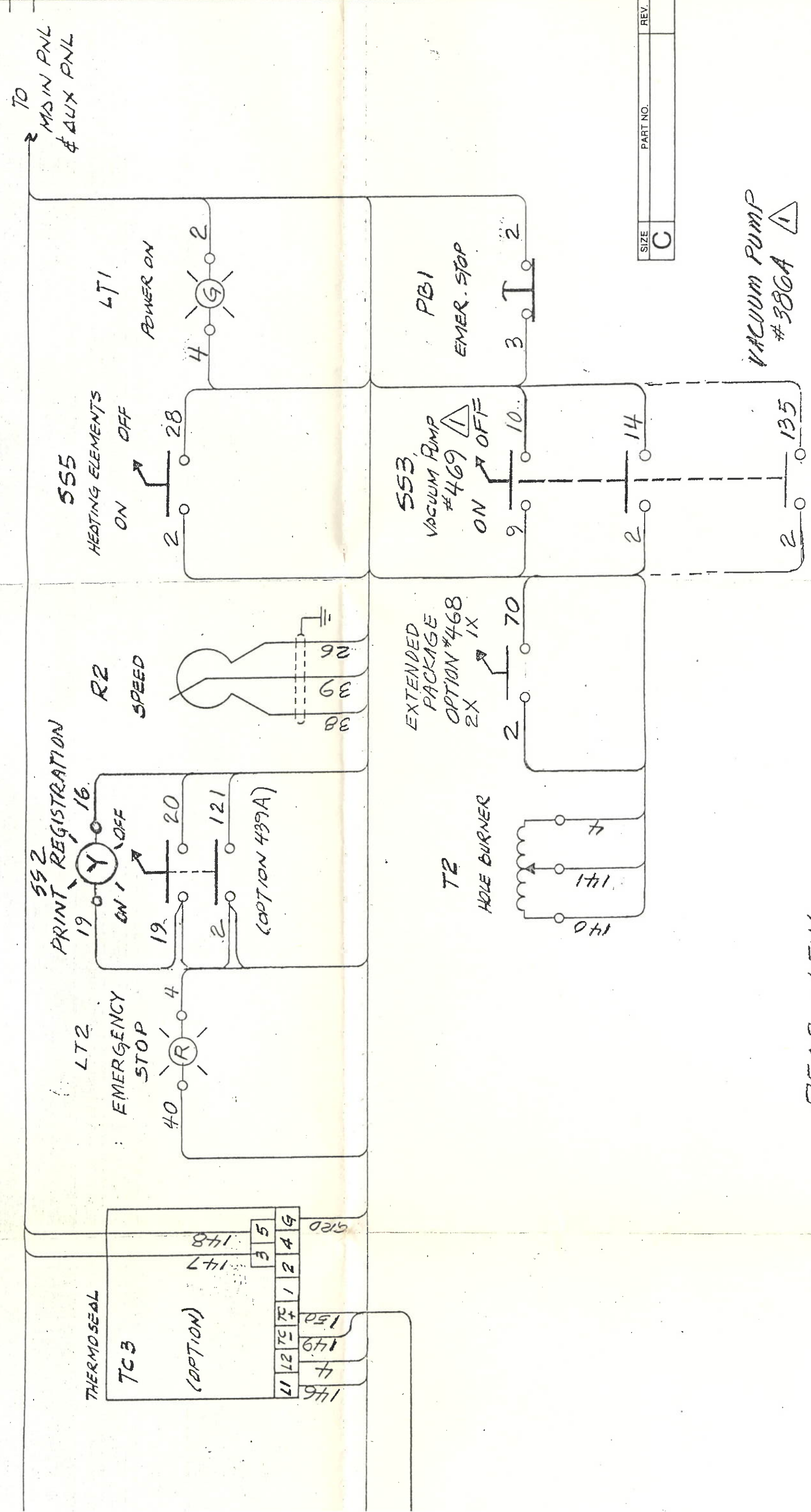
5

31 32 33

EXTENDED PACKAGE
OPTION #468

MODEL USED ON	1EDZ
ASSY. USED ON	0093
NO. REQ'D PER ASSY.	1

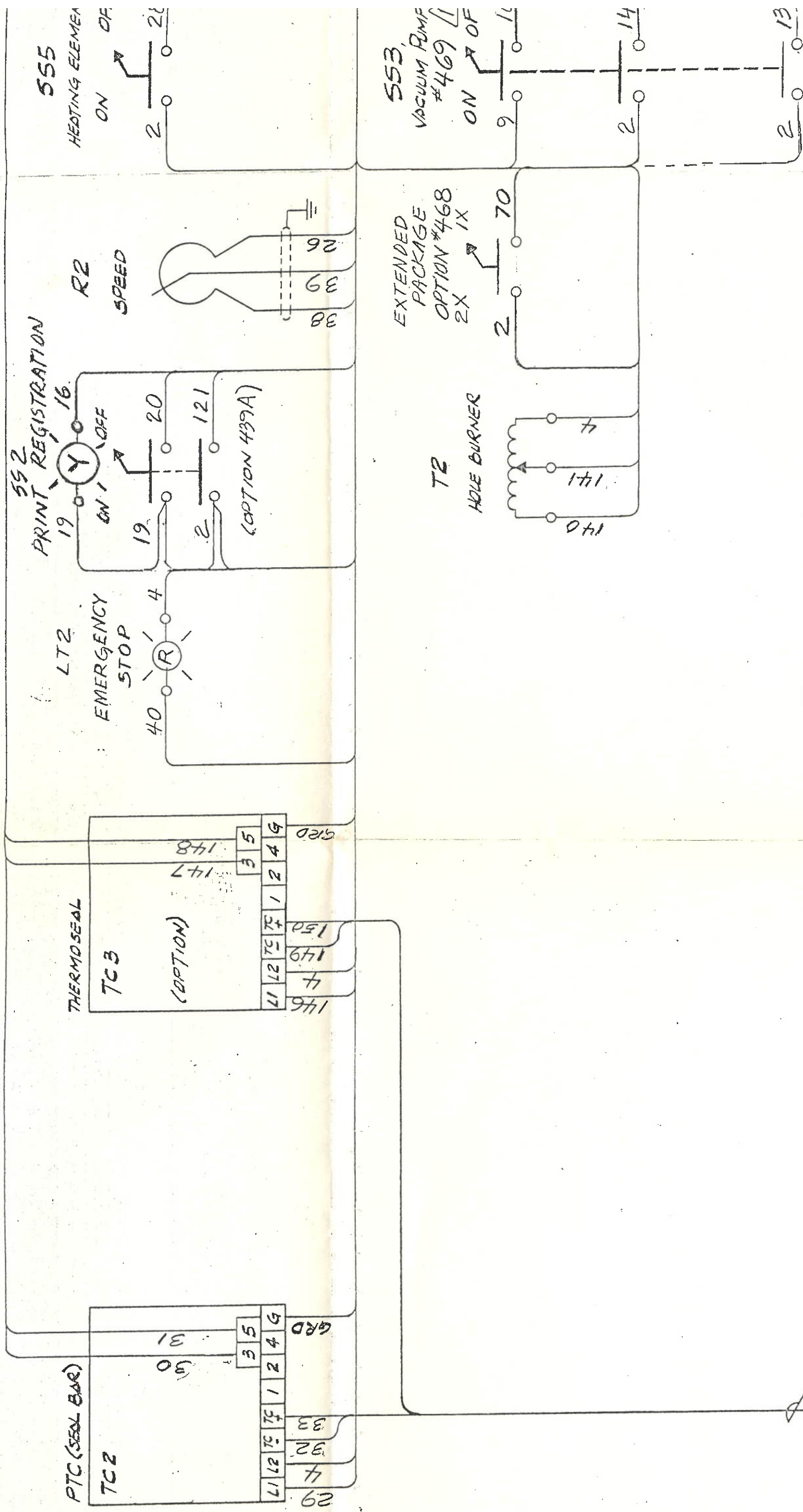
PARTS LIST		
ITEM NO.	NOMENCLATURE	NO. REQ.



SIZE	PART NO.	REV.
C		

REAR VIEW

ITEM NO.



REAR VIEW

THERMOCOUPLE WIRES
TO BE RUN
DIRECTLY TO T/C'S

PARTS LIST	
ITEM NO.	NOMENCLATURE
NO. REQ.	

30 35 36 37
PRINT REGISTRATION
OPTION 439A

27 28 35 36 37 38
PRINT REGISTRATION
OPTION 439A

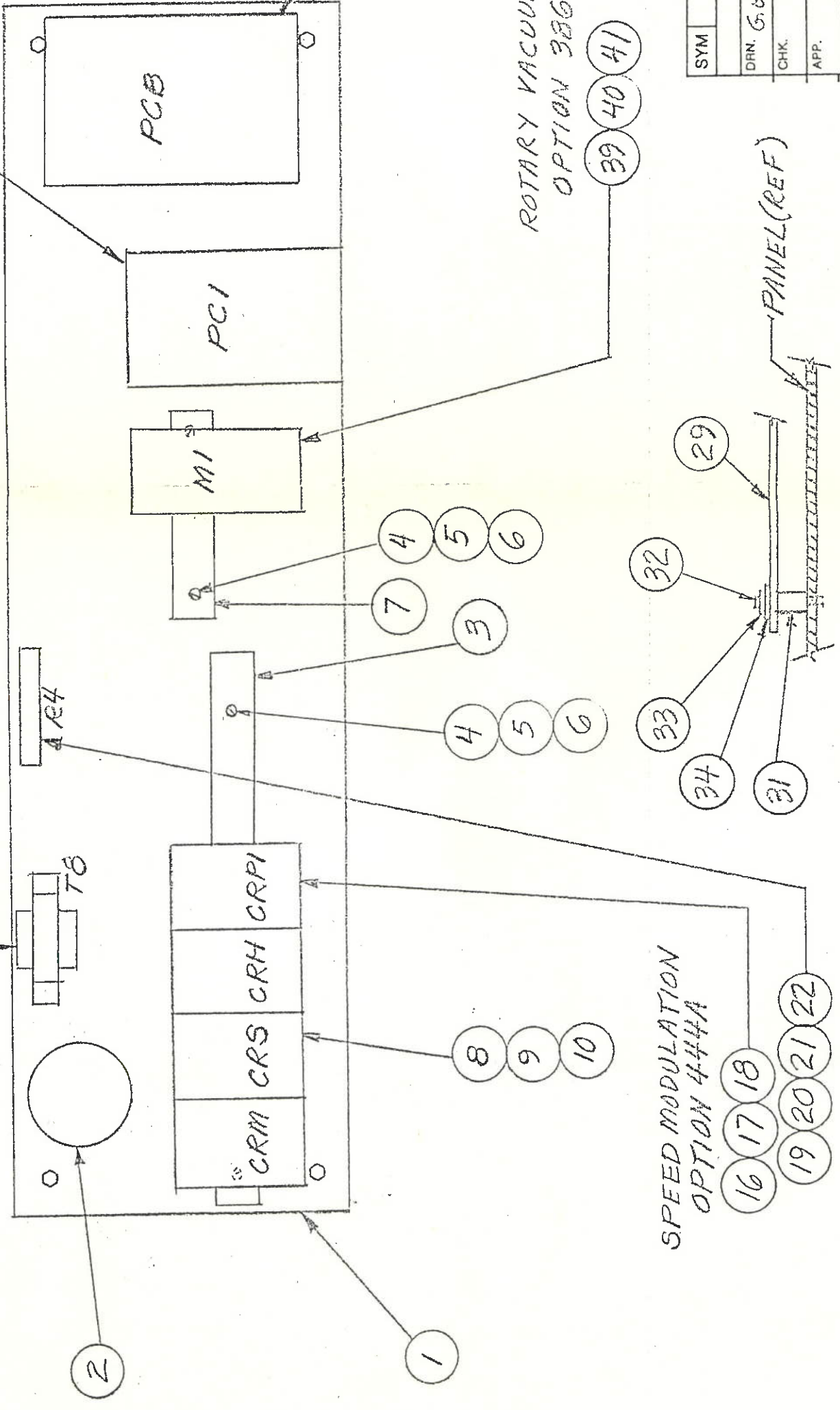
PRINT REGISTRATION
OPTION 439A
SEE DETAIL #1

ROTARY VACUUM PUMP
OPTION 386A

SPEED MODULATION
OPTION 444A

PANEL(REF)

DETAIL #1
N.T.S.



SYM		DESCRIPTION		ECO NO.		DATE /BY	
REVISIONS							
DRN. G. 672		DATE 2/15/66	weldotron corporation				
CHK.		DATE					
APP.		DATE					
MATL SEE P/L		TITLE AUXILIARY PANEL ASSEMBLY					
FINISH ~		SCALE ~		SIZE B	PART NO. 1602-0896	REV.	
TOL. UNLESS SPECIFIED		FRA DEC. ANGLE					
± 1/64 ± .005 ± 1/2°							

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PART NO.	MODEL NO.	NEXT ASSEMBLY	NO REQ'D PER ASSEM.
1602B	1602-0893	1	

REV.	PART NO.	SIZE
	B	

PART NO.

PL 1602-0896

NOTE:

ITEM NO. PRECEDED BY "A"
INDICATES SEPARATE PARTS
LIST.

MODEL USED ON

SHEET 1 OF 1

ASSY. USED ON

NO. REQ'D PER ASSY.

		16020896										AUXILIARY PANEL ASSEMBLY										P/N			
ITEM	SIZE	PART NUMBER										REV	DESCRIPTION										FINISH		
1	B	16028960											AUXILIARY PANEL DRILL DETAIL										FH4347		
2		GM15554											GROMMET, RUBBER										---		
3	A	16028961											RELAY MOUNTING CHANNEL										---		
4		SS0335											BD. HD. SCREW #8-32 X 1/2"										---		
5		WA0692											WASHER PLAIN #8										---		
6		WA1334											WASHER LOCK #8										---		
7	A	16028962											STARTER MOUNTING CHANNEL										---		
8		CP17397											RELAY MOUNTING CLIPS										---		
9		SQ12269											RELAY BASE										---		
10		SW12593											RELAY (CRM, CRS, CRH)										---		
11		WE17717											WIRE #12 AWG BLUE (MTW)										:		
12		WE2803											WIRE #14 AWG RED (MTW)										:		
13		WE2804											WIRE #14 AWG WHITE (MTW)										:		
14		WE1618											WIRE #12 AWG GREEN (MTW)										:		
	C	16028023											WIRING DIAGRAM										---		

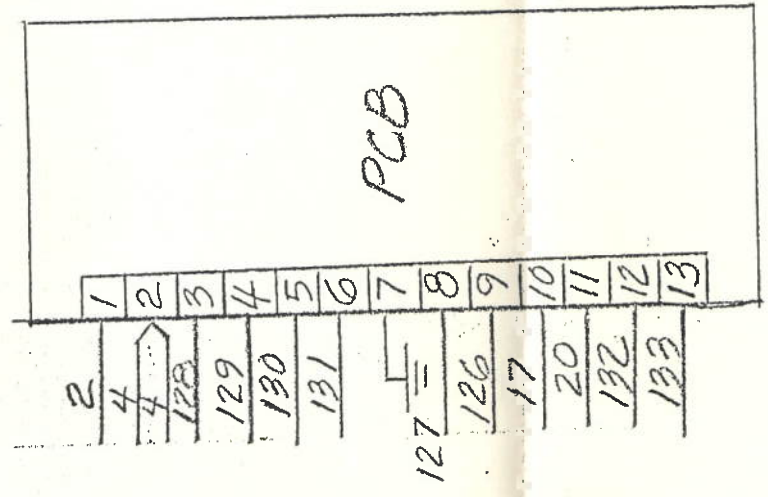
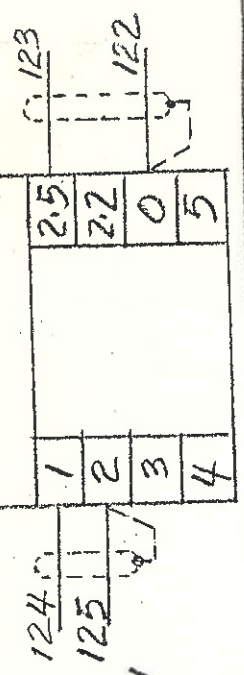
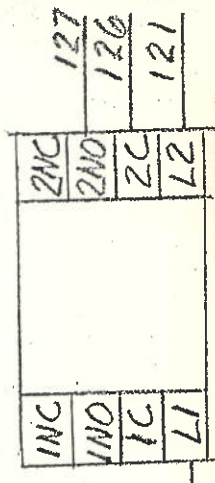
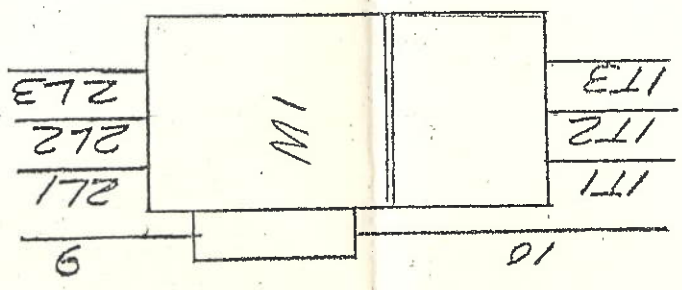
PARTS LIST

ITEM NO.	NOMENCLATURE	NO. REQ.
----------	--------------	----------

26

R4

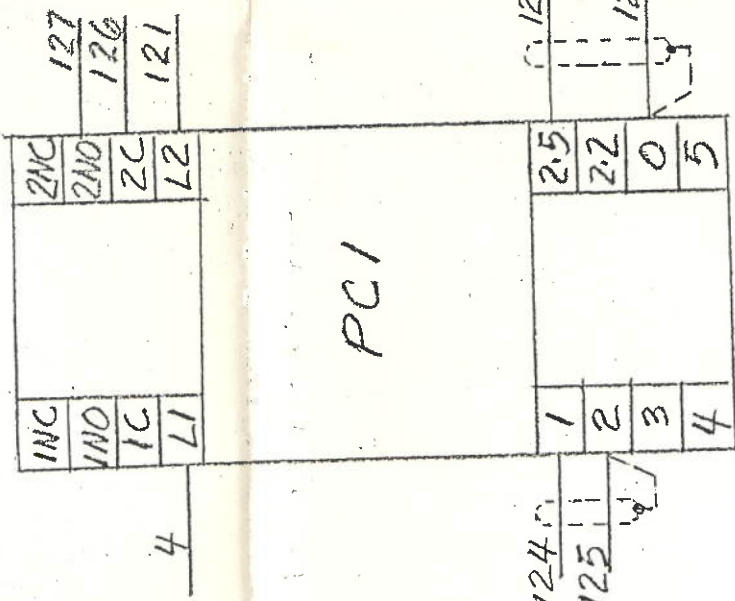
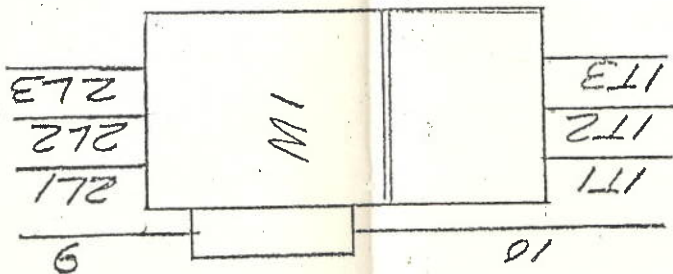
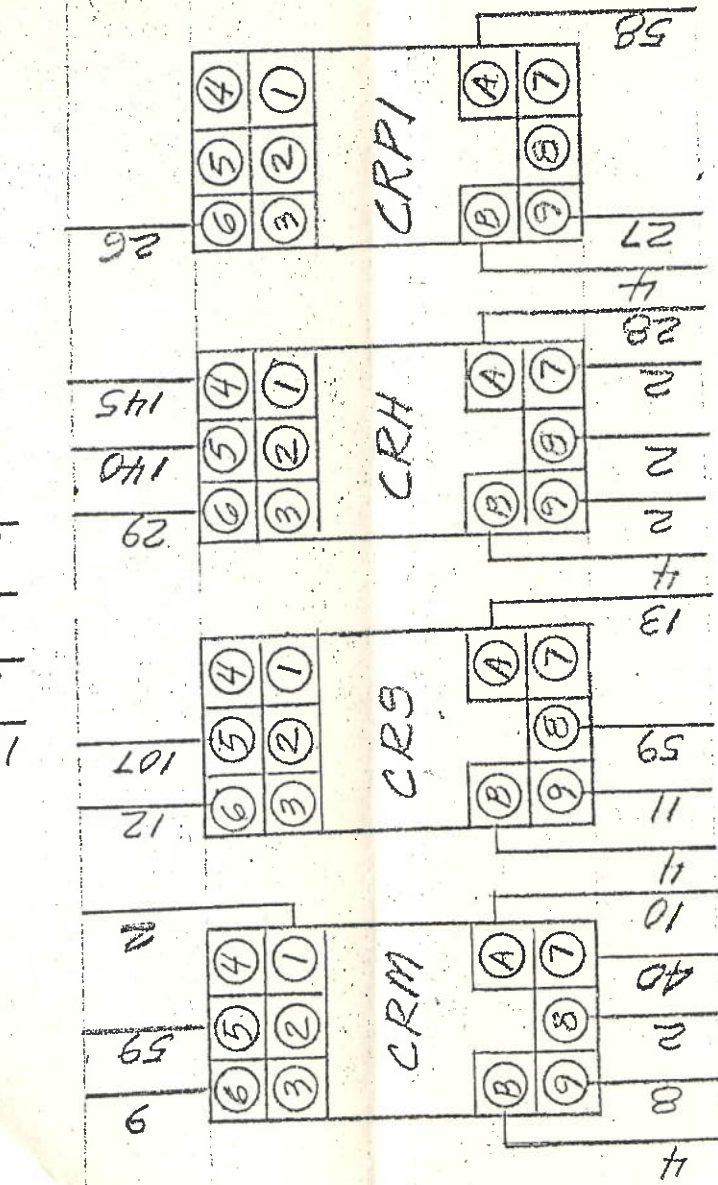
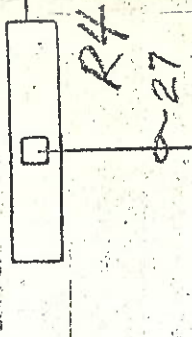
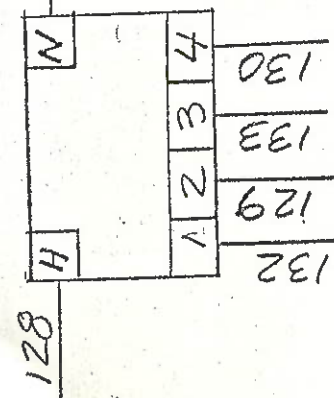
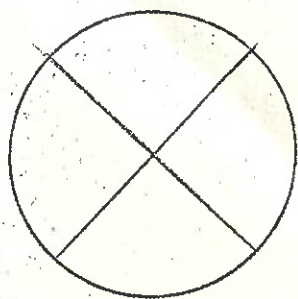
-27



SIZE	PART NO.	REV.
C		

NOTE: WIRES NO 122, 123, 124 & 125
SHALL BE RUN DIRECTLY TO
TERM. BOX #2 VIA CABLE.

ITEM NO.



NOTE: WIRES NO 122, 123, 124 & 125
SHALL BE RUN DIRECTLY TO
TERM. BOX #2 VIA CABLE.

FUSE #	APPLICATION	MODEL OR OPTION	ITEM NO
F3,4,5	ROTARY VACUUM PUMP	356A	80, 81
F10,11	PTC SEAL BAR	438C	90, 91
F12	STATIC SEAL	400B	100, 101
F13	HOLE BURNER	421A	74, 75
F14	THERMO SEAL	445A	64, 65
F12	THERMO SEAL	445A	66, 65

SIZE	PART NO.	REV.
D		

1	ADD'D ITEMS # 31, 32, 33, 39, 40	4533	17-87
SYMBOL		DESCRIPTION	ECONO. DATE/BY
DRN. RT		DATE 4/24	
CHK.	DATE		
APP.	DATE		
MATERIAL SEE P/L		TITLE	
FINISH		MODEL 1602B	
		MAIN PANEL	
		ASSEMBLY	
TOL. UNLESS SPECIFIED		SCALE	REV
FRA. DEC. ANGLE	1:1	D	1602-0897

1602B	1602-0897	1
PART NO.	MODEL NO.	REV

HOLE BURNER
OPTION 421A

70 71 72 73

4 28 29 30

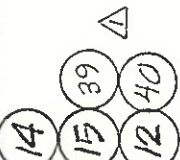
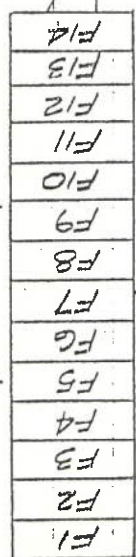
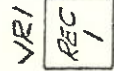
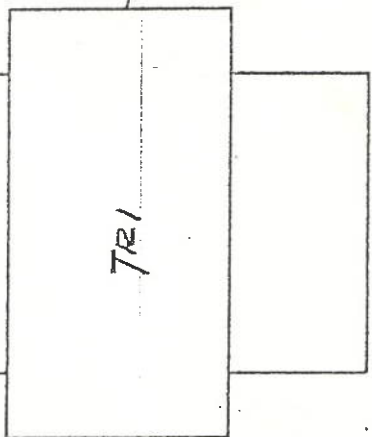
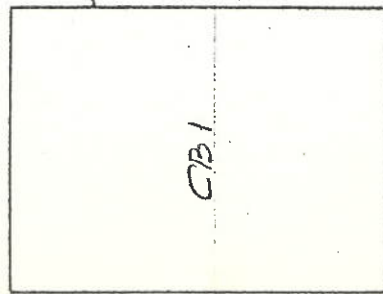
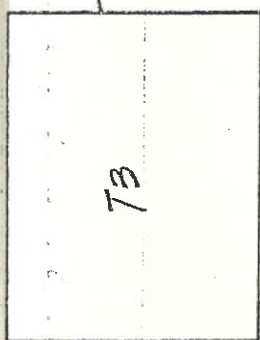
23 24 25 26

8 9 25 26 27

18 25 26 27

FOR OPTIONAL FUSES
SEE ABOVE TABLE

SEE PARTS LIST
FOR APPLICABLE
FUSE PART NO
ITEM NO

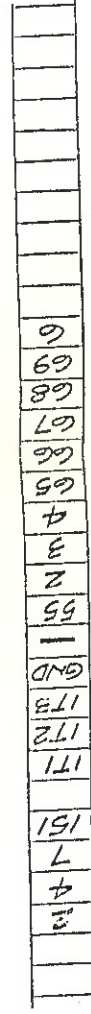
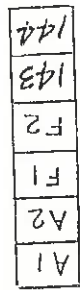
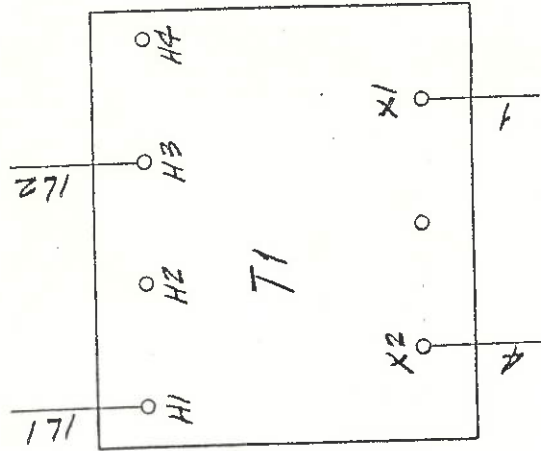
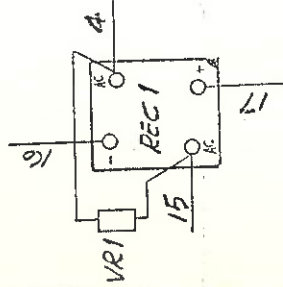
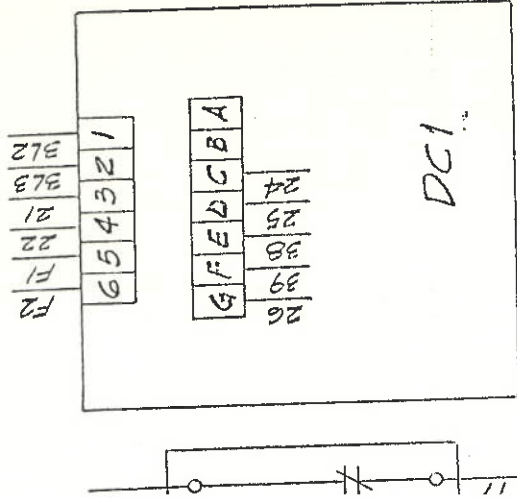


CONTRACTOR, 3 POLE
WITH AUX CONTACT
(SUPPLIED WITH ITEM 5)

PART NO.		NOTE:		MODEL USED ON		1602 B	
PL 1602-0897		ITEM NO. PRECEDED BY "A" INDICATES SEPARATE PARTS LIST.		ASSY. USED ON		0893	
SHEET 1 OF 2				NO. REQ'D PER ASSY.		1	
D		16020897		MAIN PANEL ASSEMBLY		P/N	
ITEM	SIZE	PART NUMBER		REV	DESCRIPTION	FINISH	QTY
A 1	D	16020899			MAIN PANEL WELDMENT	FH4347	1
2		CO17543			PROG. CONTROLLER	---	1
3		EM17556			DIN RAIL FOR ITEM 2	---	1
4		CU7081			CIRCUIT BREAKER (CBI)	---	1
5		EM7098			DRIVE CONTR. KIT (DCI)	---	1
6	B	16028040			DRIVE CONTR. MTG. PLATE	FH4347	1
8		TB7025			RECTIFIER (REC1)	---	1
9		RE5990			VDRISTOR (VR1)	---	1
10		TL4007			TERMINAL BLOCK	---	64
11		TL4008			TERMINAL BLOCK END	---	1
12		CP4010			TERMINAL BLOCK CLAMP	---	4
13		TL4009			CHANNEL FOR TERM. BLOCK	---	1
14		TL17387			TERMINAL BLOCK	---	2
15		TL17388			TERMINAL BLOCK END	---	1
16		SW16069			MICRO SW. & MTG. PLATE (CON1)	---	1
17		FZ7083			FUSE BLOCK	---	6
18		TL3585			CHANNEL FOR FUSE BLOCKS	---	1
19		FZ17691			FUSE, 5AMP (F1, F2)	---	2
20		FZ17690			FUSE, 25 AMP (F6, F7)	---	2
21		FZ7144			FUSE, 10 AMP (F8)	---	1
22		FZ7145			FUSE, 2 AMP (F9)	---	1
23		TR12117			TRANSFORMER (T1)	---	1
24		GM15554			GROMMET	---	1
25		SS0331			SCREW, #6-32 B.H. 1/2" C.P.	---	10
26		WA2228			LOCK WASHER #6 C.P.	---	7
27		WA2221			FLAT WASHER #6 C.P.	---	7

D		16020897		MAIN PANEL ASSEMBLY		P/N	
ITEM	SIZE	PART NUMBER		REV	DESCRIPTION	FINISH	QTY
28		SS	0335		SCREW, #8-32 B.H. 1/2" C.P.	—	13
29		WA	0470		LOCK WASHER #8 C.P.	—	13
30		WA	2222		FLAT WASHER #8 C.P.	—	13
31		TL	18166		MARKING STRIP HOLDING PLUG	—	2
32		TL	18167		MARKING STRIP	—	3 F
33		TL	17700		TERM. BLK JUMPER	—	20
34		SS	0188		SCREW, 1/4-20 H.H. 1/2" C.P.	—	4
35		WA	2231		LOCK WASHER 1/4" C.P.	—	4
36		WA	2224		FLAT WASHER 1/4" C.P.	—	4
37		CP	5122		WIRE BUNDLE FASTENER	—	25
38		WE	3291		TY-WRAP - MEDIUM	—	50
1	D	160208907			MAIN PANEL WIRING DIAGRAM	—	1
		WE	2803		WIRE #14 AWG RED (MTW)		300 F
		WE	1038		WIRE #12 AWG BLACK (MTW)		100 F
		WE	2804		WIRE #14 AWG WHITE (MTW)		100 F
		WE	17717		WIRE #12 AWG BLUE		100 F
		WE	17718		WIRE #10 AWG GREEN		25 F
		WE	2802		WIRE #14 AWG BLACK (MTW)		100 F
39		TL	18401		MARKING STRIP HOLDING PLUG		2
40		TL	18402		MARKING STRIP		1 FT

[illegible]



- 2 7. FOR MODEL 1611D USE D-1611-8907

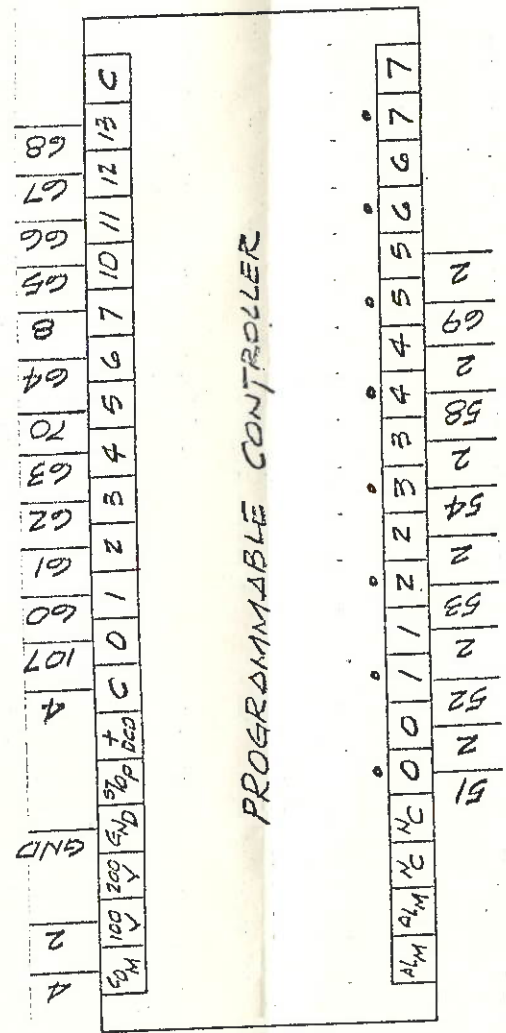
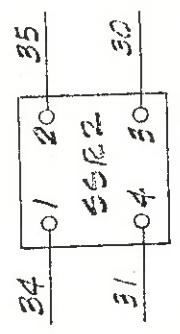
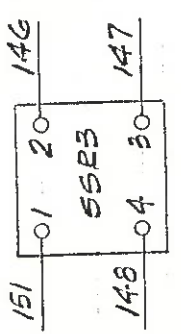
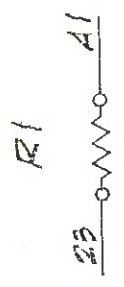
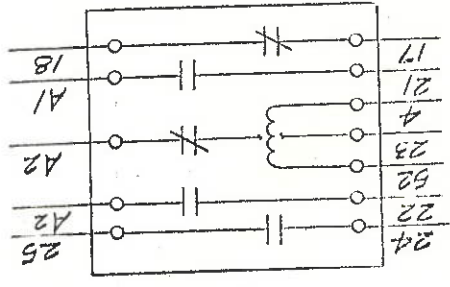
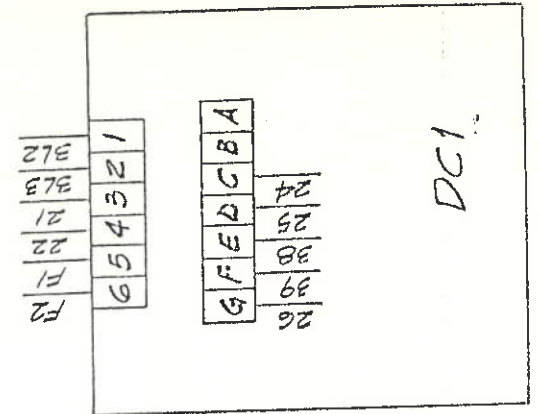
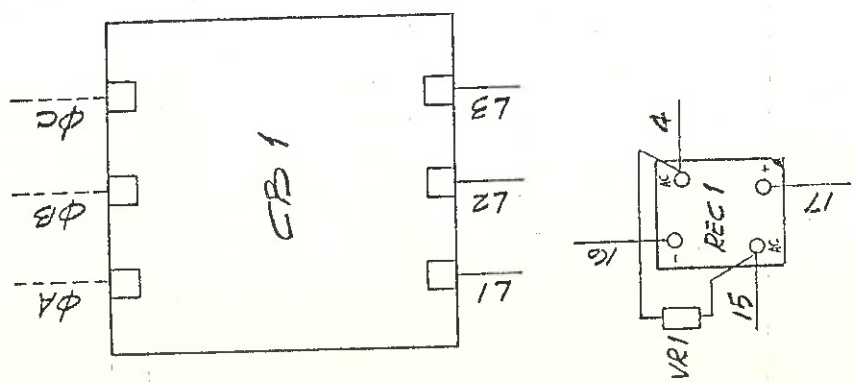
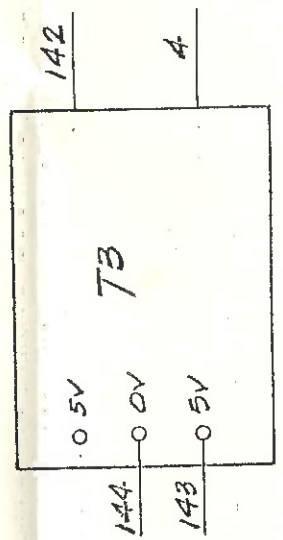
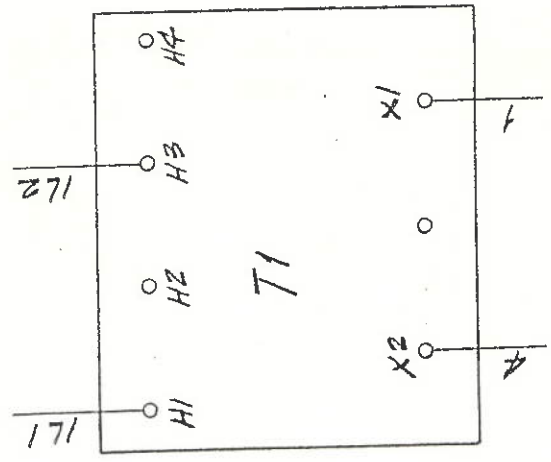
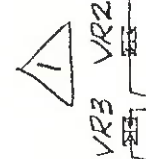
SIZE	PART NO.	REV.
D		

[illegible]

171	F1	172	271	F2	272	F3	272	F4	273	F5	272	F6	273	F7	272	F8	273	F9	272	F10	273	F11	272	F12	273	55
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A1	A2	F1	F2	143	144
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4	6	7	151	171	172	173	GND	55	2	3	4	7	151	171	172	173	GND	55	2	3	4	6	69	68	67	66	65	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
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TOP OF ENCLOSURE

SIZE	PART NO.	REV.
0		

1

2

7

6 (6)

5 (4)

2	ADDED ITEMS	9-10-11.	3344	10-23-57
1	ADDED ITEM 7		3806	9-28-57
SYM	DESCRIPTION	ECO NO.	DATE/BY	

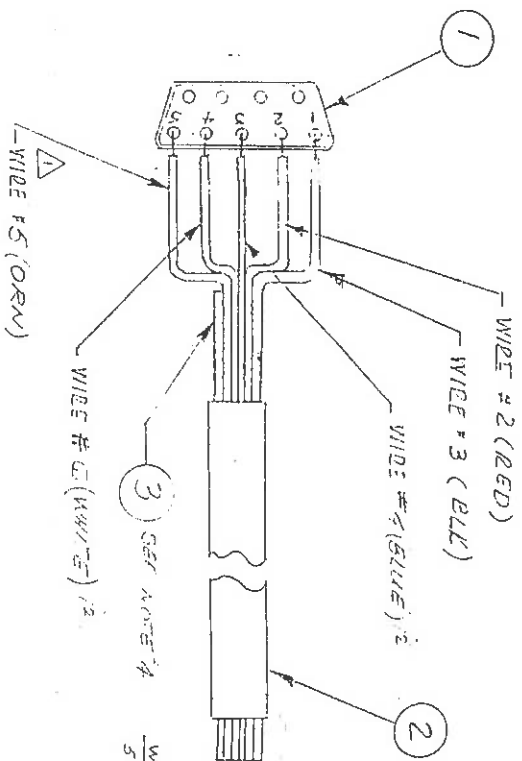
REVISIONS	
DRN. W.A. STAT	DATE 7-23-57
CHK.	DATE
APP.	DATE
MATL	
FINISH	

Weldodon Corporation

TITLE: MOUNTING ASSEMBLY ELECTRICAL ENCLOSURE

1611	PL 1611-0802	1
1663	PL 1662-0802	1

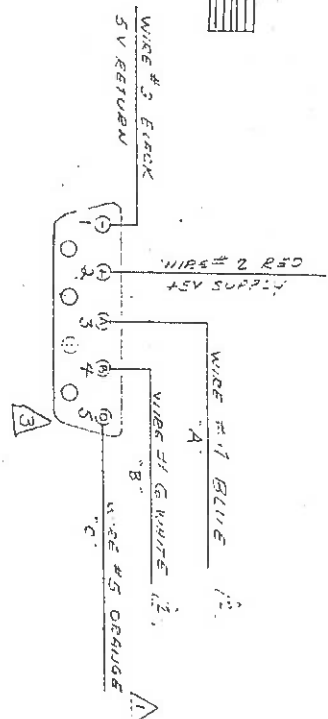
NOTE 3



DRAWING PRESENTS REAR VIEW OF THE PLUG

- NOTE:
1. AT CONNECTOR END OF CORD, STRIP JACKET APPROX 3 INCHES
 2. AT MAIN ENCLOSURE END OF CORD, STRIP JACKET 7 INCHES
 3. WIRE #3 AT THIS POSITION AND ALL OTHER WIRES TO BE POSITIONED AS SHOWN.
 4. SPARE WIRE, INSULATE WITH SHIELD TUBING.

PIN #	WIRE #	COLOR
1	3	BLACK
2	2	RED
3	4	BLUE
4	6	WHITE
5	5	ORANGE



CONFIDENTIAL

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PART NO.	MODEL NO.	NEXT ASSEMBLY	NO RECD PER ASSEMBLY
A125M	A125M-0802	1	

DATE		DATE		DATE	
ORN	2-7-90	CHK	2-7-90	APP	DATE
MATERIAL					
FINISH					
TOL. UNLESS SPECIFIED					
FRA DEC ANGLE					
± 1/64 ± .005 ± 1/2°					
SCALE					
SIZE					
PART NO.					
REV					

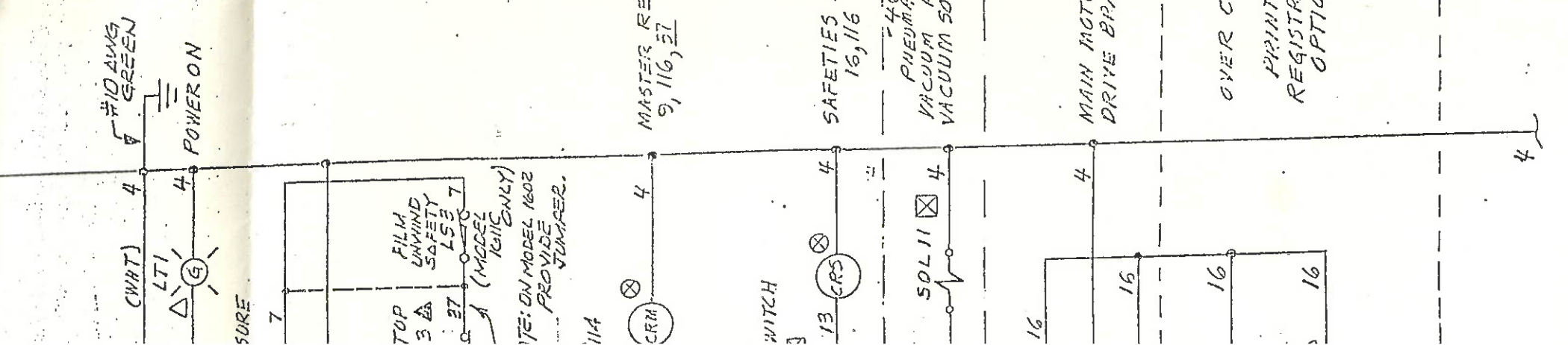
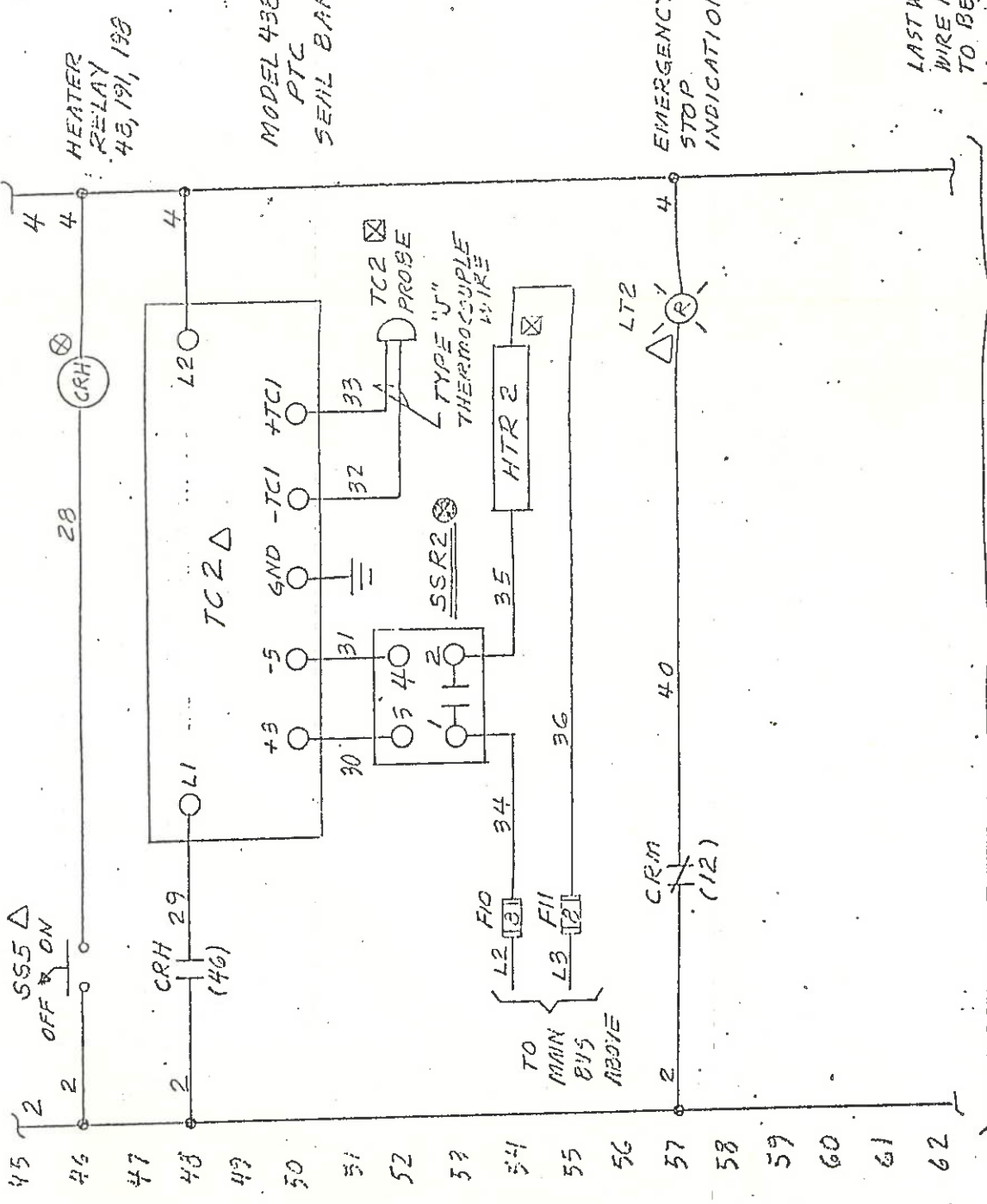
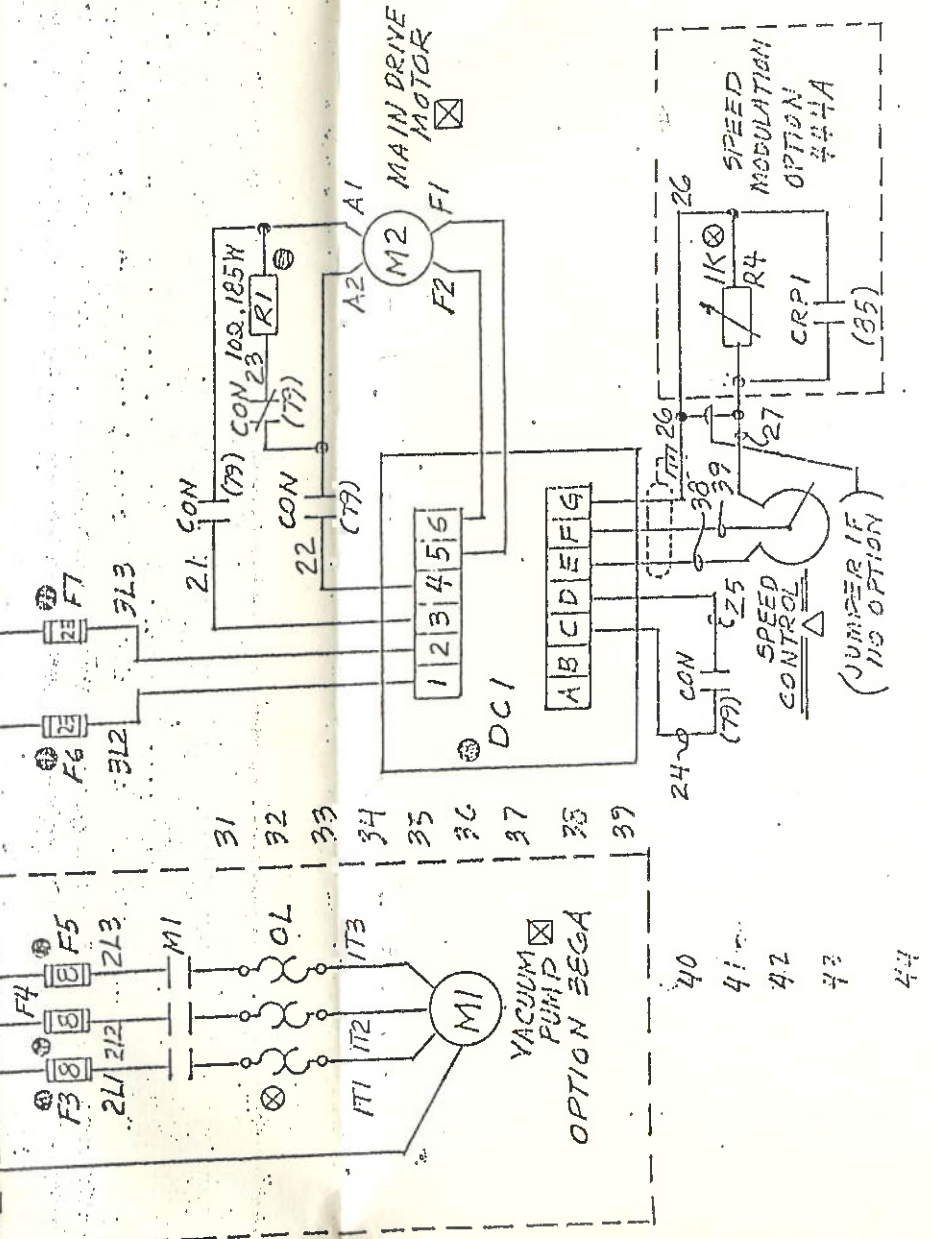
Weldotron
corporation

ENCODER CABLE
SUE HESSY

- ▲ OPERATOR STATION
- △ FRONT DOOR
- MAIN PANEL
- ⊗ AUXILIARY PANEL
- J-BOX ON MACHINE
- ⊗ ON MACHINE
- ON INFEED (OPTIONS: 379A/380A/384)
- IN ENCLOSURE (ON MACHINE)
- ⊗ CUSTOMER'S MACHINES

NOTES:

1. USE AUXILIARY CONTACT ON STARTER "M1" WHEN OPTION 386 IS SPECIFIED.
2. FOR 1602 & 1602C MACHINE USE L54. FOR 1602C MACHINE USE PX5. FOR MACHINE WITH 379 INFEED PROVIDE JUMPER, NO COVER REQUIRED.
3. ALL POWER WIRING TO BE BLACK.
4. ALL D.C. WIRING TO BE BLUE.
5. ALL A.C. CONTROL WIRING TO BE RED.



MODEL 438C/447
PTC
SEHL BAR

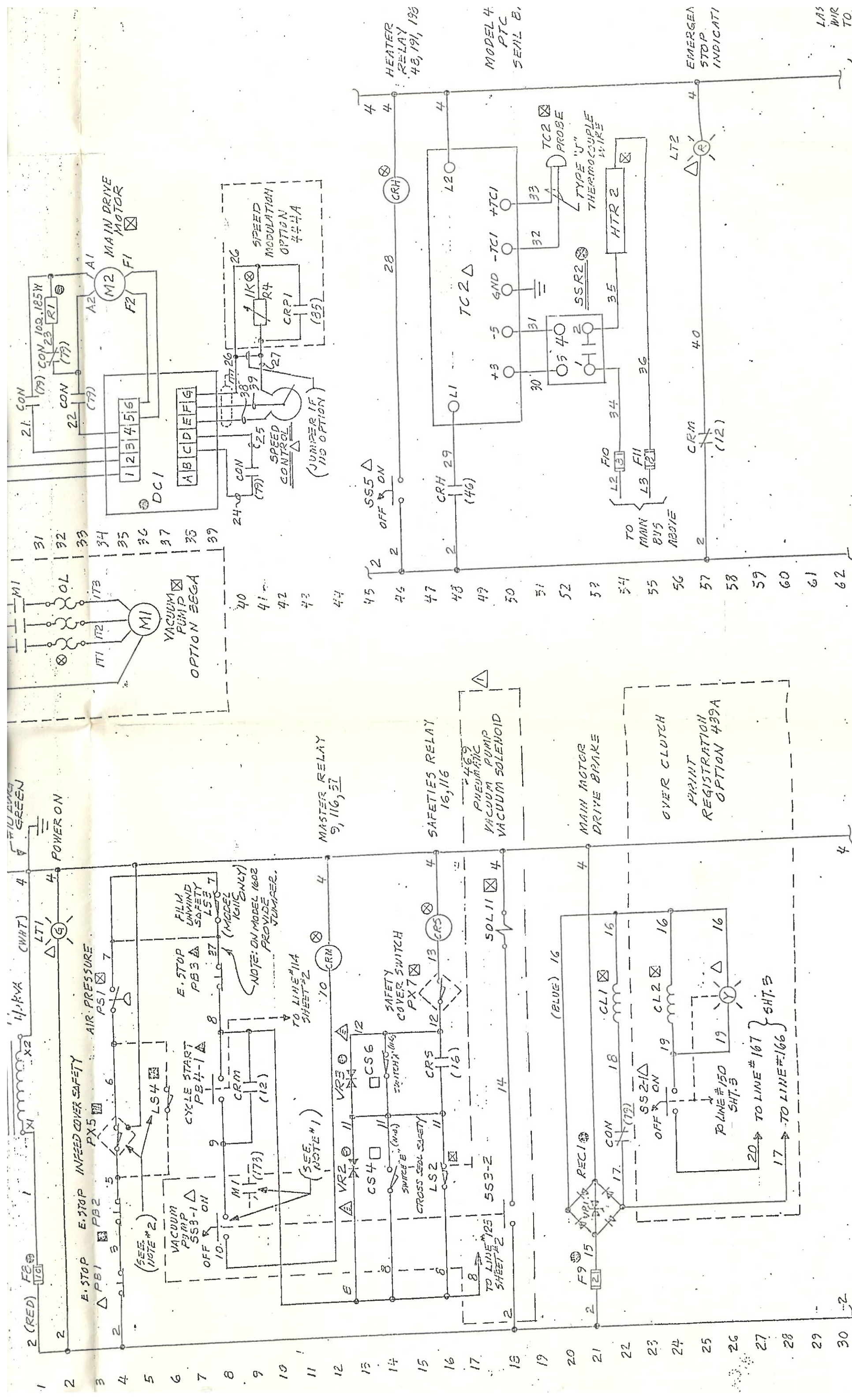
LAST WIRE #40
WIRE NUMBERS
TO BE USED 41-50

REV.	DATE	DESCRIPTION	ECONO.	DATE/REV.
4	12/1/72	WIRE 120 & 127 WERE CORRECTED TO 204 & 200 ON P.C.I.	4890	12/1/72
3	12/1/72	ADDED WIRE 41-50 (REF. LINE 13, SH. 1)	4773	12/1/72
2	12/1/72	ADDED WIRE 1602C OPTIONS	4505	12/1/72
1	12/1/72	ADDED WIRE 1602C OPTIONS	4525	12/1/72
0				

Weldcon
CORPORATION

TITLE	SCALE	SHEET NO.	TOTAL SHEETS
MAIN ELECTRICAL		1	1
SCHEMATIC			
MODEL 1602C			
230V, 3Ø, 60HZ			

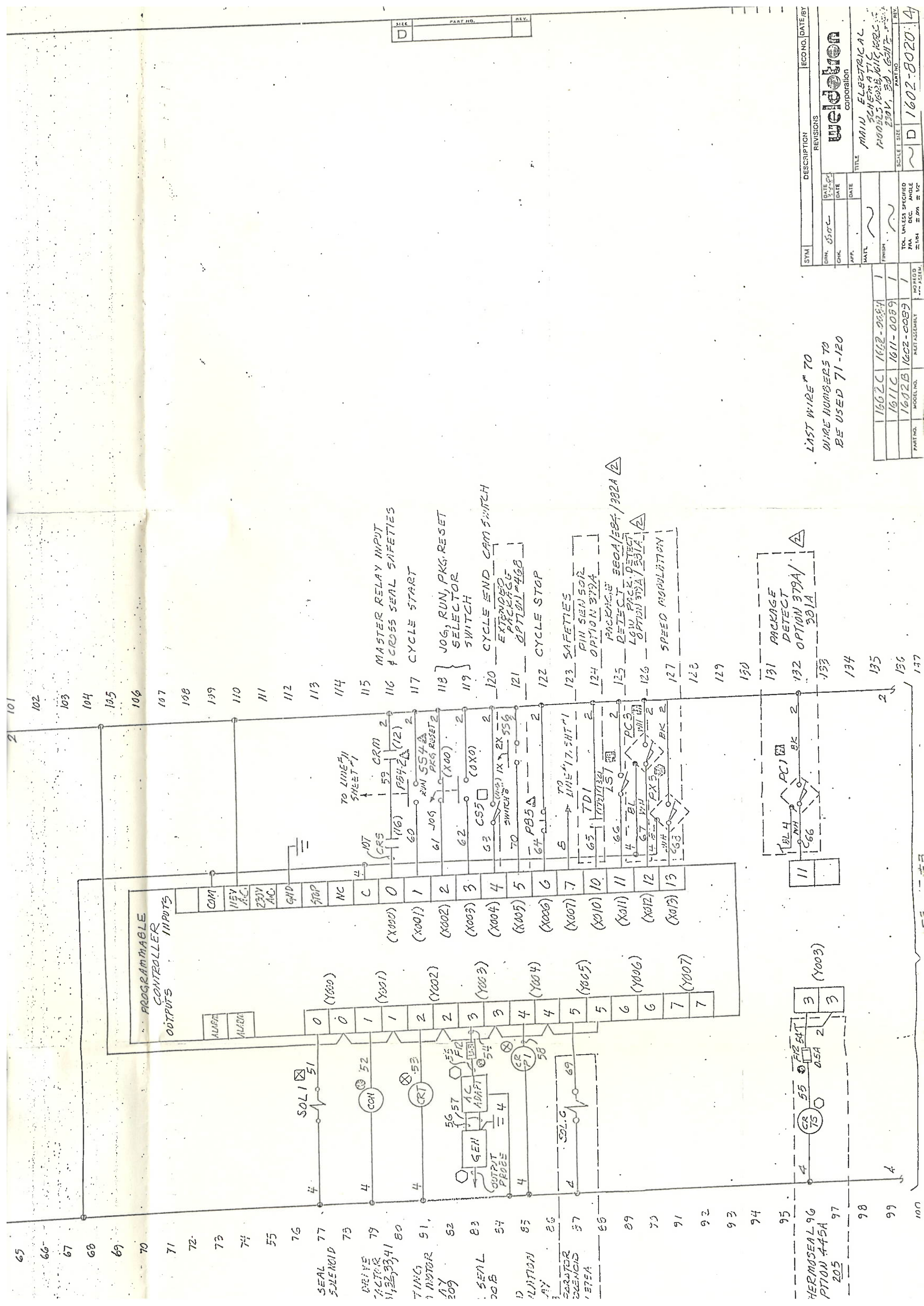
FOR
CONTINUATION SEE
SHEET #2

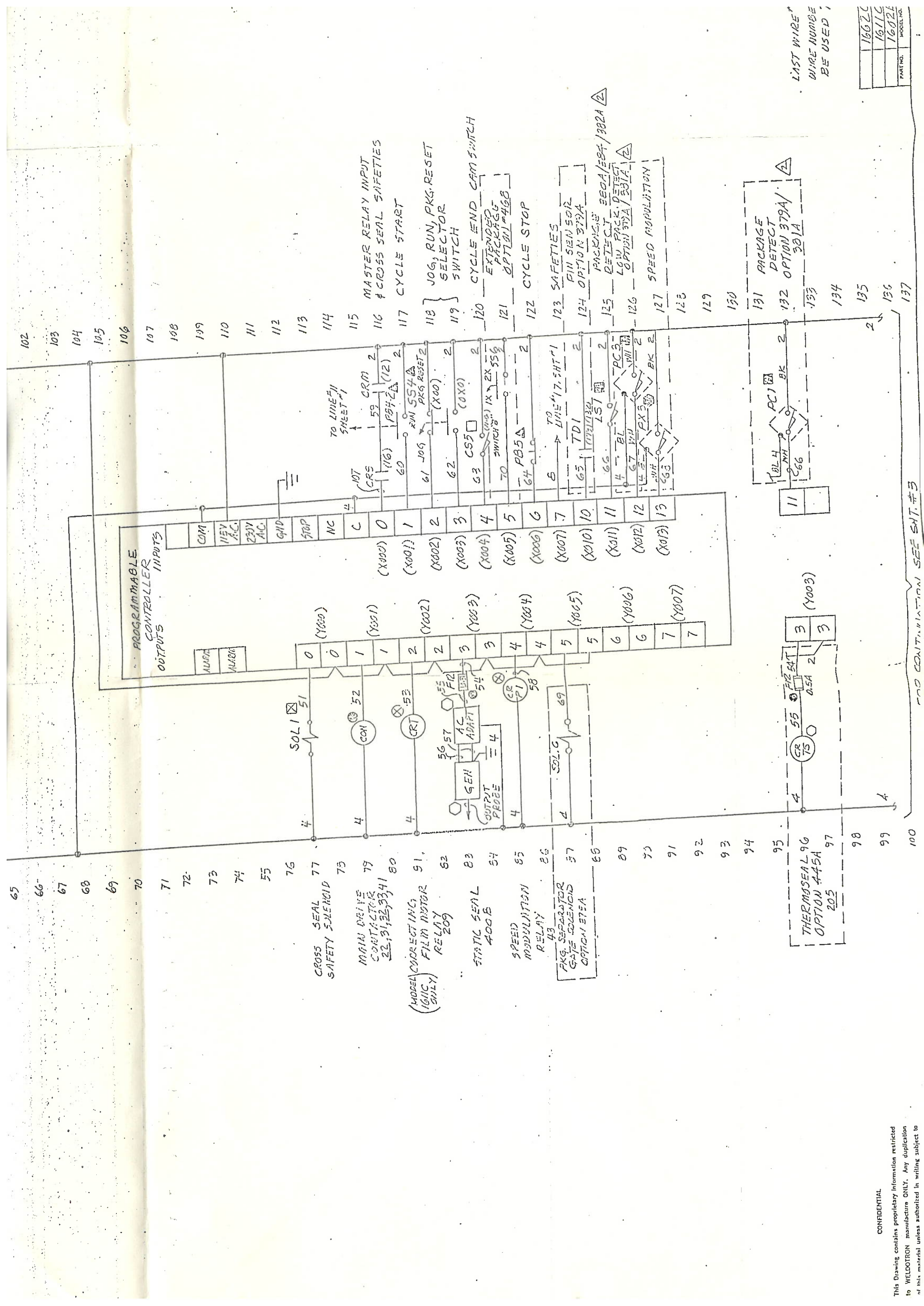


1662	1611	1602	MODEL
1662	1611	1602	MODEL
1662	1611	1602	MODEL
1662	1611	1602	MODEL

FOR CONTINUATION SEE SHEET #2

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LAST WIRE#
WIRE NUMBER
BE USED;

15622	15622
16112	16112
16022	16022
16022	16022

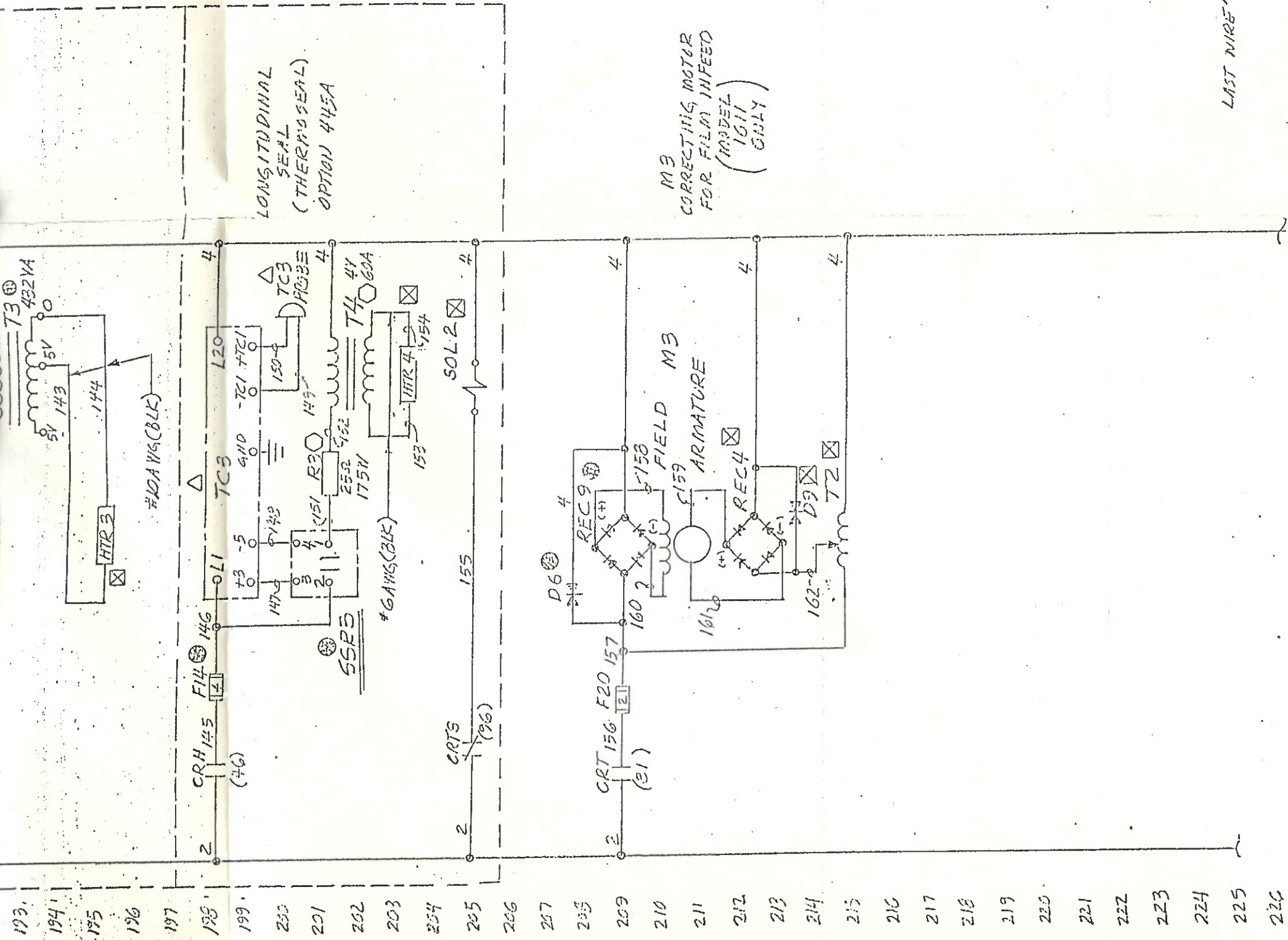
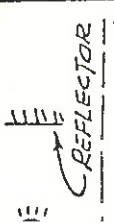
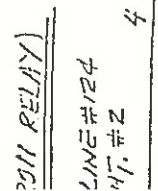
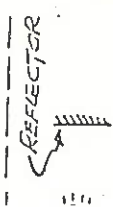
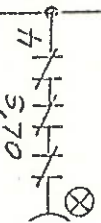
NO CONTINUATION SEE SH. #3

PRINT
REGISTRATION
OPTION 439A

#386A & 386SA
VACUUM
PUMP

OPTION 5
379A/381A
PIN SENSOR
PHOTO CELL
TIMER
(ALTERNATE
CONNECTION)

OR
OPTION 5
379A/381A
PIN SENSOR
PHOTO CELL
TIMER
(ALTERNATE
CONNECTION)



LONGITUDINAL
SEAL
(THERMOSEAL)
OPTION 445A

M3
CORRECTING MOTOR
FOR FILM INFED
(MODEL
1611
ONLY)

SHEET	PART NO.	REV.
D		

SYMBOL		DESCRIPTION	ECONO.	DATE	BY
REVISIONS					
DATE	CHK	DATE	DATE	DATE	
DATE	APP	DATE	DATE	DATE	
DATE	MATL	DATE	DATE	DATE	
DATE	FINISH	DATE	DATE	DATE	
TOL UNLESS SPECIFIED					
PART NO.	MODEL NO.	SCALE	SIZE	PART NO.	REV
1602C	1611C-00034	1	1602B	1611C-00089	1
1602B	1611C-00089	1	1602B	1611C-00089	1
1602B	1611C-00089	1	1602B	1611C-00089	1

Welded

COOPERATION

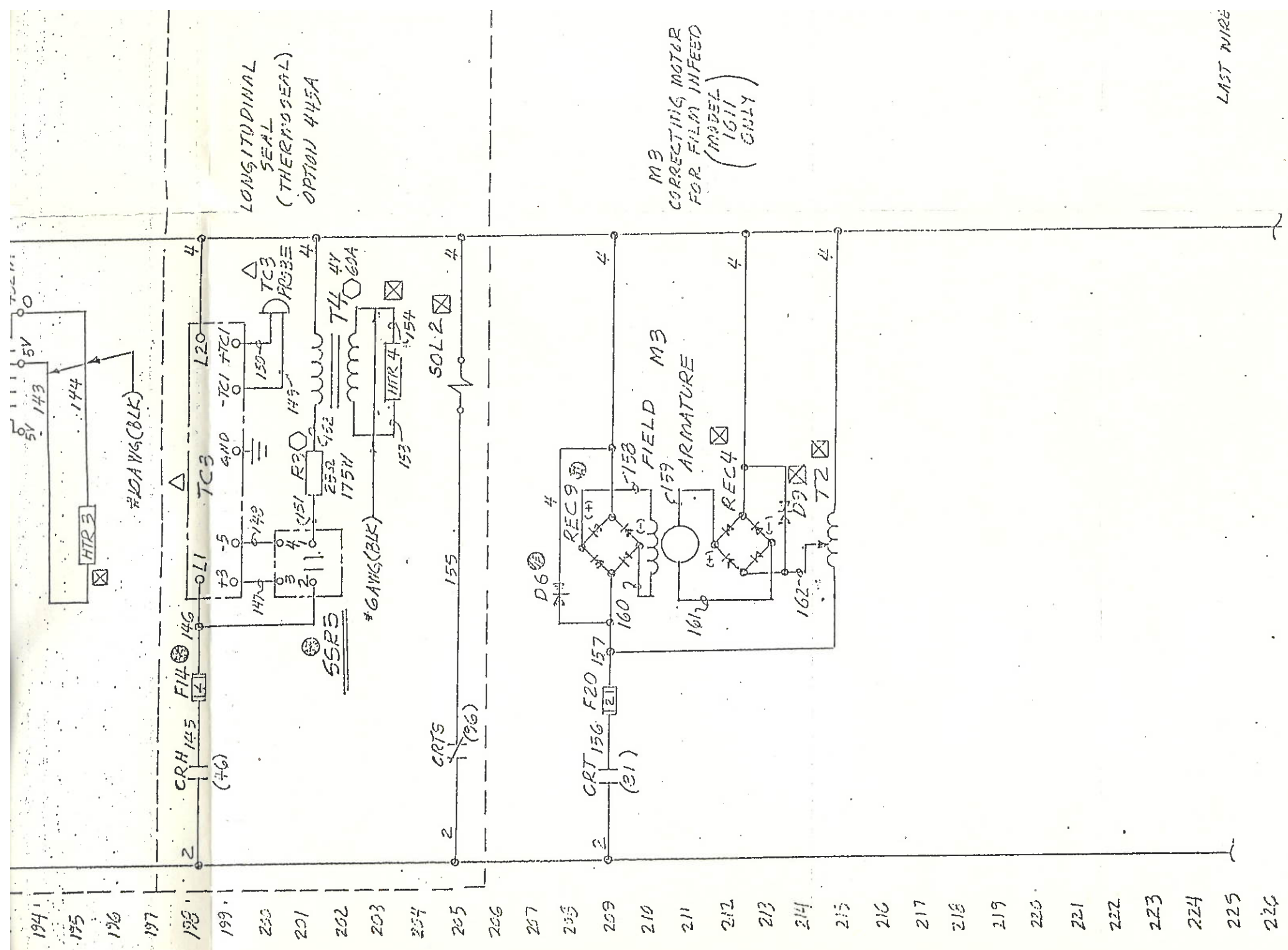
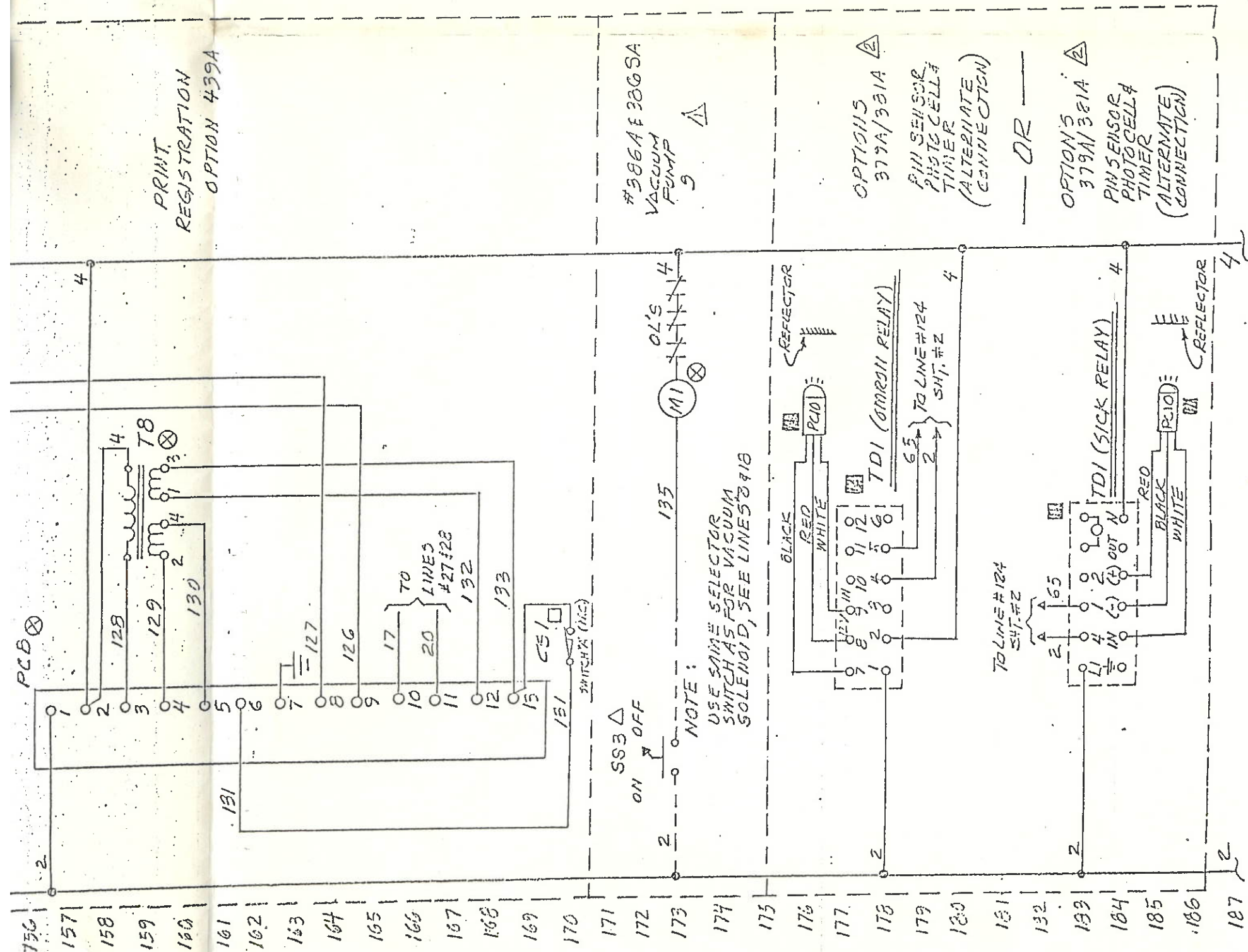
TITLE MAIN ELECTRICAL

SCHEMATIC 1602C

MODELS 1602B, 1611C, 1602C

230V, 30, 1602C

LAST NIRE # 162



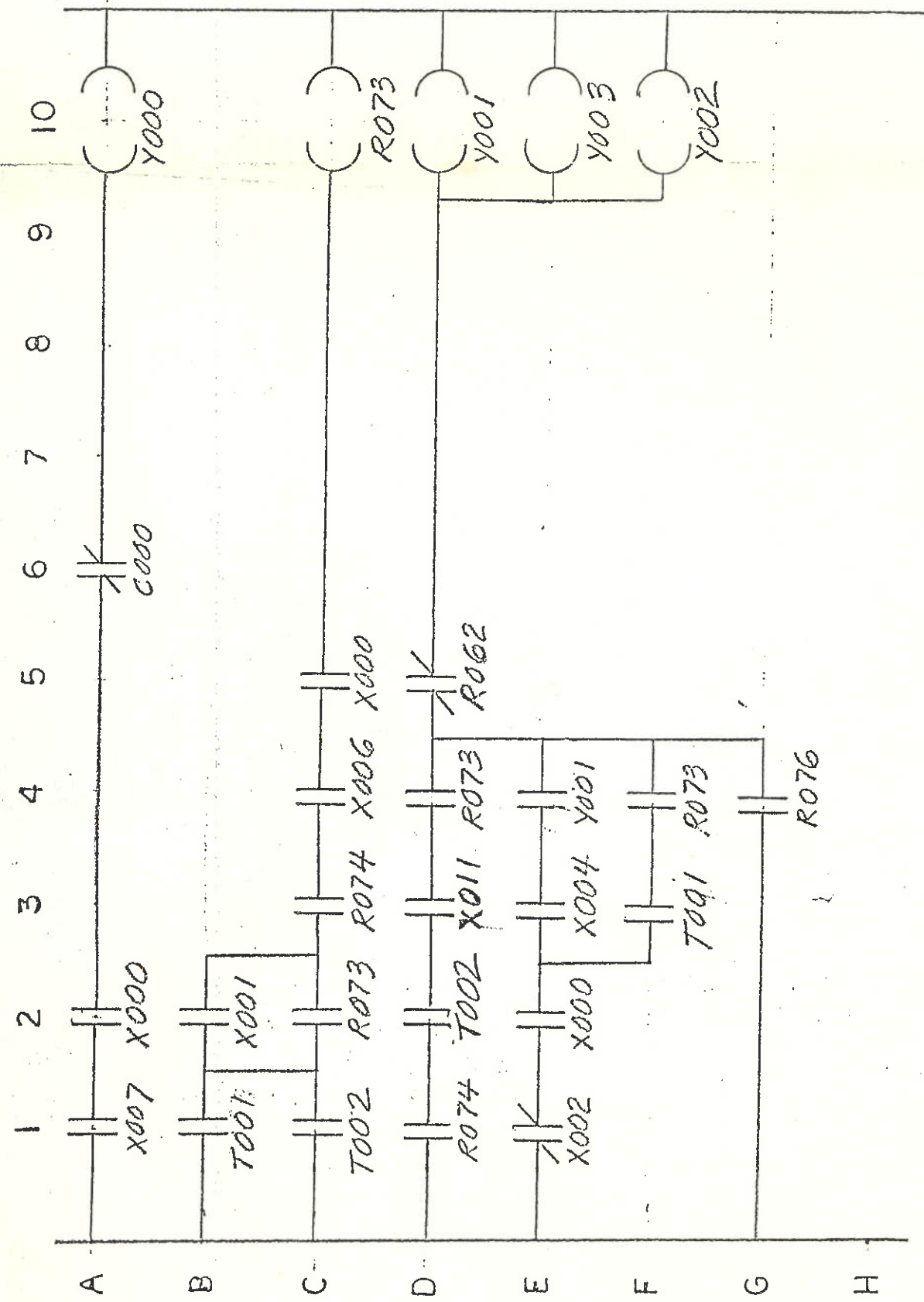
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LAST N1826

1602C	1
1611C	1
1602B	1
PART NO.	MODEL NO.

PARTS LIST	
ITEM NO.	NOMENCLATURE
NO. REQ.	



COMMENTS

Y000 - CROSS
SEAL SAFETY
SOL#1

R073 - MAIN
DRIVE PERMISSIVE

Y003 - LONGITUDINAL
SEAL

Y001 - MAIN
DRIVE CONTACTOR

Y002 - CORRECTING
FILM MOTOR
RELAY

Y005 - PACKAGE
SEPARATOR GATE
SOL#6

LEGEND

COIL
()

CONTACT
-| |-

N.O. N.C.

X 0 0 1
Device Address (octal number)

- X : Input
- Y : Output (Coil)
- R : Internal coil
- L : Latched coil
- S : Shift register
- T : Timer 1 - 9999 (decimal number) is 0.1 to 999.9 sec.
- C : Counter

CONFIDENTIAL

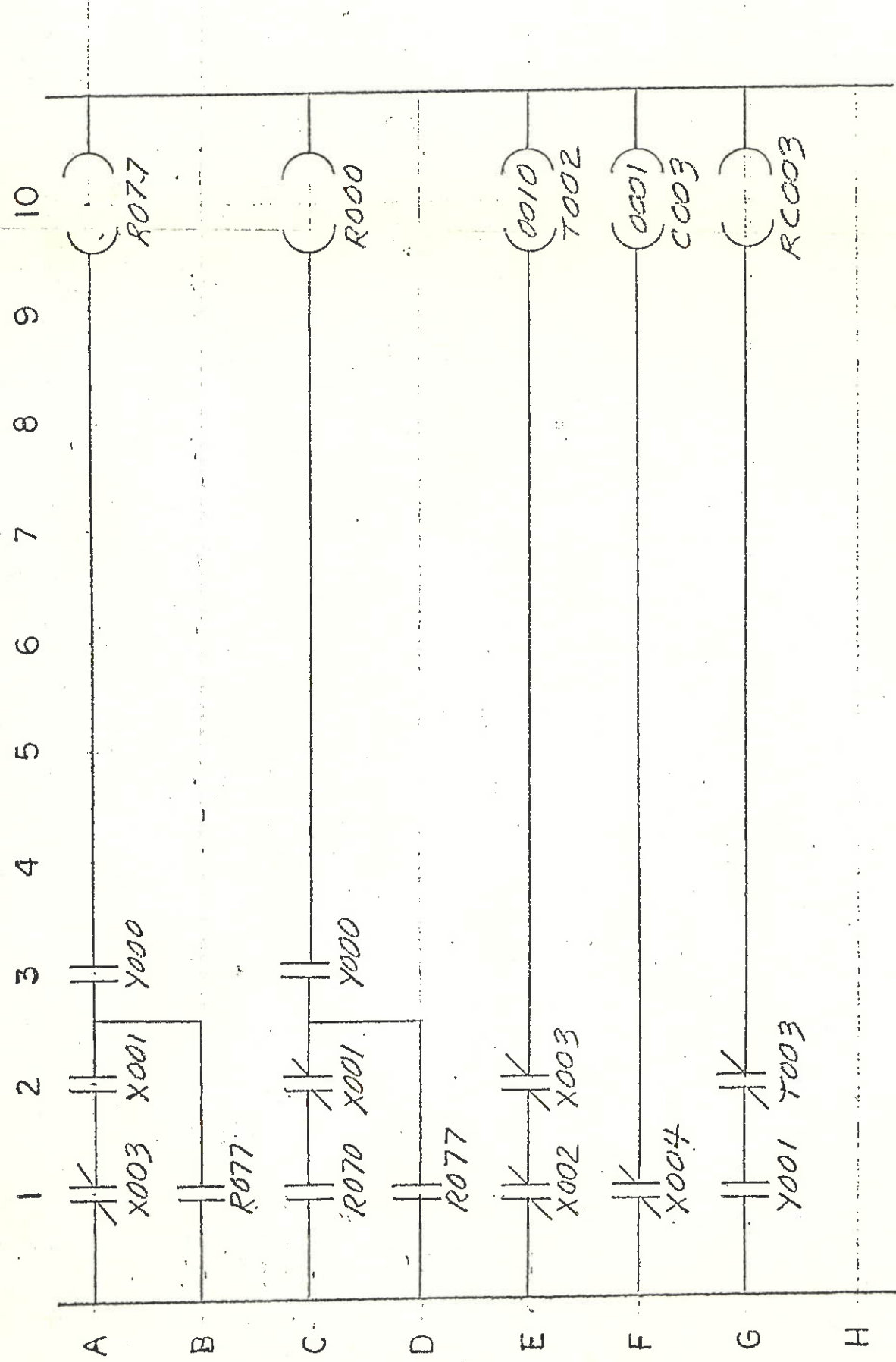
This drawing contains proprietary information restricted to WELDOTRON manufacture ONLY. Any duplication of this material unless authorized in writing subject to prosecution.

SYM	DESCRIPTION	ECONO.	DATE/BY
REVISIONS			
DRN.	DATE		
CHK.	DATE		
APP.	DATE		
MATL			
FINISH			
TOL. UNLESS SPECIFIED		SCALE	SIZE
FRA DEC. ANGLE			
±1/64 ±.005 ± 1/2°			
NO REQ. PER ASSEM.		PART NO.	REV.

Weldotron corporation

PROGRAM DIAGRAM
CUTLER HAMMER DC
1602B, 1611C
W/380/382 INFEED

B 1660-8081



COMMENTS

R077 PERMISSIVE
SEAL RELAY

R000 - JOG
PERMISSIVE

T002 - PACKAGE
RESET SELECT
TIME DELAY
1 SEC. DELAY

C003 - OVERSPEED
MONITOR
INITIALIZATION
COUNT-1

LEGEND

COIL

CONTACT

N.O. N.C.

X 0 0 1
Device Address (octal number)

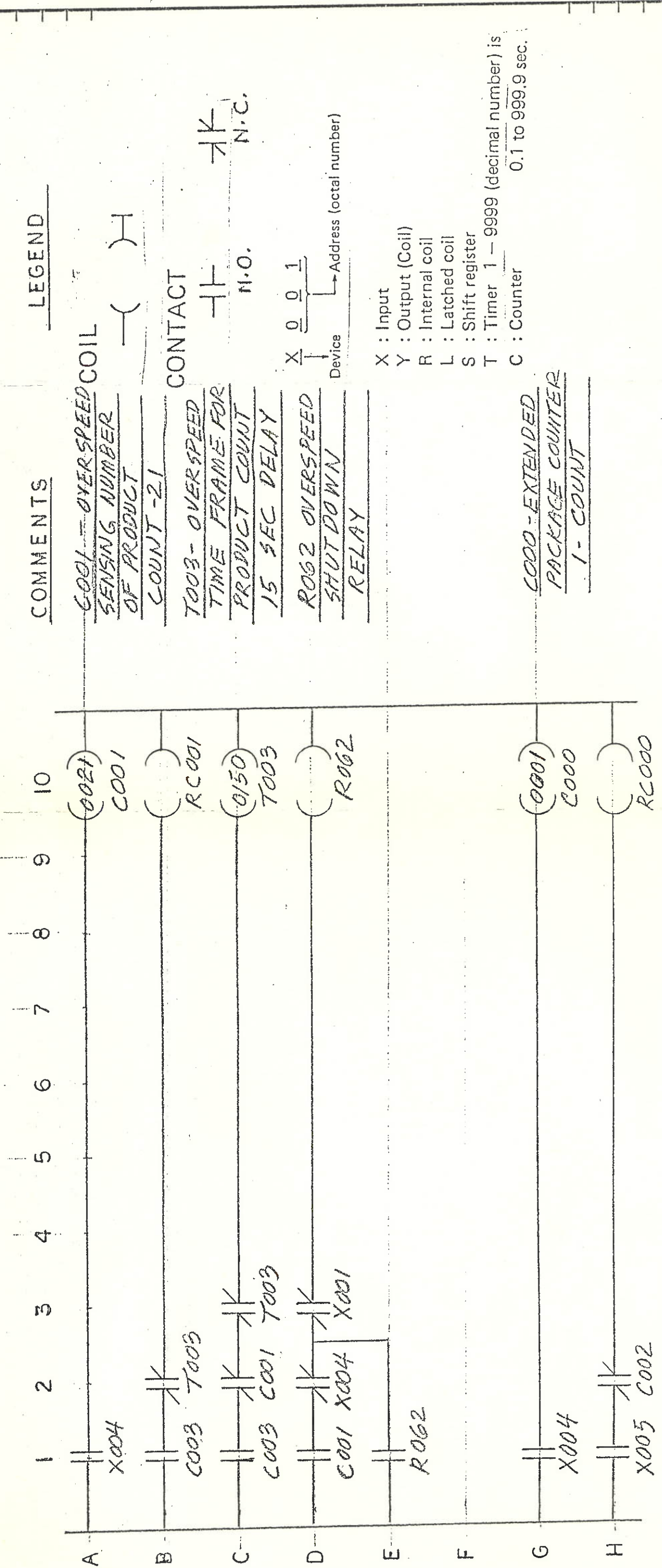
X : Input
Y : Output (Coil)
R : Internal coil
L : Latched coil
S : Shift register
T : Timer 1 - 9999 (decimal number) is 0.1 to 999.9 sec.
C : Counter

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SYM	DESCRIPTION	ECO NO.	DATE / BY
REVISIONS			
DRN.	DATE	weldotron corporation	
CHK.	DATE	TITLE	
APP.	DATE	PROGRAM DIAGRAM	
MATL	DATE	CUTLER HAMMER P/C	
FINISH	DATE	16028.161C	
TOL. UNLESS SPECIFIED		SCALE	SIZE
FRA ± 1/64	DEC. ± .006	~	E
ANGLE ± 1/2°		PART NO.	REV
		1660-8081	-

PART NO.	MODEL NO.	NEXT ASSEMBLY	NO REQ'D PER ASSEM.
----------	-----------	---------------	---------------------



OVERSPEED SET
AT 85 PKG/MIN

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material unless authorized in writing subject to prosecution.

SYM	DESCRIPTION	ECO NO.	DATE /BY
REVISIONS			
DRN.	DATE	DATE	
CHK.	DATE	DATE	
APP.	DATE	DATE	
MATL	TITLE		
FINISH	PROGRAM DINGRAM P/C CUTLER HAMMER P/C 1602B, 1611C W13801381 INFEED		
TOL. UNLESS SPECIFIED FRA DEC. ANGLE ± 1/64 ± .005 ± 1/2°		SCALE SIZE	REV.
PART NO.		MODEL NO.	NEXT ASSEMBLY
NO REQ'D PER ASSEM.		PART NO.	
B		1660-8081	

SHEET 4 of 10

PAGE 5 OF 10

REV. SCREEN 5

REV.

PART NO.

SIZE

ITEM NO.

NOMENCLATURE

NO. REQ.

1

2

3

4

5

6

7

8

9

10

A

B

C

D

E

F

G

H

X004

C000

(0001)

C002

()

RC002

COIL

PACKAGE RESET

COUNTER

1-COUNT

LEGEND

COIL

CONTACT

X 0 0 1

Device

Address (octal number)

X : Input

Y : Output (Coil)

R : Internal coil

L : Latched coil

S : Shift register

T : Timer 1 - 9999 (decimal number) is 0.1 to 999.9 sec.

C : Counter

N.O.

N.C.

COMMENTS

COIL

CONTACT

CONFIDENTIAL

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TRUKMANN'S

SYM	DESCRIPTION	ECO NO.	DATE /BY
REVISIONS			
DRN.	DATE		
CHK.	DATE		
APP.	DATE		
MATL			
FINISH			
TOL. UNLESS SPECIFIED FRA DEC. ANGLE ± 1/64 ± .005 ± 1/2°			
PART NO.	MODEL NO.	NEXT ASSEMBLY	NO REQ'D PER ASSEM.
TITLE			
Weldotron corporation			
PROGRAM DIAGRAM CUTLER HAMMER P/C 1602B, 1611C W/3801382 INFEED			
SCALE	SIZE	PART NO.	REV.
~	B	1660-8091	

SHEET 5 OF 10

NOMENCLATURE

ITEM NO.	DESCRIPTION	QTY	UNIT	PRICE	TOTAL
1	...	...	...	...	...
2	...	...	...	...	...
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87	...	...	...	...	...
88	...	...	...	...	...
89	...	...	...	...	...
90	...	...	...	...	

NO. 030

[illegible]

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SYM	DESCRIPTION		ECONO.	DATE /BY
REVISIONS				
DRN. 562	DATE 11/24/66			
CHK.	DATE			
APP.	DATE	TITLE		
MATL		PROGRAM DIAGRAM CUTLER HAMMER P/C		
FINISH		1602B, 1611C WT 30/392 INFEED		
TOL. UNLESS SPECIFIED		SCALE	SIZE	PART NO.
FRA 1/64	DEC. $\pm .005$	~	B	1660-8081
	ANGLE $\pm 1/2^\circ$			

01.309 J.E.9/13

PARTS LIST

ITEM NO.	NOMENCLATURE	NO. REQ.
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[illegible]

SYM	DESCRIPTION	ECONO.	DATE / BY
REVISIONS			
DRN.	6-52	DATE	11-24-10
CHK.		DATE	
APP.		DATE	
MAT'L	~		
FINISH	~		
TOL. UNLESS SPECIFIED		SCALE	SIZE
FRA	DEC. ANGLE	PARTNO.	REV.
± 1/64	± .005 ± 1/2°	1660-8081	

PART NO.	MODEL NO.	NEXT ASSEMBLY	NO REQ'D PER MACH
----------	-----------	---------------	-------------------

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01-300 LG27A5

PARTS LIST

[illegible]

CONFIDENTIAL

SYM	DESCRIPTION		ECONO.	DATE / BY
REVISIONS				
DRN.	DATE	DATE	 corporation	
CHK.	DATE	DATE		
APP.	DATE	DATE		
MATL	DATE	DATE		
FINISH	DATE	DATE	TITLE	
G.02 ~ ~			PROGRAM DIAGRAM CUTLER HAMMER 1602B, 1611C W/ 3801382 INFEED	
TOL. UNLESS SPECIFIED FRA DEC. ANGLE ± 1/64 ± .005 ± 1/2°			SCALE	SIZE
			~	B
			PART NO.	REV.
			1660 - 8081	

REVISIONS

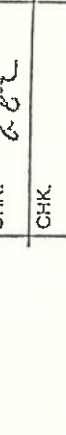
CELESTIAL

37111

TOL. UNLESS SPECIFIED		
FRA	DEC.	ANGLE
+1/64	+ .005	+ 1/2°

PART NO.	MODEL NO.	NEXT ASSEMBLY	NO REQ'D PER MACH
----------	-----------	---------------	----------------------

[illegible]

SYM		DESCRIPTION		ECO NO.	DATE /BY
REVISIONS					
DRN.	DATE	 Weldotron Corporation PROGRAM DIAGRAM CUTLER HAMMER PLC 1602B.1611C W/380/382 INFEED			
CHK.	DATE				
APP.	DATE				
MATL					
FINISH					
TOL. UNLESS SPECIFIED		SCALE	SIZE	PART NO.	REV.
FRA	DEC.	ANGLE			
± 1/64	± .005	± 1/2°		B	1660-8091
PART NO.	MODEL NO.	NEXT ASSEMBLY	NO REQ'D PER MACH		

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1602BK
TD #1038-3

1 of 2
Issued: 6/87

1602BK
SPARE PARTS KIT

<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY.</u>
BG-11441	BEARING THRUST	2
BG-11716	BEARING	1
BG-1306	BEARING .375 ID X .906	14
BG-14152	BEARING .5 W X 1 ID	6
BG-14788	BEARING .5 SH. FLANGED	2
BG-14789	BEARING .5 SH. FLANGED	2
BG-15447	NEEDLE BEARING .25 BORE	2
BG-0058	BEARING	2
BG-17854	BEARING	2
RG-1320	RING, RETAINING	6
BG-7307	BEARING 1.25 OD X .750N W	2
BL-15420	BELT	1
BL-15452	BELT VACUUM	1
CO-0577	REGULATOR	1
CX-6213	OVERLOAD HEATER	3
RG-7794	RING .75 ID X .103	4
RU-9396	SPONGE SILICONE MED 1/4 X 1	3
SG-14037	SPRING, COMP S.S.	2
SG-14805	SPRING EXTENSION	2
TO-9168	JOINER BELTING	1
VA-0574 A	VALVE 4-WAY AUTOMATIC	1
1602-3014	BRAKE BAND	1

1602BK
TD #1038-3

2 of 2
Issued: 6/87

1602BK
SPARE PARTS KIT

<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY.</u>
FZ-17691	FUSE, 5A (F1, F2)	6
FZ-17690	FUSE, 25A (F6, F7)	6
FZ-7144	FUSE, 10A, (F8)	6
FZ-7145	FUSE, 2A, (F9)	6
RE-5990	VARISTOR (VR1)	1
TB-7025	RECTIFIER BRIDGE, (REC1)	1
SW-12593	RELAY (CRS, CRM, CRH)	2
<u>MODEL 438</u>		
SW-13420	SOLID STATE RELAY (SSR2)	1
FZ-9587	FUSE, 8A, (F17 & F18)	6

NOTE

The selection of spare parts for this kit is reviewed by our Technical Services Department. The contents of this kit (but not the total dollar value) may vary. Substitutions will be made without notice and will represent an optimum selection of parts at the time the kit is prepared.

380/380AK
TD #1710

1 of 1
Issued: 6/87

380/380AK
SPARE PARTS KIT

<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY.</u>
BG-7170	BEARING	1
1600-0208	CHAIN ASSEMBLY 18" SECTION	1
1600-2038	SPROCKET	1
1600-1083	SPROCKET	1
1600-1082	SPROCKET	1
1600-2067	CHAIN	1
1612-0203P2	MICROSWITCH	1

NOTE

The selection of spare parts for this kit is reviewed by our Technical Services Department. The contents of this kit (but not the total dollar value) may vary. Substitutions will be made without notice and will represent an optimum selection of parts at the time the kit is prepared.

SHEET 1 OF 2

1602	160
------	-----

NO. REQ'D PER ASSY.

[illegible]

PAGE 2 OF 2

ITEM NO. PRECEDED BY "A"
INDICATES SEPARATE PARTS
LIST.

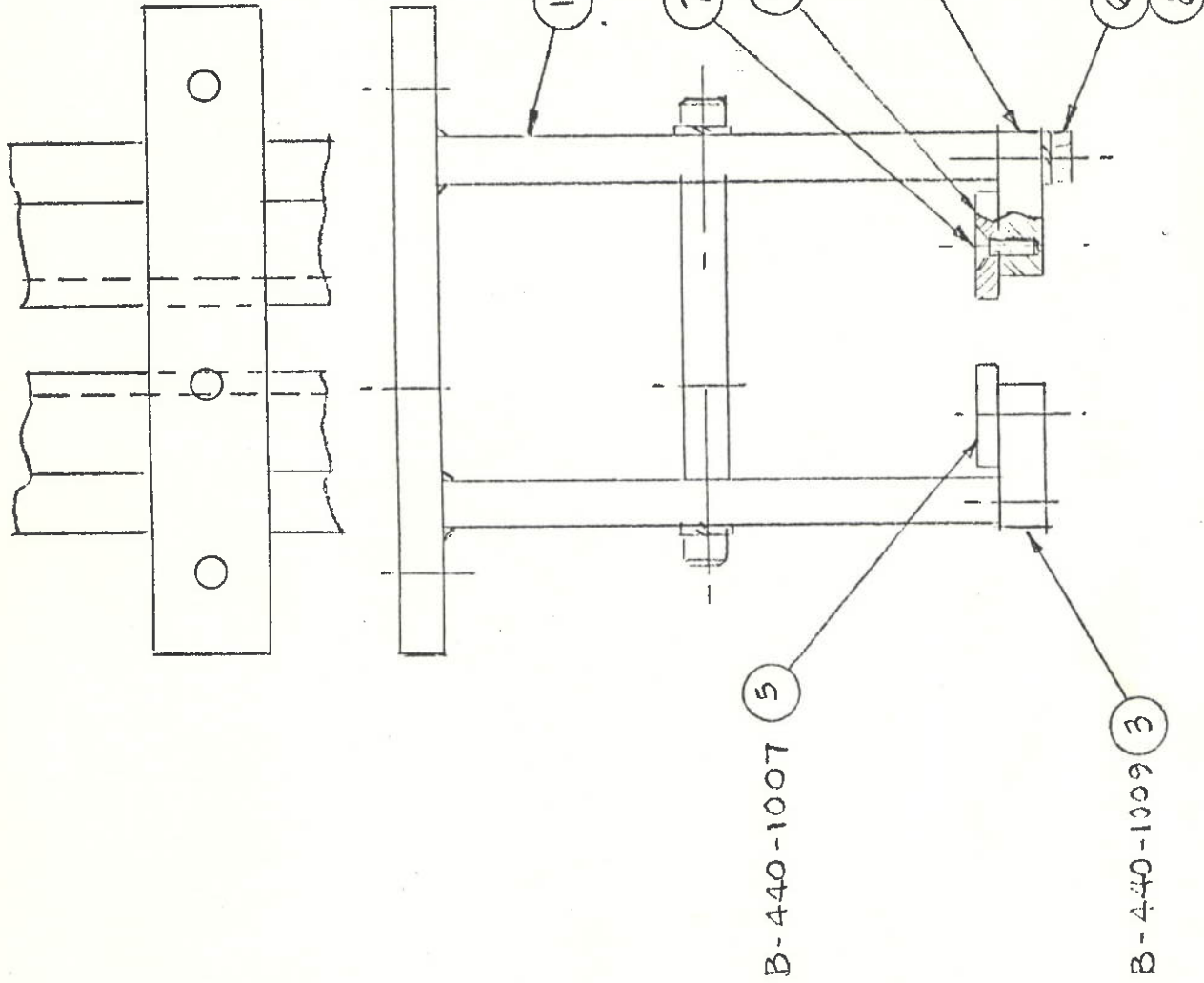
1602

NO. REQ'D PER ASSY.

1

ITEM		SIZE	PART NUMBER	REV.	DESCRIPTION	FINISH	QTY	QTY
29			AH13922		ADHESIVE		1	
30			CR4563		1/4 SJ CORD		12	
31								
32								
33			CR7780		CORD 1/2 SJ		8	
34			CP5122		TY CLAMP SELF ADHESIVE		6	
35			WE3292		TY-RAP 7.3 IN.		6	
OPTIONAL ACCESSORIES								
C			4402005		PAPER GUIDE L.H. 1605/440/409		1	
A	B		4400201		PAPER GUIDE R.H. INTERFACE		1	
C			4402001		PAPER GUIDE L.H. 1602/440/380		1	
C			4402002		PAPER GUIDE R.H. INTERFACE		1	

PARTS LIST		
ITEM NO.	NOMENCLATURE	NO. REQ.



REV.	PART NO.	SIZE
		B

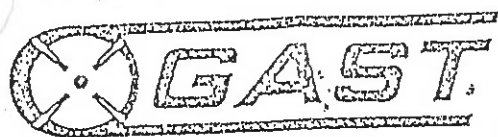
SYM	DESCRIPTION	ECONO.	DATE/BY
REVISIONS			
DRN. J.D.	DATE 10-25-84		
CHK.	DATE		
APP.	DATE		
MATL PER P/L			
FINISH			
TOL. UNLESS SPECIFIED FRA DEC. ANGLE $\pm 1/64$ $\pm .008$ $\pm 1/2^\circ$			
TITLE RAIL ASSY - CHAIN RETURN			
SCALE		SIZE	REV.
~		B	440-0102

440	R-440-0001	1
PART NO.	MODEL NO.	NO REQ'D PER ASSEMBLY

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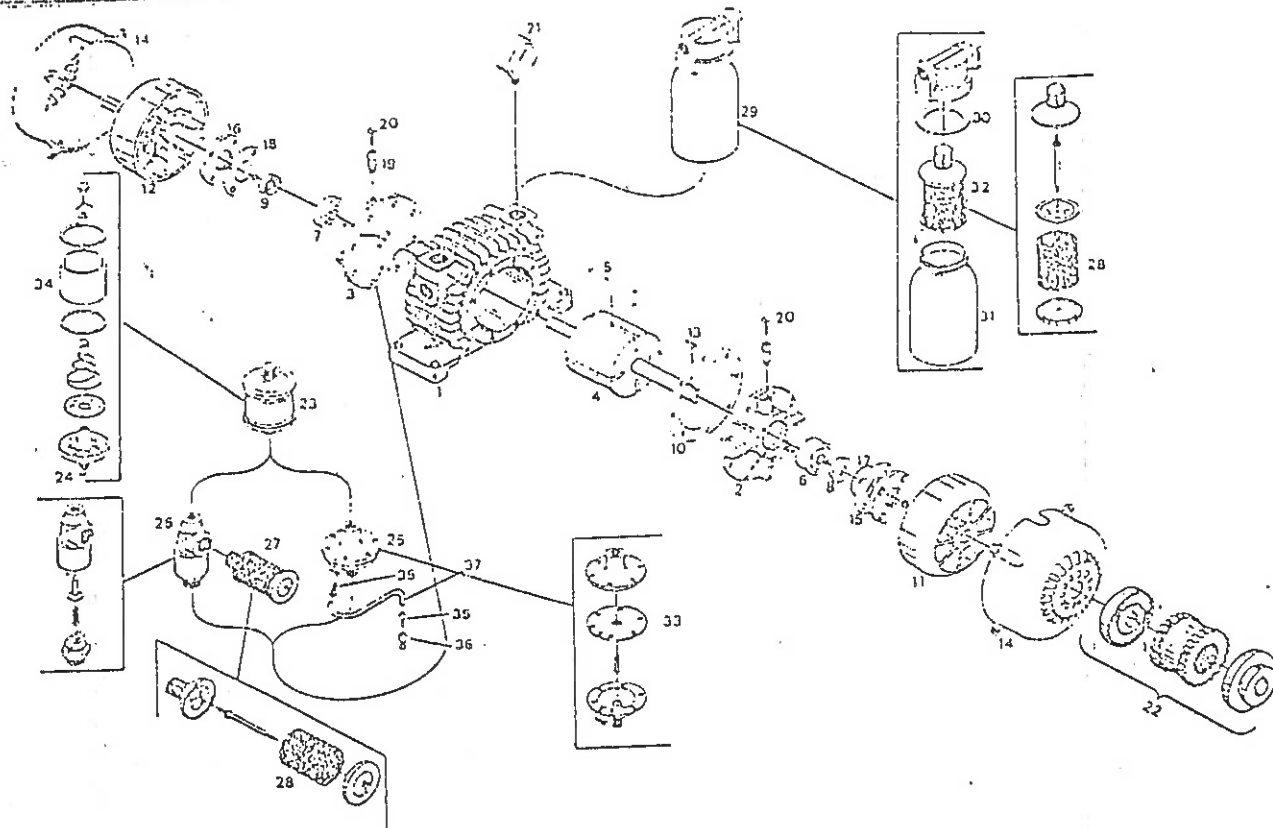
70-500
G410PL
(11-83)



MANUFACTURING CORPORATION
P. O. BOX 97, BENTON HARBOR, MICHIGAN 49022
PHONE (616) 926-6171

PARTS LIST and OPERATING and
MAINTENANCE INSTRUCTIONS
FOR MODELS: 0465, 0765, 1065, 2065,
2565, 4565, and 5565

LUBRICATED
VACUUM PUMPS
and
AIR COMPRESSORS



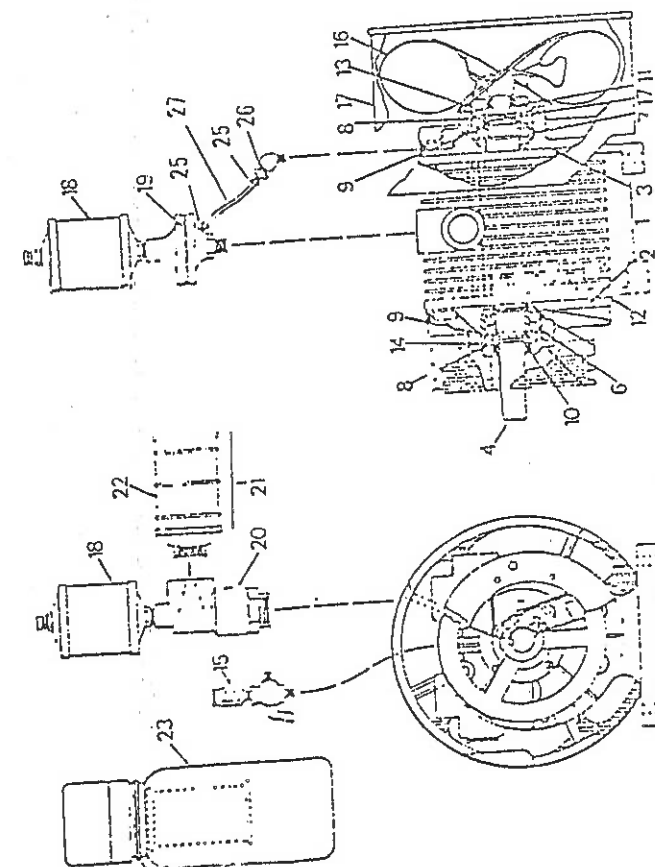
REF. NO.	DESCRIPTION	PART QNTY.	VAC. PUMP 2065-V2A	VAC. PUMP 2565-V2A	COMPRESS. 2065-P8	COMPRESS. 2565-P19
1	BODY	1	AC101E	AC101F	AC101E	AC101F
2	END PLATE, DRIVE	1	AA851	AA846	AA852	AA847
3	END PLATE, DEAD	1	AA851	AA846	AA853	AA848
4	ROTOR ASSEMBLY	1	AC843A	AC840	AC843A	AC840
5	VANE	4	AA89	AA7500	AA68	AA7500
6	BEARING, DRIVE END	1	AA735	AA735	AA735	AA735
7	BEARING, DEAD END	1	AA755D	AA755D	AA755D	AA755D
8	SHAFT SEAL, DRIVE END	1	AC842	AC848	AC842	AC842
9	SHAFT SEAL, DEAD END	1	AC849	AC849	AC849	AC849
10	BODY SPACER	1	AH567	AH567	AH567	AH567
11	COOLING FAN, DRIVE END*	1	AC326C	AC326C	AC326C	AC326C
12	COOLING FAN, DEAD END*	1	AC325B	AC326B	AC326B	AC326B
13	COUPLING KEY	1	AB136D	AB136D	AB136D	AB136D
14	FAN GUARD	2	AC1029	AC1029	AC1029	AC1029
15	END CAP, DRIVE END	1	AA856	AA856	AA856	AA856
16	END CAP, DEAD END	1	AG466	AG466	AG466	AG466
17	"O" RING	1	AC808	AC808	AC808	AC808
18	END CAP GASKET	1	AG467	AG467	AG467	AG467
19	OILER BODY	2			AA10	AA10
20	OILER CAP	2			AA11B	AA11B
21	PRESSURE GAUGE	1			AA644B	AA644B
22	COUPLING ASSEMBLY	1	AE543B	AE543B	AE543B	AE543B
23	OIL RESERVOIR	1	AA960	AA960	AA960	AA960
24	FEED WICK	1	AA973	AA973	AA973	AA973
25	VACUUM LUBRICATOR	1	V40C	V40C		
26	PRESSURE LUBRICATOR	1			AA95A	AA95A
27	FILTER ELEMENT ASSEMBLY	1			AC435	AC435
28	CARTRIDGE	2	AC393	AC393	AC393	AC393
29	EXHAUST MUFFLER & OIL TRAP	1	AA900E	AA900E		
30	COVER GASKET	1	AA405	AA405		
31	GLASS JAR	1	AA401	AA401		
32	MUFFLER ELEMENT ASSEMBLY	1	AC436	AC436		
33	DIAPHRAM	1	V33	V33		
34	OIL CYLINDER	1	AA957A	AA957A	AA957A	AA957A
35	FITTING	4	V31	V31		
36	CONNECTOR	2	V32A	V32A		
37	TUBE	2	AF339	AF339		
	SERVICE KIT	1	K295	K295	K295	K295

* Indicates parts included in Service Kit.
 *When Ordering Fans - Corresponding Retaining Ring (Drive AC448 or Dead AC447) Must Also Be Ordered.

*Units manufactured prior to September, 1977 utilized copper tubes.

When corresponding or ordering spare parts, please give complete model and serial number.
 See page 5 for optional accessories for models 2065 & 2565.

PARTS NOT NUMBERED ARE NOT AVAILABLE INDIVIDUALLY



REF NO	DESCRIPTION	PART QTY.	VAC. PUMP 4245 V6	COMPRESSION 4245 V3
1	BOUY	1	AD701	AD701
2	END PLATE, DRIVE END	1	AD81CE	AD81CE
3	END PLATE, DEAD END	1	AD81LD	AD81LF
4	MOTION & SHAFT ASSEMBLY	1	AD764	AD764
5	VANES	5	AD706	AD706
6	BEARINGS, DRIVE END	1	AC868	AC868
7	BEARINGS, DEAD END	1	AD710	AD710
8	LOCK RING	1	AD711	AD711
9	LOCK WASHEN	1	AD712	AD712
10	SHAFT SEAL, DRIVE END	1	AD713	AD713
11	SHAFT SEAL, DEAD END	1	AC849	AC849
12	END PLATE, ISPC/CH GASKET	2	AD714	AD714
13	END CAP, DEAD END	1	AD813	AD813
14	"O" RING	2	AD814	AD814
15	BEARING OIL RESERVUOIR	2	AD721	AD721
16	FAIR DRUM END	1	AD715 1	AD718 1
17	CONV	1	AD820A	AK800A
18	OIL RESERVUOIR ASSEMBLY	2	V496	
19	VACUUM LUBRICATION	2		
20	PRESSURE LUBRICATION ASSA	1	AD750	AD750
21	FILTRATION/FLEEN CART.	1	AD752	AD752
22	PELL	2	AD850	
23	EXHAUST RING & INTAKE FILT	2	AD852	
24	JAIL GASKET	4	V31	
25	FILLING	2	V32A	
26	CORRECTION	1	AF335C AF335D	
27	TUNE	1	K242	K213
28	SERVICE KIT			

[illegible]

OPTIONAL ACCESSORIES (NOT ILLUSTRATED)

1065 MODELS

Fan Pulley (5.13" Pulley Diameter)	AB140A
Pressure Gauge	AA644B
Vacuum Gauge	AA640
Pressure Relief Valve	AA600
Vacuum Relief Valve	AA840
Motorized Lubricator	AD190
Oil Reservoir for Motorized Lubricator	AD185
Oil	AD220
Glass jar intake filter assembly, 1 qt., 10 Micron	V500D
Metal jar intake filter assembly, 1 qt., 10 Micron	AB665B
Metal jar exhaust muffler assembly, 1 qt., 10 Micron	AB665C

2065 & 2565 MODELS

Pressure Gauge	AA644B
Vacuum Gauge	AA640
Pressure Relief Valve	AA307
Vacuum Relief Valve	AA308
Motorized Lubricator	AD190
Oil Reservoir for Motorized Lubricator	AD185
Glass Jar Intake Filter Assembly, 1 qt., 10 Micron	AA900D
Glass Jar Intake Filter Assembly, 1 qt., 50 Micron	AA900J
Metal Jar Intake Filter Assembly, 1 qt., 10 Micron	AB650C
Metal Jar Intake Filter Assembly, 1 qt., 50 Micron	AB650
Metal Jar Exhaust Muffler Assembly, 1 qt., 10 Micron	AB650D
Lubricating Oil, 1 qt.	AD220
Fan Pulley for Pump, 5" P.D.	AB140
Fan Pulley for Pump, 6.5" P.D.	AC374AC

0465 & 0765 MODELS

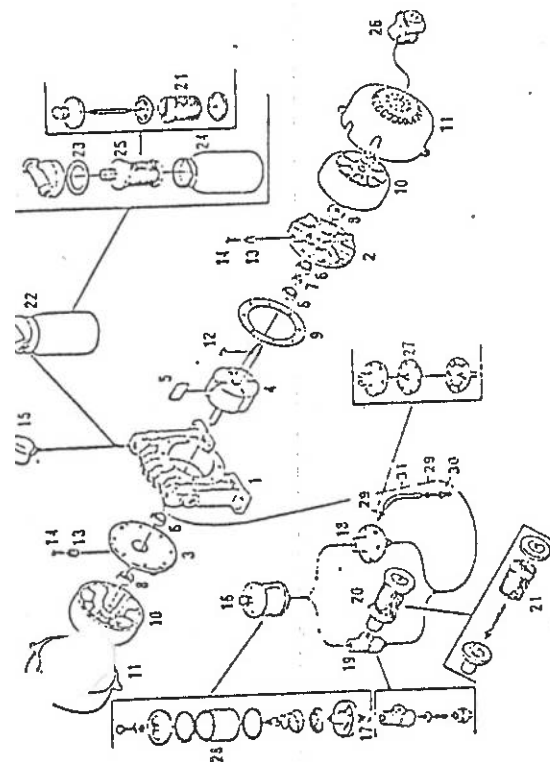
Fan Pulley (5.13" Pulley Diameter)	AB140A
Pressure Gauge	AA644B
Vacuum Gauge	AA640
Pressure Relief Valve	AA600
Vacuum Relief Valve	AA840
Motorized Lubricator	AD190
Oil Reservoir for Motorized Lubricator	AD185
Oil	AD220
Glass jar intake filter assembly, 1 qt., 10 Micron	AA600C
Metal jar intake filter assembly, 1 qt., 10 Micron	AB665B
Metal jar exhaust muffler assembly, 1 qt., 10 Micron	AB665C

4565 MODELS

AB322	PUMP-MOTOR MOUNTING BASE FOR 213& 215 FRAME MOTOR
AB322C	PUMP-MOUNTING BASE FOR 182T & 184T FRAME MOTOR
AE507	MOTOR PULLEY (2 grove, 5.2 P.D. 1 1/13" bore for 1325 RPM)
AB169	V BELT (50" lg. (2) required)
AC376C	MOTOR FAN/PULLEY (2 grove, 6.5 P.D. 1 1/18" bore for 1725 RPM)
AB166	V BELT (53" lg. (2) required)
AE777	BELT GUARD
AD190-V4 oiler (for vacuum pump) 115/60/1 AD190-P4 oiler (for compressor) 115/60/1 AD185 oil reservoir (32 oz.) AD135 Connecting tubes & fittings	

5565 MODELS

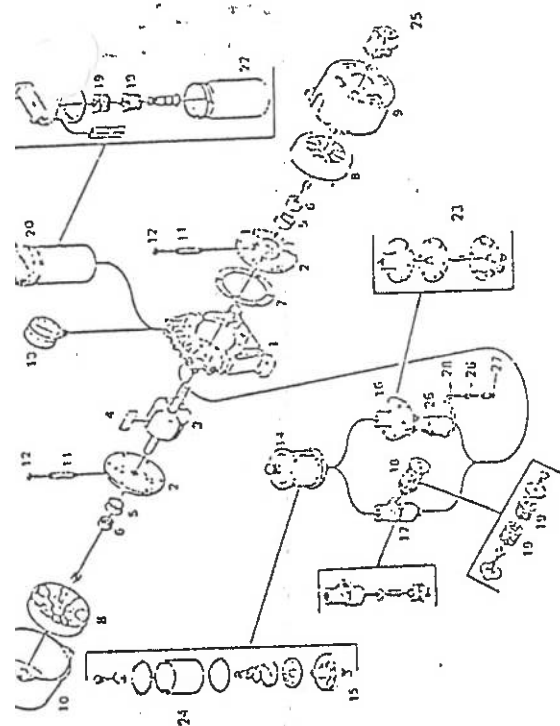
		VAC. PRESS.	
Pressure	AD730	2	1
	AA960A-1		1
	AD750		1
Vacuum	V40C	2	
	AA960A-2		
	LUBRICATOR RESERVOIR FILTER		
	LUBRICATOR RESERVOIR		



REF. NO.	DESCRIPTION	PART QTY.	VAC. PUMP 1065-V2A	COMPRESSOR 1065 P10
1	BODY	1	AC460	AC460B
2	END PLATE, DRIVE END	1	D1322	D1322D
3	END PLATE, DEAD END	1	D1322A	D1322E
4	MOTOR & SHAFT ASSM.	1	D334H	D334H
5	VANE	4	D335J	D335J
6	BEARINGS	3	D327	D327
7	BEARING SPACER	1	D316	D316
8	SHAFT SEAL	2	AA150	AA150
9	BODY SPACER	1	AA157	AA157
10	COOLING FAN*	2	AC326A	AC326A
11	FAN GUARD	2	AC107B	AC107B
12	Coupling Key	1	AA130D	AA130D
13	OILER BODY	2	AG46B	AG46B
14	OILER CAP	2	AA118	AA118
15	PRESSURE GAUGE	1	AA440	AA440
16	OIL RESERVOIR ASSM.	1	AA960	AA960
17	FEED VICK	1	AA273	AA273
18	VACUUM LUB. ASSM.	1	V40C	V40C
19	PRESSURE LUB. ASSM.	1	AA800C	AA800C
20	INTAKE FILTER ASSM.	1	AC393	AC393
21	CANRIDGE	2	AA800D	AA800D
22	EXHAUST MUFF & OIL TR.	1	AA405	AA405
23	COVER GASKET	1	AA401	AA401
24	GLASS JAR	1	AC434.1	AC434.1
25	MUFF ELEMENT ASSM.	1	AE547A	AE547A
26	COUPLING ASSM. (1 PC.)	1	V31	V31
27	DIAPHRAGM	1	AA967A	AA967A
28	OIL CYLINDER	1	V31	V31
29	FITTING	4	V31	V31
30	CONNECTOR	2	V31	V31
31	TUBE	2	AF319	AF319
	SERVICE KIT	1	K297	K297

* Denotes parts in SERVICE KIT.
 * When ordering AC326A Fan, also order (1) AC446 Retaining Ring for each fan ordered.
 † Units manufactured prior to September, 1977 utilized cupper tubes.
 When corresponding to ordering spare parts, give complete model and serial number.

PARTS NOT INDIVIDUALLY AVAILABLE



REF. NO.	DESCRIPTION	PART QTY.	VACUUM PUMPS	COMPRESSORS
1	BODY	1	D455 V7B	D455 P30A
2	END PLATE	2	AC601	AC601
3	MOTOR & SHAFT	1	AC600	AC600
4	VANE	4	AC608	AC608
5	BEARINGS	2	B335G	B335G
6	SHAFT SEAL*	2	AA37	AA37
7	BODY SPACER	1	AA562	AA562
8	COOLING FAN†	2	B330	B330
9	FAN GUARD, DRIVE END	1	B340C	B340C
10	FAN GUARD, DEAD END	1	AC604	AC604
11	OILER BODY	2	AC604A	AC604A
12	OILER CAP	2		AB104
13	PRESSURE GAUGE	1		AA118
14	OIL RESERVOIR ASSM.	1	AA560	AA560
15	FEED VICK	1	AA973	AA973
16	VACUUM LUB. ASSM.	1	V40C	AA973
17	PRESSURE LUB. ASSM.	1		A380A
18	INTAKE FILTER ASSM.	1		B343B
19	FILTER FELT	4	B344A	B344A
20	EXHAUST MUFF & OIL TR.	1	V575	V575
21	COVER GASKET	1	B67A	B67A
22	GLASS JAR	1	AA175	AA175
23	DIAPHRAGM	1	V31	V31
24	OIL CYLINDER	1	AA967A	AA967A
25	COUPLING	1	AE547A	AE547A
26	FITTING	4	V31	V31
27	CONNECTOR	2	V31A	V31A
28	TUBE	2	V57	V57
	SERVICE KIT	1	K234	K234

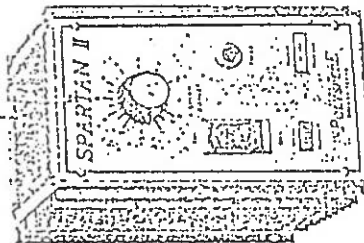
* Denotes parts in SERVICE KIT.
 † When ordering B340C Fan, also order (1) AC605 Retaining Ring for each fan.
 When corresponding to ordering spare parts, give complete model and serial number.
 See page 5 for optional accessories for models D455, D465, & 1605.

PARTS NOT INDIVIDUALLY AVAILABLE

CCV
ADJUSTABLE SPEED DRIVE SYSTEMS

SPARTAN II

BASIC MANUAL



POLYMER

6710 Tenth Avenue / Dallas, Texas 75211
Phone 214-361-7215

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CONGRATULATIONS!

The control which you have purchased is, we believe, the finest SCR motor speed control available today. We invite you to inspect both the exterior and interior of your new SPARTAN II motor control and to note the quality of design and workmanship which is evident throughout the control.

Polyspede has endeavored to furnish all of the features normally included only in the more expensive controls in the attractive, compact, low cost SPARTAN II package. Check these standard features and compare.

- * Full wave rectified power
- * Speed regulation adjustable to 1% of base speed
- * Current limiting adjust (to 150%)
- * Maximum and minimum speed adjusts
- * Transient voltage protection
- * Rectifier-Protection Fusing
- * Controlled acceleration
- * 20:1 speed range
- * Temperature stable speed setting
- * Instant response to "ON" command
- * Starts reliably when AC power is switched on
- * Not affected by AC line noise
- * Ease of maintenance
- * Compact size
- * Adaptable to automation

WARRANTY

Polyspede warrants the SPARTAN II Control to be free from defects in workmanship and material for a period of 12 months from the date of shipment. For further details refer to Terms and Conditions of Sale, Bulletin 1100.

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DESCRIPTION OF PACKAGE STYLES

STANDARD PACKAGE: Pictured on the cover. Model numbers will be per Table I (eg: SP-101).

OPEN CHASSIS UNIT: Model numbers in Table I will be preceded by the letter "O" (eg: OSP-101). Open chassis units are similar to the picture on the cover, but are furnished without a face plate, lower end plate and back plate. The "Speed Adjust" potentiometer, fuses and fuse blocks are furnished loose for customer installation.

SYSTEMS-TYPE UNIT: Model numbers in Table I will be preceded by the letter "S" (eg: SSP-101). These units are normally supplied pre-mounted on a panel and pre-wired to various options as a part of a "Spartan II System." They are "bare" with no enclosing plates furnished. Numerous parts of this manual such as installation and wiring instructions do not apply to Systems Type Spartan II Units. The manual is included however as a reference for servicing and adjustment purposes. See separately furnished drawings for installation instructions.

1. DESCRIPTION

The SPARTAN II Drive system consists of a SPARTAN II solid-state regulated power unit, a Polyspede shunt-wound DC motor, and option boxes (if selected) to provide such auxiliary functions as reversing, dynamic braking and jogging.

The power unit is a highly developed regulator system capable of maintaining motor speed precisely at any given level within the advertised speed range of the control. Two internal regulators are provided. The primary regulator maintains speed constant at a selected value until the motor load (torque) exceeds a preset value, normally 150% of rated motor torque. As this occurs, the second regulator assumes control and allows speed to drop but holds motor torque constant at the preset limiting value. If the motor load continues to increase, as would be the case if the driven machine had jammed, the torque limit is capable of holding this preset value of torque down to locked-rotor or zero speed condition. Thus, the control has two modes of operation; a constant speed (normal) mode and a constant torque (overload) mode. Operation is smooth and stable in both modes.

In the normal constant speed mode, the control holds motor speed constant at a selected value, determined by the setting of the

"Speed Adjust" knob, by regulating armature voltage. Load changes are compensated for by an "IR" compensation circuit which senses any increase in armature current and raises armature voltage to compensate for the increased voltage drop in the motor armature. This circuit thus controls the regulation (speed change) due to load changes. With proper adjustment of the "IR" circuit, no-load to full-load regulation of less than 1% of base speed can be readily achieved with little or no sacrifice of stability.

All components used in the regulators are temperature-compensated and shift of speed setting due to changes in temperature within the control housing is negligible. Also, the setting of the torque limit point is insensitive to temperature changes and the regulators are not affected by changes in line voltage within the specified range of allowable input voltages.

The SPARTAN II family covers 1/6 to 2 horsepower per Table I. Controls of a given voltage rating are identical except for connection of the sensing resistor. Table I gives sensing resistor connections for various models. Field conversion of controls with a given voltage rating from one horsepower to another is accomplished by reconnecting the sensing resistor and changing the model tag per Table I.

The drive motor and the SPARTAN II unit are protected against overloads by the excellent SPARTAN II torque limit. In addition, the SPARTAN II unit is protected against damage due to accidental wiring shorts or grounds by fast-acting rectifier-protection type fuses inserted in the AC input lines. The fuses are located behind the face plate (enclosed models) or furnished loose for user connection (open Chassis models).

 *
 * WARNING
 *
 * If fuse replacement becomes necessary, use only
 * the specified fuses. The use of substitute fuses
 * may void control warranty.
 *

TABLE I

MODEL	CONTROL VOLTAGE	CONTROL HORSEPOWER	FUSE TYPE	R71 CONNECTION (DIAGRAM #)
SP-16, SP-25	115	1/6 or 1/4	A	1
SP-33, SP-50	115	1/3 or 1/2	A	2
SP-75, SP-100	115	3/4 or 1	A	3
SP-34, SP-51	230	1/3 or 1/2	B	1
SP-76, SP-101	230	3/4 or 1	B	2
SP-150, SP-200	230	1 1/2 or 2	B	3

Fuse type A: Chase-Shawmut AL3 X 25

Fuse type B: Chase-Shawmut A25 X 25

SENSING RESISTOR (R71) CONNECTIONS

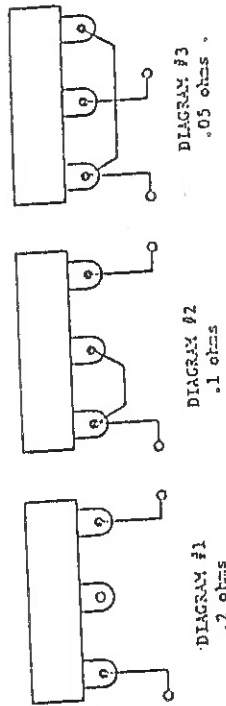


Table II gives technical specifications of the control unit and matched Polyspede motor.

Section 12 gives user application information for specific applications such as contactor operation, reversing and external torque programming.

TABLE II
SPECIFICATION

CONTROL UNIT

Input Voltage (Single Phase)	115VAC $\pm$ 10 volts (115V. models) 230VAC $\pm$ 20 volts (230V. models)
Input Frequency	50/60 Hz
Output Voltage to Armature	0-50VDC (0-180VDC on 230 V. models)
Output Voltage to Field	100VDC (200VDC on 230 V. models)
Speed Range	0-100% 100:1
Speed Range for Specified Regulation	Adjustable to 1% of base speed
Regulation	Linear
Stability of Speed Setting: Temp. Coefficient (Typ.) ¹ Line Voltage Coefficient (Typ.) ²	$\pm$.05% of base speed per $^{\circ}$ C $\pm$.05% of base speed per volt change ($\pm$.025% for 230 V. models)
Speed Dial Characteristics	Linear
Linear Acceleration Time: (0 - 90% of final speed)	0.5 to 15 sec. variable
Torque Limit Adjustment Range	75% to 200% rated torque
External Adjustment Points Available, Linear	
Maximum Ambient Temp	40 $^{\circ}$ C
External Signal Capability	See Polyspede Application Bulletins
NOTES: 115 V. DRIVES, 1800 RPM or 2100 RPM	
Armature Voltage	90 volts, unfiltered, rectified
Field Voltage	100 volts, unfiltered, rectified
Ambient Temperature	40 $^{\circ}$ C max.
Speed Range	20:1 at rated torque
Speed Stability Temp. Coefficient (Typ.) ³ Field Voltage Coefficient (Typ.) ⁴	$\pm$ 0.1% of base speed per $^{\circ}$ C $\pm$ 0.2% of base speed per volt change
Service Factor	1.0
Short-Term Overload Capacity	150% rated torque

TABLE II
SPECIFICATIONS (continued)

MOTOR, 230 V. DELTAS, 1800 RPM OR 2400 RPM	
Armature Voltage	180 volts, unfiltered, rectified
Field Voltage	200 volts, unfiltered, rectified
Ambient Temperature	40° C max
Speed Range	20:1 at rated torque
Speed Stability	
Temp. Coefficient (Typ.) ³	+ 0.1% of base speed per °C
Field Voltage Coefficient (Typ.) ⁴	- 0.1% of base speed per volt change
Service Factor	1.0
Short-Term Overload Capacity	150%

- NOTES: 1. Temperature of motor held constant, ambient temperature of control varied.
2. Field voltage to motor supplied by separate source, line voltage to control unit varied.
3. Temperature of control unit held constant, temperature of motor varied.
4. Voltage input to control unit held constant, motor field voltage varied (from separate source).
5. Quantities marked "Typ." will vary from unit to unit.

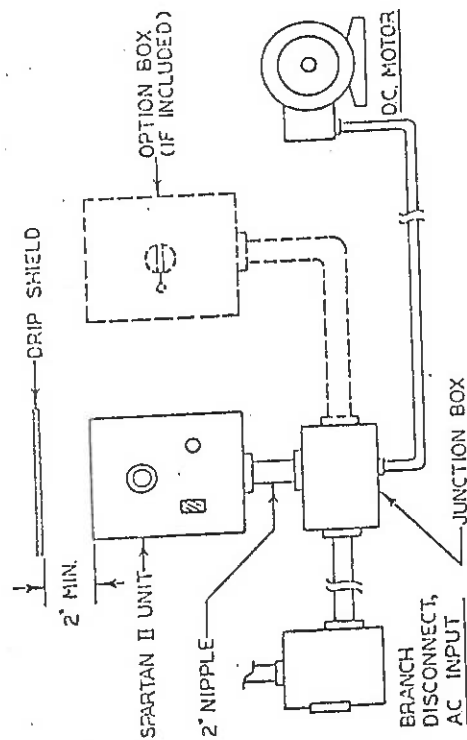
2. INSPECTION

Check for shipping damage. If damage is found, report it to the carrier immediately. Do not attempt to operate the drive if visible damage to the circuit boards or any electronic component exists.

3. INSTALLATION

3.1 MOUNTING

Mount and install standard unit as shown below. (Does not apply to OSP and SSP models).



INSTALLATION NOTES

- (1) Wiring will be easier if the 2" nipple is installed and if wiring is connected to the SPARTAN II terminal blocks before mounting the control unit. Remove face plate and lower end plate. Install nipple and wiring as described in 3.2.
- (2) Do not block ventilation holes in top and bottom plates.
- (3) Drip shield is to guard against chips and liquid spills.
- (4) Install in area where ambient temperature is 40° C. (104° F.) or lower.
- (5) Assume that the SPARTAN II housing is grounded.

3.2 WIRING PROCEDURE - (Does not apply to SSP models)

Remove the four screws which attach the face plate to allow access for wiring the unit.

Select the schematic on the following page which applies to the control being installed. Size all wires which carry armature current or line current to handle currents shown in Table III. All other wires may be #18 AWG or smaller as permitted by local code. All connections to 52 T3 should be made with flexible stranded wire, no larger than

#18 AWG to avoid damage to the circuit board due to strain. Lug wires and be sure nothing shorts to the chassis or shorts between terminals.

Clearly identify the branch-circuit disconnect; this disconnect must carry the currents shown in Table III, but should have a fuse or trip rating not greater than 30 amperes. If the distribution system which feeds the disconnect is of greater capacity than 120KVA, or if power factor correction capacitors are used, install an isolation transformer (sized at roughly 2 1/2KVA per horsepower) immediately ahead of the branch disconnect.

TABLE III
CURRENT RATINGS FOR WIRE SIZING

INPUT VOLTAGE	HORSEPOWER	RMS AMPERES
115 VAC	1/6	3
115 VAC	1/4	5
115 VAC	1/3	6
115 VAC	1/2	9
115 VAC	3/4	14
115 VAC	1	18
230 VAC	1/3	3
230 VAC	1/2	5
230 VAC	3/4	6
230 VAC	1	9
230 VAC	1 1/4	14
230 VAC	2	18

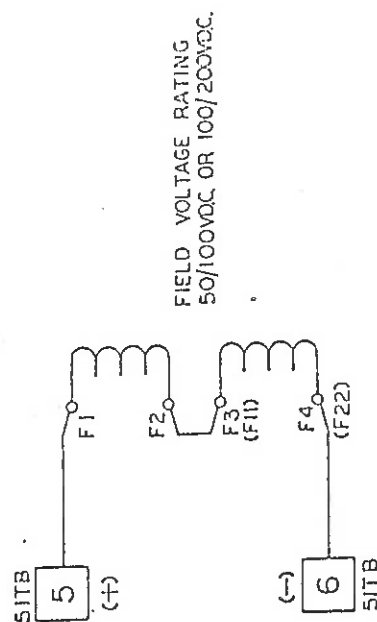
NOTICE

Motor field lead designations F1 and F2 in the external connection diagrams on the facing page and in the schematics on pages 40 & 41 are for reference only. Some DC motors are provided with dual voltage field windings connectable for high or low voltage. The field voltage supplied by the Polyspede SPARTAN II control is as follows:

115VAC Input - 100VDC Field

230VAC Input - 200VDC Field

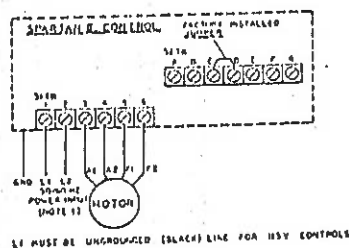
Typical dual voltage field winding connection is as follows:



Refer to motor wiring information plate and connect field windings for the proper voltage. Note also that some motors have permanent magnet fields in which case no connections are made to Terminals 51 TB-5 and 51 TB-6.

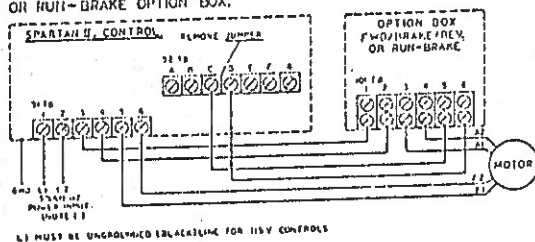
3.3 CONNECTIONS DIAGRAMS-ENCLOSED CONTROLS.

3.3.1 BASIC CONTROL, EXTERNAL CONNECTIONS.



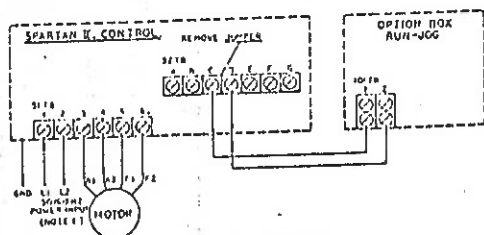
L1 MUST BE UNGROUNDING (BLACK) LINE FOR HSY CONTROLS

3.3.2 BASIC CONTROL, CONNECTIONS TO FORWARD-BRAKE-REVERSE OR RUN-BRAKE OPTION BOX.



L1 MUST BE UNGROUNDING (BLACK) LINE FOR HSY CONTROLS

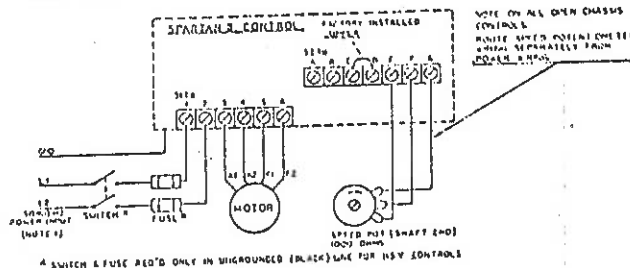
3.3.3 BASIC CONTROL, CONNECTIONS TO RUN-JOG OPTION BOX.



L1 MUST BE UNGROUNDING (BLACK) LINE FOR HSY CONTROLS

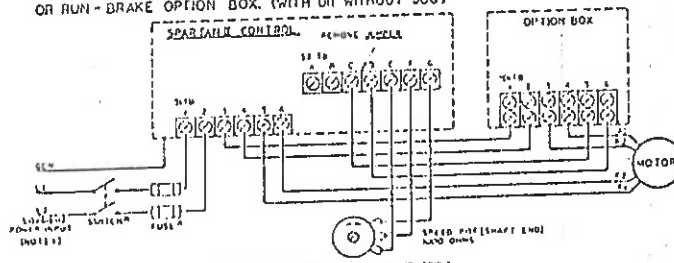
3.4 CONNECTION DIAGRAMS-OPEN CHASSIS CONTROLS.

3.4.1 BASIC CONTROL, EXTERNAL CONNECTIONS.



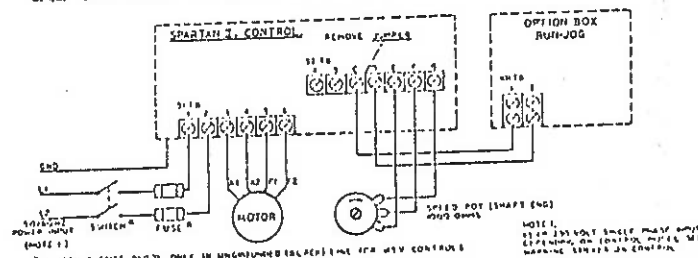
A SWITCH & FUSE REQUIRED ONLY IN UNGROUNDING (BLACK) LINE FOR HSY CONTROLS

3.4.2 BASIC CONTROL, CONNECTION TO FORWARD-BRAKE-REVERSE OR RUN-BRAKE OPTION BOX. (WITH OR WITHOUT JOG)



A SWITCH & FUSE REQUIRED ONLY IN UNGROUNDING (BLACK) LINE FOR HSY CONTROLS

3.4.3 BASIC CONTROL CONNECTIONS TO RUN-JOG OPTION BOX.



A SWITCH & FUSE REQUIRED ONLY IN UNGROUNDING (BLACK) LINE FOR HSY CONTROLS

4. INITIAL TURN-ON PROCEDURE

Re-check all wiring. Accidental grounds on any of the motor leads or speed potentiometer wires (open chassis controls) may damage the unit when power is applied. Inspect for pinched wires. The face plate should be in place; if loose support it so that no terminals on the face plate can short to the chassis. Assume that service is of correct voltage as indicated by warning tags attached to the SPARTAN II unit.

Turn speed potentiometer to zero. Turn power on at the branch disconnect and at the SPARTAN II switch. Slowly advance speed potentiometer while observing motor. If motor rotation is incorrect, turn power off at the branch disconnect and reverse A1 and A2 connections in the motor conduit box.

The face plate light labeled "Fuse" is used to indicate blown fuses. The light burns in normal operation but does not burn if fuses are blown.

Check for satisfactory operation throughout the speed range.

If instability (hunting) is observed, reduce the setting of the "IR" trim potentiometer as described in the following section.

Also, if zero-speed creep is observed, or if maximum speed is higher than desired, or if acceleration time is not as desired, adjust the control as described in the following

section. If initial operation is satisfactory, no readjustment is necessary.

5. ADJUSTMENTS

Five internal adjustments are provided.

- (a) Minimum speed ("Min")
- (b) Maximum speed ("Max")
- (c) IR (load) compensation ("IR")
- (d) Torque limit ("Torque")
- (e) Acceleration ("ACC")

The functions of these adjustments are described in Table IV.

All adjustments, except "IR", are preset at the factory. A "typical" test motor is utilized. The "Max" and "Torque" adjustments do not depend on individual motor characteristics and therefore should be correct as received. The "IR" and "Min" adjustments, however, are somewhat dependent on characteristics of the particular motor used, and should therefore be made by the user when the drive is installed. Job-site adjustment of "IR" is necessary to achieve specified regulation. The adjustments are permanent; periodic re-adjustment is not necessary.

Perform adjustments per Table IV and in the order listed in Table IV. The adjustments are completely independent of each other except as noted below:

ADJUSTMENT NOTES

(a) "IR" has a slight effect on "Min", but "Min" does not affect "IR".

(b) "Min" has a slight effect on "Max".

Thus performing adjustments in the order listed in Table IV eliminates any necessity for repeating a calibration operation.

Note that torque limit ("Torque") is independent of the other adjustments. Since this is basically a protective adjustment, preset at the factory, it should not be re-adjusted except to decrease the limit point.

5.1 ADJUSTMENT PROCEDURE

- (a) Turn power off at branch disconnect.
- (b) Remove four screws that fasten face plate and fold face plate forward to expose the adjustment trim pots.
- (c) Turn power on and proceed with the adjustments per Table IV.

CAUTION: The circuit board and components are "hot" with respect to control enclosure and face plate components. Wrap screwdriver shaft with electrical tape to avoid accidental shorts. Do not let screwdriver blade slip and short circuit board components. Support face plate as necessary during adjustments. Also face plate components are "hot" - do not allow terminals to touch control housing.

ADJUSTMENT NAME	DESCRIPTION OF FUNCTION; NOTES	ADJUSTMENT PROCEDURE
"IR"	Sets the load regulation (% slowdown of motor as shaft load is changed from zero to full rated load.) If load slowdown is of no concern, rotate "IR" trim pot fully counterclockwise.	<u>Approximate method</u> - Set speed control knob for 20% speed. - Rotate "IR" trim pot clockwise until motor begins to hunt. - Back off "IR" trim pot counterclockwise until hunting stops. - Back off "IR" trim pot 1/3rd of the span between this setting and zero setting. This method usually results in slight overcompensation. <u>Exact method</u> - Turn drive power off and connect a DC ammeter in series with the A1 motor lead, between motor and control. Do not use clamp-on meter. - Set speed control knob for 20% speed. - Turn drive power on. With motor shaft loaded as lightly as feasible, read motor speed with a strobe light or a tachometer. - Load the motor shaft until ammeter reads rated motor current (see nameplate). Read motor speed with strobe light or tachometer. - If motor speed decreased as motor was loaded, adjust the "IR" trim pot and repeat (c) and (d) until little or no speed decrease is noted. - In performing (d) and (e) be sure motor is not loaded heavily enough to cause torque limiting to occur. - Remove ammeter and reconnect A1 motor lead. Recheck control at very low speed for cogging.
"MIN"	Sets the zero calibration of the speed control knob. Clockwise rotation of "MIN" trim pot increases speed.	- Set speed control knob to zero. - Rotate the "MIN" trim pot clockwise until motor starts to rotate. - Decrease the "MIN" trim pot setting until motor rotation stops.

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"MAX"	Calibrates the speed at which motor turns when speed control knob is set at 100%. Clockwise rotation of the "MAX" trim pot increases maximum motor speed.	- Turn drive power off. - Connect a DC voltmeter between A1 and A2 motor leads at the motor. - Set meter scale so that rated armature voltage (90 volts or 180 volts as noted on motor nameplate) may be read. - Turn power on. Turn speed control knob to 100% setting. - Adjust "MAX" trim pot until meter reads nameplate rated voltage (90 volts or 180 volts). NOTE: If desired, a tachometer or strobe light may be used in lieu of the DC voltmeter. Proceed as described above, except adjust "MAX" trim pot until tachometer or strobe light indicates that motor is turning at base speed.
"TORQUE"	(Torque limit). Sets the maximum torque that can be obtained from the motor, and the maximum armature current that the control unit will deliver. Torque adjustment is preset at the factory for 150% to 200% of rated motor torque (current) depending on motor horsepower. Clockwise rotation of the "TORQUE" trim pot increases the torque that the motor will deliver.	- Turn power off. - Connect a DC ammeter (not a clamp-on type) in series with the A1 motor lead between motor and control unit. - Turn power on. - Set speed control knob for low speed (e.g. - 10% setting). - Apply friction braking to the motor shaft until motor stalls out. Caution: Watch ammeter to assure that control is limiting current. Stall current should read roughly 150% of rated armature current (see motor nameplate). - If current is too high, rotate the "TORQUE" trim pot counterclockwise to decrease. Adjust to desired acceleration time. C.W. rotation increases time.
"ACC"	Acceleration adjustment sets time for motor to reach set speed.	

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6. OPERATION (Does not apply to model SSP controls).

6.1 BASIC CONTROL

If the control system does not include an option box (forward-brake-reverse, run-brake, or run-jog), the motor is started simply by pressing the on-off switch to the "on" position. Turning this switch off removes all power from the control and from the motor. There is no need to return the speed control knob to zero when re-starting the drive. The control unit contains a linear acceleration unit variable from .5 to 15 seconds. When the control is turned off at the on-off switch, wait at least 2 seconds for the controlled acceleration circuit to reset before again pressing the switch on. The speed control dial is linear; that is, 50% setting of the dial commands 50% of maximum motor speed.

6.2 CONTROL WITH RUN-JOG OPTION BOX

Operation of this control is identical to that of the basic control, except that a spring-loaded run-jog switch is provided for turning the control on and off rapidly. This switch may be pulsed on and off as rapidly as the operator can activate it with no adverse effects in the control. When this switch is in the "run" position the control and motor operate normally as described under "Basic Control". The switch has a center-off position. In this position

power is left on the control and on the motor field, but drive will not run. The switch is spring-loaded in the "jog" position and returns to the center-off position when released and the motor coasts to zero speed. In the "jog" position the control also runs precisely as it would in the "run" mode, and if the "jog" switch is held down, the motor will accelerate to the speed set on the speed control knob. The switch may be left in the center-off position indefinitely with the main power switch still in the "on" position. If the drive is left unattended, however, it may be advisable to turn the control "on-off" switch off.

6.3 CONTROL WITH RUN-BRAKE OPTION BOX

This option box contains a braking resistor and a run-brake switch. In the "run" position, operation is as described under "Basic Control". When the switch is activated to the "brake" position, the motor brakes rapidly to a stop. In the "brake" position, electrical power remains on the control and on the motor field. The control system may thus be shut down by leaving the run-brake switch in the "brake" position. It is permissible to leave the control system unattended in the "brake" mode with the control unit "off-on" switch on. CAUTION: The main power switch must be turned off if any part of the system requires servicing.

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6.4 CONTROL WITH FORWARD-BRAKE-REVERSE OPTION BOX

Operation of this system is identical to that of the "run-brake" system except that the switch in the option box has a third position, "reverse", which reverses motor rotation. The switch has a mechanical delay in the center "brake" position which prevents an operator from switching rapidly from "forward" to "reverse". For relatively low inertia loads, this delay is long enough to allow the motor to brake to a stop before the switch is reversed. If the motor is connected to a high inertia load, however, the braking time may be longer than the mechanical delay which the switch forces. In this case the operator should watch the motor to assure it has stopped before attempting to reverse motor rotation. Otherwise, the fuses may blow. The comments of the previous section concerning leaving the control "on" in the "brake" mode apply.

6.5 OPERATORS NOTE

SPARTAN II control units (except for the open chassis types) will have a light labeled "overload" or "fuse" on the face plate. This light burns if control is operating normally. If power is on and light is not burning, it is probable that a fuse has blown and that the control requires service.

7. TROUBLE SHOOTING

7.1 TROUBLE SHOOTING TABLE

The majority of major malfunctions which might be encountered may be stated simply as:

- (a) Motor does not run.
- (b) Motor runs only at full speed or over speed.
- (c) System blows fuses or breakers repeatedly.
- (d) Motor operation unstable.

Table V tabulates these malfunctions, probable causes, and actions required for testing. If fuse blowing is the problem, read Table V and then start the checkout procedure of Section 7.1.1 (115 volt controls) or 7.1.2 (230 volt controls).

WARNING: Dangerous voltages are present in the control housing and at the motor terminals. Only personnel familiar with electrical test procedures, test equipment and safety precautions should attempt these tests. Do not allow switch terminals, fuse block terminals or pot terminals to touch control housing.

Before starting tests which require disassembly of the SPARTAN II unit, read Paragraph 7.2, "General Test Procedures", and observe caution notes therein.

7.1.1 TROUBLE SHOOTING PROCEDURE: 115 VOLT CONTROLS

If fuses blow, a light bulb checkout procedure may be used without danger of damaging the control and without excessive

fuse blowing during checkout. Proceed as follows:

- (a) Turn power off at the service disconnect ahead of the control.
- (b) Connect a 120 volt 100 watt incandescent light bulb in series with the ungrounded AC input line (L1).
- (c) Replace control fuse if it is blown.
- (d) Disconnect A1, A2, and field wires at the motor. Insulate wire ends.
- (e) Turn power on; turn the control "on-off" switch "on". Bulb should not burn at any setting of the speed control pot. If bulb burns, either the SPARTAN II control is defective or external wiring to the control contains a fault.
- (f) If bulb burned in step (e), turn all power off and disconnect all external wiring to S1 TB and S2 TB except for the two AC input lines. With bulb still inserted in series with AC line as in step (b), turn power on and turn control "on-off" switch "on". If bulb still burns, the SPARTAN II unit is defective and requires servicing. Proceed per sections 7.2, 7.3 and 7.4. If bulb does not burn, start reconnecting all external wires one at a time until the wire is located which causes bulb to burn. Repair or replace all defective wiring.

(g) If no faults are located in the preceding steps, leave light bulb connected as in the preceding steps and reconnect A1 and A2 wires at the motor. Leave field wires disconnected and insulated. Set speed control pot at zero and turn on all power. Light should not burn. Increase speed setting to 20%. Lamp brilliance should increase smoothly to nearly full brilliance. (Note - lamp flicker and erratic brilliance may be observed at settings above 15% or 20% - this is normal).

(h) Repeat step (g) with motor field wires connected. Results should be similar except that bulb will burn at about 1/2 brilliance with speed control set at zero (due to motor field current) and will increase to nearly full brilliance at a 15% or 20% setting of the speed pot.

(i) If operation is normal in all preceding steps, remove light bulb and reconnect all wiring for normal operation.

(j) If occasional fuse blowing occurs, an intermittent short or ground is indicated. Inspect motor leads and motor brush pigtails for possible faults. Inspect SPARTAN II unit for loose foreign objects (washers, nuts, wire clippings, etc.) Test all external wiring.

7.1.2 TROUBLE SHOOTING PROCEDURE, 230 VOLT CONTROLS

If fuses blow a light bulb checkout procedure may be used

without danger of damaging the control and without excessive fuse blowing during checkout. Proceed as follows:

Perform all of the steps used in checkout of 115 volt controls (section 7.1.1) except with the following changes:

(a) Use two 115 volt 100 watt light bulbs connected in series in each of the two AC input lines (a total of four bulbs). This is necessary since both lines may be "hot" in a 230 volt service and either line may be susceptible to faults to ground.

(b) Results should be the same as in the preceding section (7.1.1) except that bulb brilliance will be less than that described for 115 volt controls because of the number of bulbs used.

TABLE V
TROUBLE SHOOTING PROCEDURE

MALFUNCTION	PROBABLE CAUSE	ACTION
(a) Motor does not run.	(a) AC input to control not present.	Routine test.
	(b) Fuse blown.	Remove fuse, check with ohmmeter.
	(c) Terminals C and D of 52 TB not shorted (must be shorted to run). If control has an option box, option box switch must be in "Forward", "Reverse", or "Run" position to operate motor. Option box switches apply the short. If option box is not present, short is applied on 52 TB.	Turn power off and test (with ohmmeter) between C and D on 52 TB for zero ohms.
	(d) Armature circuit of motor open.	Check wiring to motor; test motor per 7.4.1.3.
	(e) Motor jammed mechanically.	Rotate motor shaft manually to check.
	(f) Sensing resistor (R71) in control unit open or connections loose.	Check R71. Normal resistance is less than 1 ohm. Check for loose connections.
	(g) Speed pot open or incorrectly connected.	Disconnect wires from speed pot at 52 TB E, F, and G. Check pot per 7.4.2. Reconnect.
	(h) Problem on circuit board 1498.	Test board per 7.4.4.
(b) Motor runs only at full speed or over-speed.	(a) Motor field open.	Check wiring to motor field. Check motor per 7.4.1.2.
	(b) Field voltage to motor absent or low.	With system running, check voltage between motor leads F1 and F2. Should be 100V DC (200 V DC in 230 volt units). If low, check AC line voltage and rectifiers in control unit (per 7.4.3).
	(c) Faulty SCR in control unit.	Test SCR's per 7.4.3.
	(d) Speed pot faulty or incorrectly connected.	Test speed pot per 7.4.2.

	(e) Problem on circuit board 1498.	Remove circuit board 1498. If motor stops, test board per 7.4.4. If motor still runs, problem is not on circuit board.
(c) System blows fuses or breaker repeatedly.	(a) Incorrect AC input voltage.	Routine test. Compare AC input voltage against warning stickers on control.
	(b) Incorrect connections between motor and control.	Routine test. Compare with connection diagrams in back of manual.
	(c) Accidental short between terminals on control unit or option box.	Routine test and visual inspection.
	(d) Motor overloaded. (Note - If fuse blows immediately at turn-on, use procedure of page 16a or page 16b).	Disconnect load from motor shaft and re-test. Alternate: Place DC ammeter (not clamp-on type) in series with A1 lead at motor and note current, compare with motor nameplate.
	(e) Motor faulty.	Disconnect all leads from motor and test control per 7.1.1 or 7.1.2 (Steps a-a). If bulbs do not burn, test motor per 7.4.1.
	(f) Motor locked mechanically.	Rotate motor shaft manually.
	(g) Rectifier or SCR stud shorted to control unit housing.	Test per 7.4.3.1.
	(h) Shorted rectifier or SCR in control unit	Test per 7.4.3.2.
(d) Motor operation unstable (hunting or bumping).	(i) Shorted wiring in control unit.	Routine test and visual inspection.
	(a) "IR" trim pot set too high.	Rotate "IR" trim pot counterclockwise (RF-5.1) and re-test.
	(b) Yellow jumper on board 1498 not in place. (Doesn't apply to tach-feedback systems or systems that use external filtering.)	See Fig. 2. TP-D and TP-C must be shorted by plug-in jumper (except in the indicated applications). Install jumper if absent.

7.2 GENERAL TESTING PROCEDURE

7.2.1 Precautions to be Observed

7.2.1.1 - Use a Simpson Model 250 Multimeter (or equivalent) for making the tests, unless otherwise indicated. When an ohmmeter is called for in test procedures, use one of the ohms scales on the Model 250 Multimeter. Do not use electronic type voltmeters which require plugging into AC power.

7.2.1.2 - All test points on both the motor and the control unit are electrically "hot" with respect to control housing, to motor frame, and to conduit ground. Be extremely careful not to short any of these points to housing or frame.

7.2.1.3 - When testing voltages inside the control unit, use small diameter probes insulated except for a very small tip area, or "minigator" clips with insulating sleeves.

7.2.1.4 - Be sure electrical power is off when making continuity or resistance checks.

7.2.1.5 - Unless otherwise noted, always disconnect the motor from the control unit when making motor tests per 7.4.1.

7.3 DISASSEMBLY

Except on open chassis controls, parts of the control housing must be removed to gain access to test points. Proceed as follows if removal is called for.

7.3.1 Face Plate Removal - Turn power off at branch disconnect ahead of control unit. Remove four screws that attach face plate. Allow face plate to swing forward it will be held in place by the wire bundle. Support face plate as necessary.

7.3.2 Removal of Circuit Board 1493 - Remove four screws which attach upper end plate. Remove upper end plate. Slide circuit board upward and out of control housing. Always tilt face plate out first (7.3.1).

7.3.3 Removal of Lower Cover Plate - This plate covers the exposed studs of the rectifiers and SCR's. Remove upper end plate per 7.3.2. Slide lower cover plate upward and out of control enclosure.

7.4 SPECIFIC TEST PROCEDURES

7.4.1 Motor Tests - Turn power off at branch disconnect for all motor tests. Disconnect and identify all wiring to motor at the motor.

7.4.1.1 Shorts to Frame - Using a Megger set for 400 volt test potential, check leakage resistance between the A1, A2, motor field leads and the motor frame. Readings of less than 10,000 ohms indicate possible problems. A dead short indicates need for immediate repair. Checks for dead shorts may be made with an ohmmeter or a continuity tester if a Megger is not available. Retest while rotating armature by hand.

7.4.1.2 Open or Shorted Field - Check resistance between the motor field leads. Resistance should be between 100 ohms and 600 ohms depending on motor size.

7.4.1.3 Open Armature - Check resistance between the A1 and A2 motor leads (ohmmeter, RX1 scale). Resistance should be low (less than 10 ohms). Rotate armature slowly, while observing ohmmeter. A high resistance reading at any point in a revolution is a trouble indication. Armature "opens" are usually the result of bad brushes, burned commutator segments, or severed wires.

7.4.2 Speed Pot Test

7.4.2.1 - Inspect for Proper Connection - The wiper (center terminal) of the speed pot must terminate on 52 T3, Lug F. The outer terminals of the pot terminate on lugs E and G. If control works, but speed pot works "backwards", the connections to lugs E and G are reversed.

7.4.2.2 - Test Speed Pot for Fault - Disconnect power to control. Disconnect the three speed pot wires at Terminals E, F and G of 52 T3. Identify wires for proper reconnection. Read resistance between outer two terminals of pot on ohmmeter. Resistance should be 1000 ohms $\pm$ 10%. Read resistance between center terminal of pot and an outer terminal. As pot shaft is rotated, resistance should vary smoothly from near zero to 1000 ohms (or the reverse). Jumpy readings indicate a faulty pot. Repeat with ohmmeter connected between the other outside terminal and the center terminals (wiper). Reconnect wires to Terminals E, F and G of 52 T3 after tests.

7.4.3 Rectifier and SCR Tests

7.4.3.1 Stud-to-Heatsink Shorts - All stud mounted rectifiers and SCR's are insulated from the heatsink (main enclosure) by a thin heat-conducting washer (mica or a special plastic) and a through-hole bushing. Shorts between the stud and the heatsink can occur if the washer is damaged. Before testing, turn power off at branch disconnect. Fold face plate out per 7.3.1 (enclosed controls) and remove circuit board per 7.3.2. Using an ohmmeter with one lead connected to the grounding lug on the control housing, touch the other lead to each rectifier and SCR stud, one at a time. No reading (no continuity) should be observed on the meter. If high voltage breakdown of the washers is suspected, a Megger set

for 100 volt test should be used in place of the ohmmeter.

CAUTION: Do not touch anything in the control with the Megger probes except the studs and ground lug. An observed stud-to-heat-sink short means that mounting hardware is faulty, but does not necessarily mean that the SCR or rectifier is faulty.

7.4.3.2 Tests for Faulty Rectifiers and SCR's - Simple tests with an ohmmeter cannot conclusively show that an SCR or a rectifier is good, but shorted or open rectifiers and shorted SCR's can be detected.

Fold face plate out per 7.3.1 (enclosed controls), and remove circuit board per 7.3.2. Disconnect A1, A2, and motor field leads at the motor. Use a Simpson Model 260 Multimeter set on the R x 100 scale; polarity switch should be "+ DC".

Connect meter leads to SCR 71 per Fig. 1. Meter should read a high resistance, equal to or near full scale. Reverse meter leads and repeat. This reading should also be high. Repeat on SCR 72.

Connect meter leads to D71 per Fig. 1. Meter should read a high resistance, near full scale. Reverse meter leads and repeat. Meter should now read a low resistance, on the order of 500 ohms, but not zero. Repeat on rectifiers D72, D73, D51 and D52. Note that D51 and D52 are mounted on the output printed circuit board, and that they are not

accessible. Test as shown in Fig. 1. Be sure that all fuses are good and that printed circuit conductors leading to D51 and D52 are intact.

If any of the readings which should be "high" fall as low as the readings described as "low" in the preceding paragraph, the device is faulty. If a rectifier does not have a "low" reading in one direction per the preceding paragraph, the rectifier is "open".

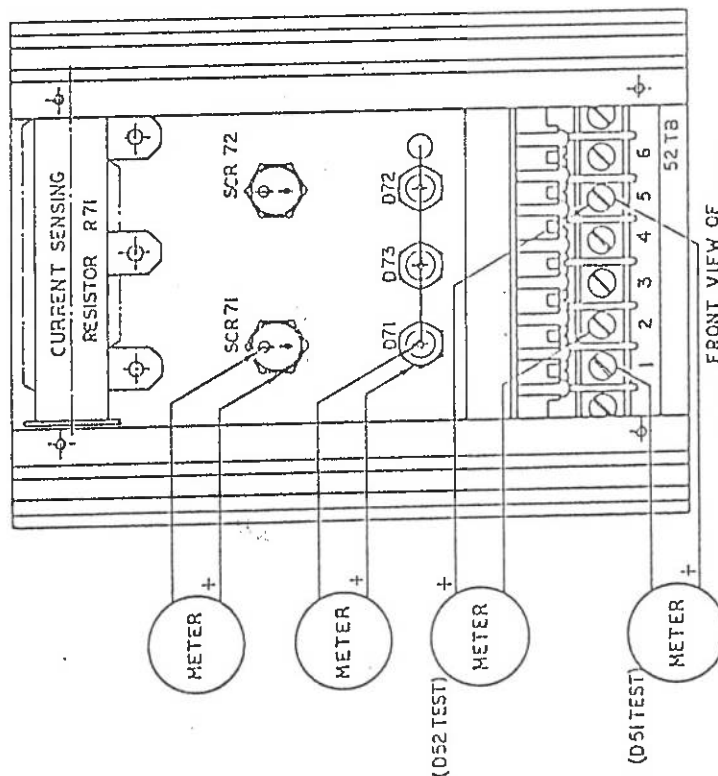
If results on all rectifiers are the reverse of those described ("high" and "low" readings reversed), and if a multimeter other than the specified one was used, the meter is probably a "reverse polarity" type on "ohms" ranges, and the rectifiers are probably not faulty.

7.4.4 Circuit Board Tests (Board E1492) - Swing face plate outward per 7.3.1. Turn power on. Observe all precautions given in 7.2. Set up speed pot per Fig. 2 and make voltage measurements as shown in Fig. 2.

7.4.4.1 - Interpretation of Readings - (Refer also to functional schematic of board given in Fig. 3)

(a) If reading (3) is as shown but reading (2) is zero, the board is faulty (R33 open or D6 or C9 shorted).

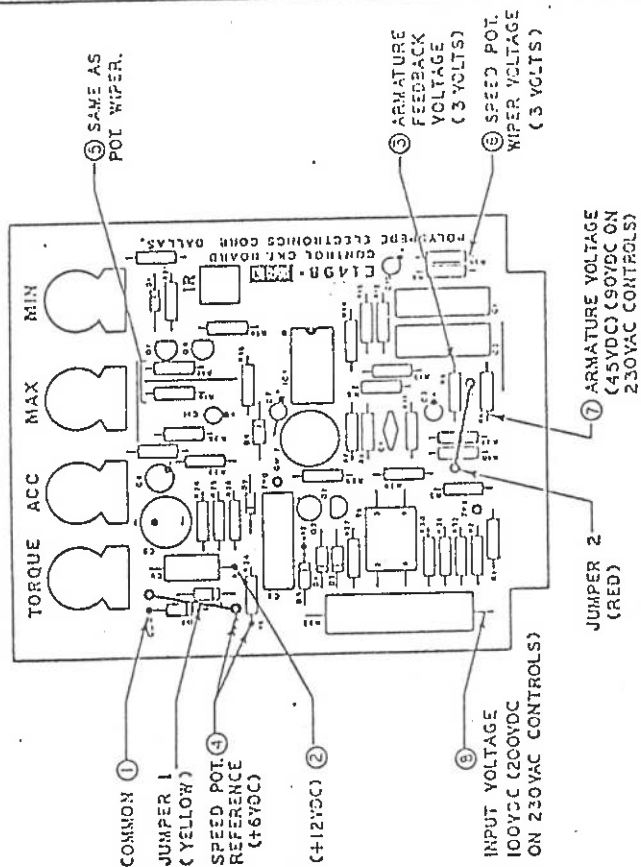
FIG. 1.
RECTIFIER AND SCR TEST



FRONT VIEW OF
SPARTAN II. CHASSIS, CIRCUIT
BOARD REMOVED

METER: SIMPSON MODEL 260 MULTIMETER SET ON THE
"RX 100" SCALE, "+" DC POLARITY.

FIG. 2
TROUBLE SHOOTING TEST POINTS
ON BOARD E1498



NOTE:

JUMPER 1 SHOWN IN INTERNAL
TORQUE LIMIT MODE.
JUMPER 2 SHOWN IN ARMATURE
FEEDBACK MODE.

MEASUREMENTS MADE WITH SPEED POT SET
AT 50%.

USE SIMPSON MODEL 260 MULTIMETER OR
EQUIVALENT.

NEGATIVE LEAD ON METER CONNECTED TO
POINT 0 FOR ALL MEASUREMENTS.

VOLTAGES APPROXIMATE - 10% DEVIATION
IS NOT A TRIBLE INDICATION.

- (b) If reading (6) is as shown but (5) is zero or some small value, IC-1 may be at fault or ACC pot open; or C5, Q1 or Q4 shorted.
- (c) If reading (4) is as shown but reading (6) is not, either speed pot or wiring leading to speed pot is faulty.
- (d) Readings (3) and (5) should be nearly identical.
- If reading (5) is as specified but (3) is high or low, check board to be sure jumper 2 (Fig. 2) is correctly in place and not loose.
- (e) If jumper 2 is correct and if reading (3) is high and motor overspeeding, but stops when board is removed, the board is faulty.

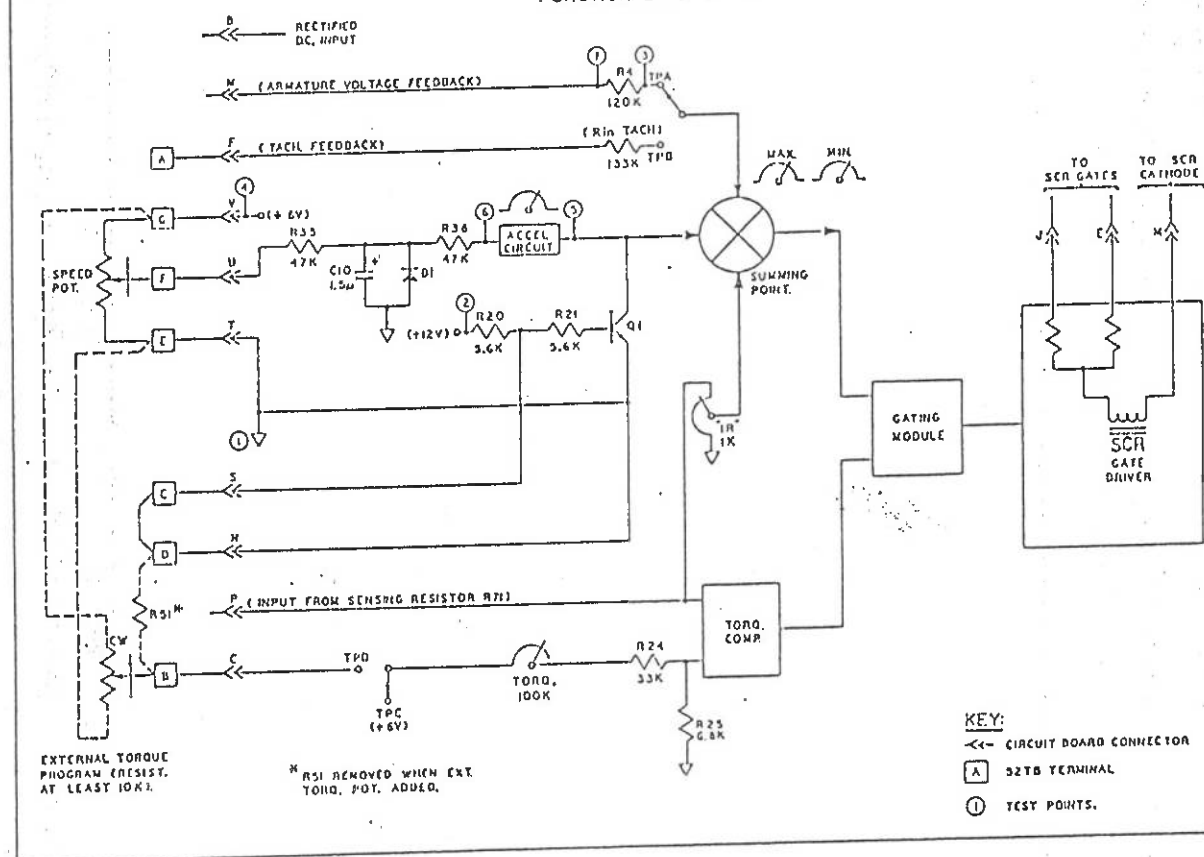
8. REPAIR

Repair service for all types of repair is available at the factory. For on-site repairs, proceed as follows. Use rosin core solder only.

8.1 MOTOR REPAIR

Motor repairs, other than routine brush replacement, should be referred to a reputable motor repair shop, or the motor should be returned to the factory for repair.

FIG. 3
SPARTAN II CIRCUIT BOARD
(BOARD 1498)
FUNCTIONAL SCHEMATIC



8.2 ROUTINE REPAIRS ON CONTROL

Replacement of the speed pot, fuses, switches and replacement of the plug-in circuit board can be handled by any qualified serviceman experienced in repair of electronic equipment. Use Polyspede replacement parts.

3.3 REPLACEMENT OF STUD-MOUNTED RECTIFIERS AND SCR'S

Only repair personnel experienced in the mounting of these components should attempt field replacement. Use Polyspede replacement parts. Insulating washers are special heat-transfer types. Do not use ordinary insulating washers for replacement. Proceed as follows:

8.3.1 - Turn power off at branch circuit disconnect. Remove faceplate per 7.3.1 (enclosed controls). Remove circuit board per 7.3.2 (enclosed controls). Remove lower cover plate (enclosed controls). Remove control mounting screws, detach conduit (if used), and disconnect all input wires (identify wires). Move control unit to work-bench.

8.3.2 - Unsolder top connections of rectifier or SCR to be replaced. Loosen the nut which holds the stud of the device; do not allow the device itself to turn as nut is removed. Remove the device and the insulating washer and sleeve.

8.3.3 - Clean the heatsink mounting area with a lint-free cloth and inspect area for burrs. Use a new insulating washer. Apply silicone grease (Dow Corning #4 compound or Makelard type 122) to both sides of washer. Do not allow dirt, metal particles, etc. to come in contact with greased surfaces. Small particles can puncture the washer. Replace the insulating sleeve in the heatsink mounting hole. Install the new rectifier and the insulating washer. Thread the mounting nut on the device stud. Hold the device body securely; do not allow it to turn as the nut is tightened. Tighten nut to 20 in-lbs torque. Test for a stud-to-heatsink short per 7.4.3.1 after tightening nut. Resolder top connections, reassemble control, remount and reconnect.

8.3.4 - Follow the turn-on procedure given in 7.1.1 (115V controls) or 7.1.2 (230V controls).

8.4 CIRCUIT BOARD REPAIR

Circuit board repair should not be attempted in the field. Replace the circuit board as an assembly and return the faulty board to the factory for repair. Circuit boards damaged by attempts at field repair are not covered under warranty. Credit cannot be allowed on board assemblies in which the board itself is damaged.

8.5 SPARTAN II REPAIR PARTS

115 VOLT CONTROLS

DESCRIPTION	SCHEMATIC DESIGNATION	IDENTIFICATION NUMBER	NOTES
On-off switch	S91		Specify "115V"
Fuse		A13 x 25	
*Speed pot	Pot 91	1000 ohms	
Speed pot knob			
*Mounting hardware kit			Contains insulating hardware for mounting 2 SCR's & 3 rectifiers
*SCR	SCR 71 SCR 72		
*Power rectifier	D71, D72, D73		
*Field rectifier	D51, D52		
Sensing resistor	R71		
Heatsink board		1445	Board only with terminals
Face plate assembly, wired		B1205-000-00	Wired assembly Specify "115V"
*Circuit board assembly		1498	Includes all components, mounted & wired
Input-output circuit board assembly		B1203-000-00	Includes all components, mounted & wired Specify "115V"
Heatsink assembly		B1207-000-00	Includes all components, mounted & wired Specify "115V"

Specify control voltage and type (SPARTAN II) on order. If parts are for repair of a specific control, specify serial number and model number.

* Parts recommended for customer stocking.

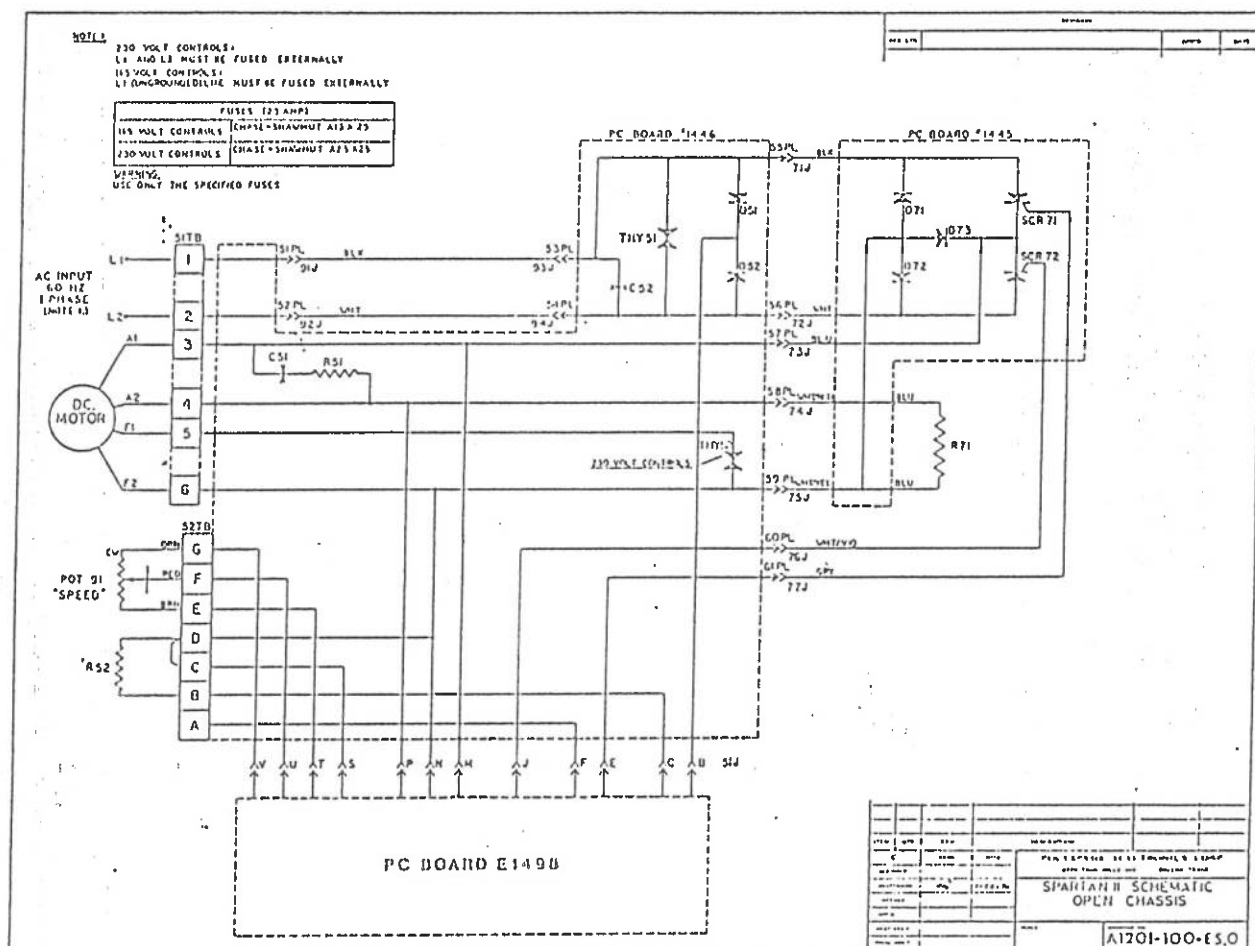
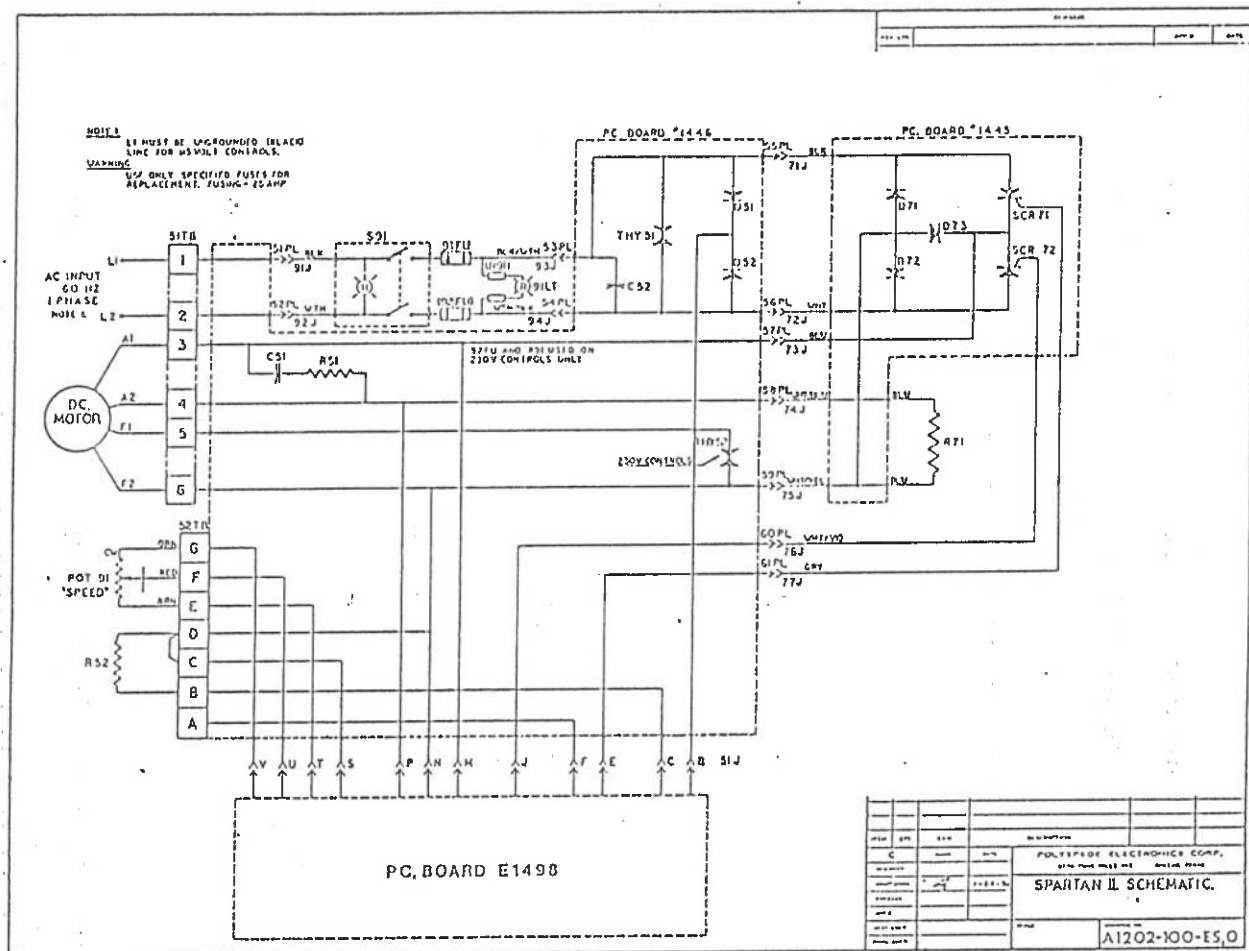
8.6 SPARTAN II REPAIR PARTS

230 VOLT CONTROLS

DESCRIPTION	SCHEMATIC DESIGNATION	IDENTIFICATION NUMBER	NOTES
On-off switch	S91		Specify "230V"
Fuse		A25 x 25	
*Speed pot	Pot 91	1000 ohms	
Speed pot knob			
*Mounting hardware kit			Contains insulating hardware for mounting 2 SCR's & 3 rectifiers
*SCR	SCR 71 SCR 72		
*Power rectifier	D71, D72, D73		
*Field rectifier	D51, D52		
Sensing resistor	R71		
Heatsink board		1445	Board only with terminals
Face plate assembly, wired		B1205-000-00	Wired assembly Specify "230V"
*Circuit board assembly		1498	Includes all components, mounted & wired
Input-output circuit board assembly		B1203-000-00	Includes all components, mounted & wired Specify "230V"
Heatsink assembly		B1207-000-00	Includes all components, mounted & wired Specify "230V"

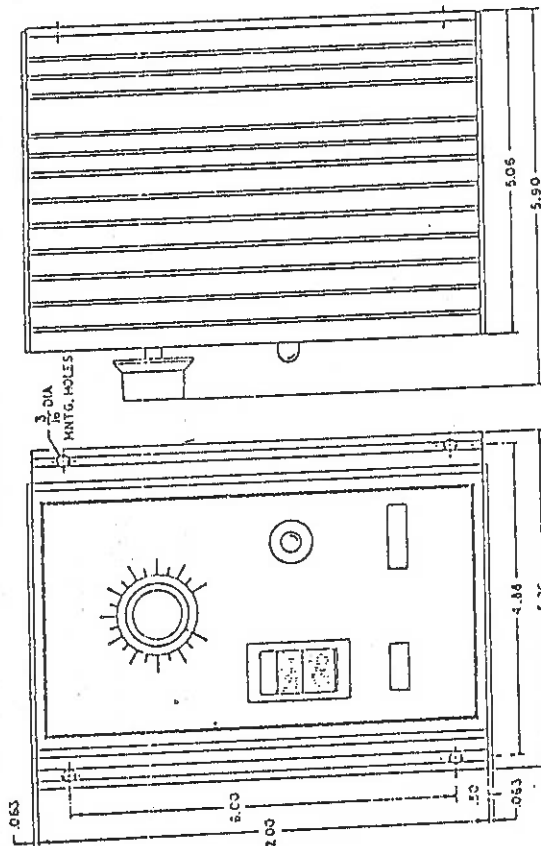
Specify control voltage and type (SPARTAN II) on order. If parts are for repair of a specific control, specify serial number and model number.

* Parts recommended for customer stocking.



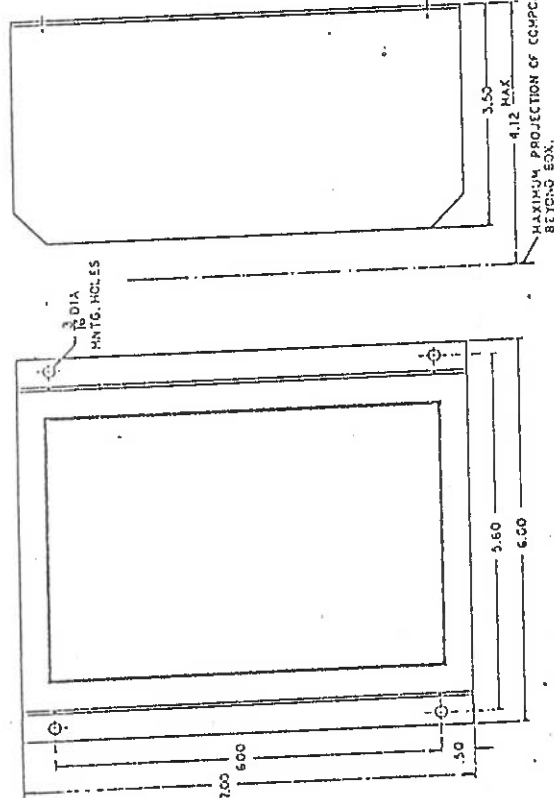
DIMENSIONS:

SPARTAN II. CONTROL

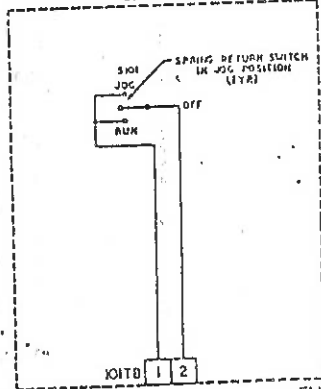


NOTE: ALLOW 2" CLEARANCE ABOVE AND BELOW FOR COOLING.

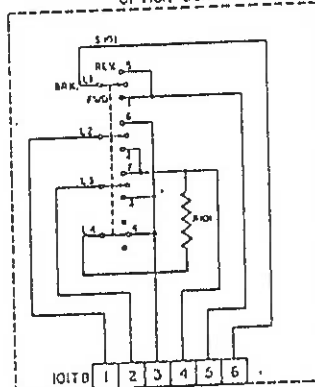
SPARTAN II. OPTION BOX



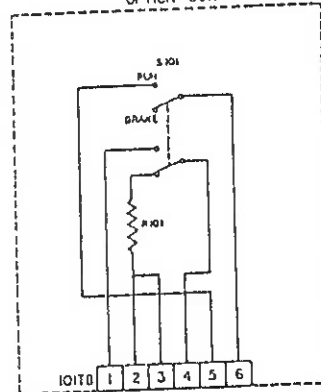
RUN-JOG
OPTION BOX



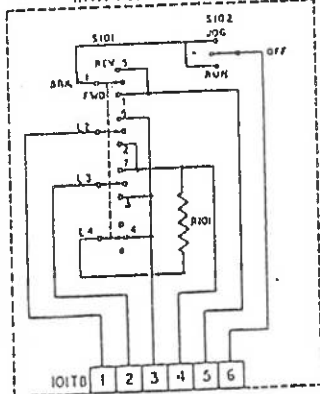
FWD-BRAKE-REV.
OPTION BOX



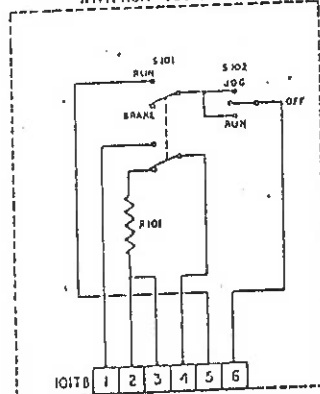
RUN-BRAKE
OPTION BOX



FWD-BRAKE-REV.
OPTION BOX
WITH RUN-JOG ADDED



RUN-BRAKE
OPTION BOX
WITH RUN-JOG ADDED



11.4. OPTION BOX SCHEMATICS.

9. PERIODIC MAINTENANCE

Blow dust accumulations off of the control unit periodically with an air hose. Inspect motor brushes and determine the replacement intervals required by the particular application. Motor bearings are pre-lubricated for long life operation without regreasing.

10. SYSTEM FLEXIBILITY

The SPARTAN II drive was designed as a basic building block which can be incorporated into relatively complex systems, including automated processes. Several unique features of the control unit are not described in this basic manual, but are covered in supplementary application bulletins. See also section 12.0 herein.

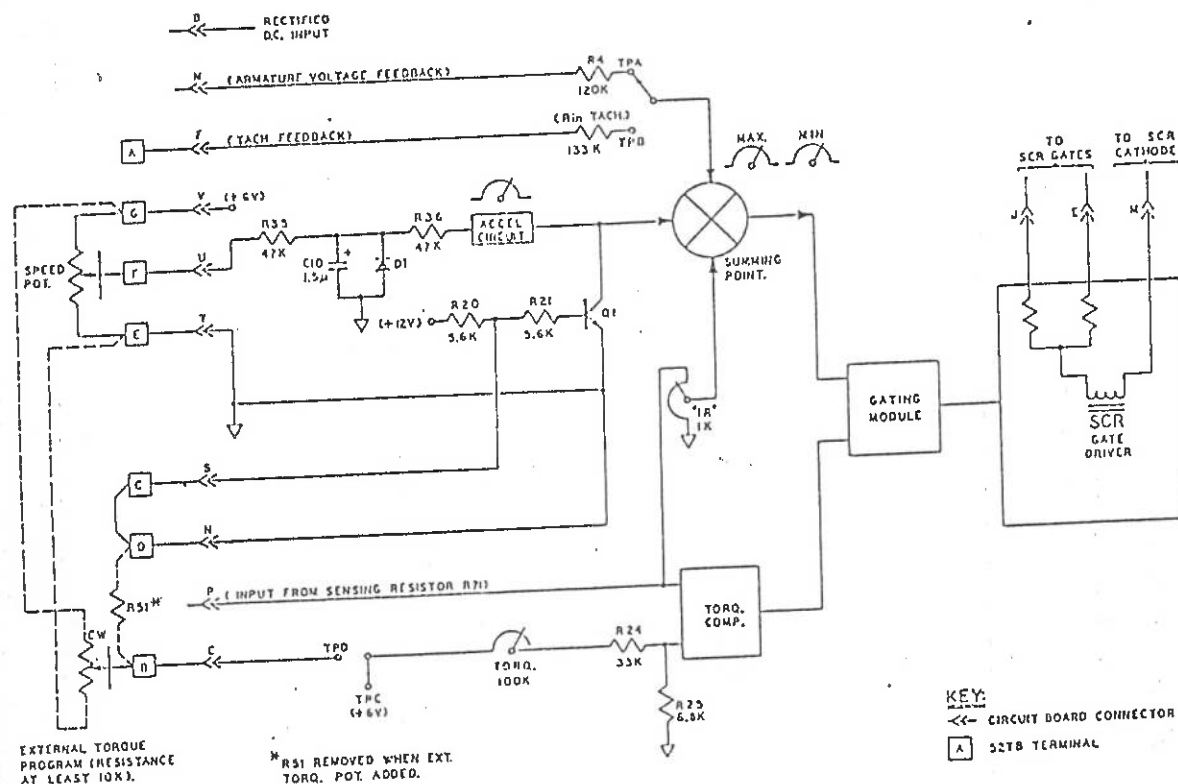
11. SCHEMATICS AND TECHNICAL DESCRIPTION

Schematics included in this section are for reference use and for use in servicing the control.

11.5 CIRCUIT DESCRIPTION (Refer to Functional Schematic (Fig. 3)).

A regulated +6 volts DC is applied to the speed potentiometer. The voltage on the wiper is applied via an acceleration circuit to a summing point. IR compensation and speed feedback voltages

FIG. 11.5.1
SPARTAN II CIRCUIT BOARD
(BOARD 1498)
FUNCTIONAL SCHEMATIC



are also summed at this point. The amplified difference voltage at the output of the summing point is applied to the gating module.

Provided that load conditions are such that the torque comparator section is not active, the amplified difference voltage from the speed summing point is transmitted through the gating module to the SCR gate driver.

The gate driver generates pulse of such a phase as to adjust the armature voltage to a value which will maintain a null at the summing point.

Functionally the SCR gate driver is a voltage controlled phase shift generator.

If armature current rises to a level such that the voltage from the sensing resistor R71, applied to the torque comparator, exceeds a fixed value set by the torque limit pot, the torque comparator takes control of the gating module. The unit is now under torque control. When this condition exists the load current is held at a constant value and if the load is further increased armature current will stay fixed but the speed will drop. In torque limit the speed may drop to zero while still maintaining the same armature current. Therefore even if the motor locks, current is limited to the preset value, and so the motor is protected.

Acceleration is controlled by a linear integrator creating a linearly rising voltage, the final value of which is set by the speed pot setting and whose slope is controlled by the setting of the acceleration pot.

The "min" pot introduces a voltage into a summing point in the speed control line in order to set zero speed or some minimum speed condition desired. It may also be used to determine motor starting point relative to an external control voltage or current. External torque control may be provided by either a torque control voltage scaled to a maximum of 6 volts or by an external 10K pot connected to the internal 6V supply.

Tachometer voltage feedback may be used instead of armature voltage feedback. Circuit values are adjusted to accommodate tachometers with output voltages of 45 to 50 volts per 1000 rpm. Values other than this may be accommodated but require a component change on the board.

Transistor Q1, if allowed to conduct, forces the speed input to the zero volts level. Q1 is kept in a nonconducting state by a shorting jumper which forces the base of Q1 to zero volts. Removal of this jumper biases the transistor to saturation and thus inhibits the speed signal voltage.

In systems with braking, reversing and jogging operations the jumper is replaced by a switch which opens during braking, and between cycles during jogging, to effectively force a zero speed command. For normal operations Q1 must be held "off" by presence of the jumper or a switch closure.

12. APPLICATION DATA

In addition to the switch-operated reversing, braking and jogging option boxes described elsewhere in this manual, Polyspede offers custom-designed "SPARTAN II Systems" which consist of a standard SPARTAN II motor control unit mounted on a panel with various options, eg: contactors, external signal transducer, linear acceleration unit, special enclosures, etc. SPARTAN II systems can be designed to meet practically any user requirement. Polyspede recommends the use of these factory-designed systems. The following application data is provided, however, to aid knowledgeable users in designing their own motor control systems utilizing a basic SPARTAN II unit.

NOTE - Polyspede's warranty covers the SPARTAN II unit and (for the case of custom-designed SPARTAN II Systems) all factory-supplied accessories provided external connections to such systems are per factory specification. The following information is advisory

only. Warranty on the control unit is not extended to cover damage to the SPARTAN II control unit caused by improper use in user-designed systems.

12.1 CONTACTOR-OPERATED DRIVES

In certain applications, it may be necessary to start the SPARTAN II motor control system with a user's contactor. The contactor may be used to make and break the two AC lines, or it may make and break the two armature lines A1 and A2.

IMPORTANT

If the contactor is connected to make and break the DC lines (A1 and A2) a third set of normally open contactor contacts must be provided and connected to short 52 TB terminal C to 52 TB terminal D. The factory-installed jumper between these two terminals must be removed. (See connection diagrams, page .) The third set of contacts should be an auxiliary set with gold contact surfaces and preferably a wiping action since the circuit between terminals C and D is low level. Opening of the circuit between terminals C and D instantaneously resets the controlled acceleration circuit and prepares it for a "soft start" when the contactor is again activated.

If the contactor is connected to make and break the AC input lines, the connections to 52 TB terminals C and D are not necessary. In this case, however, it is necessary to allow

two seconds to elapse between contactor activations to allow the controlled acceleration circuit to "bleed down" and reset. (Rapid jogging not permitted.) Failure to reset the controlled acceleration circuit may cause fuses to blow on the next start-up cycle.

12.2 CONTACTOR REVERSING

External contactors or manually operated switches may be used to reverse motor rotation. This is accomplished by physically reversing the external connections between S1 T3 terminals 3 and 4 and the A1 and A2 input lines to the motor. In designing a reversing setup the following conditions must be met:

(a) The contactors (or switches) must be electrically or mechanically interlocked such that forward and reverse contactors cannot be activated simultaneously. Simultaneous operation would short out the control output and cause fuses to blow.

(b) Auxiliary contacts must be provided on both the forward and reverse contactors such that S2 T3 terminals C and D are shorted when either contactor is activated, but opened when neither contactor is activated (controlled acceleration reset). For further explanation of the operation of the "reset" circuit, refer to section 12.1 "Contactor-Operated Drives".

(c) The motor must be allowed to stop rotation before it is reversed. Reversing electrical power to a rotating motor ("plugging" the motor) causes high inrush currents which may damage the control unit, cause fuse blowing, or cause motor commutator damage.

In custom-designed SPARTAN II systems, Polyspede provides an anti-plugging relay which senses CEMF due to motor rotation and electrically prohibits activation of any contactor until motor rotation ceases.

12.3 BRAKING

In a contactor-reversed system it may be desirable to provide braking to cause rapid stopping of the motor and therefore to allow quicker reversing. If a power resistor (5 ohms 75 watts in 115 volt systems or 10 ohms 75 watts in 230 volt systems) is connected across the motor armature leads (A1 and A2) after the control has been disconnected from the SPARTAN II unit by contactor release, the motor will act as a generator and brake to a stop. (Larger wattage resistors will be required for high-inertia loads or frequent stops and starts.) The braking resistor must be removed from the circuit before power is re-applied.

12.4 JOGGING

If rapid starts and stops are required, do not use the "on-off" switch. Stop the drive by removing the jumper between 52 T3 terminals C and D, and start the drive by re-applying the jumper. See Fig. 3.4.3 and Fig. 11.4 for schematic. Read Section 6.2. See also note in Para. 12.1 concerning contact surfaces.

12.5 EXTERNAL TORQUE LIMIT ADJUSTMENT

The internal "torque" adjustment trim pot is a calibration adjustment trim pot used to preset torque. If it is desirable to add an externally adjusted torque pot proceed as follows:

- Remove 1500 ohm 1/2 watt resistor connected between 52 T3 terminals B and D (if present).
- Connect a 10K ohm potentiometer between 52 T3 terminals G, E, and B as shown in Fig. 12.6.3.
- Clockwise adjustment of the 10K pot will adjust torque output from 0 to 150% of rated torque. If 0 to 100% rated torque is desired the external pot should be set fully clockwise and the internal trim pot set for 100% torque.
- Use good quality totally enclosed potentiometers as a defective pot could cause unlimited torque program conditions.

EXTERNAL SIGNAL PROGRAMMING

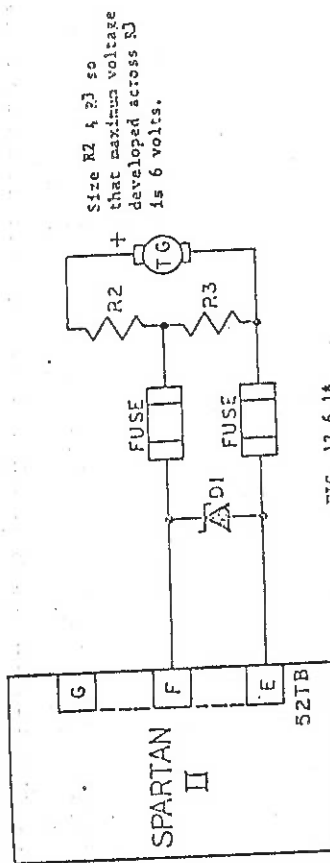


FIG. 12.6.1*
EXTERNAL VOLTAGE SOURCE
(Typical Tachometer Follower Circuit)

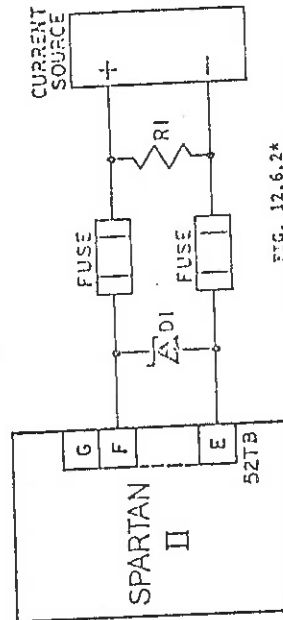


FIG. 12.6.2*
EXTERNAL CURRENT SOURCE
(Process Instrument)

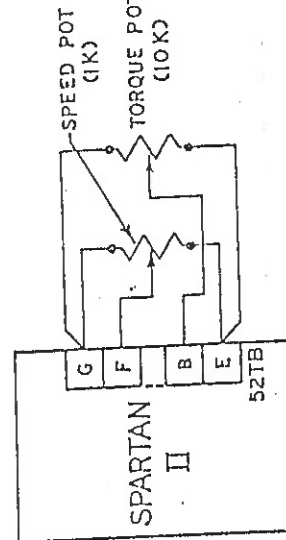


FIG. 12.6.3
EXTERNAL TORQUE LIMIT

12.6 EXTERNAL SIGNAL PROGRAMMING

12.6.1 SPEED

The SPARTAN II control unit can be programmed by an external current signal taken from a process instrument or by an external voltage signal taken from a DC tachometer or other DC voltage source. Basically, any DC voltage which varies from zero to six volts may be applied between 52 T3 to terminals E and F to vary speed from zero to 100%. Speed will vary directly and linearly with the applied voltage. Also, the control will not "load" the signal source since its input impedance at terminal F is high (typically greater than 100,000 ohms). The following general procedure applies:

- a) Disconnect the 3 speed-pot wires from 52 T3 terminals E, F, and G.
- b) Connect the external signal source to 52 T3 through a transducer constructed per Figures 12.6.1 or 12.6.2.
- c) If the external signal source is not isolated from the A.C. lines, or if one side of it is connected to ground, A.C. power must be supplied to the SPARTAN II control by an isolation transformer (preferably an electrostatically shielded type.)

In Fig. 12.6.2, the "min." adjustment in the SPARTAN II control is re-adjusted so that the low-level currents (1, 4, or 10 ma levels) cause zero speed output. In both Figures, the fuses and the zener diodes protect the SPARTAN II inputs against accidental polarity reversal, voltage transients, and accidental grounding of the input wires without affecting accuracy of the system. Do not omit these components.

12.6.2 TORQUE

An external signal may be used to program torque. A voltage of six volts will give that torque preset by the internal torque pot.

If a larger value of programming voltage is available it must be scaled down by a voltage divider so that the maximum voltage available on terminal B of 52 T3 is six volts.

A voltage variation of from zero to six volts between terminals B and D of 52 T3, (positive on B) will give a torque variation of from zero to that value preset by the internal torque control.

The yellow jumper on the 1493 circuit board will have to be moved from TFC to TPD to utilize the external torque programming feature.

12.7 TACHOMETER FEEDBACK

The SPARTAN II control unit may be connected to utilize tachometer feedback rather than armature feedback if higher precision in speed control is desired.

To accommodate tach feedback the following procedure should be followed:

- a) Change the red jumper from TPA to TPB
- b) Set IR pot to zero (fully counter clockwise)
- c) Connect tachometer leads with positive lead to terminal A and negative lead to terminal D on 52 TB. If the drive system is connected for reversing, the tachometer leads must be reversed when motor rotation is reversed so that terminal A is always positive.
- d) When in operating condition readjust "max" pot for desired maximum speed. If an AC tach is used a full wave bridge rectifier should be used with the positive bridge connection going to terminal A and negative to terminal D on 52 TB.

NOTE: Circuit constants are designed for a tach voltage of 45 - 50 volts per 1000 rpm. If tach voltage varies radically from this the factory would have to be consulted for circuit board modifications.

12.8 OPERATION IN ENCLOSURES

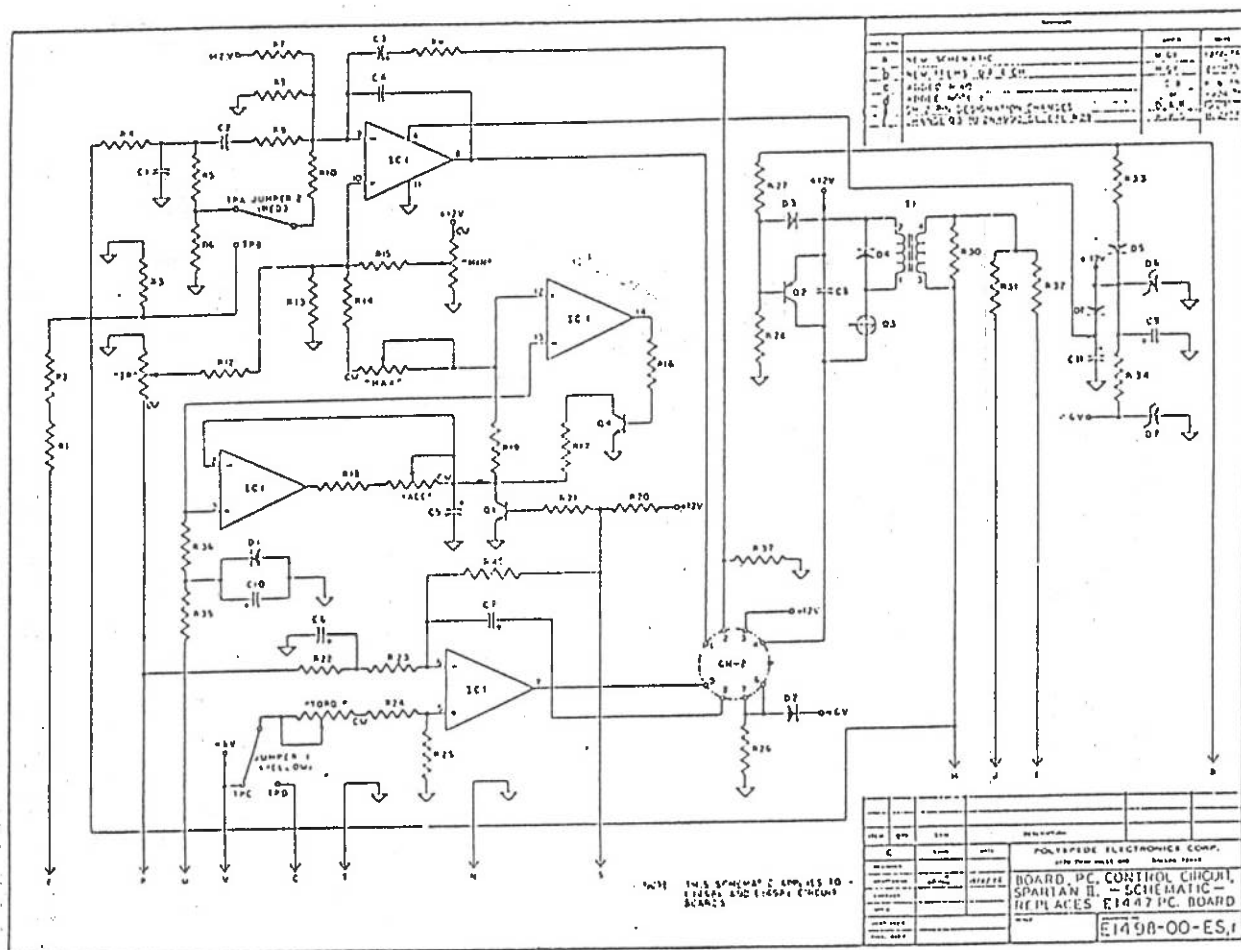
The SPARTAN II unit is designed for use at full rated power in open areas with air temperatures of 40°C (104°F) or lower. If the SPARTAN II unit is mounted inside a non-ventilated enclosure (NEMA 12 or NEMA 4) and operated at maximum 10 amp DC output (1 HP at 115 AC, or 2 HP at 230 volts), it is likely that air temperature inside the enclosure will exceed 40°C and the unit will overheat. Operation in enclosures may, however be accomplished as follows:

Fan Cooling - Add a small fan inside the enclosure to move air across the fins of the SPARTAN II unit. This increased cooling efficiency will allow operation in air temperatures up to 60°C (140°F) which will cover most cases. A ROTRON "muffin" fan (50 to 100 cfm) or PAMOTOR series 4500 are sufficient.

Situations in Which Fan May Be Omitted - If the enclosure is large and contains no other components which generate significant heat, or if room temperatures are exceptionally low (e.g. always 72°F) or if the average load on the SPARTAN II unit is small (e.g. under 1/2 HP application), the fan may be omitted. Maximum case temperature of 30°C (measured on the cold aluminum case) is the determining factor. When in doubt, use the fan.

12.9.1 ENGINEERING DATA

Maximum permissible case temperature (on gold housing) is 30°C. For estimating purposes, assume that the SPARTAN II case temperature will rise 40°C above enclosure air temperature in 1 HP, 115VAC controls (or in 2 HP, 230VAC controls). Also for these two cases internal power dissipation is 38 watts and 41 watts respectively.



OPERATING and MAINTENANCE INSTRUCTIONS

CONSTRUCTION: Your rotary pump is a precision product with only .0015" - .005" total clearance at the top and ends of the rotor (depending on the model). The unit is built of steel and cast iron and is designed for pumping dry air. Protect it from excessive dirt and moisture, give it proper care and preventative maintenance and you will receive years of trouble free service.

INSTALLATION: The pump and its solid base (preferably metal) should be anchored to either a shelf, the floor or another piece of machinery. To save time and avoid inconvenience, position the pump to provide easy access to all lubricators, filters and mufflers.

CONNECTIONS are standard pipe thread. Be sure to use lines of the same diameter as connections. If the distance is great, use lines with a larger diameter than connections. Give lines a uniform slope, place drain cock at low point, and avoid extra elbows. For ease of servicing, use a union or hose with clamps near the pump (a hose helps eliminate noise and vibration). If a vacuum/pressure supply tank is used, slope the line towards tank, provide a drain at the bottom, and place a check valve between the tank and pump so the pump will not run backwards when turned off.

ACCESSORIES such as mufflers, filters, gauges and relief valves are useful and very important. Mufflers reduce the noise level, filters provide cleaner air, gauges indicate performance and relief valves will reduce work load of the pump where maximum performance is not required.

WARNING - THE MOTOR MAY BE THERMALLY PROTECTED AND CAN AUTOMATICALLY RESTART WHEN THE PROTECTOR RESETS. ALWAYS DISCONNECT POWER SOURCE BEFORE SERVICING.

LUBRICATION: Use of the correct oil and the proper amount of oil is important. Excessive lubrication rarely does as much harm as inadequate lubrication. Gast AD220 Oil is available in convenient quart containers from the factory or through Gast stocking representatives. Order by part #AD220. A high detergent (10 wt. high detergent) automotive engine oil may be used as an equivalent to Gast AD220. In a high ambient location a 20 wt. oil may be used.

OILER OPERATION: Be sure the oiler is lubricating the pump properly. Should the oil feed too fast or slow, contact the factory. Oilers are available with various rates of oil feed.

IF YOUR UNIT IS EQUIPPED WITH A MOTORIZED LUBRICATOR, BE SURE IT IS WIRED TO 115 VOLT OUTLET AND OPERATES ONLY WHEN THE PUMP IS RUNNING.

SERVICING: Most failures to build up pressure or produce vacuum are due to leaks in connecting lines, dirty filters or sluggish vanes. See "Cleaning" for care of filters or vanes which may stick in rotor slots due to lack of oil, too much oil or too heavy oil. If foreign particles are present in pump chamber, an experienced mechanic may remove the end plate OPPOSITE THE DRIVE SHAFT END. DO NOT REMOVE THE END PLATE ON THE DRIVE END. This will permit the removal of the four (4) sliding vanes for a thorough cleaning in a *solvent and also provide accessibility to any particles which must be removed.

CLEANING: With the pump stopped, remove the felts from the intake and exhaust filters and wash them in a *solvent. When clean and dry, replace the felts. To flush the pump of dirt, viscous oil, etc., remove the filter and muffler, and WHILE PUMP IS RUNNING permit several ounces of *solvent to be drawn into the pump at intake. Flush unit in a well ventilated area. Eye protection is recommended. Keep face away from exhaust port and do not flush unit with flammable solvent. After all the solvent has passed through the pump, immediately relubricate with oil and replace filter and muffler.

INSPECTION: Regular inspection may prevent expensive repairs. Occasionally examine the shaft for side or end "play" by moving it manually while pump is idling. If pump or motor shows evidence of overheating or excessive noise, stop it immediately for repairs.

We recommend you have a spare pump on hand for emergencies.

*Recommended commercial solvent for air motors and lubricated pumps is Gast Flushing Solvent part #A11255. DO NOT USE KEROSENE.

DANGER: To prevent explosive hazard, do not pump combustible liquids or vapors with these units.

It is usually quickest and least expensive to send the unit in for rebuilding. Authorized service facilities are located at:

Gast Manufacturing Co., Ltd.
Halifax Road, Cressex Estate
High Wycombe, Bucks HP12 3SN
England
High Wycombe 23571

Brenner-Fiedler & Assoc.
13824 Bentley Place
Cerritos, CA 90701
213/404-2721 - 714/521-6280

Gast Manufacturing Corp.
2550 Meadowbrook Road
Benton Harbor MI 49022
616/926-6171

Wainbee, Ltd.
121 City View Drive
Rexdale, Ontario, Canada M9W 5A9
416/243-1900

Gast Manufacturing Corp.
505 Washington Ave.
Carlstadt NJ 07072
201/933-8484

Wainbee, LTD.
215 Brunswick Blvd.
Pointe Claire, Montreal,
Canada H1R 4R7
514/697-8810