

SECTION 1. GENERAL INFORMATION

1.1. GENERAL

This section of the manual contains important information about your SHANKLIN F-4 "Form-Fill-Seal" Automatic Wrapper. It contains specific information about the configuration of your particular machine as well as SHANKLIN's Limited Warranty, Service Policy and patent information.

Contained within this section is a Safety Insert printed on yellow paper. This section contains vital information that you are urged to read carefully before operating the machine. This safety information has been repeated in various places in this manual as well.

This section is structured as follows:

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Inserts - add between 1.1 and 1.2

Service Policy
Limited Warranty Policy
Safety Policy

*** NOTICE**
UNAUTHORIZED MODIFICATION TO A MACHINE WILL VOID THIS WARRANTY.
DISASSEMBLY OF PURCHASED COMPONENTS WILL VOID THE
WARRANTY ON THOSE COMPONENTS.

SHANKLIN CORPORATION
100 WESTFORD ROAD
AYER, MASSACHUSETTS 01432
TEL: 508-772-3200

SERVICE POLICY - AUGUST 1, 1991

SERVICE LIMITED WARRANTY *

All service work is performed by a highly competent service engineer, and any new parts installed by him carry a new parts 90-day guarantee. However, since the nature of the customer's application varies from plant to plant, and since many parts of the machine may have had considerable use, we cannot make any guarantee as to how long the machine will run without further service.

FIELD SERVICE

Field service work will be performed by a qualified service engineer at the rate of \$75.00 per hour when on the job and \$40.00 per hour traveling portal to portal. Time charged will include all time actually spent in transit to and from the customer's plant as well as time spent working at the plant. In addition, any travel expenses will be paid for by the customer. Mileage is charged at \$0.31 per mile where automobile travel is concerned, and appropriate airline, bus, car rental, hotel and meal expenses, etc. will be charged at their actual cost (Pricing is subject to updates).

SERVICE AT OUR FACTORY

Shanklin Corporation will provide service as ordered by customers in our shop in Ayer, Massachusetts, at a rate of \$50.00 per hour. Parts are extra and will be charged at our prices current at the time. We will be pleased to submit cost estimates for repairing and rebuilding Shanklin Packaging Machinery, but since the true condition of components frequently cannot be determined until the work is done, we cannot submit firm prices for repair work in advance.

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(Rates updated July 1, 1996)

SHANKLIN CORPORATION
100 WESTFORD ROAD
AYER, MASSACHUSETTS 01432
TEL: 508-772-3200

LIMITED WARRANTY POLICY - AUGUST 1, 1991

NEW MACHINE AND PARTS WARRANTY *

Seller warrants to the original Buyer that all the major parts and components of the products furnished hereunder (Parts with a list price of \$50.00 or more) will be free from defects in material and/or workmanship under normal use and service for ONE FULL YEAR from the date of shipment from the Seller's factory or warehouse. In addition, Seller extends to the original Buyer a ninety day warranty on all other non-consumable parts. This warranty shall not apply to Products which have been subject to misuse, neglect, accident, water or corrosion, or to parts that customarily require periodic replacement. ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, ARE EXCLUDED AND DISCLAIMED INCLUDING, WITHOUT LIMITATION, THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR ANY USE OR PURPOSE, (WHETHER OR NOT SUCH USE OR PURPOSE HAS BEEN DISCLOSED TO SELLER IN SPECIFICATIONS AND DRAWINGS PREVIOUSLY OR SUBSEQUENTLY PROVIDED BY SELLER WHETHER OR NOT SELLER'S PRODUCTS ARE SPECIFICALLY DESIGNED OR MANUFACTURED BY SELLER FOR BUYER'S USE OR PURPOSE).

Seller's sole obligation under this warranty and Buyer's sole and exclusive remedy shall be (1) the repair or replacement, at the Seller's option, of any defective Product or part or accessory therefore F.O.B. Seller's factory; or (2) at Seller's option, the return to Buyer of the original purchase price for the Product in exchange for its return to Seller; in each case provided that the defect is proved to Seller's satisfaction within 90 days from the date of the original shipment.

Seller will not be liable for any repairs made outside Seller's factory without its prior written authorization. Specific authorization to return any Product or part or accessory must be obtained from Seller and transportation charges shall be prepaid by Buyer.

IN NO EVENT SHALL SELLER BE LIABLE FOR ANY SPECIAL, PUNITIVE, CONSEQUENTIAL OR INCIDENTAL DAMAGES TO ANY PROPERTY OR ANY PERSON IN CONNECTION WITH THE SALE, SHIPMENT, INSTALLATION OR USE OF THE PRODUCTS AND BUYER AGREES TO INDEMNIFY AND HOLD SELLER HARMLESS AGAINST SUCH DAMAGES.

***WARNING:** UNAUTHORIZED MODIFICATION TO A MACHINE MAY VOID THIS WARRANTY. DISASSEMBLY OF PURCHASED COMPONENTS WILL VOID THIS WARRANTY ON THOSE COMPONENTS.

(Reprinted July 1, 1996)

SAFETY

!!! IMPORTANT !!!

READ THIS ENTIRE SAFETY SECTION CAREFULLY BEFORE OPERATING MACHINE

Although all necessary precautions have been taken in the design and manufacture of this packaging machine, operation of the machinery involves certain risks. Do NOT place this packaging machine into operation until all personnel associated with the machinery have become aware of the following warnings of potential hazards. We further urge you to perform your own safety study on the machinery and its installation prior to operation.

DISREGARD FOR POTENTIAL HAZARDS CAN LEAD TO:

SERIOUS INJURY TO PERSONNEL AND/OR DAMAGE TO THE EQUIPMENT. IT IS THE EMPLOYER'S RESPONSIBILITY TO ENSURE THAT PERSONNEL ARE PROPERLY TRAINED AND THAT PROPER SAFETY PROCEDURES ARE FOLLOWED.

UNDER NO CIRCUMSTANCES SHOULD THE MACHINE BE RUN WITH ANY GUARDS REMOVED OR ANY SAFETY DEVICES NON-FUNCTIONING.

GENERAL WARNINGS

This section contains three pages of general warnings. In addition, these and other warnings have been placed in appropriate places in this manual.

**PLEASE HEED ALL "WARNINGS" AND "CAUTIONS"
CONTAINED THROUGHOUT THIS MANUAL**

WARNING!

DO NOT TAMPER WITH THE ELECTRICAL WIRING, NOTIFY LICENSED ELECTRICIAN FOR MAINTENANCE. ALWAYS DISCONNECT ELECTRICAL POWER BEFORE ATTEMPTING MAINTENANCE TO ANY ELECTRICAL OR MOVING PARTS.

WARNING!

**IN ORDER TO PREVENT INJURY TO MACHINERY AND/OR PERSONNEL,
DO NOT INCREASE SETTINGS ON EITHER ELECTRICAL OR MECHANICAL
OVERLOAD SAFETY DEVICES**

WARNING!

KEEP ALL EXTREMITIES, JEWELRY, LOOSE CLOTHING AND HAIR
AWAY FROM MOVING ASSEMBLIES AND CONVEYORS.

WARNING!

CONVEYOR BELTS THAT HAVE BECOME WORN OR FRAYED CAN
BE HAZARDOUS AND SHOULD BE REPLACED PROMPTLY.

WARNING!

NEVER OPERATE THIS OR ANY MOVING EQUIPMENT WITHOUT ALL COVERS AND
GUARDS IN PLACE. THE INTERNAL MECHANISM OF MOST PACKAGING MACHINERY
CONTAINS NUMEROUS SHEAR, PINCH, AND IN-RUNNING NIP POINTS, MANY OF
WHICH ARE CAPABLE OF CAUSING SEVERE INJURY AND PERMANENT DISFIGURATION

WARNING!

TO MINIMIZE POTENTIAL FOR PERSONAL INJURY, ALWAYS BE SURE THAT
MACHINE OPERATORS AND OTHERS WORKING ON MACHINERY ARE PROPERLY TRAINED
IN THE CORRECT USAGE OF THE EQUIPMENT AND PROPERLY INSTRUCTED
REGARDING THE SAFETY PROCEDURES FOR OPERATION

WARNING!

HEAT SEALING ARMS AND JAWS AND SHRINK TUNNEL OPENINGS
ON PACKAGING MACHINERY CAN GET VERY WARM AFTER A PERIOD OF USE.
KEEP HANDS AWAY WHILE IN OPERATION AND USE CAUTION IF THE MACHINE HAS
BEEN RUNNING RECENTLY.

WARNING!

DO NOT MAKE ANY MODIFICATIONS TO THE CONTROL PROGRAM OF THE PROGRAMMABLE LOGIC CONTROLLER, THE ELECTRICAL CIRCUITRY OR THE MECHANICAL ASSEMBLIES OF THIS MACHINERY. SUCH MODIFICATIONS MAY INTRODUCE HAZARDS THAT WOULD NOT OTHERWISE BE ASSOCIATED WITH THIS MACHINERY. THE SHANKLIN CORPORATION CANNOT BE HELD RESPONSIBLE FOR MALFUNCTIONS, PERSONAL INJURY, OR PROPERTY DAMAGE RESULTING FROM SUCH UNAUTHORIZED MODIFICATIONS.

WARNING!

THE USE OF CERTAIN TYPES OF PLASTIC FILMS IN SEALING AND/OR SHRINKING EQUIPMENT MAY RESULT IN THE RELEASE OF HAZARDOUS FUMES DUE TO THE DEGRADATION OF THE FILM AT HIGH TEMPERATURES. BEFORE USING ANY PLASTIC FILM IN THIS EQUIPMENT, THE MANUFACTURER OR SUPPLIER OF THE FILM SHOULD BE CONTACTED FOR SPECIFIC INFORMATION CONCERNING THE POTENTIAL RELEASE OF HAZARDOUS FUMES. ADEQUATE VENTILATION SHOULD BE PROVIDED AT ALL TIMES.

WARNING!

IN ORDER TO PREVENT INJURY TO MACHINERY AND/OR PERSONNEL, PROPER VOLTAGE (AS INDICATED ON NAMEPLATE) MUST BE APPLIED TO MACHINE.

WARNING!

IN ORDER TO PREVENT INJURY TO MACHINERY AND/OR PERSONNEL, PROPER EQUIPMENT GROUND (IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE) MUST BE SUPPLIED TO MACHINE.

WARNING!

NEVER INSERT PRESSURIZED CONTAINERS OR VOLATILE, FLAMMABLE OR EXPLOSIVE MATERIALS INTO OR THROUGH A SHRINK TUNNEL. RESULTING FIRE OR EXPLOSION CAN CAUSE SERIOUS PERSONAL INJURY.

1.2. PATENT INFORMATION

SHANKLIN CORPORATION EQUIPMENT IS MANUFACTURED UNDER ONE OR MORE OF THE FOLLOWING US PATENTS:

3,312,811	3,490,981
4,035,983	4,219,988
4,339,093	4,419,855
4,447,284	4,537,016
5,097,939	R30,010
and Pending	

* NOTICE

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DISASSEMBLY OF PURCHASED COMPONENTS WILL VOID THE
WARRANTY ON THOSE COMPONENTS.

1.3. SPECIFIC MACHINE DATA

1.3.1. Pertinent Machine Data

COMPLETION DATE: 02/01/97

MODEL: F-5A SERIAL NUMBER: F-9778

VOLTAGE: 230 PHASE: 1PH HERTZ: 60/50

1.3.2. Schematic Wiring Diagrams

Copies of schematic and logic diagrams can be found in Section 8 of this manual.

DRAWING	REVISION	TITLE	
F0339	<u>D</u>	F SERIES SCHEMATIC (DWG Reference)	[X]
6FF-002	<u>D</u>	F PC LOGIC	[X]
_____	_____	_____	

1.3.3. Option Listing

FILM INVERTING HEAD

Fixed Inverting Head H= _____ ☐

Adjustable Inverting Head - 6" ☒

SEALING SYSTEM

Hot Wire ☐

Hot Wire with Narrow Level Jaw ☐

Hot Knife - Wide Fin Blade ☒

Hot Knife - Wide Fin - Heated Bottom Jaw ☐

Cool Cut Jaw ☐

Other _____ ☐

SIDE SEAL

Diverging Belts ☒

Hot Air ☐

Band Sealer ☐

FILM SELVAGE REMOVAL SYSTEM

Vacuum Remover ☒

Film Selvage Winder ☐

Large Capacity Scrap - 150 gal. ☐

AIR EVACUATION DEVICE

Hole Punch, Shanklin ☐

Hole Punch, Park-Air ☐

Pin Hole Perforator ☒

INFEED EYES

Vertical ☒

Horizontal ☐

Optional Dual Eyes ☐

OTHER

Flighted Infeed (____ ft.) ☐

Harmonic Infeed _____ ☐

Shuttleworth Paper Feeder ☐

Automatic Product Placement Conveyor ☐

Right Angle Infeed Conveyor ☐

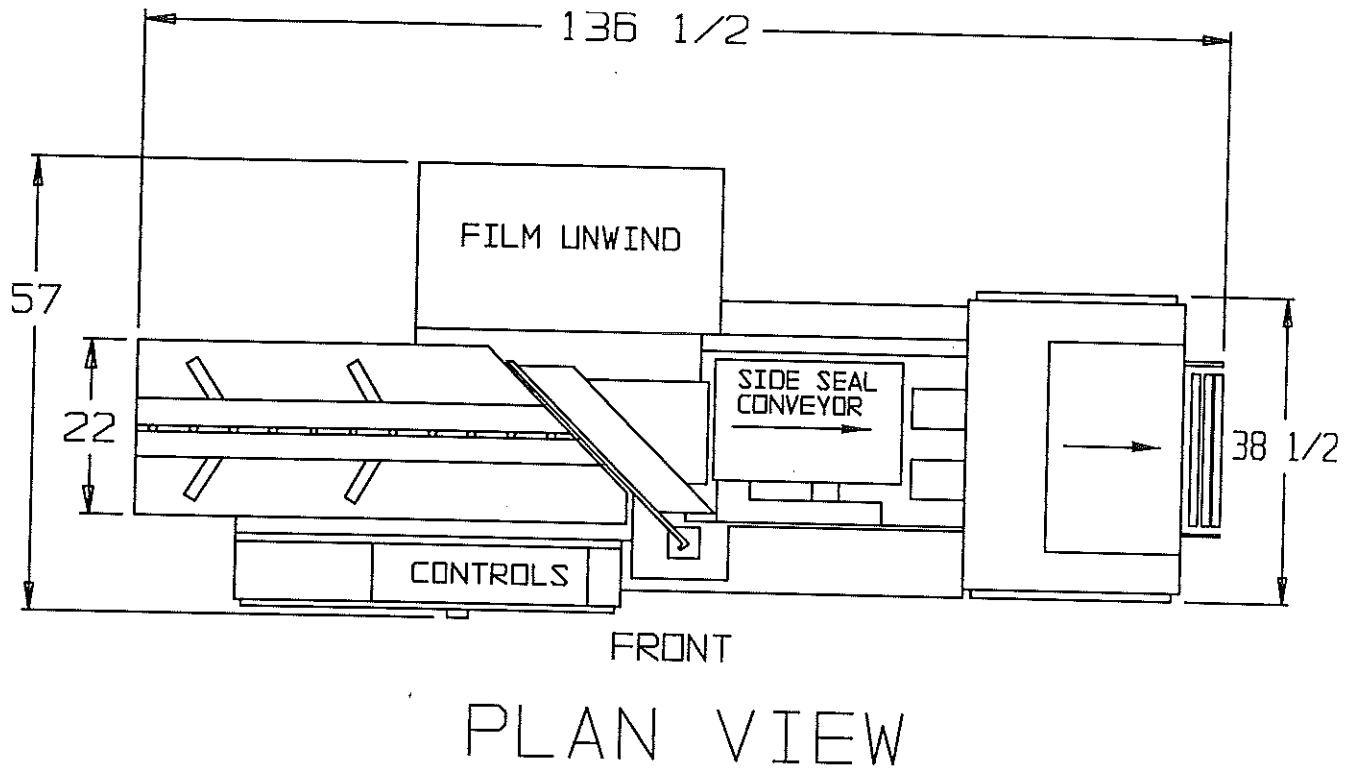
Print Registration ☐

End Seal Variator ☐

Spare Parts Kit ☐

EZ Load Comp. c/Golder ☒

1.3.4. Basic Floor Plan Drawing



JAW SAFETY CIRCUIT VERIFICATION TEST

The operation of the jaw safety circuit should be verified at least once per day. The jaw safety circuit is designed to reopen the jaws immediately whenever the jaws contact an object upon closing. The test requires you to attempt to make a seal with a rubber test object between the jaws. When functioning properly, the jaw safety circuit will force the machine into an Emergency Stop state upon contact with the test object.

1. All guards must be in place. All doors and hoods must be closed.
2. Connect the compressed air supply for the machine.
3. Power up the machine. Make sure machine is in MANUAL mode.
4. Press the E-STOP button.
5. For this test, you need a resilient object, preferably a 3/8" thick strip of 40 durometer red silicone rubber. Place the test object on the conveyor belt between the seal jaws.
6. If the machine has latching E-STOP buttons, they must be released before the next step.
7. Put the machine into a READY state by pressing the READY button (may be marked RESET, CONTROL RESET, or READY TO START).
8. Perform the test by pressing the manual seal button (may be a single button marked CYCLE or two buttons marked SEAL). The button(s) must be held down until the jaws close completely.
 - PASS INDICATION: Jaws close and then immediately reopen; the READY light extinguishes.
 - FAIL INDICATION: Jaws do not reopen immediately and/or READY light remains on.
9. Repeat Steps 4-8 several times with the rubber object at different points along the entire length of each seal jaw to ensure the integrity of the jaw safety circuit.

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A three page SAFETY INSERT (printed on yellow paper) is included at the beginning of this section. You are urged to read this section carefully before operating the F-5.

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2.1. GENERAL OPERATING INSTRUCTIONS

2.1.1. Introduction

Congratulations on your purchase of a SHANKLIN packaging machine, the finest shrink packaging equipment on the market today!

The Shanklin Model F-5 is a continuous motion horizontal "Form-Fill-Seal" machine designed to wrap packages in plastic film. The F-5A features a flighted lug infeed conveyor and pneumatic end seal closure.

This highly versatile machine runs equally well at both high and low speeds, and its speed can be adjusted at the control console. The resulting packages have neat welded bead trim seals on three sides of the package with no overlap seams on the bottoms or ends of the packages.

This manual has been custom designed for your machine. It has been written to serve a variety of purposes, among them

- A. a quick reference to the operation of your machine
- B. a detailed reference to all the controls, indicators, and options on your machine
- C. a vital aid to ordering replacement parts from the SHANKLIN parts department.

We want to get your machine up and running as quickly as possible and have included the basic start up and film loading instructions in the following section. These instructions will serve as a good operation reference for your machine.

IMPORTANT!

Prior to using your new machine, be sure to arrange for installation and startup service from your authorized SHANKLIN distributor.

2.1.2. Setting Up and Operating Your Machine

This section gives step by step instructions on how to set up your machine for your specific package, how to apply power, make seals and run packages.

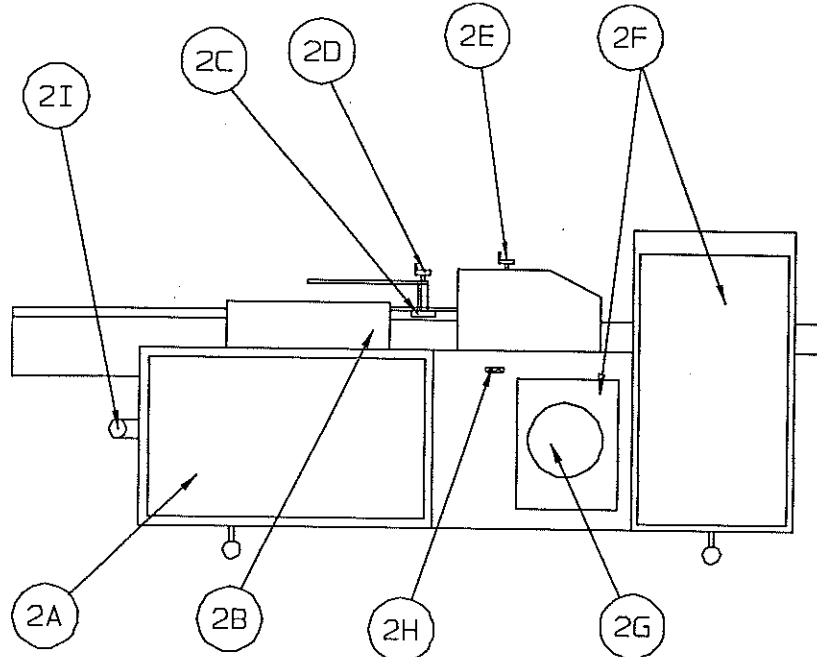
If necessary, use the Component Description drawing included after this section in order to locate machine parts. All other drawings referred to in this section are included in Section 7 of this manual.

When you first get your machine and have it uncrated, have a licensed electrician connect the correct power to the machine. Also, have air applied to the machine and have the unwind, optional hole punch, and scrap remover installed, if necessary.

WARNING!

Make sure power is OFF at the start of this procedure

1. Adjust the infeed package guides. When the product is centered on the infeed conveyor, there should be 1/4 to 1/2" total looseness between the guides and the product.
2. Set the inverting head width (refer to Item 2C in drawing below). The "point" of the inverting head should be 1/8" beyond the border of the package guide.



3. *Adjustable inverting heads only.* Set the inverting head height to be 1/4" above the top of the product (2D).
4. Adjust the position of the side seal conveyor (2H) so it is in line with the inner package guide on the infeed.
5. Position the infeed guide bar to approximately 1/4" away from the side sealer rollers.
6. Set the side sealer height (2E) so that the belts of the side sealer come together at the centerline of the product.
7. Set infeed pusher spacing (use Drawing #K05-0004 to determine the proper pusher spacing).
8. Since the lug spacing can only be placed at certain intervals, it is necessary to vary the speed of the infeed conveyor. This is done by adjusting the speed variator, connecting the main drive of the machine to the infeed conveyor. The variator speed control is located to the left of the main electric box. By turning the variator handle clockwise, the infeed conveyor will speed up in relation to the side seal and end seal conveyors. This decreases the spacing between packages. Start with a long spacing and gradually decrease.

CAUTION!

THE VARIATOR CAN BE ADJUSTED ONLY WHEN THE MACHINE IS RUNNING.

The correct package spacing is achieved when the distance between the packages on the side seal conveyor is approximately 1 1/2" greater than the package height.

9. The end seal jaws are triggered by an electric eye which senses the trailing end of a package and triggers an adjustable counter for placement of the end seal. The end seal placement is controlled by a counter within the PLC (accessed via the touch screen). To modify the package spacing and place the end seal in the center of the gap between packages, adjust the spacing through the touch screen. The end seal placement may also need to be reset each time the package spacing is modified.
10. When the seal jaw opening has to be changed, the crank changeover drawing (included in Section 7 of this manual) should be used. The section for jaw height setting shows the pneumatic cylinder in the proper crank hole settings. The table lists the seal jaw height variations available for standard, lo-profile and hi-profile package heights.
11. Load film roll onto unwind. The outer edge of the film should be 1/4" beyond the "point" of the inverting head.
12. Thread film through the unwind using the film threading diagram on the side of the unwind.
13. Power up the machine with the Main Power Disconnect on the Lower Electric Box (2A, Page 2-4).

The POWER ON indicator next to the Main Power Disconnect will light up. Note the touch screen display. The display will indicate the present status of the machine.
14. Press the READY TO START button on the Main Control Panel. The button should light, indicating that the machine is in a READY state. If it doesn't, check the Touch Screen Display for fault status. See Fault Status page 17.
15. Turn on the SEAL HEAT through the touch screen on the main display menu.
16. Set the side sealer wire temperature using the pots on the Main Control Panel (labeled SIDE SEAL CONSTANT HEAT and SIDE SEAL RUNNING HEAT). Start with ammeter settings of 20 CONSTANT and 25 RUNNING.
17. Thread the film through the inverting head and into the side sealer rollers.
18. Run film through by pressing the START button. If necessary, adjust the side sealer temperature so that a good cut is being made at the side sealer. When enough film has passed through the side sealer, connect the selvage film to the film removal system. Stop the machine with the red STOP button.
19. You are now ready to run product. Load product onto infeed conveyor. Run product by pressing the START button.

20. Adjust the end seal temperature up to cutting temperature. The temperature setting is affected by many factors, among them the type of seal system and the type of film you are using. Here are some general guidelines:

Hot Wire (polyolefin)

Adjust the wire current by moving the HOT WIRE CONSTANT HEAT and HOT WIRE IMPULSE HEAT pots on the Main Control Panel.

Set the HOT WIRE CONSTANT HEAT pot to a setting that results in a reading of 10A on the END SEAL CURRENT Ammeter when the jaws are in an idle position (the end seal ammeter is located to the right of the side sealer on the end seal hood). Set the HOT WIRE IMPULSE HEAT pot to a setting that will result in a reading of 28A to 30A when the seal arm is in a sealing position.

Make several attempts at sealing/cutting before making temperature adjustments. When making adjustments, always adjust in very small increments (no more than a 5-10% increase on the pots).

Hot Knife

When setting the temperature, you should always start low and work your way up.

To adjust the temperature, press the up or down arrow keys on the temperature controllers (on the Main Control Panel) to the desired setting. The setpoint is indicated on the green display on the controller. Wait for the knife to equalize to the set temperature (the actual temperature is indicated on the red display on the temperature controller).

Your authorized SHANKLIN distributor can advise you of good temperature settings based on seal system and film type. Here are some general guidelines for starting temperatures for certain film types:

Film Type	Top Jaw	Heated Bottom Jaw (Cool-Cut Jaw only)
PVC	295°	250°
Polyethylene	280°	250°
Polyolefin	310°	---

Make several attempts at sealing/cutting before making temperature adjustments. When making adjustments, always adjust in very small increments (5 degrees at a time).

21. Continue making seals until you are satisfied with the seal quality. Make adjustments to the temperature and dwell setting as needed. Make several attempts at sealing/cutting before making adjustments and always adjust in very small increments.
- A. To adjust the temperature, refer back to the previous step for instructions.

- B. To adjust the dwell, you must access the menu in the touch screen where the jaw dwell setpoint resides. This is address N7:3 and is accessed by pressing the end seal button of the operator adjustment menu.

This display indicates that 100 is the value stored in location N7:3 (*Note that "100" is a setting common to Hot Knife. For Hot Wire, this setting would be closer to "10"*).

The stored value, multiplied by .01 seconds, determines the actual dwell time. A setting of 100 equals a dwell time of 1 second ($100 \times .01$). To change the dwell to 0.8 seconds for example, the setting would need to be changed to 80.

NOTE

To modify the contents of an address, you must access the Operator Adjustment Menu. Refer to page 16, Section 2.3.4 for further information.

22. Make adjustments as needed until you are satisfied with the seal quality and the shrink appearance.

2.2. COMPONENTS

This section describes the major components on the F-5 "Form-Fill-Seal" Automatic Wrapper. Refer to the Component Description drawings (page 2-8) to identify the location of these components.

2.2.1. Main Electric Boxes / Main Control Panel

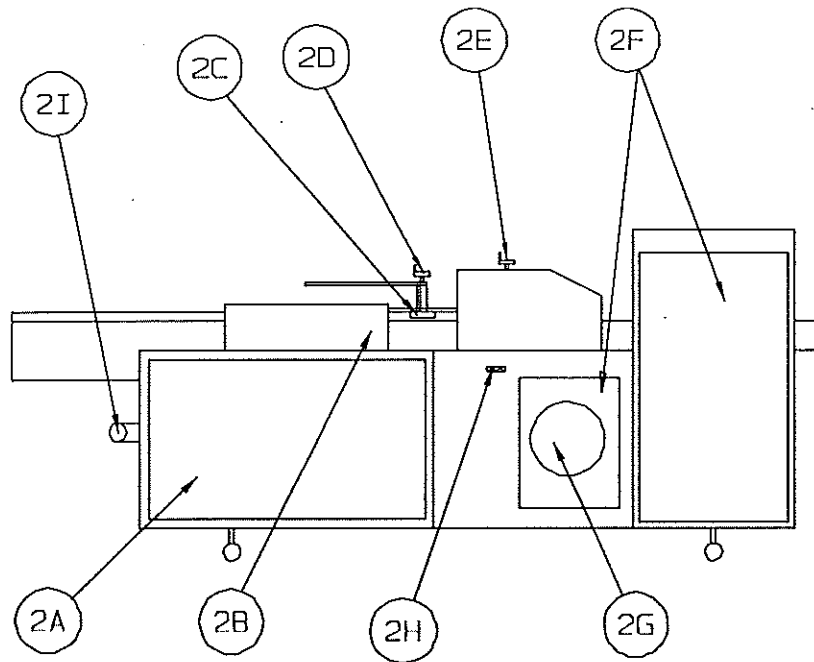
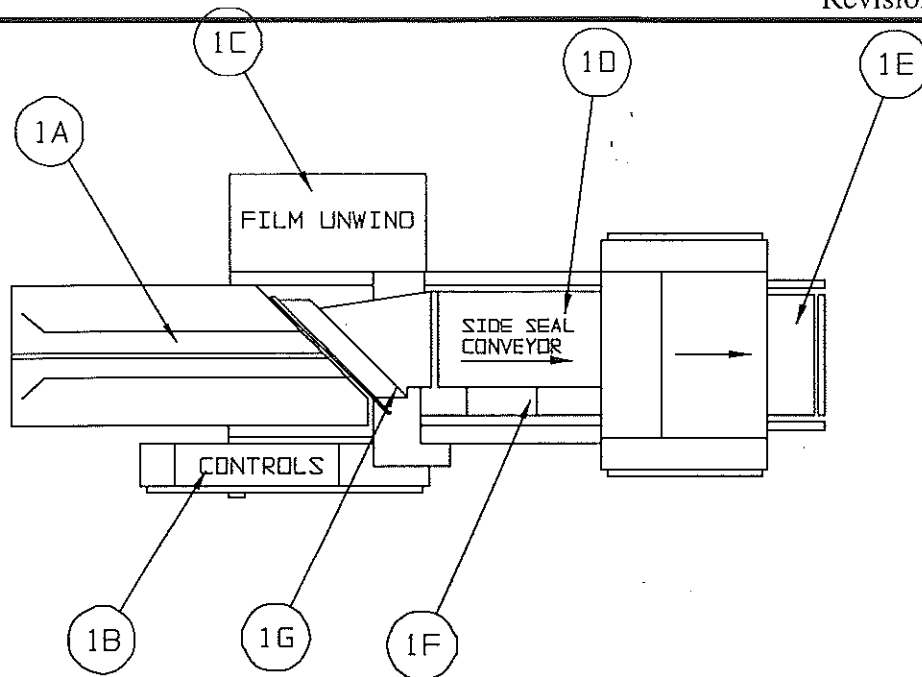
ITEMS 1B, 2A, & 2B ON THE COMPONENT DESCRIPTION DWG (PAGE 2-8).

Enclosures bolted to frame of machine, protecting electrical components mounted within. The outside of the Lower Electric Box contains the main power disconnect, the power-on indicator, and the side seal heat controls. The Main Control Panel contains the majority of the controls used to operate the F-5A.

2.2.2. Infeed Conveyor

ITEM 1A ON THE COMPONENT DESCRIPTION DWG (PAGE 2-8).

The infeed conveyor system is designed to provide a steady flow of product into the machine while spacing product so that it can be sealed consistently. Various infeed conveyor system options are available depending upon the machine application and production requirements.



2.2.3. Inverting Head

ITEM 1G ON THE COMPONENT DESCRIPTION DWG (ABOVE).

The inverting head can be either fixed or adjustable.

With the adjustable inverting head, the height is adjusted using the balcrank located at the mounting base of the inverting head.

Width change of the adjustable inverting head is accomplished with a sliding mount and a choice of three different length web guides.

The fixed inverting head has a predetermined height, but still can be adjusted for the width by sliding the mount. Fixed inverting heads are sized according to product being run.

2.2.4. Side Seal Belt Conveyor

ITEM 1D ON THE COMPONENT DESCRIPTION DWG (PAGE 2-8).

The side seal conveyor is located immediately adjacent to the side sealer. Film is threaded through the inverting head and pulled by the side sealer and conveyor, creating a sealed tube. Product is inserted through the inverting head into the sealed tube. It is then conveyed along the conveyor until it transfers to the end seal conveyor belt.

2.2.5. Diverging Belt Side Sealer

ITEM 1F ON THE COMPONENT DESCRIPTION DWG (PAGE 2-8).

When the machine is running, the film gets pulled through by the side sealer, where the film is sealed and severed, forming a sealed tube of film.

The side sealer is attached to the main drive of the side seal conveyor. The speed of the side sealer is identical to the speed of the side seal conveyor. This provides for smooth product travel at various speeds. The side sealer is equipped with a balcrank used for making height adjustments. To raise or lower the side sealer you must loosen the T-screw and turn the balcrank (clockwise to raise, counter clockwise to lower). Once you've reached the proper position, tighten the T-screw to lock the balcrank in place. Traction rollers are placed ahead of the side sealer providing tension on the film in order to aid with film tracking through the machine.

2.2.6. End Seal Conveyor

ITEM 1E ON THE COMPONENT DESCRIPTION DWG (PAGE 2-8).

The end seal conveyor consists of two belts (optional single wide) which extend through the sealing carriage to the end of the machine. The sealing carriage moves longitudinally along the machine at precisely the same speed as the package in order to make the end seal without having to stop the movement of the package through the machine. The end seal conveyor belt starts at the infeed roll, runs over the top left hand roll of the carriage, drops down beneath the bottom roll of the carriage, and passes over the top right hand roll of the carriage forming a "U". The bottom seal jaw moves up and down inside the "U" formed by this loop of belt.

The belt then travels to the discharge end of the machine. The coated roller is the drive roller.

2.2.7. End Seal Mechanism

The end seal mechanism consists of two jaws on a traveling carriage that ride back and forth on two horizontal shafts. Forward carriage motion is obtained from a brake on the carriage drive roll, and reverse carriage motion is obtained from an air cylinder.

In order to make a seal, the top seal jaw moves downward and the bottom seal jaw moves upward until the two seal jaws meet at the centerline of the package. This motion is accomplished by means of a toggle crank located on either side of the end seal jaw mechanism. This crank is driven by an air cylinder.

In order to ensure that the seal is always made at the centerline of the package, the entire shaft that carries the toggle is designed so that it can move up and down inside the jaw height assembly, thereby raising or lowering the end seal jaws. Thus, the seal jaw opening is generally the same for similarly sized packages, and the only change that is required to place a seal in the centerline of the package is to raise or lower the shaft carrying the toggle cranks.

2.2.8. End Seal Jaws

There are a variety of end seal jaws available for the F-5A. These are discussed further in Sections 2.5. and 2.6.

2.2.9. Film Unwind

ITEM 1C ON THE COMPONENT DESCRIPTION DWG (PAGE 2-8).

The film unwind provides smooth release of the film by utilizing rollers, dancer bar, and a variable speed DC gearmotor. Film is threaded through a pair of coated drive rollers. The bottom roller is driven by the gearmotor with the other resting on top. This provides positive traction, allowing the side sealer to pull the film with reduced tension on the film. The speed of the drive rollers is determined by speed of the machine. As the demand for film increases, the unwind speed increases proportionally. Tension from the film pulls the dancer bar up engaging a limit switch providing power to the DC motor control board. The dancer bar also provides speed control by use of a potentiometer connected to the bar using two timing pulleys and a timing belt.

Once tension on the dancer bar is released and dancer bar returns to normal, the limit switch disengages and switches the motor off. The unwind also has a three position labeled reversing switch, to allow for use of A wind or B wind rolls of film.

2.2.10. Hole Punch

Pneumatic actuated, electric solenoid controlled punch used to provide air evacuation holes in film.

2.2.11. Pin Hole Perforator

A pin hole perforator can be used in place of the hole punch. This consists of a set of heads which have pin wheels placed against a rubber coated roller. Number of heads will determine the amount of holes in the film.

2.3. CONTROLS

2.3.1. Control Functions

The incoming single phase voltage is connected by the customer to the inlet receptacle. From this point an appropriately fused disconnect switch distributes power to the voltage option transformer (208v -> 230v or 460v -> 230v) or directly to machine systems providing 230v AC for:

- Control Transformer via two/5A fuses. (230v -115v)
- Scrap motor switch and receptacle via two/10A fuses.
- Main drive motor DC control board via two/5A fuses through normally open relay contacts.
- Hot knife end seal option via two/5A fuses through heat switch.

The Control Transformer provides 115v AC for:

- Hot wire end seal
- Hot wire side seal
- Indicator light "Power On"
- The remainder of the control circuit

2.3.2. Main Controls

This section gives a general description of the function of each control and indicator found on the main control panels.

2.3.2.1. Main Power Disconnect

Red and yellow switch on lower electric box door. Provides a means of disconnecting incoming power mechanically. It is a fused switch so it also provides over-current protection which will interrupt power if a current fault occurs in the machine.

2.3.2.2. Power On Light

Red light indicates status of power applied on 115v AC side of control transformer.

2.3.2.3. Safety Status Light

Red light *flashing* indicates a "non-ready" status. The cause of the status can be checked by pressing the Ready To Start button. Refer to the status screen of the touch screen to identify the fault condition.

Red light *solid* indicates machine can be put into a "ready-to-start" condition.

Note:

When the machines are powered up, the light will stay on until the "ready to start" circuit is energized by pushing the "Ready To Start" pushbutton.

2.3.2.4. Emergency Stop Pushbutton

When pushed in, it stops all machine functions until it is unlatched and "Ready to Start" is re-energized.

2.3.2.5. Ready To Start Pushbutton/Light

Enables the safety circuit and the heat circuit. The amber light indicates ready to run condition. If this button is pushed while the red Safety Status light is flashing, the status code (at PLC address N9:0) will be updated.

2.3.2.6. Start Pushbutton/Light

Starts the automatic operation of the machine, as long as all pertinent conditions are met. The green light (solid) indicates a run condition. A flashing green light indicates the machine is Ready, but is waiting for product (A wait condition will also be indicated on the status display screen of the touch screen).

2.3.2.7. Stop Pushbutton

Stops automatic machine operations. Ready-to-Start circuit remains enabled, maintaining power to the hot wire heat circuit.

2.3.2.8. Seal Heat Switch (Optional)

Controls the power applied to the sealing system in the machine. It also overrides the alarm condition from the temperature controllers and allows the machine to run.

2.3.2.9. Main Drive Pot

Speed control pot for main drive motor.

2.3.2.10. Jog Rev / Jog Fwd Switch

In the RUN position, provides control power for normal machine operation.

In JOG FORWARD or JOG REVERSE position, normal machine operation is stopped, initiating the main drive motor circuit in the forward or reverse direction. This feature is helpful for setup or in the event of a jam.

2.3.2.11. Side Seal Constant Heat

Potentiometer controlling constant heat to side sealer when machine is in an idle condition.

2.3.2.12. Side Seal Running Heat

Potentiometer controlling heat to side sealer when machine is in a run condition.

2.3.2.13. Side Seal Ammeter

Provides a visible indication of the side sealer wire current level. It also helps to determine whether or not the side sealer is functioning.

2.3.2.14. Jog Speed Pot

This pot sets the machine speed when using the JOG FWD/JOG REV switch.

2.3.3. Optional Controls

2.3.3.1. Product Detect Override Switch

Turning this switch on will override the Start/Stop or Dual Speed control logic and allow the machine to run whether or not there is a product in front of the infeed eye.

2.3.3.2. Dual Speed Option

Provides faster operating speed when accumulator eye remains blocked. Switches back to slow speed when accumulator can not be kept full.

Dual speed operation requires an additional eye on the accumulating conveyor. Dual speed operation is selected through the touch screen (address B3:0/1). Refer to section 2.3.4. for more information.

HOT WIRE

2.3.3.3. Seal Wire Ammeter

Provides a visible indication of the end seal wire current level. It also helps to determine whether or not the seal cycle is functioning.

2.3.3.4. Constant Heat Pot

This potentiometer controls the current on the seal wire whenever the *Seal Heat* switch is ON and a seal is not being made. The constant heat setting primarily maintains a minimum current to the seal wires to improve the quality of the first two or three seals.

2.3.3.5. Impulse Heat Pot

This potentiometer controls the current to the seal wire while making a seal.

2.3.3.6. Limit Pot

(Inside Main Control Panel) Sealed pot that sets the upper limit for the current that is adjusted with the *Constant Heat* pot.

HOT KNIFE

2.3.3.7. Top Jaw Heat Control

Solid state temperature control; controls top seal jaw heat.

2.3.3.8. Bottom Jaw Heat Control

Solid state temperature control; controls bottom seal jaw heat.

2.3.4. Programmable Controller

The F-5 contains an Allen-Bradley Programmable Logic Controller (PLC). Set-points and data locations within the PLC are accessed via the Touch Screen display located on the Main Control Panel.

The touch screen control panel is password protected to preserve, control, and avert tampering with pre-set adjustments.

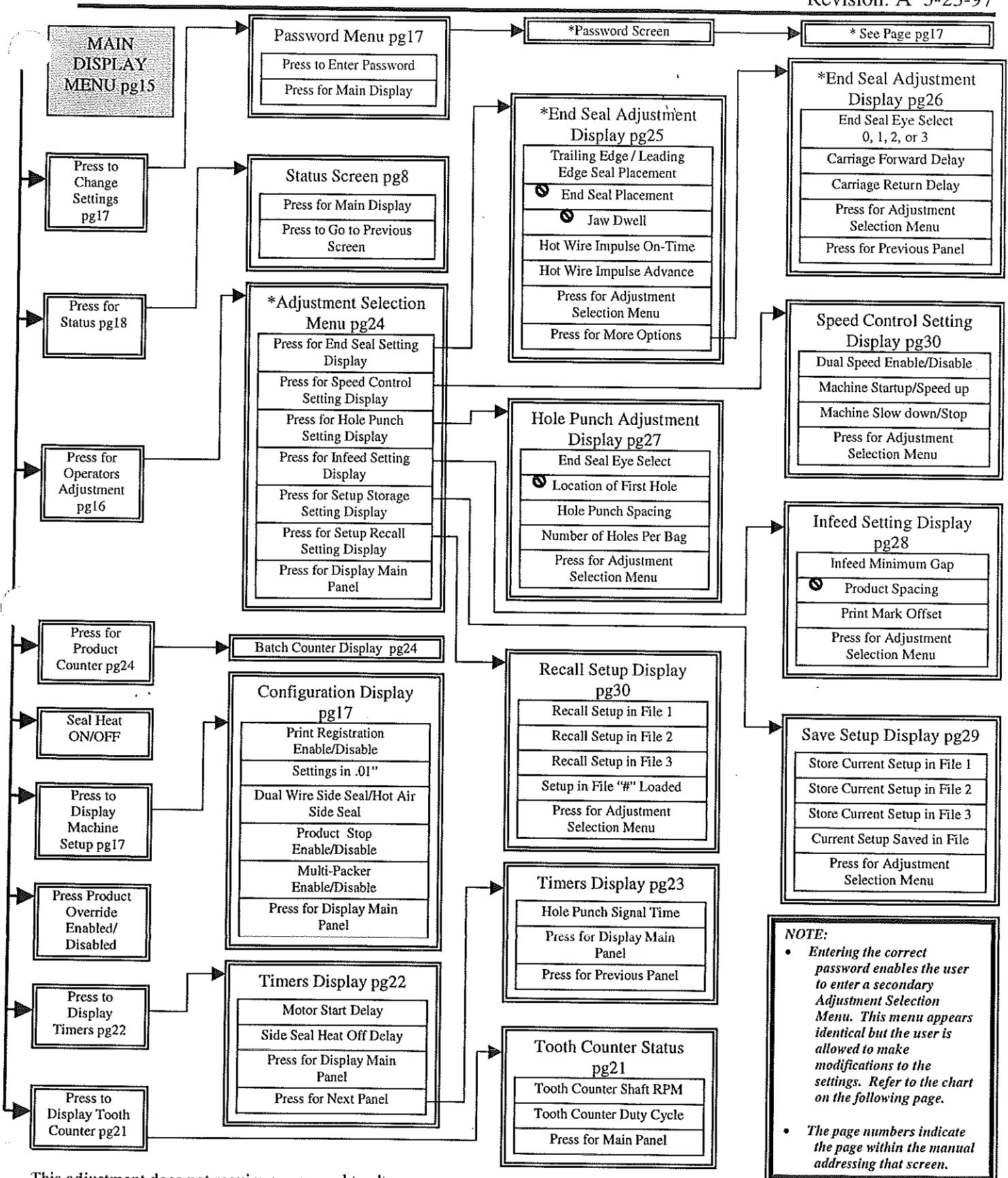
The following page consists of a detailed flow chart guiding the user through the different displays of the touch screen.

NOTICE:

When the user is in **DISPLAY** mode, the screens will state the word "DISPLAY" in the title. When the user is in the adjustments mode (the system password has been entered) the touch screen will omit the word "DISPLAY" (EX: TIMERS DISPLAY & TIMERS).

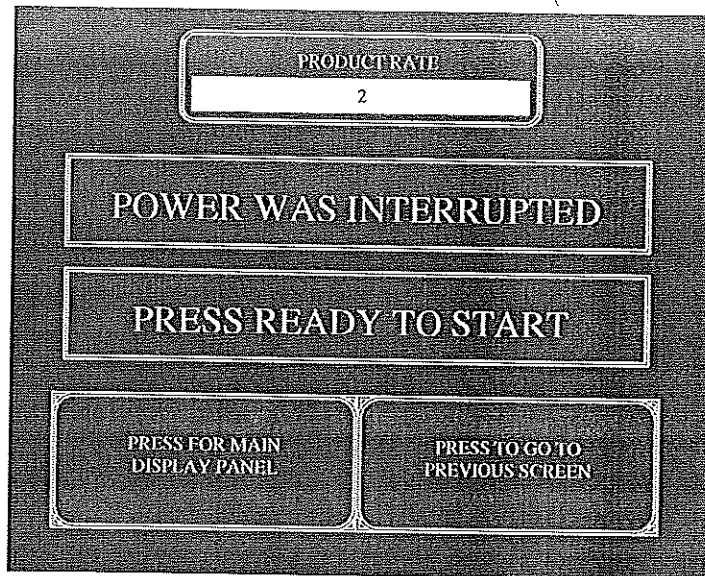
NOTICE:

There are four (4) adjustment settings that **DO NOT** require a password to alter. They are End Seal Placement, Dwell Time, Product Spacing, and First Hole Punch Location.



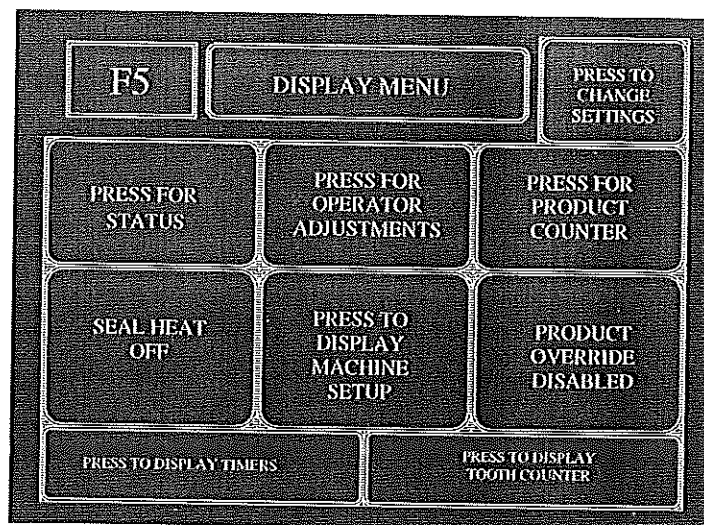
This adjustment does not require a password to alter.

Upon start-up, the touch screen will display (below) any fault status conditions and allow you to view the factory settings, however it will not allow any changes or adjustments.



STATUS SCREEN

Press the "PRESS FOR MAIN DISPLAY PANEL" button to get to the main display menu of the system as shown below.



MAIN DISPLAY MENU

You will need to enter a password to change adjustments. All Shanklin Equipment shipped with a touch screen will have a factory default password of "4321" and should be changed upon start-up. Without the password, no changes can be made to machine settings. To enter the password, press the main display menu screen (above) where it reads "Press to Change Settings". A screen will open that will prompt you to enter the password. After entering the password, the screen will change to the main adjustment menu screen. You now have access to all system adjustments.

This section gives an overview of how to access and modify PLC data using the Touch Screen. It also lists and describes the following:

- Status Messages
- Changing Values
- Machine Setup storing/recalling
- Product Counters, and Timers
- Machine Configuration

For more detailed information about the operation of the PLC, refer to the manufacturer's documentation which has been shipped with this manual.

2.3.4.1.Using Passwords

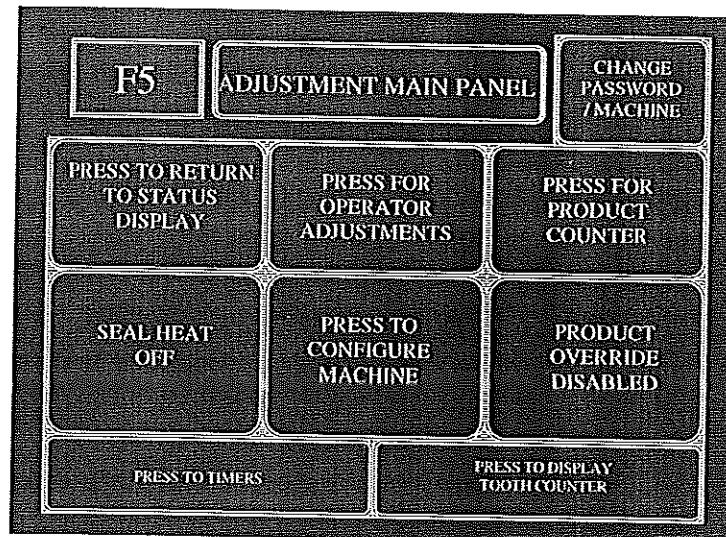
To change the password, press the main panel (previous page) where it reads "Press to Change Settings".

There are four (4) adjustment settings that **DO NOT** require a password to alter. These are End Seal Adjustment, Dwell Time, Product Spacing, and Fist Hole Punch Location.

CAUTION:

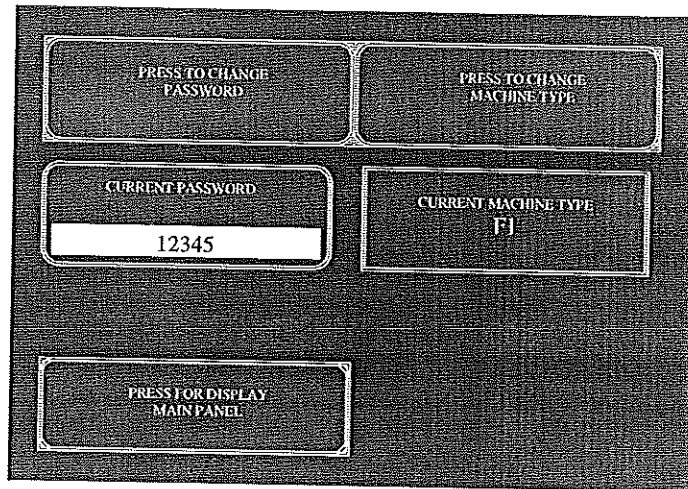
The touch screen display will maintain only one password. Changing the password will void all passwords previously entered.

Enter the existing password. The following display will be shown.



MAIN ADJUSTMENT MENU

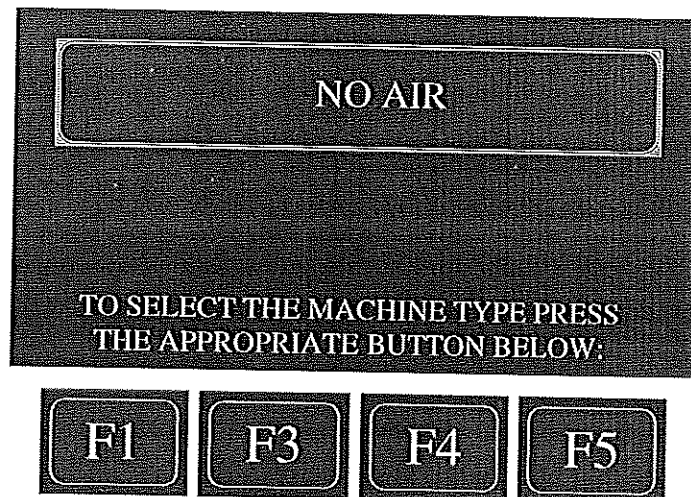
Press the "Changing Password/Machine" button. This will bring up a screen (below) to modify the password or the machine type. Press the Change Password button and enter the new password. All passwords are numbers and can be any number or combination of numbers from 1 to 32767. Press enter and then press done. This will bring you back to the Change Password/Machine" screen (below). Verify your new password in the "current Password" display. Record the new password in the supplied Operators Guide for future reference.



The screen displays four buttons: "PRESS TO CHANGE PASSWORD" (top left), "PRESS TO CHANGE MACHINE TYPE" (top right), "CURRENT PASSWORD" (bottom left) showing "12345", and "CURRENT MACHINE TYPE" (bottom right) showing "F1". A fifth button, "PRESS FOR DISPLAY MAIN PANEL", is located at the bottom center.

CHANGE PASSWORD SCREEN

The Machine Setup Screen (if selected) will appear as shown below. The "NO AIR" statement signifies the present status (or fault) on the system. Note: The machine type is set at the factory and this screen will NOT required access unless the machine type is significantly altered.



The screen displays a large button labeled "NO AIR" at the top. Below it, text reads "TO SELECT THE MACHINE TYPE PRESS THE APPROPRIATE BUTTON BELOW:". At the bottom, there are four buttons labeled "F1", "F3", "F4", and "F5".

MACHINE SETUP SCREEN

Once adjustments have been made, press the status button on the main adjustment panel to return to the display mode.

For assistance with password problems, see troubleshooting "Section-3", of the Owners Manual. For more detailed information about the operation of the Touch Screen and PLC, refer to the manufacture's documentation shipped with this manual.

2.3.4.2. Modifying Data

To modify data with a Touch Screen, first enter your password then access the correct screen on the touch screen display. The choices of the main adjustment menu are; Operator Adjustment, Machine Configuration, Timers, and Product Counters. Refer to the figure at the bottom of page 16.

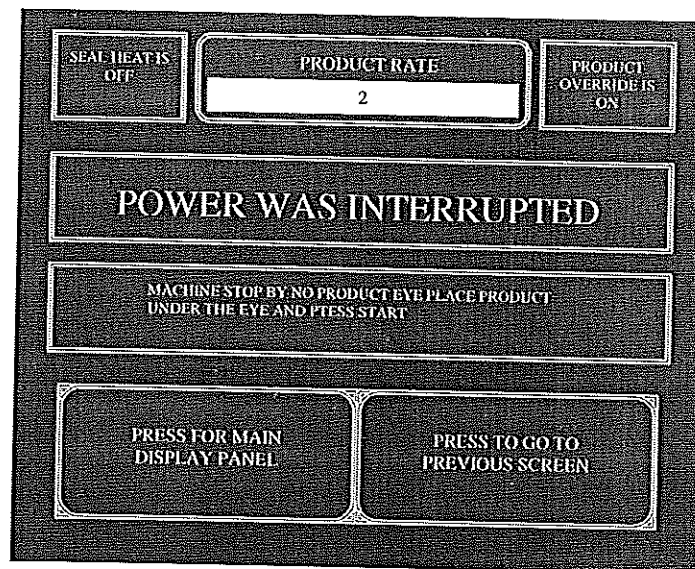
There are four (4) adjustment settings that DO NOT require a password to alter. These are End Seal Adjustment, Dwell Time, Product Spacing, and Fist Hole Punch Location.

NOTICE:

When the user is in DISPLAY mode, the screens will state the word "DISPLAY" in the title. When the user is in the adjustments mode (the system password has been entered) the touch screen will omit the word "DISPLAY" (EX: TIMERS DISPLAY & TIMERS).

2.3.4.3. Fault Status

The touch screen display will default to the status screen (see below) when a fault is detected.



STATUS SCREEN

A listing of the fault messages that will be displayed and an explanation of the corrective action to be taken follows;

No Faults - No corrective action required.

Control Panel E Stop - Unlatch button, press ready to start.

Front Cabinet E Stop - Unlatch button, press ready to start.

- Rear Cabinet E Stop** - Unlatch button, press ready to start.
- Control Panel Cover is Open** - Close & secure cover, press ready to start.
- Front Panel Door is Open** - Close & secure door, press ready to start.
- Front Cabinet Door is Open** - Close & secure door, press ready to start.
- End Jaw Hood is Open** - Close hood, press ready to start.
- Rear Cabinet Door is Open** - Close & secure door, press ready to start.
- Rear Panel is Open** - Close & secure rear panel, press ready to start.
- External E Stop is Pressed** - Unlatch button, press ready to start.
- External Interlock is Open** - Interlock switch is located on infeed conveyor control box. Close & secure box cover, press ready to start.
- Product Jam Switch** - Clear product jam, press ready to start.
- Infeed Clutch Jam Switch** - Clear jam, reset clutch, press ready to start.
- Jog Mode was Used** - Press ready to start.
- Jaw Safety Tripped on Closing** - The jaw safety was tripped during the closing cycle. Check for product in the jaw opening, clear jams, press ready to start.
- Jaw Safety Tripped on Opening** - The jaw safety was tripped during the opening cycle. Check for correct operation of the film clamps, press ready to start.
- Carriage Home Sensor** - Carriage is not in the home position, verify air pressure. Press ready to start.
- Film Clamp Sensor Failed to Cycle** - Check jaw safety switches. Press ready to start.
- Temperature Controller Alarm** - There is a fault in one of the temperature controllers on the main panel. After locating & correcting the fault, press ready to start.
- End of Film** - Check film supply & install new roll. Press ready to start.
- Jaw Close Time-out** - Check operation of all jaw safety switches, reset actuators if necessary. Press ready to start.
- Jaw Closed Switch Failed to Cycle** - Check operation & adjustment of the jaw closed switch & actuator, press ready to start.
- Power was Interrupted** - When power returns, display should read (Power was interrupted - press ready to start).
- No Air** - Forward limit switch was activated even though jaws were not cycling, check air pressure, press ready to start.

2.3.4.4. Main Panel

To access data via the touch screen display press the Main Panel button. This will display (see Page 15) the primary selection screen. From this screen the following areas can be accessed;

- Machine Status
- Tooth Counter
- Machine Configuration
- Timers
- Product Counters
- Machine Adjustments

NOTICE:

When the user is in DISPLAY mode, the screens will state the word "DISPLAY" in the title. When the user is in the adjustments mode (the system password has been entered) the touch screen will omit the word "DISPLAY" (EX: TIMERS DISPLAY & TIMERS).

Also displayed on the Main Panel are switches for the Seal Heat & Product Detector. Pressing either of these switches will alter the state of the function displayed. The machine type is displayed on the top far left of the Main Panel screen. The change settings button enables the user to enter the password and modify the machine settings. The password *MUST* be entered to alter any system settings.

If at anytime, a fault is detected, the touch screen will automatically switch from the screen that the user is at to the machine status screen. The machine status screen will indicate the appropriate fault.

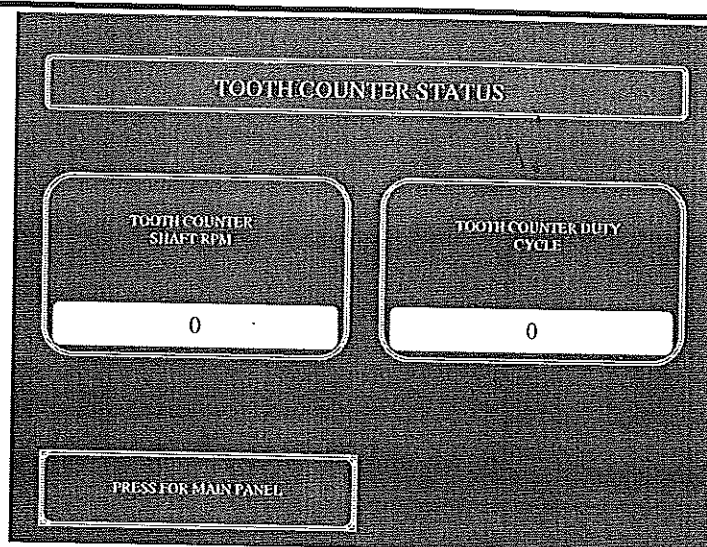
2.3.4.4.1. Machine Status

To display the machine status at any time press the "Press for Status" button near the top left of the Main Panel Display screen. The display will show the machine running or fault status and product rate. Refer to the figure on page 15.

A seal heat off light will flash indicating that the seal heat is off. A product override light will flash indicating that the product override is on. To return to the Main Panel screen, touch the "Main Panel" button. To return to the previous screen, press the "Previous Screen" button.

2.3.4.4.2. Tooth Counter

To access the Tooth Counter Display, press the tooth counter display button near the bottom right of the Main Panel screen. This will display the tooth counter status screen (see next page) to allow for correct setting of the tooth counter proximity sensor. The ideal duty cycle for this tooth counter is 50%. The second feature of this display is the tooth counter shaft speed which indicates the R.P.M. of the shaft that the tooth counter wheel is running on. To return to the Main Panel simply press the "Main Panel" button.



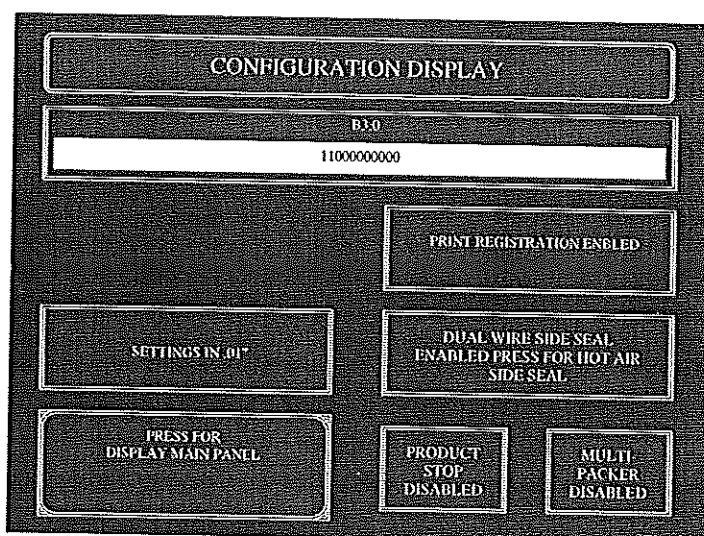
TOOTH COUNTER STATUS

2.3.4.4.3. Machine Configuration

To access the Machine Configuration display from the Main Panel, press the "Configure Machine" button. The Configuration display screen contains buttons that will require choices to be made for the following options;

- **Print Registration (Print Mark Detection)**
- **Multipacker Enable/Disable**
- **Dual Wire Side Sealer / Hot Air Side Sealer**
- **Product Stop Capability**
- **Scale Factor (Set in Inches or Centimeters)**

This display (below) will enable or disable the above functions. Refer to page 17, Modifying Data, for additional information.



CONFIGURATION DISPLAY

Each button within this display will show the function "enable" or "disable". The button will change from dark (DISABLE) to light (ENABLE). There are no other adjustments to this display.

To return to the Main Panel, press the Main Panel button at the lower left of the display.

2.3.4.4.4. Timers

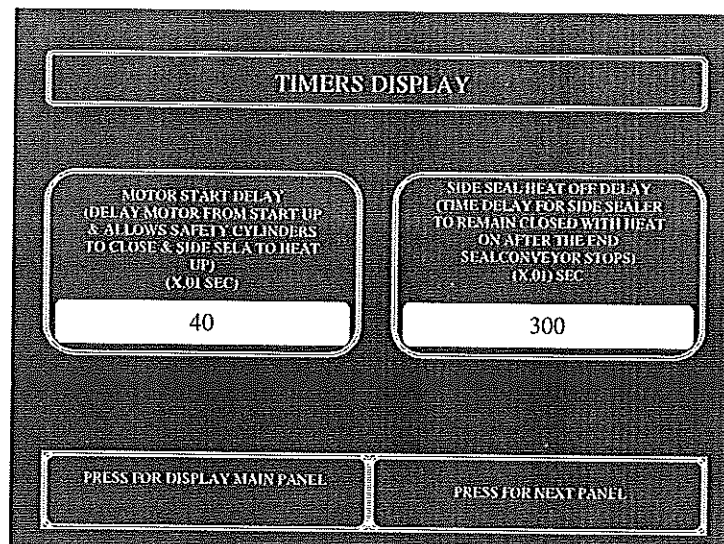
To access the timers in the PLC via the touch screen display, press the Timers button at the bottom left of the Main Panel display. The timers available from this display (see below) are;

- Motor Start Delay Timer
- Side Seal Heat off Delay
- Hole Punch Signal Timer

NOTICE:

When the user is in **DISPLAY** mode, the screens will state the word "**DISPLAY**" in the title. When the user is in the adjustments mode (the system password has been entered) the touch screen will omit the word "**DISPLAY**" (EX: **TIMERS DISPLAY & TIMERS**).

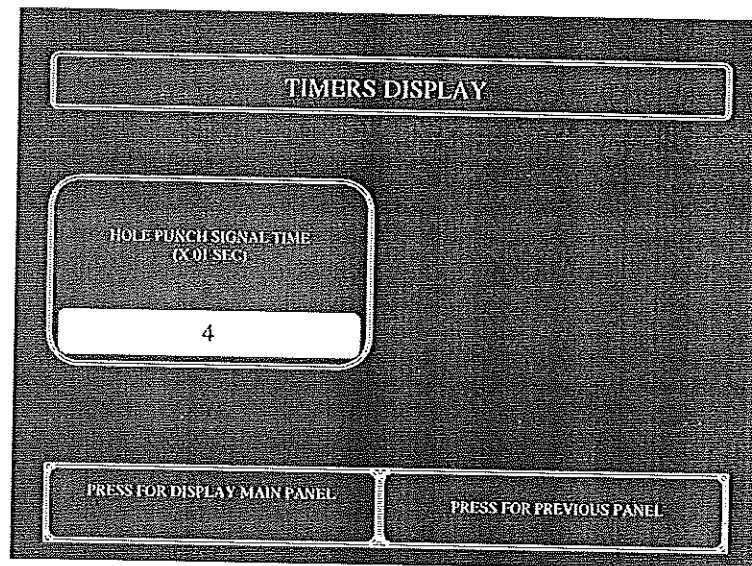
Motor Start Delay Timer button. This feature allows a time to be programmed in to the PLC to delay the start of the motor, allowing the side sealer jaws time to engage. The current value for this timer is displayed in a display bar at the bottom of this button. The factory default value for this timer is 10 which gives a 0.1 second delay. To alter this timer see **Changing Values**.



TIMERS DISPLAY

Side Seal Heat off Delay button. This sets a time delay (setting X .01 seconds), allowing the side sealer to remain closed with heat on after the clutched end seal conveyor stops. This should be set just high enough to prevent the side sealer air cylinder from cycling between every product. The default setting is 300 (which equals a 3 second delay). This value can be changed if necessary, see **Changing Values**.

The second screen (below), accessed by pressing the "Next Panel" button, is the **Hole Punch Signal Time**, it is used to send a timed signal to the hole punch solenoid each time the PLC requires the hole punch to be fired. The value of this signal is displayed in the display bar at the bottom of this button. The factory default value for this timer is 45 which gives a 0.45 second signal. This value can be changed if necessary, see **Changing Values**.



TIMERS DISPLAY (SCREEN 2)

To return to the Main Panel screen press the Main Panel button. To return to the previous screens, press the "previous panel" button.

2.3.4.4.5. Product Counters

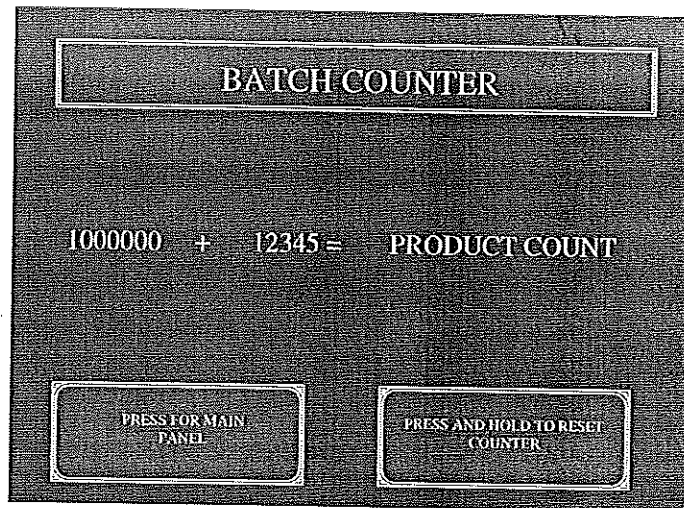
To access the product counters in the PLC via the touch screen display, press the "Product Counters" button at the top right of the Main Panel display. This counter (see next page) has been configured to be used as a totalizer for the operator to keep track of products produced since the last reset of the Batch Counter.

The counts are accumulated in blocks of 10000, displayed to the left of the counter screen, with the products less than 10000 displayed to the right of the counter screen. Reading from left to right will provide the total batch count since the last reset.

The left count will not show until a count of 10,000 has occurred.

For example the left count might be 50000 with a right count of 4353, the total would be read as 54353.

The batch counter can be reset by pressing the "Press & hold to reset Counter" button (below), also see **Changing Values**.



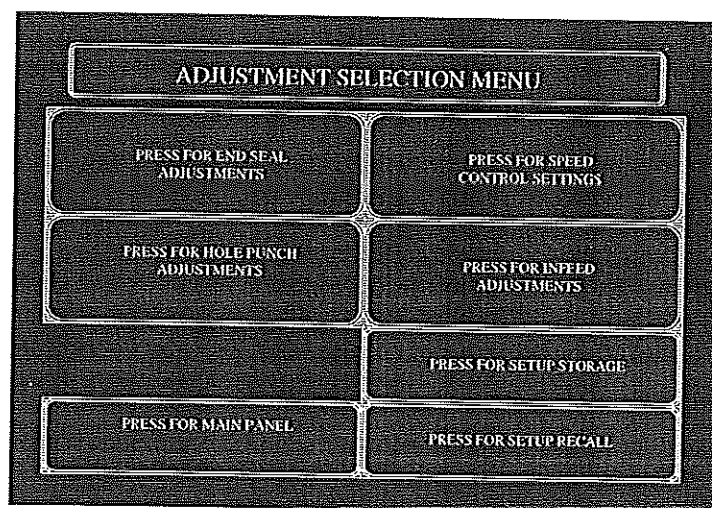
BATCH COUNTER

To return to the Main Panel press the Main Panel button.

2.3.4.4.6. Machine Adjustments

To access the adjustments available to the operator, press the Operator Adjustment button. The first screen displayed is a menu (see below) of these items that are adjustable by the operator. These are;

- End Seal Adjustment
- Speed Control Adjustment
- Hole Punch Adjustment
- Infeed Adjustment
- Setup Storage
- Setup Recall



ADJUSTMENT SELECTION MENU

NOTICE:

When the user is in **DISPLAY** mode, the screens will state the word "**DISPLAY**" in the title.
When the user is in the adjustments mode (the system password has been entered) the touch screen will omit the word "**DISPLAY**" (**EX: TIMERS DISPLAY & TIMERS**).

Pressing the **End Seal Adjustment** button will display (see below) those features that pertain to the end seal system.

- **Trailing Edge Seal Placement**
- **End Seal Placement**
- **Jaw Dwell**
- **Hot-wire Impulse On-time**
- **Hot-wire Impulse Advance**
- **End Seal Minimum Gap**
- **End Seal Eye Select**
- **Carriage Forward Start Delay**
- **Carriage Return Delay**

The screenshot shows a screen titled "END SEAL ADJUSTMENTS". It contains several buttons and value displays:

- TRAILING EDGE SEAL PLACEMENT PRESS FOR LEADING EDGE** (button)
- END SEAL PLACEMENT** (button) with a value display of **475**
- JAW DWELL** (button) with a value display of **15**
- HOT WIRE IMPULSE ON-TIME** (button) with a value display of **38**
- HOT WIRE IMPULSE ADVANCE** (button) with a value display of **20**
- END SEAL MINIMUM GAP** (button) with a value display of **200**
- PRESS FOR ADJUSTMENT SELECTION MENU** (button)
- PRESS FOR MORE OPTIONS** (button)

END SEAL ADJUSTMENTS

Trailing Edge Seal Placement button is an on/off control and when activated will change the edge sensing from leading to trailing or vice versa.

The End Seal Placement button with a value display bar at the bottom edge, displays the current value of this counter. This counter will place the end seal at a pre-set distance from the point at which the end seal eye was triggered. The value of this counter can be changed to effect the End Seal Placement position. This setting can be altered without the use of a password.

Jaw Dwell sets the time (setting X .01 seconds) that the jaw will stay closed during a seal cycle. . This setting can be altered without the use of a password.

Hot-wire Impulse On-time sets the time (setting X .01 seconds) that the impulse heat stays on. The default setting is 38 (which equals a 0.38 second on-time).

Hot-wire Impulse Advance sets the time (setting X .01 seconds) that the impulse heat comes on before the jaw closes. The default setting is 20 (which equals a 0.2 second advance)

End Seal Minimum Gap sets a distance to allow for a gap in a product. It should be set to 0 when not needed.

The distance traveled per count is determined by the scale factor.

Note: This may not work properly if the leading edge seal placement is selected.

Note: This setting cannot be larger than the product spacing.

END SEAL ADJUSTMENTS

END SEAL EYE SELECT

- 0) EITHER EYE SIGNAL
- 1) USE MAIN EYE
- 2) USE AUXILIARY EYE
- 3) USE BOTH EYES

1

CARRIAGE FORWARD DELAY

12

CARRIAGE RETURN DELAY

16

PRESS FOR ADJUSTMENT SELECTION MENU

PRESS FOR PREVIOUS PANEL

END SEAL ADJUSTMENTS (SCREEN 2)

End Seal Eye Select (above)

- at 0 = Either eye signal energized is interpreted as a product.
- at 1 = Use main eye signal only.
- at 2 = Use auxiliary eye signal only.
- at 3 = Both - if both signals are energized, it is interpreted as a product.

Carriage Forward Start Delay (setting X .01 seconds) determines how long after the jaw begins to close that the carriage begins to move downstream. If this setting is too low, the jaw will close on taller products.

Carriage Return Delay (setting X .01 seconds) determines how long after the jaw begins to open that the carriage begins to return to home. If this setting is too low, the jaw can hit a taller product when the carriage returns. See **Changing Values**.

To return to the Main Panel screen press the Main Panel button.

NOTICE:

When the user is in **DISPLAY** mode, the screens will state the word "**DISPLAY**" in the title. When the user is in the adjustments mode (the system password has been entered) the touch screen will omit the word "**DISPLAY**" (**EX: TIMERS DISPLAY & TIMERS**).

Hole Punch Adjustment.

Pressing the Hole Punch Adjustment button displays those adjustments that pertain to the hole punching system. The features available from this screen (below) are as follows;

- **Hole Punch Mode**
- **Location of First Hole**
- **Hole Punch Spacing**
- **Number of Holes Per Bag**

HOLE PUNCH ADJUSTMENTS

HOLE PUNCH MODE
0) EQUAL SPACING NOT REG
1) INFEEED SPACING NOT REG
2) INFEEED PRODUCT SENSOR
3) END SEAL EYE
1234

LOCATION OF FIRST HOLE
12345

HOLE PUNCH SPACING
12345

NUMBER OF HOLES PER BAG
12345

PRESS FOR ADJUSTMENT SELECTION MENU

HOLE PUNCH ADJUSTMENTS

Hole Punch Mode determines the mode of hole punching, a display bar at the bottom of this button shows the current value selected. The selections available are as follows;

- **Equal Spacing, Not Registered**
- **Infeed lug sensor (lugged infeeds only)**
- **Infeed spacing eye (clutched harmonic infeed only)**
- **End Seal Eye (optional on all F-4 and F-5A machines).**

Location Of First Hole sets the distance from the hole punch trigger (determined by the hole punch mode) to the first hole. The distance traveled per count is determined by the scale factor in inches or centimeters. . This setting can be altered without the use of a password.

Hole Punch Spacing sets the spacing of the punched holes when equal spacing or multiple holes per bag are selected.

Number of Holes per Bag sets the maximum number of punched holes per bag. It can be set to any number. When set to 0 , the hole punch logic is off.

To change these settings see **Changing Values**.

To return to the Operator Adjustment panel, press the Adjustment Menu button.

Infeed Adjustments

To adjust product infeed, press the "Infeed Adjustment" button. The panel will change to the Infeed Adjustment screen. The features available from this screen (below) are as follows:

- **Infeed Minimum Gap**
- **Product Spacing**
- **Print Mark Offset**
- **Harmonic Product Length**

The image shows a control panel titled "INFEED ADJUSTMENTS". It contains four rectangular buttons arranged in a 2x2 grid. Each button has a title and a numerical value "1234". The top-left button is labeled "INFEED MINIMUM GAP". The top-right button is labeled "PRODUCT SPACING". The bottom-left button is labeled "PRINT MARK OFFSET (SETS HOW FAR THE FILM TRAVELS AFTER SENSING THE PRINT MARK ON THE FILM)". The bottom-right button is labeled "HARMONIC PRODUCT LENGTH (SETS THE PRODUCT LENGTH FOR CLUTCHED HARMONIC INFEED)". Below the grid is a single button labeled "PRESS FOR ADJUSTMENT MENU".

INFEED SETTINGS

The **infeed minimum gap** determines the minimum gap between each product entering the film. This variable is utilized on a harmonic infeed option. The distance traveled is determined by the scale factor.

The **product spacing** determines the amount of space between each product when end sealing. The distance traveled is determined by the scale factor. . This setting can be altered without the use of a password.

The **print mark offset** determines how far the film travels after sensing a print marking, before the product is fed in. The distance traveled is determined by the scale factor.

The **harmonic product length** sets the product length for the clutched harmonic infeed. The distance traveled is determined by the scale factor.

To change these settings, see **Changing Values**. To return to the Operators Adjustment panel, press the "Adjustment Menu" button.

Setup Storage and Recall

- Setup Storage
- Setup Recall

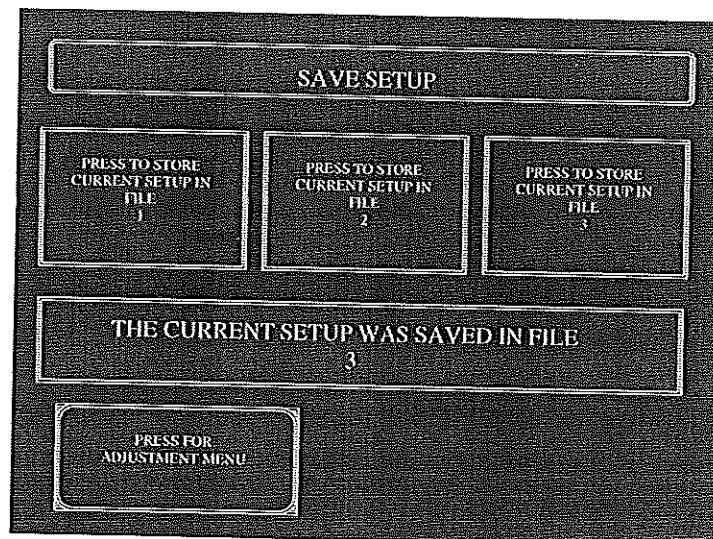
NOTICE:

When the user is in **DISPLAY** mode, the screens will state the word "**DISPLAY**" in the title. When the user is in the adjustments mode (the system password has been entered) the touch screen will omit the word "**DISPLAY**" (EX: **TIMERS DISPLAY & TIMERS**).

Pressing the Setup Storage or Setup Recall button displays the buttons relating to the Machine Set-up Storage or Recall features.

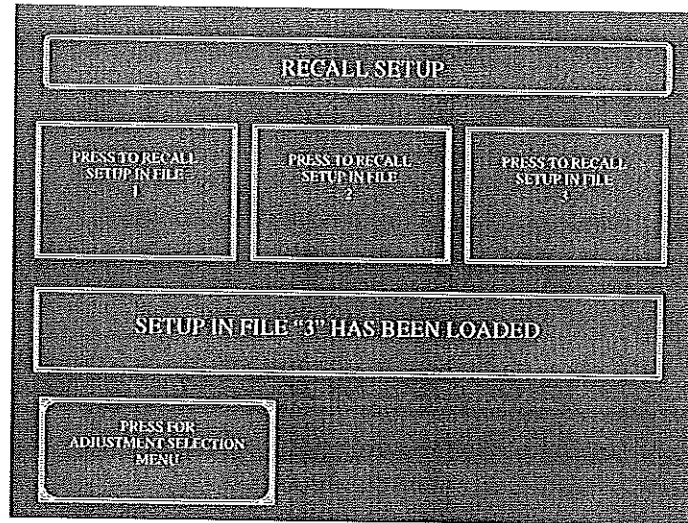
The F-5A has the capability to store three sets of setup parameters for later recall. To save the current machine setup first locate the Machine Set-up Storage button.

By pressing the **setup storage** button, three buttons utilized in storing the setup will appear (see below). By pressing the appropriate file number, the setup will be stored. The save action will be confirmed by displaying; "The current setup was saved in file X" (X signifies the file number that was saved).



SAVE SETUP

By pressing the **setup recall** button, three buttons utilized in recalling a stored setup will appear (see example on following page). By selecting the appropriate file number, the setup will be recalled. The display will confirm the recalled setup by displaying; "setup file X has been loaded" (X signifies the recalled file number).



RECALL SETUP

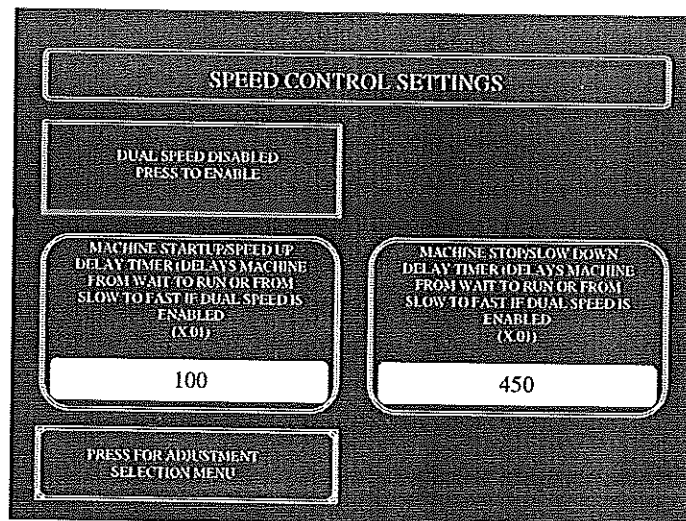
To change these settings, see **Changing Values**.

To return to the Operators Adjustment panel, press the adjustment Menu" button.

Speed Control

Pressing the speed control setting button will display (below) those features that pertain to the speed control functions of the machine. These are;

- **Dual Speed Enable or Disable**
- **Start-up or Speed-up Delay**
- **Stop or Slow-down Delay**



SPEED CONTROL SETTINGS

The top control button is an on/off button and will display it's current enable or disable dual speed logic setting.

Just below is the Speed Control Machine start speed-up button. For start / speed up timer that sets a time delay (setting X .01 seconds) for the transition from wait to run mode and from slow to fast speed (when machine is set to dual speed). The factory default setting is 100, which equals a 1.0 second delay.

To the right of that button is the stop / slow down timer and it sets a time delay (setting X .01 seconds) for the transition from run to wait mode and from fast to slow speed (when machine is set to dual speed). The factory default setting is 70, which equals a 0.07 second delay.

To change the value of either of these delay timers see **Changing Values**.

NOTICE:

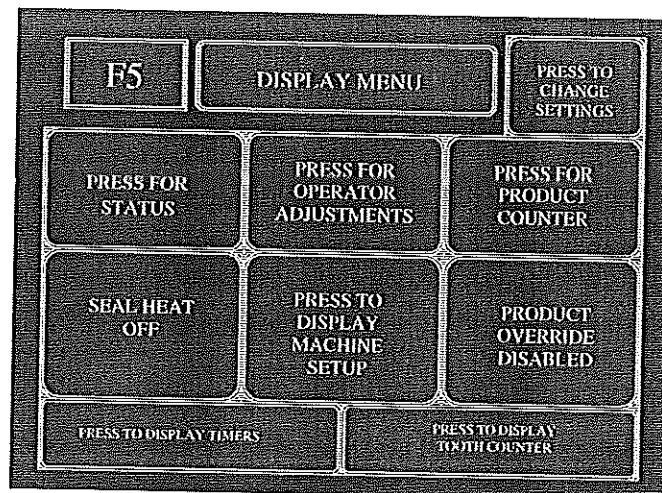
When the user is in **DISPLAY** mode, the screens will state the word "**DISPLAY**" in the title. When the user is in the adjustments mode (the system password has been entered) the touch screen will omit the word "**DISPLAY**" (EX: **TIMERS DISPLAY & TIMERS**).

To return to the operator adjustments panel, press the Adjustment Menu button.

2.3.4.5. Changing Values

There are four (4) adjustment settings that **DO NOT** require a password to alter. These are End Seal Placement, Dwell Time, Product Spacing; and First Hole Punch Location.

To access the changing values function of this machine, first enter the password by pressing the "change settings" button on the main display menu (below).



MAIN DISPLAY MENU

For any of the features previously explained having the capability for having their value changed, the procedure is the same in all cases. First press the button "press to change settings" then enter the password and press enter. This will bring you to the adjustment menu, where you can enter the screen of the feature you wish to change the value of. If the display is a change status display "on/off function" simply touch the display button of the feature that you wish to change the value of. If the display is a change value display, touch the display and a keypad display will open.

The keypad display is the adjustable values operator and the keypad is used to enter changes. Above the keypad, one display will show the current value. The second will have a flashing cursor displaying the value you entered. Above and below the second line, are displayed the maximum and minimum allowed values. Using the numeric keys on the keypad, enter in the value that you wish to change to, then press the Enter key to install this as the current value. Next press the Done key, below the Enter key, to complete the change & return to the previous screen.

If you decide not to change the value do not press the Enter key, simply return to the previous screen by pressing the Done key.

2.3.5. Run Mode and Speed Control

If *Stop* is pressed when machine is in Run mode, a "soft stop" (a stop following the seal cycle in progress) will be executed.

If your machine is equipped with an accumulating infeed conveyor, the machine RUN mode can be configured to key off of one or two optional product infeed eyes. When two product infeed eyes are used, the machine can also be set up to run in a dual speed mode.

NOTE

When using Accumulator Low Level Eye (Eye 3) and/or Accumulator High Level Eye (Eye 4), they must be set to Light-Operate if the eyes are Retro-Reflective type or Dark-Operate if the eyes are Proximity (Diffuse Reflective) type.

2.3.5.1. No Eyes on the Accumulating Conveyor

Without product eyes on the accumulating conveyor, the machine operates in the normal manner: When *Start* is pressed, the machine enters the RUN mode and the green light illuminates solid. The machine will run until the *Stop* (or *E-Stop*) button is pressed or the machine trips on safety.

2.3.5.2. One Eye on the Accumulating Conveyor

With the single eye configuration, the machine will enter the RUN mode when *Start* is pressed. The green light will flash indicating "waiting for product".

When the eye is covered, the machine will run and the green light will illuminate steady. If the eye is uncovered, the machine will stop and the green light will flash, indicating "waiting for product."

2.3.5.3. Two Eyes – Single Speed - on the Accumulating Conveyor

The machine can operate with two eyes on the accumulating conveyor and can be set to run in a single speed configuration by disabling the dual speed option. This can be accomplished with the “dual speed” toggle button located in the speed control settings panel (refer to Page 30 for more information).

The machine will enter the RUN mode when *Start* is pressed. The green light will flash, indicating “waiting for product”. When Eye 3 and Eye 4 are both covered, the machine will start and the green light will illuminate solid.

The machine will continue to run until Eye 3 (the more downstream of the two eyes) is uncovered. When Eye 3 is uncovered, the machine will stop and the green light will flash. When both eyes are covered again, the machine will automatically restart.

2.3.5.4. Two Eyes – Dual Speed - on the Accumulating Conveyor

The machine can operate with two eyes on the accumulating conveyor and can be set to run in dual speed configuration by enabling the dual speed option. This can be accomplished with the “dual speed” toggle button located in the speed control settings panel (refer to Page 30 for more information). Time delays can be set in dual speed mode with the use of the touch screen. Refer to section 2.3.4 for additional information.

The machine will enter the RUN mode when *Start* is pressed. The green light will flash indicating “waiting for product”.

When both Eye 3 and Eye 4 are covered, the machine will start in fast speed and the green light will illuminate solid.

If Eye 4 (the upstream eye) is uncovered while Eye 3 remains covered, the machine shifts to slow speed.

If Eye 3 is uncovered at any time, the machine will stop and the green light will flash. When the eyes are again both covered, the machine will automatically restart in fast speed.

Time delays can be set in the PLC using the Touch Screen. Refer to speed control in section 2.3.4 Programmable Controller page 30, for more information.

2.3.5.5. No Product Detect Eye

If the No Product Detect Eye (Eye 11) is installed, the wrapper will stop when that eye is uncovered (and a lug is detected, if applicable) and will remain stopped until that eye is again covered and *Start* is pressed.

2.4. CHANGEOVER FOR DIFFERENT PACKAGE SIZES

2.4.1. Film Changeover

To change film on the F-5A, you must remove the spindle from the unwind, remove one of the core chucks from the spindle, pull off the existing roll, and install a different roll. The core chucks are both adjustable on the spindle, each held in place by a quick release handle.

This provides for proper positioning of the roll on the spindle. The spindle also has a quick release handle that adjusts the location of the roll once the core chucks are positioned and holds the roll solidly on the spindle.

Feed the film through the unwind as per the film threading diagram tag. As the film comes out of the unwind, feed it over the support bar, around the opener bar on the inverting head bracket, and over the inverting head. Reach through the inverting head, and grip the center fold of the film and pull it through the inverting head. The machine is now threaded with film and ready to set to size.

2.4.2. Inverting Head Height Changeover

For a fixed inverting head, complete head must be changed to accommodate new height. For an adjustable inverting head, adjust the height of the adjustable inverting head to clear the package by approximately 1/2 inch using the crank located on the inverting head mount.

2.4.3. Width Changeover

Place the package on the infeed conveyor and adjust side guides until the package is centered on the conveyor with approximately 1/4" to 1/2" of total looseness. Tighten package guides securely in place. Adjust the inverting head and the side seal conveyor in order to achieve the proper size wrap around the package.

2.4.4. Height Changeover-End Seal

In order to ensure that the seal is always made at the centerline of the package, the entire shaft which carries the toggle cranks can be moved up and down inside the jaw height assembly. The housing is located inside the end jaw housing behind the front and rear door. One quick release handle is loosened on the operator side of the machine and then (by turning a balcrank accessible through the end jaw housing door), a chain is moved which in turn operates two screws to raise the shaft mechanism for the high profile package (or lower it for a low profile package). Thus, the seal jaw opening is generally the same for similarly sized packages. The only change that is required to place the seal at the centerline of the package is to raise or lower the shaft carrying the toggle cranks.

When the seal jaw opening has to be changed, use the Crank Changeover Diagram (drawing E08-0008, included in Section 7 of this manual). Select the minimum jaw opening that is closest to greater than the package height. From the same line on the chart, the correct crank and connecting link holes can be determined. Adjust the air cylinder toggle cranks for the proper opening: loosen the toggle crank bolts and rotate the main toggle shaft to achieve the proper opening and re-tighten the bolts, with the air cylinder fully retracted.

In normal conditions the speed of the seal conveyor is the same as the speed of the side seal conveyor belt. In the case of high profile packages, however, a sprocket change can be introduced between the end seal conveyor and the rest of the machine, permitting the end seal conveyor to operate at a slightly slower speed than the side seal belt conveyor. An end seal variator is also available as an option to achieve variable speeds between these belts.

2.4.5. Length Changeover

Infeed conveyor lug spacing will change according to the package length. The carrier bases are spaced 4 1/2 inches apart, permitting lug spacing of 4 1/2", 9", 13 1/2", 18", 27", 36", and 54" apart. Refer to DWG. #KO5-0004 (included in Section 7 of this manual) for the best lug spacing for your package. Once the lug spacing is determined from DWG. #KO5-0004, the lugs can be inserted or removed from the carrier links to obtain the desired spacing. Since the lug spacing can only be placed at certain intervals, it is necessary to vary the speed of the infeed conveyor. This is done by adjusting the speed variator, connecting the main drive of the machine to the infeed conveyor. The speed variator is located behind the heat control door. By turning the variator handle clockwise, the infeed conveyor will speed up in relation to the side seal and end seal conveyors; thereby, decreasing the spacing between packages. Turning the handle counter-clockwise will increase the spacing.

CAUTION!

Variator can be adjusted only when the machine is running.

Start with a long spacing between packages and close gradually. When the end seal jaws start kicking back packages, the spacing is too close and should be increased.

The end seal jaws are triggered by an electric eye which senses the trailing end of a package and triggers an adjustable end seal counter for placement of the end seal. The end seal placement is controlled by a counter in the PLC to change the package spacing and place the end seal in the center of the space between packages.

2.5. MAKING SEALS ON SHANKLIN HOT WIRE WRAPPERS

2.5.1. General

CAUTION!

It is suggested that the controls be left alone until instructed in the proper setting procedures.

It is easy to make quality seals in most films provided the operator understands the film he is sealing and the machine that he is using. The SHANKLIN F-5 "Form-Fill-Seal" Automatic Wrapper has been designed to give the operator precise control over the variable factors involved in making hot wire seals. Still, this control can prove troublesome; if the operator does not understand the equipment or the wrapping film, he can accidentally "over adjust" the machine so that it no longer seals any type of film until properly reset.

2.5.2. Hot Wire End Seal Jaws

The hot wire end seal jaws consist of a hot wire running the length of a row of trapezoidal beads. The wire makes a seal against Teflon fiberglass cloth backed up with a silicone rubber pad and sponge rubber pad on the lower bed. A spring loaded film clamp in the upper jaw prevents film from coming into contact with the wire until the jaws are fully closed, and also helps to take a little tension out of the film when a seal is being made.

2.5.3. Hot Wire Seal Systems

In the impulse system the wire is held at a low heat setting called "Constant Heat" while the machine is idle. When the machine is operated and the seal jaws meet, the wire is impulsed with higher current called "Impulse Heat" to reach sealing temperature quickly. In a system of this type, the faster the machine cycles, the less the wire will cool down, and therefore the more consistent the wrapper operation will become.

2.5.4. Wire Selection

CAUTION!

Seal wires are subjected to extreme thermal changes. SHANKLIN Shrink Wrapper seal wires and terminations are specifically engineered and manufactured to withstand the shock of normal operations. Be wary of non factory substitutions.

All SHANKLIN Sealers and Wrappers use .040 diameter wire. Bare wire is generally used for POLYOLEFIN and POLYPROPYLENE films. Teflon coated wire is used for PVC and POLYETHYLENE films.

2.5.5. Condition Of Jaws And Beds

Before attempting to make a seal, check to make sure that the seal wire and upper jaw are clean. Any bits of film caught on the wire or caught between the wire and the ceramic beads may cause poor seals in this region.

The lower bed should be in good condition. The Teflon fiberglass tapes may show the impression of the wire and some discoloration. If the tapes are burned or are completely blackened in the region where they are touched by the wire, then the Teflon tapes should be replaced. Refer to Section 3 of this manual for instructions on changing the lower seal beds.

CAUTION!

Any attempt to use tapes beyond their proper life will result in burned lower beds and this, in turn, will result in replacing lower beds prematurely.

2.5.6. Wire Voltage

Shanklin wrappers use a solid state device controlled by two potentiometers labeled *constant* and *impulse*. These are located on the front panel of the lower electric box. The current controls the speed with which the wire heats up, but it does not control the actual temperature of the wire. To make the wire heat up rapidly, increase the impulse current. To make it heat up less rapidly, decrease the impulse current.

2.5.7. Wire Temperature

CAUTION!

In all sealing operations, the wire temperature should be as cool as possible. Excessive temperature on the seal wire will result in a short seal wire life, charred film, and burned tapes and beds.

Wire temperature is determined by the amount of current and the length of time the current is maintained on the seal wire. Length of time is determined within the PLC, but is limited to 1 second maximum for impulse current. In order to change wire temperatures, adjustments to the constant and impulse pots is required.

Set the constant pot to approximately 45-50 on its dial and set the impulse pot to approximately 60-75 on its dial. These settings should give you a reading on the Ammeter of 9A to 12A in the idle position and a reading of 28A to 30A when the seal jaw is in a sealing position. Use the Ammeter as a reference. Fine tuning adjustments may be needed for optimum seal.

2.5.8. Setting the Jaw Safeties

Refer to Section 3 of this manual for information on Setting the Jaw Safety.

2.5.9. End Seal Dwell

The dwell is the length of time the end seal jaws stay closed during a seal cycle. It may be desirable to increase the dwell time of the end seal jaws when the machine is cycling rapidly because of short product and/or fast conveyor speeds.

The dwell is controlled in the PLC, and can be accessed by the touch screen. For more information about the operation of the touch screen, refer back to section 2.3.4. that begins on page 2-13.

2.5.10. Seal Jaw Pressure

One variable in making a satisfactory seal is the pressure exerted on the film by the seal wire when the upper jaw and the lower bed are brought together under pneumatic pressure.

In the event that the seal pressure is heavier at one end of the jaw than at the other, the problem can be corrected by adjusting the bearings on the ends of the connecting rods, attached to the seal jaws.

When the seal jaw is sealing, the wire will run hotter where there is less pressure and cooler where there is more pressure. The bed acts as a heat sink absorbing the heat out of the wire. Thus if a good seal is being obtained at one end of the jaw but the film is not cutting clean at the other end of the jaw, it is entirely possible that the pressure is too great where difficulty in the cut is being experienced.

Usually once the proper pressure and velocity is set to a seal jaw, it should not have to be readjusted unless the jaw opening is changed. If new silicone and sponge beds are put into the seal jaw, it may be necessary to make some slight adjustment to obtain correct pressure and velocity.

2.5.11. Summary

If proper attention is given to the settings and procedures listed in this section, the F-5 will produce excellent seals. If difficulty is experienced, return to the recommended settings as described in this section or refer to the Troubleshooting section of this manual.

2.6. MAKING SEALS ON SHANKLIN HOT KNIFE WRAPPERS

2.6.1. General

CAUTION!

It is suggested that the controls be left alone until instructed in the proper setting procedures.

It is easy to make quality seals in most films provided the operator understands the film he is sealing and the machine that he is using. The SHANKLIN F-5 "Form-Fill-Seal" Automatic Wrapper has been designed to give the operator precise control over the variable factors involved in making hot knife seals. Still, this control can prove troublesome; if the operator does not understand the equipment or the wrapping film, he can accidentally "over adjust" the machine such that it no longer seals any type of film until properly reset.

2.6.2. Types Of Seal Systems

The Hot Knife and Cool Cut sealing system jaws produce a wide fin seal. Each jaw contains a heating element and a cutting and sealing blade. The Cool Cut system and some Wide Fin systems include a heated bottom jaw with a grooved rubber or felt pad. The heat for each is independently controlled by a thermocouple controlled temperature controller. Once the set temperature is reached, the machine is ready to run. The length of the seal cycle is controlled by the end seal dwell setting in the PLC.

2.6.3. Condition Of Jaws And Beds

2.6.3.1. Hot Knife Systems

Before attempting to make a seal, check to make sure that the seal blades are clean. Film build up could cause poor seals. When cleaning, bring blades up to temperature and wipe along blades with a ball of selva film or a soft damp cloth ball.

WARNING!

Burns could occur if the knife assembly touches bare skin.

The lower beds should be in good condition. The silicone or felt should be smooth and flat along the length of the entire bed. If the beds show any signs of deterioration, they should be replaced. Refer to Section 3 of this manual for instructions on changing the lower seal beds.

2.6.3.2. Cool Cut Systems

Before attempting to make a seal, check to make sure the jaws are clean. Remove any bits of film with a soft cloth or a rolled up piece of film, while the jaws are warm.

CAUTION!

The Cool Cut blade is extremely sharp. Do not attempt to clean the jaw with the blade extended.

The lower beds should be in good condition. The silicone or felt should be smooth and flat along the length of the entire bed. If the beds show any signs of deterioration, they should be replaced. Refer to Section 3 of this manual for instructions on changing the lower seal beds.

2.6.4. Hot Knife/Cool Cut Temperatures

CAUTION!

If the machine is idle for an extended period of time with the bottom jaw heat on, damage to the belts may occur.

Here are some general guidelines for temperature settings for Hot Knife seal bars (Actual settings may vary).

WIDE FIN JAW

TYPE FILM	TEMP (F°)
PVC - REYNOLDS 5044	325
OLEFIN-DUPONT HP	345
OLEFIN-CRYOVAC D955	350

Here are some general guide lines for temperature settings for Cool Cut seal bars (Actual settings may vary).

COOL CUT JAW

TYPE FILM	TEMP (F°) TOP JAW	TEMP (F°) BOTTOM JAW
PVC - REYNOLDS 5044	315	200
OLEFIN-DUPONT HP	285	200

WARNING!

On machines with a heated bottom jaw, the temperature should be set no higher than 300° F. Ideally, the temperature of the bottom jaw should be set to approximately 200° F and only increased if required to make good seals.

The bottom jaw is in close proximity to the end seal belts and if a temperature higher than 300° F is maintained, the belts may become damaged from the heat.

2.6.5. Hot Knife Temperature Controller

The top and bottom seal jaws are independently controlled with solid state temperature controllers. The temperature required for good seals will not be the same for both jaws. Trial and error testing will determine what temperature is best. The controllers have a high limit of 400° F. This is to prevent damage to the coating on the seal blades. Further information on the controllers is included in Section 5 of this manual.

2.6.6. Setting the Jaw Safeties

Refer to Section 3 of this manual for information on Setting the Jaw Safety.

2.6.7. Alignment Of The Top And Bottom Jaws

Many problems concerning sealing and cutting on the Cool-Cut system can be attributed to top jaw misalignment with the slot in the bottom pad. The alignment must be checked on both ends of the jaw to insure proper alignment.

To check alignment, disconnect air and cycle to closed position. Pull top jaw down manually to check alignment at each end.

2.6.8. End Seal Dwell

The dwell is the length of time the end seal jaws stay closed during a seal cycle. It may be desirable to increase the dwell time of the end seal jaws when the machine is cycling rapidly because of short product and/or fast conveyor speeds.

The dwell is controlled in the PLC, which can be accessed through the touch screen. For more information about the operation of the touch screen, refer back to section 2.3.4. that begins on page 2-13.

2.6.9. Seal Jaw Pressure

One variable in making a satisfactory seal is the pressure exerted on the film by the sealing knife when the upper jaw and the lower bed are brought together under pneumatic pressure.

In the event that the seal pressure is heavier at one end of the jaw than at the other, the problem can be corrected by adjusting the threaded rods which attach the knife assembly to the jaw.

When the seal jaw is operating, the blade will run slightly hotter where there is less pressure and cooler where there is more pressure. The bed acts as a heat sink, absorbing the heat out of the knife rather than permitting it to heat up as hot as it should. Thus, if a good seal is being obtained at one end of the jaw, but film is not cutting clean at the other end of the jaw, it is entirely possible that the pressure is too great where difficulty in the cut is being experienced.

Usually, once the proper pressure is set to a seal jaw, it should not have to be adjusted unless the jaw opening is changed. If a sealing blade change is made or if new silicone and sponge beds are put into the seal jaw, it may be necessary to make slight adjustments to obtain the correct pressure and velocity.

2.6.10. Summary

If proper attention is given to the settings listed above, the SHANKLIN F-5 "Form-Fill-Seal" Automatic Wrapper will produce excellent seals. If difficulty is experienced, return to the recommended settings as described above or refer to the Troubleshooting section of this manual.

SECTION 3. TROUBLESHOOTING

This section is structured as follows:

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A three page SAFETY INSERT (printed on yellow paper) is included at the beginning of this section. You are urged to read this section carefully before operating the F-5

SAFETY

!!! IMPORTANT !!!

READ THIS ENTIRE SAFETY SECTION CAREFULLY BEFORE OPERATING MACHINE

Although all necessary precautions have been taken in the design and manufacture of this packaging machine, operation of the machinery involves certain risks. Do NOT place this packaging machine into operation until all personnel associated with the machinery have become aware of the following warnings of potential hazards. We further urge you to perform your own safety study on the machinery and its installation prior to operation.

DISREGARD FOR POTENTIAL HAZARDS CAN LEAD TO:

SERIOUS INJURY TO PERSONNEL AND/OR DAMAGE TO THE EQUIPMENT. IT IS THE EMPLOYER'S RESPONSIBILITY TO ENSURE THAT PERSONNEL ARE PROPERLY TRAINED AND THAT PROPER SAFETY PROCEDURES ARE FOLLOWED.

UNDER NO CIRCUMSTANCES SHOULD THE MACHINE BE RUN WITH ANY GUARDS REMOVED OR ANY SAFETY DEVICES NON-FUNCTIONING.

GENERAL WARNINGS

This section contains three pages of general warnings. In addition, these and other warnings have been placed in appropriate places in this manual.

**PLEASE HEED ALL "WARNINGS" AND "CAUTIONS"
CONTAINED THROUGHOUT THIS MANUAL**

WARNING!

DO NOT TAMPER WITH THE ELECTRICAL WIRING, NOTIFY LICENSED ELECTRICIAN FOR MAINTENANCE. ALWAYS DISCONNECT ELECTRICAL POWER BEFORE ATTEMPTING MAINTENANCE TO ANY ELECTRICAL OR MOVING PARTS.

WARNING!

**IN ORDER TO PREVENT INJURY TO MACHINERY AND/OR PERSONNEL,
DO NOT INCREASE SETTINGS ON EITHER ELECTRICAL OR MECHANICAL
OVERLOAD SAFETY DEVICES**

WARNING!

KEEP ALL EXTREMITIES, JEWELRY, LOOSE CLOTHING AND HAIR AWAY FROM MOVING ASSEMBLIES AND CONVEYORS.

WARNING!

CONVEYOR BELTS THAT HAVE BECOME WORN OR FRAYED CAN BE HAZARDOUS AND SHOULD BE REPLACED PROMPTLY.

WARNING!

NEVER OPERATE THIS OR ANY MOVING EQUIPMENT WITHOUT ALL COVERS AND GUARDS IN PLACE. THE INTERNAL MECHANISM OF MOST PACKAGING MACHINERY CONTAINS NUMEROUS SHEAR, PINCH, AND IN-RUNNING NIP POINTS, MANY OF WHICH ARE CAPABLE OF CAUSING SEVERE INJURY AND PERMANENT DISFIGURATION

WARNING!

TO MINIMIZE POTENTIAL FOR PERSONAL INJURY, ALWAYS BE SURE THAT MACHINE OPERATORS AND OTHERS WORKING ON MACHINERY ARE PROPERLY TRAINED IN THE CORRECT USAGE OF THE EQUIPMENT AND PROPERLY INSTRUCTED REGARDING THE SAFETY PROCEDURES FOR OPERATION

WARNING!

HEAT SEALING ARMS AND JAWS AND SHRINK TUNNEL OPENINGS ON PACKAGING MACHINERY CAN GET VERY WARM AFTER A PERIOD OF USE. KEEP HANDS AWAY WHILE IN OPERATION AND USE CAUTION IF THE MACHINE HAS BEEN RUNNING RECENTLY.

WARNING!

DO NOT MAKE ANY MODIFICATIONS TO THE CONTROL PROGRAM OF THE PROGRAMMABLE LOGIC CONTROLLER, THE ELECTRICAL CIRCUITRY OR THE MECHANICAL ASSEMBLIES OF THIS MACHINERY. SUCH MODIFICATIONS MAY INTRODUCE HAZARDS THAT WOULD NOT OTHERWISE BE ASSOCIATED WITH THIS MACHINERY. THE SHANKLIN CORPORATION CANNOT BE HELD RESPONSIBLE FOR MALFUNCTIONS, PERSONAL INJURY, OR PROPERTY DAMAGE RESULTING FROM SUCH UNAUTHORIZED MODIFICATIONS.

WARNING!

THE USE OF CERTAIN TYPES OF PLASTIC FILMS IN SEALING AND/OR SHRINKING EQUIPMENT MAY RESULT IN THE RELEASE OF HAZARDOUS FUMES DUE TO THE DEGRADATION OF THE FILM AT HIGH TEMPERATURES. BEFORE USING ANY PLASTIC FILM IN THIS EQUIPMENT, THE MANUFACTURER OR SUPPLIER OF THE FILM SHOULD BE CONTACTED FOR SPECIFIC INFORMATION CONCERNING THE POTENTIAL RELEASE OF HAZARDOUS FUMES. ADEQUATE VENTILATION SHOULD BE PROVIDED AT ALL TIMES.

WARNING!

IN ORDER TO PREVENT INJURY TO MACHINERY AND/OR PERSONNEL, PROPER VOLTAGE (AS INDICATED ON NAMEPLATE) MUST BE APPLIED TO MACHINE.

WARNING!

IN ORDER TO PREVENT INJURY TO MACHINERY AND/OR PERSONNEL, PROPER EQUIPMENT GROUND (IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE) MUST BE SUPPLIED TO MACHINE.

WARNING!

NEVER INSERT PRESSURIZED CONTAINERS OR VOLATILE, FLAMMABLE OR EXPLOSIVE MATERIALS INTO OR THROUGH A SHRINK TUNNEL. RESULTING FIRE OR EXPLOSION CAN CAUSE SERIOUS PERSONAL INJURY.

WARNING!

DO NOT MAKE ANY MODIFICATIONS TO THE CONTROL PROGRAM OF THE PROGRAMMABLE LOGIC CONTROLLER, THE ELECTRICAL CIRCUITRY OR THE MECHANICAL ASSEMBLIES OF THIS MACHINERY. SUCH MODIFICATIONS MAY INTRODUCE HAZARDS THAT WOULD NOT OTHERWISE BE ASSOCIATED WITH THIS MACHINERY. THE SHANKLIN CORPORATION CANNOT BE HELD RESPONSIBLE FOR MALFUNCTIONS, PERSONAL INJURY, OR PROPERTY DAMAGE RESULTING FROM SUCH UNAUTHORIZED MODIFICATIONS.

WARNING!

THE USE OF CERTAIN TYPES OF PLASTIC FILMS IN SEALING AND/OR SHRINKING EQUIPMENT MAY RESULT IN THE RELEASE OF HAZARDOUS FUMES DUE TO THE DEGRADATION OF THE FILM AT HIGH TEMPERATURES. BEFORE USING ANY PLASTIC FILM IN THIS EQUIPMENT, THE MANUFACTURER OR SUPPLIER OF THE FILM SHOULD BE CONTACTED FOR SPECIFIC INFORMATION CONCERNING THE POTENTIAL RELEASE OF HAZARDOUS FUMES. ADEQUATE VENTILATION SHOULD BE PROVIDED AT ALL TIMES.

WARNING!

IN ORDER TO PREVENT INJURY TO MACHINERY AND/OR PERSONNEL, PROPER VOLTAGE (AS INDICATED ON NAMEPLATE) MUST BE APPLIED TO MACHINE.

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WARNING!

NEVER INSERT PRESSURIZED CONTAINERS OR VOLATILE, FLAMMABLE OR EXPLOSIVE MATERIALS INTO OR THROUGH A SHRINK TUNNEL. RESULTING FIRE OR EXPLOSION CAN CAUSE SERIOUS PERSONAL INJURY.

3.1. GENERAL MACHINE TROUBLESHOOTING

The following should be checked before troubleshooting this equipment.

1. All **WARNINGS** listed in this manual, should be read and fully understood before attempting any troubleshooting procedures.
2. The voltage supplied to the machine should be that stated on the machine's nameplate.
3. The air pressure supplied for the machine should be stated on the machine's nameplate.

CAUTION!

Improper voltages will cause various problems with machine control functions, and can also cause damage to the machine.

Problem	Probable Cause	Corrective Action
<i>Wrapper does not operate.</i>	1. Lack of Power or incorrect voltage. 2. Blown Fuse(s). 3. Broken switch or relay. 4. Incorrect or lack of air pressure.	1. Verify main power supply and main disconnect switch conditions. 2. Verify all fuses - Refer to the supplied schematic(s). Replace if necessary. 3. Verify operation of all switches and relays - refer to the supplied schematic(s). Replace if necessary. 4. Verify Air supply. Verify proper pneumatic settings.

Problem	Probable Cause	Corrective Action
<i>Wrapper turns on but does not function.</i>	1. Estop pressed. 2. Blown Fuse(s). ◇ 3. Broken switch or relay. 4. Incorrect or lack of air pressure.	1. Verify Estop condition. 2. Verify all fuses - Refer to the supplied schematic(s). Replace if necessary. 3. Verify operation of all switches and relays - refer to the supplied schematic(s). Replace if necessary. 4. Verify Air supply. Verify proper pneumatic settings.
<i>Unacceptable first seal Succeeding seals are acceptable.</i>	1. Arm dropping too FAST - "Jaw Close" needle valve set too high. 2. Arm dropping too SLOW - "Jaw Close" needle valve set too low.	1. Adjust "jaw close" needle valve down. 2. Adjust "jaw close" needle valve up.
<i>Wrapper jaw will not cycle.</i>	1. Stuck relay. 2. Jaw cylinder valve faulty. 3. Jaw cylinder faulty. 4. Air lines flooded with oil or water. 5. Faulty seal button. 6. Eye out of alignment.	1. Verify relay function. Refer to supplied schematic. Replace if necessary. 2. Replace arm cylinder valve. 3. Replace arm cylinder. 4. Drain fluid from air lines regularly 5. Replace seal button. 6. Realign eye.

Problem	Probable Cause	Corrective Action
<i>Seal jaw slams.</i>	1. Seal jaw valve set improperly. 2. Incorrect setup on jaw toggles. 3. Inconsistent air supply.	1. Adjust exhaust valve. 2. Correct setup. 3. Verify air supply and adjust if necessary.
<i>Wrapper operates inconsistently (Sometimes slow, Sometimes good seals, Sometimes bad seals)</i>	1. Voltage fluctuation 2. Air supply fluctuation. 3. Seal jaw cylinder faulty. 4. Seal jaw control valves faulty. 5. Water or oil flooding system. 6. Loose electrical connections. 7. Lost memory in P.C.	1. Verify line voltages and stability. 2. Verify air supply to machine is adequate. 3. Replace seal jaw cylinder. 4. Replace seal jaw control valve. 5. Drain fluid from air lines regularly. 6. Verify and secure all connections. Refer to the supplied schematic(s). 7. Reload logic memory in P.C.
<i>Conveyor will not Run.</i>	1. Conveyor belt jammed against side of belt housing. 2. Conveyor motor capacitor faulty. 3. Conveyor motor faulty. 4. Conveyor belt too tight.	1. Re-track conveyor belt to run in center of pulleys. 2. Replace motor capacitor. Refer to supplied schematic(s). 3. Replace conveyor motor. 4. Adjust tensioning screw on conveyor take-up bracket. Refer to drawing B06-0030 for bracket location.

Problem	Probable Cause	Corrective Action
<i>Wrapper Does Not Operate.</i>	1. No power or incorrect voltage. 2. Main and/or control circuit breaker off. 3. Blown fuse(s). 4. Broken switches, relays, or loose wires. 5. Doors or covers open, safety switch - open circuit. 6. Slip clutch loose. 7. E-stop Pressed	1. Check voltage at receptacle, and plug in power cord. 2. Verify and correct if necessary. 3. Verify and replace if required. Refer to supplied schematic for assistance. 4. Verify and replace if required. Refer to supplied schematic for assistance. 5. Verify and correct. 6. Tighten clutch. Refer to drawing B05-0051. 7. Verify E-stop condition.
<i>Wrapper Turns On But Does Not Function.</i>	1. Doors or covers open, safety switch - open circuit. 2. Control settings. 3. Insufficient air pressure and/or regulator out of adjustment. 4. Memory logic in PLC.	1. Verify and correct. 2. Verify control settings and correct if required. 3. Verify and correct if required. 4. Reload if necessary.
<i>Packages Jamming.</i>	1. Infeed conveyor guides not properly set.	1. Set correctly and restart.

Problem	Probable Cause	Corrective Action
<i>Packages Kicking Back.</i>	1. Product spacing set too close. 2. Incorrect sprocket driving end seal belt. 3. Centerline of jaws meeting too high. 4. End Seal belts are slipping. 5. End Seal Variator improperly set.	1. Increase product spacing. 2. Verify and replace if required. 3. Adjust jaw height assembly. 4. Check tension belt and drive roll Replace if required. 5. Reset correctly.
<i>End Seal Jaws Coming Down On Packages.</i>	1. End seal placement not set properly. 2. End seal minimum gap incorrectly set. 3. Package spacing set too close. 4. Carriage forward delay Setting too large.	1. Adjust end seal placement number. 2. Adjust the minimum gap number. 3. Increase the product spacing. 4. Verify and reset as required.
<i>Infeed Does Not Operate.</i>	1. Torque limiter loose. 2. Conveyor lug jammed.	1. Replace Verify and adjust. 2. Remove jam and reset.
<i>Infeed Lug Rubbing On Inverting Head.</i>	1. Infeed too close to inverting head.	1. Move infeed conveyor back.
<i>Poor Packages.</i>	1. Inverting head too large for package profile. 2. Package spacing set too far apart. 3. Tunnel malfunctioning.	1. Correct inverting head size/position. 2. Adjust speed variator. 3. Check tunnel.

Problem	Probable Cause	Corrective Action
<i>Package Spacing Erratic.</i>	1. Infeed conveyor torque limiter slipping. 2. Lugs on infeed not equally spaced. 3. Film not picking up package as it goes into inverting head. 4. Unwind feed roller not closed. 5. Side seal belt guides not compressing belts enough. 6. Improper incoming voltage.	1. Verify and adjust. 2. Space lugs correctly. 3. Verify height of inverting head. 4. Adjust guides. 5. Verify side seal. 6. Verify and correct voltage.
<i>Film Slipping On Conveyor.</i>	1. Improper film tension. 2. Improper side seal belt tension. 3. Fouled unwind rollers.	1. Adjust film tension so dancer rides half way up. 2. Check belt guides for proper belt tension – Correct if necessary. 3. Clean unwind rollers.
<i>Green (Start) Light Flashes During Carriage Return.</i>	1. Carriage is hitting forward limit switch before completing seal.	1. Decrease jaw dwell time.
<i>Machine Is Running With No Green (Start) Light</i>	1. Possible problem with carriage forward limit switch.	1. Verify function of carriage forward limit switch. Refer to supplied schematic for assistance.
<i>No Red (Safety) Light No Green (Start) Light No Amber (Ready) Light</i>	1. Power supply problem 2. Possibly a blown fuse.	1. Verify power supply and voltage output. 2. Verify and replace as required. Refer to the supplied schematic for additional information.

Problem	Probable Cause	Corrective Action
<i>Carriage Cycles, But Jaws Do Not Close.</i>	1. Insufficient or incorrect air pressure.	1. Verify and correct air supply/pressure as required.
<i>When Machine Starts To Run, Carriage Slowly Moves Away From Home Position, Then Shuts Off.</i>	1. No air pressure	1. Verify and correct air supply/pressure as required.

Note:

When troubleshooting machine, ensure that inputs and outputs are functioning properly according to the Schematic and Logic Diagrams.

3.2. HOT WIRE SEALING SYSTEMS

CAUTION!

Seal wires are subject to extreme thermal property changes.
SHANKLIN shrink wrapper seal wires and terminations are specifically engineered and proved to withstand the shock of normal operations.
Be wary of non factory substitutions.

Problem	Probable Cause	Corrective Action
<i>Poor Seals (Refer to supplied "Hot Wire" insert for instructions.)</i>	1. Wire temperature set too HIGH or LOW. 2. Wire voltage set improperly. 3. Loose connections. 4. Lower tapes or lower beds in poor condition. 5. Pressure along seal jaws not consistent. 6. Air pressure too HIGH or LOW.	1. Adjust wire temperatures. 2. Set voltage to proper operating parameters. 3. Verify connections. Refer to the supplied schematic(s). 4. Rebuild seal beds. 5. Verify jaw alignment. Reset if required. 6. Match air pressure to required setting located on name plate.
<i>Lower beds burned.</i>	1. Worn out Teflon tapes. 2. Worn out sponge rubber and silicone beds.	1. Replace tapes. 2. Replace beds.
<i>Film build up on lower beds or film sticking to lower beds.</i>	1. Seal wires too HOT. 2. Tapes need repairing. 3. Uneven pressure along seal jaw.	1. Adjust wire temperature setting. 2. Replace tapes or spray with a TEFLON release agent. 3. Adjust seal jaw pressure.

Problem	Probable Cause	Corrective Action
<i>Film builds up on seal wires.</i>	1. Dwell timer too HIGH. 2. Seal wire running too HOT. 3. Uneven pressure along length of seal jaws or lumps in lower bed. 4. Contamination between seal jaw beads and wires.	1. Turn dwell timer down. 2. Adjust seal wire temperatures. 3. Replace lower bed and adjust jaw. 4. Remove wires and clean beads.
<i>Sealer functions but seal wires do not.</i>	1. Wire voltage too LOW. 2. Loose electrical connection in sealer. 3. Faulty relay.	1. Verify wire voltages. 2. Verify all seal wire connections. Refer to the supplied schematic(s). 3. Replace relay. Refer to supplied schematic(s).
<i>Premature seal wire replacements.</i>	1. Wire temperature set incorrectly. 2. Possible shorting of seal wires against parts of machine. 3. Seal jaw pressure not uniform. 4. Insulator terminal block binding on pivot and not maintaining tension on wires. 5. Weak tension springs on insulator block. 6. High heat set too high.	1. Wire temperature may have to be set lower as machine warms up. 2. Verify wire placement and connections. 3. Check for lumps in lower beds. 4. Replace blocks. 5. Replace springs. 6. Adjust heat settings.
<i>First seal not good, succeeding seals ok</i>	1. CONSTANT HEAT setting too low.	1. Adjust settings.

CAUTION!

Seal wires are subject to extreme thermal property changes.
SHANKLIN shrink wrapper seal wires and terminations are specifically
engineered and proved to withstand the shock of normal operations.
Be wary of non factory substitutions.

3.2.1. Solid State Seal Wire Heat Control

The S.C.R. controls the heat applied to the seal wires by utilizing a circuit consisting of a resistance network. The resistance network has three variable resistors (pots) wired in series between terminals # 7 and # 8 of the control board.

The first in the series is a constant heat pot. It is variable from 5K OHMS (minimum dial setting/maximum resistance) to approximately zero (maximum dial setting/minimum resistance).

The next pot in the series is a 10-turn, 0-20K OHM limit pot. This pot is factory preset so that a 100% setting of the constant heat pot yields approximately 12 AMPS to the seal wires. At the 0 dial setting, the constant heat pot yields approximately 8 AMPS to the seal wire.

During the constant heat the impulse heat pot acts as a fixed 35K OHM limit resistor. Impulse heat is accomplished by shunting a section of the impulse heat pot with the normally open contacts of CR-14 (A). This reduction in control resistance causes an inversely proportional increase output to the seal wire for impulse heat.

Note:

**Inversely proportional: when the resistance is decreased,
output to seal wire is proportionally increased.**

Most instances of apparent failure are caused by either loose connections to the unit or problems in the resistance network.

3.2.2. The Resistance Network

SETTINGS: It is extremely difficult to give specific settings for all machines since every application is different and most electronic components have a variance of plus or minus 20%. However, because of the adjustable limit pot we have been able to come closer to a standard. The constant heat is commonly set anywhere 40% to 70% on L-Sealers, and impulse heat can be set anywhere between 60% and 80% (**both are usually set higher on HS- machines**). Do not be concerned if your settings are considerably different. Remember that these are only approximations and you must fine tune your application according to your needs.

3.2.3. Testing The Resistance Network

WARNING!

Make sure that the machine stays disconnected from power during this entire test.

The resistance network total value can be checked by disconnecting the lead from terminal #8 of the control board and measuring the resistance between that lead and terminal #7 (still connected). The resistance readings will measure between 35K OHMS (Constant and limit pots set at 100%) and 60K OHMS (Constant and limit pots set at 0%).

Vary the constant heat pot and read the control values. These values represent test results of the constant heat limit control values only.

To verify that the impulse heat is working properly jumper across the common and normally open terminals of CR-14 (A). With the impulse pot set at maximum, you should see a drop of roughly 35K OHMS. As the impulse pot is turned down verify the overall resistance increase proportionally. Refer to the schematic for specific values.

3.2.4. Checking The Hot Wire Power Controller

CAUTION!

Disconnect power to machine before checking the Hot Wire Power Controller.

When problems arise in the seal heat circuit, the problems usually manifest themselves in the form of loose connections (i.e. broken or shorted wires).

Areas to check are:

- A. Seal wire (for shorts against bar).
- B. All terminals (for broken or loose connections).
- C. Fuses (for blown circuits).
- D. Mechanical hardware on SCR Power Controller (for tightness).

Note:

Make sure all connections are tight. In some cases, the hardware is actually current carrying conductors such as the four 1/4" hex head screws attaching the P.C. board to the heat sinks, and the nuts attaching the Silicone Control Rectifiers (SCR) to the heat sinks. The nuts attaching the heat sinks to the fiber board also provide circuit connections.

Further tests and calibration, other than SCR Power Controller unit replacement, require qualified personnel only. If you have any further questions, please call SHANKLIN CORPORATION.

3.3. HOT KNIFE SEALING SYSTEMS

Problem	Probable Cause	Corrective Action
<i>Poor Seals (Refer to supplied "Hot Knife" insert for instructions.)</i>	1. Knife temperature set too HIGH or LOW. 2. Lower beds in poor condition. 3. Pressure along seal jaws not consistent. 4. Air pressure too HIGH or LOW. 5. Incorrect dwell timer setting.	1. Adjust knife temperatures. 2. Rebuild seal beds. 3. Verify jaw alignment. Reset if required. 4. Match air pressure to required setting located on name plate. 5. Adjust dwell timer settings in the PLC.
<i>Film builds up on seal bar.</i>	1. Dwell timer too high. 2. Knife temperatures set too high. 3. Teflon coating worn off.	1. Decrease dwell timer. 2. Adjust knife temperatures. 3. Recoat or replace seal bar and blade.
<i>Seal heat not functioning properly.</i>	1. Thermocouple probe has loose connection or is broken. 2. Heater has loose connection or is broken. 3. Blown Fuse. 4. Loose connection. 5. Broken temperature controller. 6. Broken solid state relay.	1. Verify and replace if necessary. 2. Verify and replace if necessary. 3. Verify and replace. Refer to supplied schematics for assistance. 4. Locate and correct. Refer to supplied schematics for assistance. 5. Verify and replace if necessary. Refer to supplied schematics for assistance. 6. Verify and replace if necessary. Refer to supplied schematics for assistance.

3.4. LUBRICATION INSTRUCTIONS

Component(s)	Procedure(s)
Bearings and Idler Sprockets	Lubricate every 6 months with a high quality bearing grease - NLGI Grade 2 or equivalent.
Gear Reducer	After first 100 hours of operation replace oil, then change every 2,500 hours or every 6 months. Replace with a high grade lubricant conforming to AGMA #7.
Pneumatic Oiler	Fill to oil level line with SAE #10 non-detergent oil. Do not overfill. Set oiler while machine is operating to approximately 1 drop every 3 to 4 minutes.
Air Line Filter	Drain water from filter bowl regularly.
Ball Bushings	Oil shafts lightly every week with SAE #10 non-detergent oil.
Roller Chains	Periodically inspect chains to determine frequency of lubrication. Lubricate with SAE #30 oil. Apply lubricant with a brush or spout can to the inside of chain at the edges of the side plates.
Snubber Cylinders	Add 2 or 3 drops of SAE #10 non-detergent oil monthly.

3.5. ADJUSTMENTS

3.5.1. Setting the Pneumatic End Seal

1. Open the flow control valves controlling the seal jaw opening and closure so that they are wide open. Now start running packages through the machine.
2. Adjust the seal jaw temperatures and dwell time so that the seal is completed prior to the carriage reaching the end of its travel. Incorrect adjustments will cause the carriage to reach the end of its travel prior to the completion of a seal.
3. Now adjust the flow control valves on the jaw opening and closing cylinder so that the seal jaw operation is smooth. If the seal jaw hits the package on its return stroke, it may be necessary to maintain a relatively high rate of speed on the jaw opening. If, on the other hand, it is difficult to obtain enough carriage stroke downstream, it may be necessary to open the jaw closure valve slightly. This will enable the jaw to close with minimal time loss between packages.
4. The pneumatic cylinder is equipped with an adjustable cushion on the pivot end of the cylinder. This should be adjusted if the cylinder is pounding on the return stroke.
5. After these adjustments have been made, it may be necessary to go back and fine tune the heat settings or valve settings slightly to accommodate specific packages.

3.5.2. Setting the Pneumatic Carriage Return

Setting the pneumatic carriage return is a relatively simple matter providing that the following step-by-step instructions are carefully followed:

1. Adjust seal jaw temperature and dwell time so that the seal is completed prior to the carriage reaching the end of its travel.
2. Adjust the two flow control valves that control the carriage return: one is labeled "Carriage Speed" and one is labeled "Carriage Snubber". Adjust the "Carriage Speed" flow control valve so that the carriage returns rapidly enough to be in position to make a seal on the next package with just a slight dwell in the upstream position. In order to accomplish this on short packages, it may be necessary to shorten the seal dwell still further. Try to adjust the "Carriage Speed" valve so that the carriage moves at a rapid pace, but so that the whole action is smooth. Adjust the "Carriage Snubber" flow control valve next. The purpose of this control is to prevent the carriage from banging when it reaches the up stream position. Starting with the valve wide open, begin closing it as the carriage is cycled. If the carriage hesitates before seating in the fully returned position the valve has been closed too much restricting the return, open the valve until you obtain a smooth stop in the upstream position.
3. After these adjustments have been made, it may be necessary to go back and fine tune the heat settings slightly to accommodate an individual package.

3.5.3. Setting The Jaw Safety

Setting the jaw safety involves making adjustments to three proximity sensors located at the jaw assembly.

This section contains three procedures:

- Setting Jaw Safety Sensors PRS4 and PRS5
- Setting the Jaw Closed Sensor PRS6
- Testing the Jaw Safety Circuit

3.5.3.1. Setting Jaw Safety Sensors PRS4 And PRS5

The Jaw Safety Sensors, PRS4 and PRS5, prevent the jaw from engaging when a foreign object is introduced into the machine. To adjust PRS4 and PRS5, proceed as follows:

1. Apply power to the machine.
2. Ensure that the jaws are open (they must be open to do this adjustment). If the jaws are shut, manually open the jaws. The jaw crank spring should maintain the jaws in an open position.
3. Working from discharge end of machine, locate the two proximity sensors (PRS4 and PRS5) on the jaw. These proximity sensors must be adjusted so that they trigger upon vertical movement of the jaw clamp. The triggering of the sensor is indicated by its yellow light coming on.

The **Safety Status** light flashes if the sensors are out of adjustment. In this situation, press the **READY TO START** button to latch the current fault status into the touch screen. The touch screen will automatically display the current fault condition.

4. Press and hold the yellow **READY TO START** button (the amber light will not come on until the adjustment is done).
5. Start with the PRS4 sensor on the left side of the jaw. Loosen the actuator securing screws to allow vertical movement of the actuator. Find the sensor trigger point (the point at which the yellow light on the sensor comes on). Secure the actuator at this trigger point (**leaving it ON**).
6. Move the film clamps in a side-to-side direction. Ensure that this horizontal movement of the film clamps does NOT cause the yellow light on the switch to go out. If the light goes out, the actuator is too far away from the sensor (more than 2 millimeters) and must be adjusted. Proceed as follows:
 - a. Loosen the actuator securing screws.
 - b. Move (tap) the actuator toward the sensor until the yellow light on the sensor comes on.
 - c. Secure the actuator.
 - d. Move the film clamps side-to-side again and make sure the yellow light on the sensor remains on.

When PRS4 is properly set, repeat Steps 5-6 of this procedure for the other sensor (PRS5). **Don't forget the side-to-side test of the jaw!**

Once PRS4 and PRS5 are set properly, go on to the next procedure and adjust the Jaw Closed sensor (PRS6).

3.5.3.2. Setting The Jaw Closed Sensor PRS6

The jaw closed proximity sensor (PRS6) is located to the right of PRS5. This sensor allows for seals to be made without triggering the safety sensors. To adjust the sensor, proceed as follows:

NOTE:

**Make sure that air is connected
to the machine during this procedure**

1. Press the amber READY TO START button.
2. Press the green START button.
3. Start the conveyor moving very slowly with the MAIN DRIVE pot on the front panel.
4. Press CYCLE to engage the jaws. When jaws meet, the safety will trigger; the machine will stop and the jaws will quickly open.
5. Remove air from the machine. Push the jaws closed by hand.
6. Loosen the two screws on the PRS6 actuator. Move the actuator vertically until the bottom of the actuator is lined up with the centerpoint of the "target" on the proximity sensor. Secure the actuator.

3.5.3.3. Testing The Jaw Safety Circuit

To test the jaw safety circuit, proceed as follows:

1. Apply air to the machine

CAUTION!

When air is applied, jaw will open quickly.

2. Press the amber READY TO START button. The amber light should come on. If it doesn't, PRS4 and PRS5 need to be adjusted. Refer back to the procedure in this section titled *"Setting Jaw Safety Sensors PRS4 and PRS5."*
3. Press the green START button
4. Test the override by pressing CYCLE to engage jaws.
5. The cycle should complete (jaws close and open without stopping the machine). If machine cycles properly, speed up the conveyor and press CYCLE again. Keep doing this for the entire conveyor speed range. The machine should cycle properly at all speeds. If the safeties trigger and stop the machine, go back and readjust PRS4, PRS5 and PRS6.

6. Bring the conveyor back down to its slowest speed. The safeties can now be tested by introducing a foreign object into the jaw mechanism. Use a resilient rubber object, 1/4"-3/8" thick (preferably a 3/8" thick strip of 40 durometer red silicone rubber) for this test.
7. Put the rubber object on the side seal conveyor. When the object crosses the jaw, press CYCLE to engage the jaw. When contact with the object is made, the jaws should immediately open, and the machine should stop.
8. If machine cycles (shuts off) as it should, speed up the conveyor, put the rubber object on the side seal conveyor and press CYCLE again. Keep doing this for the entire conveyor speed range. The machine should cycle properly at all speeds. If the safeties do not trigger and stop the machine, go back and readjust PRS4, PRS5 and PRS6.

3.5.4. Adjusting The Diverging Belt Side Sealer

3.5.4.1. General

This section contains four procedures for the diverging belt side sealer. There is also a troubleshooting section that follows the procedures. The four procedures are:

- Adjusting seal wire alignment and clearance
- Adjusting the seal wire heat
- Changing seal wires
- Replacing ceramic beads

Before attempting to adjust the Side Sealer, read and understand the instructions found in this section. Use the following drawings (except where noted, copies of the drawings are included in Section 7 of this manual):

B05-0150 "Diverging Belt Side Sealer Assembly"
E05-0038 "Tracking Roll Assembly"
E05-0196 "Top Plate Assembly"
E05-0197 "Top Jaw Assembly"
E05-0198 "Bottom Jaw Assembly"
G05-0069 "Seal Wire Alignment"(included after this procedure)
H05-0164 "Idler Pulley Mounting Assembly-Top"

WARNING!

Disconnect the power from the machine before making any adjustments to the side sealer.

3.5.4.2. Adjusting The Wire Alignment And Clearance

(using drawing #G05-0069)

The top and bottom seal wires must be positioned directly over each other and should be gapped to a distance of .010 as a starting point (fine tuning of the gap may be required). Proceed as follows:

1. Remove the top and bottom belt guides.
2. Remove the top and bottom outer belts, identifying each one so they may be replaced correctly. The top and bottom belt sets are matched pairs and cannot be mixed.
3. Remove both sets of jam nuts (*item 1*), washers, and springs from the guide pins on the top plate assembly.
4. Check the alignment of the top and bottom wires while pressing down on guide pins. The wires should be directly over each other. If an adjustment is needed, loosen the hex bolts (*item 4*) that secure the top plate assembly. Once loose, the top plate can move laterally in order to line up the wires. When wires are aligned, tighten the two hex bolts.
5. Adjust the gap between the wires with a .010 feeler gauge. Press down on the guide pins until the adjusting nuts (*item 2*) bottom out on the spacers (*item 3*). In this position, check the distance between the wires. Adjust the distance by turning the adjusting nuts. When the proper gap is achieved, replace the springs, washers, and jam nuts on the guide pins.
6. Replace the top and bottom belts.
7. Ensure that the belt tension is sufficient. The belt should have a play of about 1/4" in either direction (tested at the midpoint between the belt idler pulley (*item 7*) and the jaw).
8. If belt tension needs to be adjusted, loosen the four 1/4-20 hex head bolts that secure the belt idlers. Adjust the idlers to obtain the proper tension.
9. Replace bottom belt guide, aligning the top surfaces of both lower belts.
10. Replace top belt guide. Lower guide so that the top and bottom belts are able to grip film firmly enough to drive it through the sealer.
11. Replace all covers and guards.
12. Reconnect power to the machine.

3.5.4.3. Adjusting The Side Sealer Seal Wire Heat

The heat for both the top and bottom seal wires are controlled together. Proceed as follows:

1. Set the initial heat control settings as follows:

CONSTANT HEAT - approximately 20 on ammeter.
RUNNING HEAT - approximately 25 on ammeter.

CAUTION!

DO NOT turn the Running Heat control to 100% or seal wire failure and damage to the side sealer may occur.

2. Set the air pressure to 50 PSI.
3. Insert film and run film by starting the machine. Product should NOT be on the machine while making this adjustment. Adjust the RUNNING HEAT so that a strong seal is made with minimum heat (usually a 25-30 setting)

NOTE:

During operation some slight adjustments (fine tuning) of the wire heat may be necessary.

3.5.4.4. Changing Side Sealer Seal Wires

1. Remove the top and bottom belt guides.
2. Remove the top and bottom outer belts, identifying each one so they may be replaced correctly. The top and bottom belt sets are matched pairs and cannot be mixed.
3. Remove the top belt guide bracket, secured with two (2) screws.
4. Remove top jaw from support bar, secured with four (4) screws.
5. For each of the seal wires, release tension from the wires by inserting a pin or an Allen wrench into the wire pivot.
6. Remove both seal wires. Each seal wire is attached with two (2) terminal screws.
7. Inspect the notch in the brass terminal plate where the 90° bend in the wire touches. File if necessary to ensure good contact.
8. Inspect the ceramic beads for damage:
9. If the beads are undamaged, proceed to the next step.
10. If the beads have been damaged, they must be replaced.
11. Before installing the new wires, make sure there are no kinks and correct the 90° bend to obtain a sharp bend that will fit snugly in the notch of the brass fixed terminal plate.
12. Install the new seal wires. Attach the loops of the new wires onto the pins projecting from the wire pivots.
13. Lay the wire over the Teflon insert and up the back side of the wire terminal. Pull the wire up tight and wrap around the terminal screw. Tighten the terminal screw and cut off excess seal wires.

NOTE:
**EXTREME CARE MUST BE TAKEN TO PREVENT
THE SEAL WIRES FROM KINKING!!!**

14. Attach the braided copper wires to the wire pivots with the two remaining screws.
15. Remove the pins from the wire pivots and check that the wires are straight and flat (the wires must lay flat on the beads).
16. Install the top jaw to the support bar with four (4) screws.
17. Install the top belt guide bracket with two (2) screws.
18. Replace the top and bottom belts.
19. Ensure that the belt tension is sufficient. The belt should have a play of about 1/4" in either direction when properly installed.

If belt tension needs to be adjusted, loosen the four 1/4-20 hex head bolts securing the belt idler pulley. Adjust the idler to obtain the proper tension.
20. Replace bottom belt guide, aligning the top surfaces of both lower belts.
21. Replace top belt guide. Lower the guide so that the top and bottom belts are able to grip film firmly enough to drive it through the sealer.
22. Replace all covers and guards.
23. Reconnect power to the machine.

NOTE:
**If bad seals occur, refer to "Adjusting the Wire
Alignment And Clearance" procedure in this section**

3.5.4.5. Changing Side Sealer Ceramic Beads

(using drawing E05-0197 for Top Jaw and/or E05-0198 for Bottom Jaw)

This procedure is used when beads have become broken or damaged and need to be replaced. This procedure assumes that you have already performed steps *a-i* of the previous section:
Procedure for Changing Seal Wires (on page 3-20) Proceed as follows:

1. If you are working on the top jaw assembly, go to step *b*. If you are working on the bottom jaw assembly, remove the left lower belt idler pulley by removing the two (2) set screws. This will give you access to the hardware needed to remove the beads on the lower jaw. Proceed to step *b*.
2. Remove the wire terminal, secured with two (2) screws.
3. Release tension from extension spring with spring puller. This will allow the wire pivot to move freely.
4. Remove bead stop, secured with one (1) screw.

5. If beads are damaged, slide them out of jaw assembly and replace.
6. Install the bead stop with one (1) screw.
7. Reconnect extension spring.
8. Install wire terminal with two (2) screws.
9. (*bottom jaw only*) Replace the lower belt idler pulley with two (2) set screws. Ensure proper alignment of pulley.
10. Return to *step j* of the previous section: *Procedure for Changing Seal Wires* (on page 3-20) to finish the installation of the remaining hardware.

3.5.4.6. Troubleshooting Hints

- If balls of film are building up on the wire or observed on the seals, a slight change in the wire gap may be necessary. Follow the procedure (in the previous section) for adjusting and aligning the seal wires to a .010 gap. After this is done, the gap may be fine tuned while the machine is running. Back off the lock nuts for the top adjusting nuts (be sure to keep the adjusting nuts from turning). Now, with the machine running, gradually turn both adjusting nuts the same amount. A 15° turn (counter-clockwise) will close the wire gap .002-.003". Observe and test the seal after each slight adjustment. Retighten the locking nuts (without moving the adjusting nuts) when seals are satisfactory.
- Check that the "sheerface" belt guide is adjusted so that the inner and outer V-belts are level.
- Check to see that the film is held securely between the V-belts. Adjust the upper "sheerface" plate to provide sufficient pressure between the V-belts to prevent film slippage.
- Check the film feed from the unwind. Dirty or worn rubber drive rollers will cause loss of traction, putting excess tension on the film. This can cause poor side seals.
- Film tracking wheels should not be angled more than 5° past parallel as this can cause wrinkling and creasing in the film entering the side sealer. This could cause pin holes to form in the seal.
- Always run at the lowest heat settings possible. High heat settings will cause film buildup on the seal wires, requiring additional heat to seal.
- Set the machine speed to obtain minimum starting and stopping. A continuous flow will produce more uniform seals.
- Observe the film as it enters the side sealer; it should be smooth and wrinkle free. If any wrinkles or stress lines exist, they may cause poor seals and/or pin holes.
- Check the height of the side sealer. The centerline of the V-belts should match the centerline of the inverting head.
- Check any infeed guides that touch the film and adjust to eliminate stress lines.

- Check alignment of the adjustable inverting head. The top plate must line up with the bottom plate.
- Adjust film roll location to the inverting head to obtain a smooth flow of film over the head.

3.5.5. Changing Lower Seal Beds

Shanklin sealers utilize one of three cutting mechanisms: Hot Knife, Cool Cut and Hot Wire. Building the seal bed for Hot Knife and Cool Cut systems is a simple single-layer installation.

Building the seal bed for a Hot Wire system, however, is quite complicated, requiring the installation of four separate layers of material. Procedures on how to build seal beds for all three cutting systems follow.

WARNING!

Disconnect the main power source and air supply to the machine before attempting to change the seal bed on the machine.

3.5.5.1. Building The Seal Bed for Hot Knife/Cool Cut Jaws

The seal beds for hot knife and cool cut systems is a one piece installation. Before beginning, inspect the condition of the bed. It is essential that the bed be thoroughly cleaned before starting to build. Clean the bed with a suitable commercial cleaner. Proceed as follows:

1. For Cool Cut and Hot Knife with Bottom Heat systems, start by putting a couple of drops of high temperature silicone (RTV 116 or equivalent) onto the bed surface.
2. Carefully press the material into the seal bed. It is important that the bedding material be pressed straight into the seal bed. Care must be used to avoid stretching or pulling of the material as you install it. Press the material down flat to ensure that it sits snugly in the bed. DO NOT rub across the surface of the material or it may stretch.

3.5.5.2. Building The Seal Bed For A Hot Wire Jaw

REFERENCE ILLUSTRATION:

M08-0049 "BED BUILDING" (included after this section)

The bed for a hot wire jaw consists of 4 layers of material: a black neoprene layer at the base, a red silicone strip, a covering of 2" Teflon tape (5 mil thick) that secures the material to the bed and finally, a top layer of 1/2" Teflon tape (10 mil thick) which contacts the hot wire.

Before beginning this procedure, inspect the condition of the bed. It is essential that the bed be thoroughly cleaned before starting to build. Clean the bed with a suitable commercial cleaner. If there is tape stuck on the sides of the bed, it can be removed with a plastic scraper.

1. First, install the black neoprene layer. Inspect the material for wrinkles and deformities. When you are sure that you have a good, wrinkle-free piece of material, cut it to the length of the front bed, plus 1/2". Lay it in flat and press down. You want to achieve a good consistent bed to ensure quality seals with uniform strength. Do not "crunch in" the material as you go and do not stretch it either. When installed, the neoprene will be slightly higher than the top of the bed.
2. Next, take the red silicone strip and cut to the length of the bed. Wipe it clean with a suitable commercial cleaner (being careful not to stretch the material). Install the strip by centering it on top of the neoprene layer.
3. Now install the 2" Teflon tape to the bed. This is the most critical part of the procedure. The 2" Teflon tape must be carefully creased and squared in order to be properly installed.
 - a. Cut a piece of the 2" Teflon tape slightly longer than the bed and remove the backing from the tape to expose the adhesive side.
 - b. Press the end of the tape down onto the silicone and hold this point with your thumb or forefinger.
 - c. Keep your thumb/finger on the tape contact point at the end of the bed and hold the tape taut. Bring the tape down on to the rest of the bed. Make sure that there are no wrinkles or disturbances in the tape.
 - d. Now you must secure the tape to the bed. Use two hands. The tape must be creased at the bend points and secured to the sides of the seal bed. While you are creasing the tape, you should be applying a downward pressure on the top surface of the bed with your other hand. This will make the bed surface as flat as possible and will avoid excessive "arcing" of the bed surface, which would cause poor seals.
 - e. Cut any excess tape off the ends of the seal bed.
4. Once the 2" Teflon tape is installed, you are ready apply the final layer: the 1/2" Teflon tape. This layer is the part of the bed that the wire actually contacts while sealing. It is imperative that there be only one layer of this tape on the bed.
 - a. Cut a piece of the 1/2" Teflon tape that is slightly longer than the bed.
 - b. Lay the tape onto the bed, ensuring that it is centered on the bed. Smooth down with your hand.
 - c. Cut any excess tape off the ends of the seal bed.

3.5.6. Changing End Seal Wires

Changing seal wires on the SHANKLIN Wrapper is a simple operation, but care must be exercised in all steps to make sure that the new wire will operate satisfactorily.

WARNING!

Disconnect the main power source and air supply to the machine before attempting to change the seal wires on this machine.

CAUTION!

Seal wires are subjected to extreme thermal changes. SHANKLIN Shrink Wrapper seal wires and terminations are specifically engineered and manufactured to withstand the shock of normal operation. Be wary of non-factory substitutions.

1. Jaws must be fully open.
2. Remove the broken wire, cutting the wire if necessary.
3. Turn the phenolic block so that the bottom of the phenolic block touches the end of the jaw. Insert a pin or a small Allen wrench through the hole in the jaw behind the phenolic block so that it will take tension off the seal wire. Remove the screws from the terminals on the phenolic blocks.
4. Carefully clean the V-groove in the ceramic beads to remove film buildup and dirt.
5. Fasten the terminal on the end of the new seal wire to the phenolic block on both ends. Tighten the terminal screw in the phenolic block securely.
6. Pull the pin from the hole.

CAUTION!

Be careful that the wires are not kinked and that they lie in the V-grooved beads snugly.

3.5.7. Resetting the Programmable Logic Controller

This procedure will reset the PLC to factory default settings.

1. Power down the machine.
2. Access the PLC in the lower electric box.
3. Carefully insert PROM into its slot on the PLC. **Be careful not to touch the pins of the PROM chip. Static electricity can damage the chip.** The slot is keyed so the chip will only go in one way. Make sure the chip is inserted fully into slot. When inserted correctly, it will snap into place.
4. Close the electric box.
5. Power up the machine.
6. The PLC will automatically detect that the PROM is present within the socket and will proceed to load the program from the PROM into the PLC memory. It will then place the PLC into RUN mode.
7. Power down the machine and remove the PROM.
8. Power up the machine. The PLC will now operate utilizing the newly loaded program.

3.5.7.1. Troubleshooting The F-5 With a DTAM or PC

The F-5 contains an Allen-Bradley Programmable Logic Controller (PLC). Set-points and data locations within the PLC can be accessed via Data Table Access Module (DTAM) or Personal Computer (PC).

A DTAM (or PC with PLC Software) is required for the following troubleshooting procedures. Contact your authorized Shanklin Distributor (Part # EQ-0005) to order the correct DTAM for the F-5.

Troubleshooting or modifying the F-5 at this level should only be attempted by an authorized Shanklin Corporation representative or technician.

3.5.7.2. Configuring The DTAM

To configure the DTAM, follow the steps in Table 1.

Table 1. CONFIGURING THE DTAM

DO THIS ACTION	THE DEFAULT SETTING WILL DISPLAY...	OPTIONS AT THIS DISPLAY
To enter set-up mode, Press 7 and INC simultaneously	MODIFY SETUP CONFIRM?	ENTER to continue ESC to quit
Press ENTER to accept	SELECT LANGUAGE ENGLISH	ENTER to accept setting, INC or DEC to change
Press ENTER to accept	SELECT DTAM ADDRESS 0	ENTER to accept setting, INC or DEC to change
Press ENTER to accept	SELECT BAUD RATE 19200	ENTER to accept setting, INC or DEC to change
Press ENTER to accept	SET AUTO ATTACH OFF	ENTER to accept setting, INC or DEC to change
Press INC to change	SET AUTO ATTACH ON	ENTER to accept setting, INC or DEC to change
Press ENTER to accept	SET BACKLIGHTING ON	ENTER to accept setting, INC or DEC to change
Press ENTER to accept	MONITOR OVERRIDE ON	ENTER to accept setting, INC or DEC to change
Press ENTER to accept	ACCEPT SETUP CONFIRM?	ENTER to accept setting, ESC to quit
Press ENTER to accept	Display cycles though its confirmed settings	DTAM IS NOW CONFIGURED

3.5.7.3. DTAM Status Codes

The following is a list of the machine status codes found at DTAM address N9:0.

Code #	Description
0	Machine is READY and the yellow light is on.
1	Control panel E-STOP button was pushed.
2	End jaw housing front E-STOP button was pushed.
3	End jaw housing back E-STOP button was pushed.
4	Control panel cover was lifted.
5	Front panel (to the right of the electrical box) was opened.
6	Front door on the end jaw housing was opened.
7	Hood on the end jaw housing was opened.
8	Back door on the end jaw housing was opened.
9	Back panel was opened.
10	Connection provided for the external E-STOP button was open.
11	Connection provided for the external door interlock was open or Servo Synchronic door interlock was open.
12	Optional product jam sensor was tripped.
13	The jam clutch on the flighted infeed conveyor was tripped.
14	Jog switch was used while the machine was in the READY mode.
15	Film clamps were retracted after the end seal clutch was engaged, but before the jaw was closed.
16	Film clamps were retracted on the up-stroke of the seal jaw.
17	Jaws took too long to close.
18	Temperature controller on the Hot Knife or Cool-Cut seal system has indicated an alarm condition.
19	Out of film sensor was tripped.
20	Carriage took too long to return to home position. If this code occurs when the jaw is not cycling, it is probably due to a compressed air problem.
21	Film clamp sensor out of adjustment, or jaw failed to close before carriage forward limit reached.
22	Jaw Closed sensor out of adjustment.
23	Power was interrupted.

3.5.7.4. DTAM Addresses Used In The F-5

The following is a list of the PLC addresses and corresponding functions that can be accessed using a DTAM.

ADDRESS	FUNCTION
B3:0/0	Leading Edge Seal Placement Set to 0: Causes end seal jaws to close after the trailing edge of the product clears the end seal eye and travels the distance set an N7:2. Set to 1: Causes end seal jaw to close after the leading edge of the product clears the end seal eye and travels the distance set an N7:2.
B3:0/1	Dual Speed Enable Set to 1: Enables the Dual Speed logic Set to 0: Disables the Dual Speed logic
B3:0/2	Side Seal Select Set to 0: Enables the Dual Wire Side Sealer. Set to 1: Enables the Hot Air Side Sealer
B3:0/3	Overhead Unwind Select Set to 1 for machines with Overhead Film Unwinds. Set to 0 on F-5 machines.
B3:0/5	Product Stop Enable (N/A for multi-packers) Set to 1: Enables the product stop used on product placement infeed. Set to 0: Disables the product stop used on product placement infeed.
B3:0/6	Multi-packer Select Not used on F-5 machines
B3:0/8	Print Registration Set to 1 for machines to operate with printed film.

For more detailed information about the operation of the DTAM and PLC, refer to the manufacturer's documentation which has been shipped with this manual.

ADDRESS	FUNCTION
B3:0/9	Machine Identification Bit Set to 1 on all F-4 and F-5 machines.
B3:0/10	Run Mode Delay Set to 0: To disable run delay. Set to 1: Delay entering run mode to allow side sealer heat up. Delay is determined by the setting in N7:17.
C5:6.ACC	Short Term Product Counter
C5:6.PRE	Short Term Product Count Multiplier
C5:7.ACC	Short Term Product Count Multiples Counter
N7:1	F() 1 Product Spacing Sets the desired distance between products that the clutched harmonic infeed option will create. The distance traveled per count is determined by N10:0
N7:2	F() 2 End Seal Placement Settings determines how far the product edge (determined by B3:0/0)travels past the end seal eye, before the seal is made. The distance traveled per count is determined by N10:0
N7:3	F() 3 Jaw Dwell Sets the time (setting X .01 seconds) that the jaws will stay closed during a seal cycle.
N7:4	F() 4 Impulse On-Time <i>(hot wire machines only)</i> Sets the time (setting X .01 seconds) that the impulse heat stays on. The default setting is 38 (which equals a 0.38 second on-time).

For more detailed information about the operation of the DTAM and PLC, refer to the manufacturer's documentation which has been shipped with this manual.

ADDRESS	FUNCTION
N7:5	F() 5 Impulse Advance <i>(hot wire machines only)</i> Sets the time (setting X .01 seconds) that the impulse heat comes on before the jaws close. The default setting is 20 (which equals a 0.2 second advance).
N7:6	F() 6 Number of Holes This sets the maximum number of punched holes per bag. It can be set to any number. When set to "0", the hole punch logic is OFF.
N7:7	F() 7 First Hole Placement Sets the distance from the hole punch trigger (determined at address N7:9) before the hole punch places the first hole. The distance traveled per count is determined by N10:0
N7:8	F() 8 Hole Spacing Sets the spacing of the punched holes when equal spacing or multiple holes per bag are selected. The distance traveled per count is determined by N10:0
N7:9	Hole Source Setting determines how the holes are registered. 1. Unregistered holes. Holes are spaced according to N7:8. 2. Infeed Lug sensor (lugged infeed only). 3. Infeed spacing Eye (used on dual belt and clutched harmonic infeed). 4. End Seal Eye (used on F-4 and F-5 machines).
N7:10	Infeed Minimum Gap Sets a distance to allow for a gap in a product. It should be set to 0 when not needed. The distance traveled per count is determined by N10:0. This setting cannot be larger than the product spacing!

For more detailed information about the operation of the DTAM and PLC, refer to the manufacturer's documentation which has been shipped with this manual.

ADDRESS	FUNCTION
N7:11	End Seal Minimum Gap Sets a distance to allow for a gap in a product. It should be set to 0 when not needed. <i>Note that this may not work properly if B3:0/0 (Leading Edge Seal Placement) is set to 1.</i> The distance traveled per count is determined by N10:0. This setting cannot be larger than the product spacing!
N7:12	Harmonic Product Length This sets the product length for the optional clutched harmonic infeed. The infeed will run for this distance after detecting the leading edge of the product. When properly set, the trailing edge of the product will clear the compression belt just before the count is complete. When the count is complete, the harmonic infeed and its compression belt will stop, while the infeed belt of the machine continues to run pulling a gap between products. The distance traveled per count is determined by N10:0.
N7:14	Start / Speed-Up Timer Sets a time delay (setting x .01 seconds) for the transition from Wait to Run mode and from Slow to Fast speed (when machine is set to dual speed). The factory default setting is 100, which equals a 1.0 second delay.
N7:15	Stop / Slow-Down Timer Sets a time delay (setting x .01 seconds) for the transition from Run to Wait mode and from Fast to Slow speed (when machine is set to dual speed). The factory default setting is 70, which equals a 0.70 second delay.
N7:17	Motor Start Delay When B3:0/10 is set to 1, this setting is the delay time to allow the Side Sealer to heat up. The factory default setting is 25 (which equals a 0.25 second delay). Larger settings give the side sealer more time to heat up.

For more detailed information about the operation of the DTAM and PLC, refer to the manufacturer's documentation which has been shipped with this manual.

ADDRESS	FUNCTION
N7:18	End Seal Eye Select 0. Either eye signal energized is interpreted as a product. 1. Use Main Eye signal only. 2. Use Auxiliary Eye signal only. 3. Both. If both eye signals are energized, it is interpreted as a product. 4. Use Product spacing Eye. 5. Use infeed lug switch. 6. Use print film registration mark detect eye.
N7:19	Carriage Forward Start Delay Setting (value X .01 seconds) determines how long after the jaw begins to close, that the carriage begins to move downstream. If this setting is too low, the jaw can close on taller products. This should not be set to a value larger than 30.
N7:20	Carriage Return Delay Setting (value X .01 seconds) determines how long after the jaw begins to open, that the carriage begins to return to home. If this setting is too low, the jaw can hit a taller product when the carriage returns.
N7:21	Machine Setup Storage Area reserved for storing a PLC setup.
N7:22	F0 0 Machine Setup Recall Area reserved for recalling a previously saved PLC setup.
N7:23	Print Mark Offset Setting determines how far the film travels, after sensing print mark, before the product is fed in. The distance traveled per count is determined by N10:0

For more detailed information about the operation of the DTAM and PLC, refer to the manufacturer's documentation which has been shipped with this manual.

ADDRESS	FUNCTION
N9:0	F0 9 Ready Status The condition that caused the machine to leave the READY mode. This code is latched until the fault is cleared (indicated by a steady fault light) and the READY push button is pressed.
N9:1	Product Counter Display Displays the contents of the SHORT TERM PRODUCT COUNTER.
N9:2	Product Counter Multiples Counter Display Displays the contents of the SHORT TERM MULTIPLES COUNTER
N9:3	Package Rate This is the number of seals made on products in the last 60 seconds (manual cycles not counted).
N9:4	Cycle Time This is the time it takes for one complete seal cycle.
N9:5	Close Time This is the amount of time it takes the jaws to close.
N9:6	Tooth Count Duty Cycle Diagnostic for use in setting up the tooth sensor. Tooth sensor should be adjusted mechanically to obtain a count of approximately 46 to 50 for its duty cycle. If the value is too large, adjust the sensor away from the pulley. If the value is too small, adjust it closer to the pulley.
N9:7	Tooth Counter Shaft RPM Rotational speed of the shaft that the tooth counter pulley is on.

For more detailed information about the operation of the DTAM and PLC, refer to the manufacturer's documentation which has been shipped with this manual.

ADDRESS	FUNCTION
N10:0	Scale Factor Sets the relationship of distance settings to gear tooth counts. The default is 18, establishes that all distance settings will be in .01 inches. If this scale factor is set to 46, all distance settings will be in centimeters. This should never be set to "0".
C5:18.PRE	Product Gate / Stop Delay Setting in counts determines: A. Product placing infeed - How far the conveyor travels after sensing a lug, before the stop is dropped. B. Multi-packer - How far the conveyor travels after the multi-pack clears the spacing eye, before the gate is closed.
T4:5.PRE	Count Reset Timer Sets the time that the START button must be held down to clear the product counter. The factory setting is 1000 (which equals a 10.00 second hold down of the button).
T4:18.PRE	Hole Punch Dwell Sets the time (setting X .01 seconds) that the hole punch solenoid remains on to make one hole. (Factory setting is 4 = 0.04 seconds).
T4:19.PRE	Side Seal Heat Off Delay Sets a time delay (setting X .01 seconds), allowing the side sealer to remain closed with heat on after the clutched end seal conveyor stops. This should be set just high enough to prevent the side sealer from "popping up and down" between every product. The default setting is 300 (which equals a 3 second delay).

For more detailed information about the operation of the DTAM and PLC, refer to the manufacturer's documentation which has been shipped with this manual.

SECTION 4. PARTS ORDERING

This section gives information about ordering parts through SHANKLIN CORPORATION. It is structured as follows:

4.1. GENERAL INFORMATION	2
4.2. HOW TO ORDER PARTS	3
4.3. SPARE PARTS LISTS	3
4.3.1. F-5A Basic Spare Parts List	4
4.3.2. F-5A Hot Wire Spare Parts List	5
4.3.3. F-5A Wide Fin Hot Knife Spare Parts List	6
4.3.4. F-5A Cool Cut Spare Parts List	7
4.3.5. Diverging Belt Side Sealer Spare Parts List	8
4.3.6. Shanklin Hole Punch Spare Parts List	9
4.3.7. Park-Air Hole Punch Spare Parts List	10
4.3.8. Olefin Pin Perforator Spare Parts List	11

A NOTE FROM OUR PARTS DEPARTMENT

Drawings and Parts Lists contained in this manual are provided for your assistance and convenience. They are pertinent for current production machines only. If your machine was manufactured prior to the issue date of this manual, then proper machine identification is required (by use of the actual Model and Serial Numbers).

SHANKLIN CORPORATION will diligently strive to assist you in the identification of the necessary part numbers based on all of the information that you provide.

Parts incorrectly shipped due to inaccurate information provided to SHANKLIN parts personnel at the time of the order may be subject to a restocking fee.

Please feel free to give us a call; we'll be glad to help!

4.1. GENERAL INFORMATION

Parts and accessories may be obtained from the factory to fit any of your SHANKLIN packaging equipment. Our Parts Department is open Monday - Friday from 8:00 a.m. to 4:30 p.m. (Eastern Standard Time.)

Our address and phone numbers:

**SHANKLIN RESEARCH CORPORATION
100 WESTFORD ROAD
AYER, MASSACHUSETTS 01432
(508) 772-3500
FAX (508) 772-5665**

For us to process your parts order quickly, please have all required information available PRIOR TO calling the factory or the distributor. The required information and the three ways of ordering parts are outlined in the next section of this manual. However, if you are having trouble with any aspect of parts ordering, please give us a call, and we will be glad to help you the best we can.

Please specify the method you wish your parts to ship (I.E. UPS Ground, Next Day Air, Federal Express, etc.). If your order is received before 1:00 p.m. EST., we will make every effort to ship your parts to you the same day they are ordered.

4.2. HOW TO ORDER PARTS

It is required of all orders that we have the MODEL and SERIAL NUMBER of your machine. In addition we will need the following information regardless of which way you are ordering parts:

- Purchase Order Number
- Company Name and Mailing Address
- Shipping Address
- Your name
- Your department (where applicable)
- Your phone number

There are three ways to order parts through SHANKLIN Corporation:

1. Give us the SHANKLIN Part Number as found on the assembly drawing (assembly drawings are contained in Section 7 of this manual),
- or -
2. Give us data right off the nameplate of the specific part that you are replacing,
- or -
3. Give us the assembly drawing number (found in Section 7 of this manual) as well as the Item Number and Item Description on the drawing.

It's as simple as that. That's all the information you need.

4.3. SPARE PARTS LISTS

The following pages contain the Recommended Spare Parts List for your F-5. Keep in mind that this list is for NEW machines. In order to get parts for an older machine, the machine's Model and Serial Number are required. Consult the factory for the correct Spare Parts Lists for your particular machine.

4.3.1. F-5A Basic Spare Parts List

SHANKLIN PART NUMBER	ITEM	QUANTITY REQUIRED
BC-0025	1/2" Ball Bushing	4
BC-0028	3/4" Ball Bushing	4
BC-0053	Ball Bearing, 1/4" X 3/4"	6
BC-0055	Ball Bearing, 1/2" X 1-3/8"	2
EA-0071 ✓	Relay - 4 Pole	1
EA-0073	24 VDC 4NO MCR Relay	1
EA-0076	24 VDC Relay	1
EE-0349	1MFD-1K Capacitor	1
EE-0351	560 VDC MOV	1
EE-0435	3 Ohm Resistor	1
EE-0450	.47 MFD Capacitor	1
EF-0054 ✓	FNM-1.4 Fuse	1
EF-0055 ✓	FNM-5 Fuse	2
EF-0057 ✓	FNM-10 Fuse	2
EF-0100 ✓	KLK-8-Fuse	2
SA-0020	3/8 X 2" Ext. Spring	2
SC-0005	3/4" Ball Bushing Retaining Ring	4
SC-0007	3/4" Ball Bushing Seals	4
SC-0020	7/8" Internal Snap Ring	2
VA-0044	1/8" 3-Way Solenoid Valve, 24VDC, N.O.	1

UPPER ADJUSTABLE
WEB GUIDE
105-11297

4.3.2. F-5A Hot Wire Spare Parts List

SHANKLIN PART NUMBER	ITEM	QUANTITY REQUIRED
EA-0076	24VDC Relay	1
EF-0053	A50-P50 Shawmut Fuse 500v	1
EP-0004	DC/3-Wire Proximity Switch	1
MA-0034	10m Teflon Glass Tape 1/2"x36 yards	1
MA-0035	5m Teflon Glass Tape 2"x18yds	1
N01-0118-001	Calibrated Screen Control	1
N05-0363-001	Wire Foll. Block	1
N05-0365-002	Top Jaw Spacer	2
N05-0473-001	Bottom Jaw Spacer	2
N05-0498-001	Wire Tensioner Block	1
N05-0499-001	End Seal Wire-Std.-.040 Diameter	6
N06-0532-001	Ceramic Jaw Bead	10
RU-0037	1/16 x 3/4 x 36" Silicone Rubber	2
RU-0049	1/2 x 1/2 x 40" Black Neoprene	2
SA-0010	5/16 x 1 3/4" Compression Spring	2
SA-0021	3/8 x 2 1/2" Extension Spring	2

4.3.3. F-5A Wide Fin Hot Knife Spare Parts List

SHANKLIN PART NUMBER	ITEM	QUANTITY REQUIRED
EF-0100 ✓	KLK-8 Fuse	2
EJ-0009 ✓	10 A Solid State Relay	1
EJ-0084	Watlow Temperature Control	1
EP-0004	Proximity Switch	1
F05-0149-006	Seal Blade, f, HS, Non-coated	1*
F05-0149-007	Seal Blade, f, HS, Teflon Coated	1*
N05-0365-002	Jaw Spacer, Nylatron	4
SA-0018	3/8 x 2 1/4" Compression Spring	2
SPA-0030-002	Bottom Jaw Pad – 1/6" Groove	1
SPA-0169-002	Tubular Heater	1
SPA-0230-002	Thermocouple Probe - 60"	1

*Indicates that Shanklin Corporation recommends EITHER part – NOT both.

4.3.4. F-5A Cool Cut Spare Parts List

SHANKLIN PART NUMBER	ITEM	QUANTITY REQUIRED
EF-0100	KLK-8 Fuse	2
EJ-0009	10A Solid State Relay	1
EJ-0084	Watlow Temperature Control	1
EP-0004	Proximity Switch	1
J05-1665-001	Cutting Blade	1
N05-0365-002	Jaw Spacer, Nylatron	2
N05-1106-001	Top Jaw Guide	1
N05-1106-002	Top Jaw Guide	1
SA-0051	7/16 x 3" Compression Spring	2
SA-0052	3/4 x 3" Compression Spring	2
SPA-0030-002	Silicon Pad- 1/2"thk .050 Narrow Groove	1
SPA-0169-002	Tubular Heater	1
SPA-0230-002	Thermocouple Probe - 60"	2

4.3.5. Diverging Belt Side Sealer Spare Parts List

SHANKLIN PART NUMBER	ITEM	QUANTITY REQUIRED
BC-0005	¼" Ball Bushing	4
BD-0117	Ribbed V Belt (Matched Pair)	2
J05-0499-001	.050 Side Seal Wire	12
N05-0461-001	Side Seal Tracking Seal	2
N05-0922-001	Phenolic Pivot Mounting Bracket	1
N05-1053-001	Plated Bearing, ¼" Bore	4
N05-1158-001	Phenolic Spring Mount	1
N05-2669-001	Bottom Wire Terminal Mounting Block	1
N05-2669-002	Top Wire Terminal Mounting Block	1
N05-3016-001	Idler V-Pulley, Diverging Belt	5
N05-0536-001	Flat Top Ceramic Bead	8
SA-0010	5/16" X 1-3/4" Compression Spring	2
SA-0014	3/8" X 1-1/2" Extension Spring	2
SA-0020	3/8" X 2" Extension Spring	2
SA-0021	3/8" X 2-1/2" Extension Spring	2
SA-0031	1" X 2" Compression Spring	2

4.3.6. Shanklin Hole Punch Spare Parts List

SHANKLIN PART NUMBER	ITEM	QUANTITY REQUIRED
J05-0466-002	1/4" Ball Connector	2
MA-0003	3/16" Hole Punch Die	2
SPA-0014-001	Cone Spring	2
VA-0041	1/8" 3-Way Solenoid Valve, 24VDC, N.C.	1

4.3.7. Park-Air Hole Punch Spare Parts List

SHANKLIN PART NUMBER	ITEM	QUANTITY REQUIRED
MA-0078	1/8" Park-Air Die (#99-430)	3*
MA-0079	1/4" Park-Air Die (#99-431) opt.	3*
MA-0083	1/8" Park-Air Punch (#99-400)	2*
MA-0084	1/4" Park-Air Punch PN 9163 opt.	2*
VA-0041	1/8" 3-Way Solenoid Valve, 24VDC, N.C.	1

*Indicates that Shanklin Corporation recommends EITHER part – NOT both.

4.3.8. Olefin Pin Perforator Spare Parts List

SHANKLIN PART NUMBER	ITEM	QUANTITY REQUIRED
N05-1053-002	Plated Bearing, 1/2" Bore	2
SA-0020	3/8" X 2" Extension Spring	2
SPA-0361-001	Perforator Pin	16

SECTION 5. ELECTRICAL EQUIPMENT

This section is structured as follows:

5.1. LISTING OF ELECTRICAL EQUIPMENT	1
5.2. MANUFACTURERS' INFORMATION	3

5.1. LISTING OF ELECTRICAL EQUIPMENT

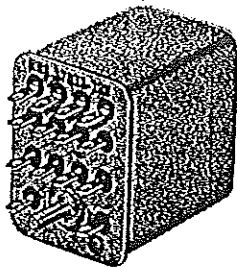
The list on the following pages contains the electrical equipment used on the F-5. Manufacturers' information is included following page 5-5.

PART NUMBER	ITEM	QUANTITY
EA-0071	Relay – 4 Pole	1
EA-0073	24 VDC 4NO MCR Relay	1
EA-0076	24 VDC Relay	1
EE-0349	1MFD-1K Capacitor	1
EE-0351	560 VDC MOV	1
EE-0435	3 Ohm Resistor	1
EE-0450	.47 MFD Capacitor	1
EF-0054	FNM-1.4 Fuse	1
EF-0055	FNM-5 Fuse	2
EF-0057	FNM-10 Fuse	2
EF-0100	KLK-8-Fuse	2
EF-0053	A50-P50 Shawmut Fuse 500v	1
EJ-0009	10 A Solid State Relay	1
EJ-0084	Watlow Temperature Control	1
EP-0004	DC/3-Wire Proximity Switch	1

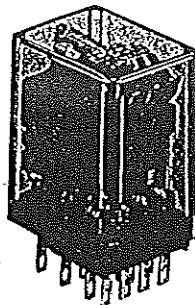
5.2. MANUFACTURERS' INFORMATION

Whenever possible, Shanklin Corporation supplies the Original Equipment Manufacturers' information. The following manufacturers information is included within this section.

DESCRIPTION	MANUFACTURER	SHANKLIN PART #
Relay 4 Pole: Form-C 3a	Potter & Brumfield	EA-0071
Relay 4 Pole: N-O, 10a	Allen-Bradley	EA-0073
Relay 1 Pole: N-O	Allen-Bradley	EA-0076
Relay 2 Pole: Form-C	Potter & Brumfield	EA-0086
Relay 3 Pole: Form-C 10a	Potter & Brumfield	EA-0087
Control Module - Photo Eye	Allen-Bradley	EC-0008
Through Beam Receiver (End Seal Eye)	Allen-Bradley	EC-0055
Infrared Light Source (End Seal Eye)	Allen-Bradley	EC-0056
Motor 1/8 Hp 266 Rpm		ED-0044
Ammeter 0-30 Ac Amp (Hot Wire)		EE-0045
Solid State Relay (Hot Knife)	Continental Industries, Inc	EJ-0009
Motor Speed Control (Selvage Winder)	KB Electronics, Inc	EJ-0016
Transformer 1000 Va (Hot Wire)	Buck	EJ-0083
Temperature Controller (Hot Knife, Drag Seal)	Watlow	EJ-0084
Proximity Switch N-O Dc/3w, Pnp	Efector Electronics, Inc	EP-0004
Proximity Sensor For Counter	Omron	EP-0005



KHS



KHU

FEATURES

- Miniature size from 2 pole to 4 pole. A 5 pole version is available as a special order.
- KHS hermetically sealed version UL Approved for Class 1 Division 2 hazardous locations.
- Various applications include process control, photocopier, and data processing.
- Low cost, semiautomated construction.

CONTACT DATA @ 25°C

Arrangements: 2 Form C (DPDT), 4 Form C (4PDT).
Expected Life: 10 million operations, mechanical; 100,000 operations min. at rated loads. Ratings are based on tests of relays with ungrounded frames.
Initial Breakdown Voltage: 500V rms, 60 Hz., between open contacts.
1240V rms, 60 Hz., between all other elements.

CONTACT RATINGS

Contact Code	Material	Resistive Rating	
		Minimum	Maximum
1	Silver	100mA @ 12VAC/12VDC	3A @ 120VAC/28VDC
2*	Silver-cadmium oxide	500mA @ 12VAC/12VDC	5A @ 120VAC/28VDC
3	Gold-silver-nickel	10mA @ 12VAC/12VDC	2A @ 120VAC/28VDC
4	Palladium	100mA @ 12VAC/12VDC	3A @ 120VAC/28VDC
5	Silver alloy	500mA @ 12VAC/12VDC	3A @ 120VAC/28VDC
6	Bifurcated cross bar, gold overlay silver	Dry circuit	1A @ 120VAC/28VDC
8	Gold diffused silver	50mA @ 12VAC/12VDC	3A @ 120VAC/28VDC

Note: Relays should only carry a maximum of 15 amps continuously for all poles combined.

*Note: KHS hermetically sealed version maximum rating is 5A @ 120VAC/28VDC.

KHA series

GENERAL PURPOSE
DRY CIRCUIT TO 5A
MULTICONTACT
AC OR DC RELAY

File E22575

File LR15734

COIL DATA @ 25°C

Voltage: From 6 to 120V DC, and 6 to 240V AC, 50/60 Hz.
Nom. Power: DC coils - 0.9 watt; 0.5 watt minimum operate @ 25°C.
AC coils - 1.2 VA; 0.55 VA minimum operate @ 25°C.
Max. Power: DC coils - 2.0 watts @ 25°C.
Duty Cycle: Continuous.
Initial Breakdown Voltage: 500V rms, 60 Hz.

COIL DATA

Nominal Voltage	DC Coils		AC Coils	
	Resistance in Ohms ±10% @ 25°C	Nominal Inductance in Henrys	Resistance in Ohms ±15%	Nominal AC Current in mA
5	32	.072	—	—
6	40	.08	10.5	200
12	160	.28	43	100
24	650	1.0	160	52
48	2,600	4.5	668	25
90	9,000	13.5	—	—
110*	11,000	17.0	—	—
120*	13,500	—	3,900	11.0
240	—	—	12,000	6.0

*Note: For 220 and 240VDC, use series dropping 5W resistor of 11,000Ω.

OPERATE DATA @ 25°C

Must-Operate Voltage: DC: 75% of nominal voltage.
AC: 85% of nominal voltage.
Operate Time: 13 milliseconds typical @ nominal voltage (excluding bounce).
Release Time: 6 milliseconds typical @ nominal voltage (excluding bounce).

ENVIRONMENTAL DATA

Temperature Range: -45°C to +70°C operate.
-60°C to +130°C storage.

MECHANICAL DATA

Mountings: #3-48 stud, sockets with printed circuit or solder terminals, or bracket plate with #6-32 threaded stud.
Termination: Printed circuit or solder/socket terminals.
Printed circuit terminals are available for KHS on a special order basis.
Insulating Material: Molded high-dielectric material.
Enclosures: See Ordering Information table.
Cover colors are available in black, red, blue, yellow and green by special order.
Weight: 1.6 oz. approx. (45 g)



BULLETIN 700

TYPE F DC RELAY RELAIS CC GLEICHSPANNUNGSRELAIS RELÉ DE C.C. RELÉ CC

S.C. P/N EA-0073
S.C. P/N EA-0088

WARNING: To prevent electrical shock, disconnect from power source before installing or servicing. Install in suitable enclosure. Keep free from contaminants.

AVERTISSEMENT: Préablement à l'installation et aux opérations de service, couper l'alimentation secteur pour empêcher tous chocs électriques. Installer dans une boîte appropriée. Protéger le relais contre les contaminants.

WARNUNG: Vor Installations-oder Servicearbeiten Stromversorgung zur Vermeidung von Elektroschock trennen. Die Geräte müssen in einem passenden Gehäuse eingebaut und gegen Verschmutzung geschützt werden.

ADVERTENCIA: Desconéctese de la corriente eléctrica, antes de la instalación o del servicio, a fin de impedir sacudidas eléctricas. Instálelo en una caja apropiada. Manténgalo libre de contaminantes. No lubrique o desengrase los conjuntos magnéticos.

ADVERTÊNCIA: Para evitar choques, desconectar da corrente eléctrica antes de fazer a instalação ou a manutenção. Instalar em caixa apropriada. Manter livre de contaminantes. Não lubrificar nem desengravar os conjuntos magnéticos.

BUL 700DC-F

700DC - F400Z**
40E

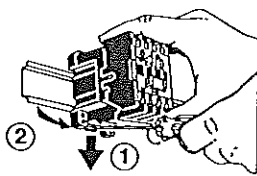
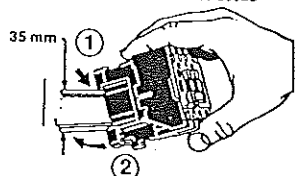
700DC - F310Z**
31E

700DC - F220Z**
22E

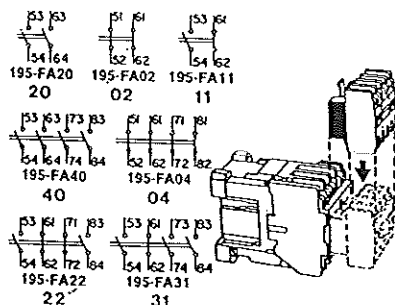
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MONTAGE
INSTALACIÓN
INSTALAÇÃO

REMOVAL
DÉPOSE
ENTFERNUNG
REMOCIÓN
REMOÇÃO

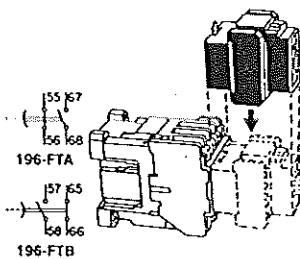
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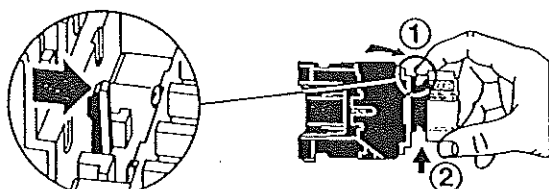
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BLOC DE CONTACTS
KONTAKTBLOCK - AUFSATZ
BLOQUE DE CONTACTOS SUPLEMENTARIO
BLOCO DE CONTATOS AUXILIARES



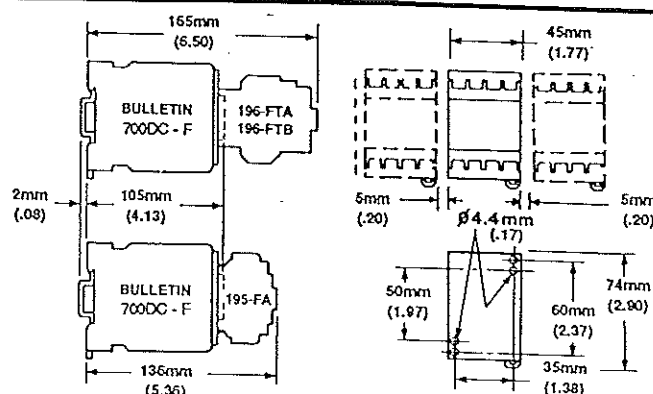
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TEMPORISATEUR PNEUMATIQUE
PNEUMATISCHER ZEITRELAIS - AUFSATZ
UNIDAD TEMPORIZADORA PNEUMATICA
UNIDADE DE TEMPO PNEUMÁTICA



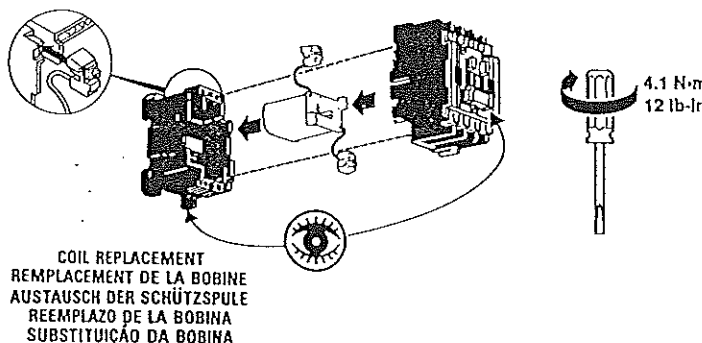
REMOVAL DEMONTAGE REMOVIBLE REMOVÍVEL



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Printed in U.S.A.



BUL 700DC-F



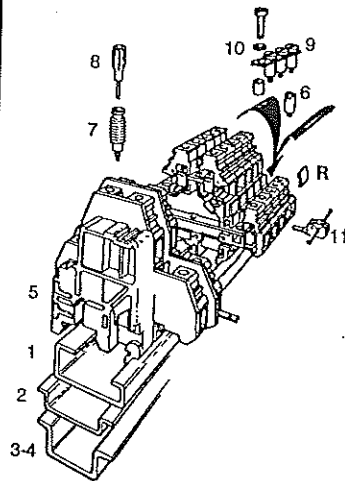
700DC-F REPLACEMENT COIL TABLE
TABLEAU DES BOBINES DE RECHANGE 700DC-F
TABELLE FÜR ERSATZSPULEN 700DC-F
CUADRO DE BOBINAS DE SUSTITUCION 700DC-F
TABELA DE BOBINAS PARA SUBSTITUIÇÃO 700DC-F

VOLTS DC	COIL NO. NUMERO DE BOBINE SPULE N° BOBINA NO. BOBINA NO.	Ω 20C Ω 20C Ω 20C Ω 20C	Z** Z** Z** Z**	WATTS WATTS WATT VATIOS WATTS
12	NB708	18.5	Z12	8.7
18	NB767	37.5	Z18	8.6
24	NB714	67	Z24	8.6
48	NB724	266	Z48	8.7
64	NB727	466	Z64	8.8
72	NB728	605	Z72	8.6
80	NB729	738	Z80	8.7
110	NB778	1425	Z11	8.5
115	NB734	1505	Z1	8.8
125	NB737	1710	Z3	9.1
220	NB747	5600	Z22	8.7
230	NB749	6015	Z23	8.8
250	NB751	7100	Z25	8.8
280	NB790	10760	Z29	7.3
300	NB793	10330	Z30	8.7



ALLEN-BRADLEY
A ROCKWELL INTERNATIONAL COMPANY

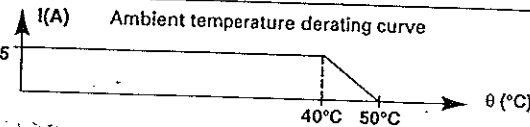
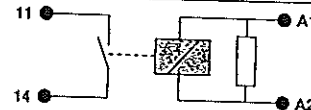
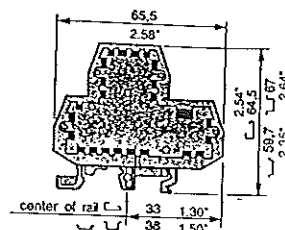
Relay interfaces Relay modules Series 7000



M 4/9.R111

Spacing 9 mm (.354")

S.C. P/N EA-0076



Type	P/N
Grey body	
M4/9.R111	12V DC 007 029.23
M4/9.R111	24V DC 007 030.20

Approvals (Contact Entelec)

Relay characteristics

COIL

Rated voltage + 20% - 20% on DC
Power
Rated current
Drop-out voltage
Status device

12 V DC	24 V DC
0.3 W	0.3 W
24 mA	14 mA
1.2 V DC	2.4 V DC

CONTACT

Type
Voltage switching range min/max
Current switching range
Load switching range AC1 min/max
Load switching range DC1 min/max
Max. load
Number of on-load operations
Number of off-load operations
Pull-in time (delay time)
Drop-out time (delay time)
Bounce time
Insulation coil / contacts
Breakdown voltage with 1.2/50 μ s wave
Insulation contacts / contacts
Storage ambient temperature
Operating ambient temperature

1 NO
12 V / 150 V DC - 250 V AC
10 mA / 5 A
0.1 VA / 1250 VA
0.1 W / 150 W

1 x 10⁶
2 x 10⁴
5 ms
6 ms
4 ms
3 kV
4 kV
750 V
- 40°C to + 80°C
- 20°C to + 50°C

Characteristics

Wire size	Solid wire	DIN-VDE	UL	CSA	NFC-UTE
		0-4 mm ²			0-4 mm ²
	Stranded wire	0-4 mm ²			0-4 mm ²

Rated voltage	V				
Rated current	A	26			30

Rated wire size	4 mm ²				2.5 mm ²
-----------------	-------------------	--	--	--	---------------------

Other characteristics

Wire stripping length	Recommended screwdriver	Recommended torque	Protection
8.5 mm .33"	4 mm	0.4-0.6 Nm 3.5-5.3 lb.in	IP 20 NEMA 1

Accessories

Type	P/N
1 Rail 32x15	PR1 Z2 32 x 15
2 Rail 35x7.5x1	PR30 35 x 7.5 x 1 prepunched
3 Rail 35x15x2.3	PR4 35 x 15 x 2.3
4 Rail 35x15x1.5	PR5 35 x 15 x 1.5
5 High end stop (all rails)	BAMH th. 9.1 mm
6 Test socket (1)	AL2 DIA. 2 mm
	AL3 DIA. 3 mm
7 Test device	DCG grey
8 Test plug	FC2 DIA. 2 mm
9 Jumper bar (not preassembled) (1)(2)	BJS9 8 poles
	BJS9 16 poles
10 Sub-assembly for jumper bar (screw + washer + post) (1)(2)	EV6D
11 IDC Jumper	
R See markers and other accessories	AD2.5
	114 205.20

(1) These accessories can be used on the lower connection only.
(2) Use of these accessories requires the cut-out of the block body by the user (pre-c)



KUP93 series

GENERAL PURPOSE
3 to 10 AMP, MULTICONTACT
AC or DC RELAY

File E22575
File LR15734

FEATURES

- AC coils 6 - 240V 50/60 Hz., DC 6 - 110VDC.
- Contact arrangement to 3PDT.
- Gold diffused and gold flash contacts available.
- Sockets available for all models.
- Push-to-test button and coil indicator lamps.
- Accepted pin pattern for HVAC Industry.
- Primarily designed for the HVAC Industry.

CONTACT DATA @ 25°C

Material: Fine silver or silver cross bar, silver-cadmium oxide

CONTACT RATINGS

Material	UL/CSA Ratings	Life Expected
Fine silver	5A @ 28VDC or 240VAC, 80% PF, 1/10 HP @ 120VAC, 1/4 HP @ 240VAC	100,000
Silver-cadmium oxide	10A @ 28VDC or 240VAC, 80% PF, 1/4 HP @ 120VAC, 1/3 HP @ 240VAC 10 FLA, 30 LRA @ 120VAC, 5 FLA, 15 LRA @ 240VAC	100,000 30,000
Fine silver cross bar	3A @ 32VDC or 250VAC 125VA @ 125VAC or 250VAC	100,000 30,000

INITIAL DIELECTRIC STRENGTH

Between Open Contacts: 500V rms.
Between Adjacent Contacts: 1,500V rms.
Between Contacts and Coil: 1,500V rms.

COIL DATA @ 25°C

Nominal Power:
DC Coils: 1 to 2 Watts.
AC Coils: 1, 2 pole: 2VA; 3 pole: 2.7VA.
Initial Insulation Resistance: 100 megohms, min., at 25°C.

COIL DATA

	Nominal Voltage	DC Resistance In Ohms ± 10%*	Must Operate Voltage	Nominal Coil Current (mA)
DC Coils	6	32.1	4.5	187
	12	120	9.0	100
	24	472	18.0	51
	48	1,800	36.0	26.7
	110	10,000	82.5	11
AC Coils	2.0VA (1 or 2 Pole)			
	6	6	5.1	335
	12	21	10.2	168
	24	85	20.4	84
	120	2,250	102.0	17.5
	240	9,110	204.0	8.75
	2.7VA (3 Pole)			
	6	4.2	5.1	460
	12	18	10.2	230
	24	72	20.4	115
	120	1,700	102.0	24
	240	7,200	204.0	12

*AC coils, ± 15%

OPERATE DATA @ 25°C

Must Operate Voltage:
DC Coils: 75% of nominal voltage or less.
AC Coils: 85% of nominal voltage or less.
Operate Time (Excluding Bounce): 15 milliseconds, typical, at nominal voltage.
Release Time (Excluding Bounce):
DC Coils: 10 milliseconds, typical, at nominal voltage.
AC Coils: 10 milliseconds, typical, at nominal voltage.

ENVIRONMENTAL DATA

Temperature Range:
Storage:
All Coils: -45°C to +105°C.
Operating:
DC Coils: -45°C to +70°C.
AC Coils: 1-2 pole, -45°C to +55°C.
3 pole, -45°C to +45°C.

MECHANICAL DATA

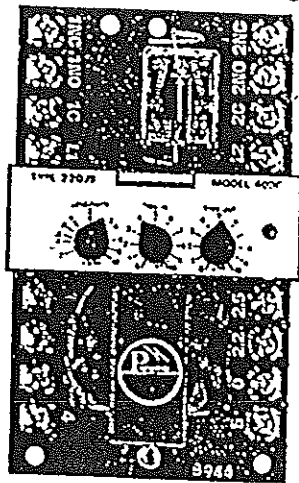
Termination: .187" x .020" quick connect.
Enclosures: Clear polycarbonate dust cover.
Weight: 3.0 oz. (86 g) approximately.

TYPE 22/4000

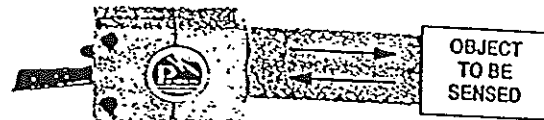
S.C.P/N = EC-0008 (Module)

SEPARATE CONTROLS AND SENSORS

TIME DELAY SEPARATE CONTROL AMPLIFIER TYPE 22 SERIES 4000



Module



Modular design separate dual time delay control amplifiers for use with a wide selection of sensors. Two models one with a long and one with short timing range. Timing modes are ON and OFF delay, and NO delay.

CATALOG NUMBERS		VOLTAGE SUPPLY	POWER CONSUMPTION	DIFFERENTIAL % (LIGHT CHANGE)	SENSITIVITY ADJUSTMENT (LOGARITHMIC)	OUTPUT CHARACTERISTICS			RESPONSE TIME		TIMING RANGE
FUNCTION MODULE	CONTROL BASE					TYPE	RATING	LEAKAGE	CONTROL	OUTPUT	
22DJ9-4000	—	—	—	80%	50 to 1	—	—	—	1ms	—	ON 10 sec OFF 15 sec
22DJ9-4001	—	—	—			—	—	—	1ms	—	
	60-1600B	102-132 VAC 50/60Hz	2VA			DPDT EM Relay	5A-120VAC 2.5A-240VAC 1A-120VDC	—		ON 10ms OFF 10ms	
	61-1601B	200-264 VAC 50/60Hz				SP-NO AC TRIAC	1A-265VAC 20mA min.	1mA		ON 8ms	
						SP-NO FET AC/DC	30mA-120 VAC/DC	10microA		ON 1ms	
						Voltage DC Output	30mA 24VDC	—		—	
						NPN open collector	250mA 24VDC	1mA		—	

SPECIFICATIONS

Ambient Temperature -40°F to 135°F
 (-40°C to 57°C)
 Relative Humidity 90%
 Turn-ON pulse suppression Yes
 Synchronous Detection Yes

Timing Repeatability (Constant V and Temp.) 1%
 Light/Dark Operation Yes
 Alignment Indicator and Test Points Yes
 Operating Distance Depends on sensors selected

PRODUCT DETECT
PRODUCT DETECT

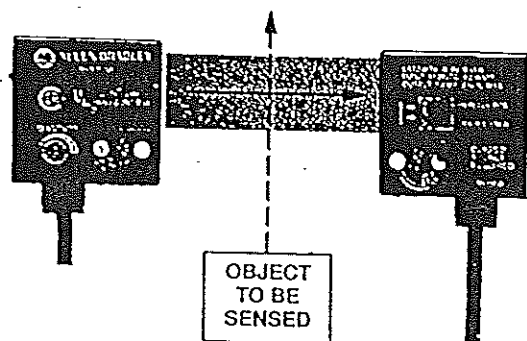
Receiver Photoeye
Source Photoeye

S. C. P/N EC-0055 (1 of 2)
S. C. P/N EC-0056 (1 of 2)

7000

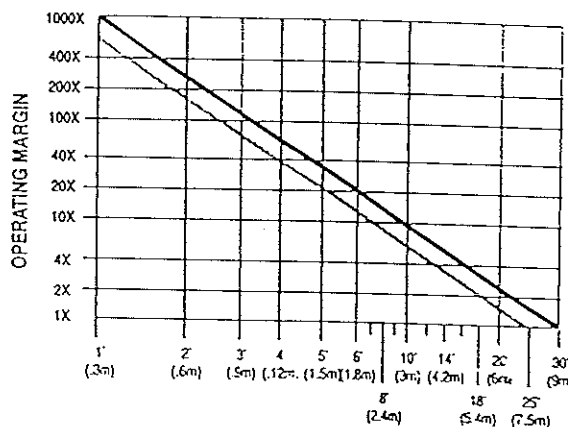
TRANSMITTED BEAM

TRANSMITTED BEAM 42SMR/42SML SERIES 7100



Designed for long-range and environmental penetration applications. Infrared and visible red models permit close stacking of the sensors, without cross talk in light curtain applications.

TYPICAL RESPONSE CURVE



IR (IR) 42SML-7100 & 42SMR-7100/7101
RED (RED) 42SML-7110 & 42SMR-7110/7111

CATALOG NUMBER	VOLTAGE SUPPLY	SUPPLY CURRENT	OUTPUT COMPLEMENTARY OPEN COLLECTOR (NPN)			RESPONSE TIME	OPERATING DISTANCE	REVERSE POLARITY PROTECTION	TRANSMITTING LED	FIELD OF VIEW
			TYPE	RATING	LEAKAGE (OFF STATE)					
	11-28 VDC	25mA		100mA	10 microA	1ms ON	2:1 Margin: 22' (6.70m)	YES	—	8°
42SMR-7101			PNP			1.5ms OFF				
42SML-7100	11-28 VDC	45mA	LIGHT SOURCE			—	1:1 Margin: 30' (9.2m)	YES	INFRA-RED 880nm	3°

SPECIFICATIONS

Power Consumption:

Source and Receiver 1.2 Watts at 28 VDC

Sensitivity Adjustment 4 Turn Pot.

Ambient Temperature -40°F to +150°F
(-40°C to +65°C)

Relative Humidity 95%

Operating Environment:

NEMA 3, 4X, 6P, 12, 13, and IP67(IEC144) rated housing. Housing material is high-impact, chemically resistant Valox.

Cable Models 42SMR-7100, 7101, 7110, 7111
42SML-7100 and 7110

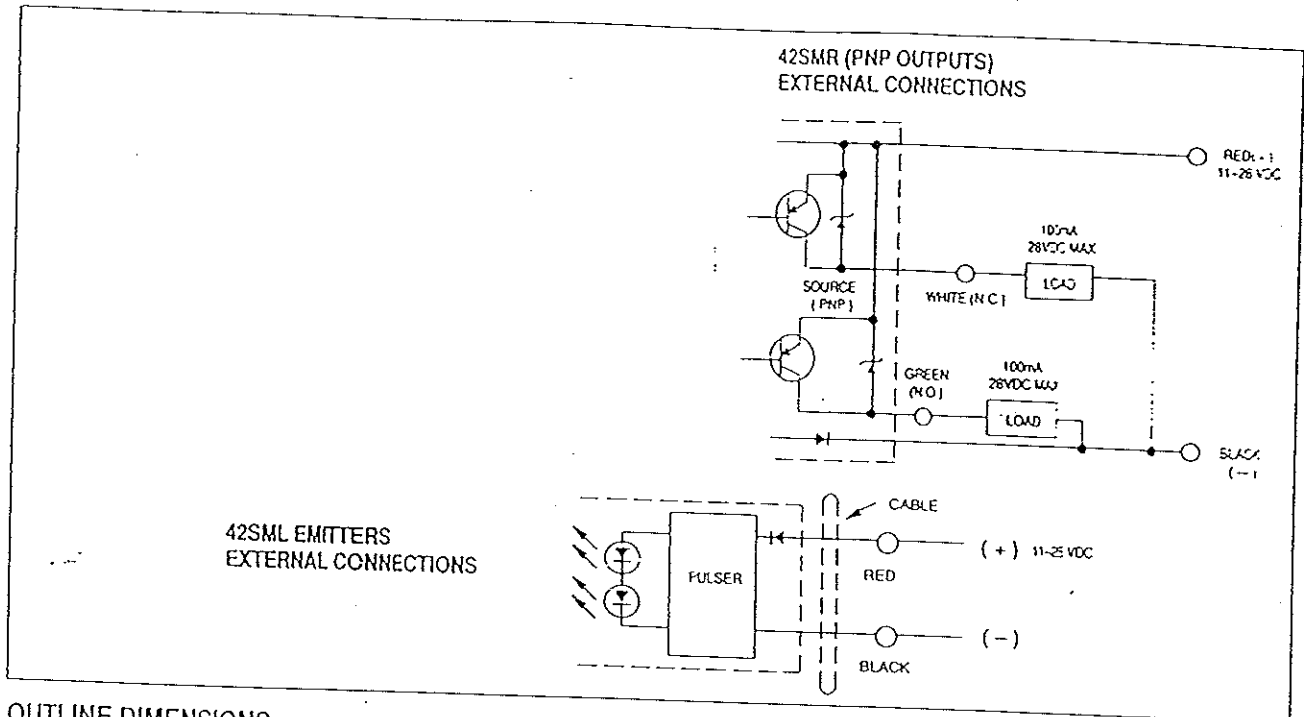
Supplied with 10' (3m) of four conductor flexible PVC jacketed cable.

Quick-Disconnect Models 42SMR-7100-QD, 7101-QD, 7110-QD and 7111-QD, 42SML-7100-QD and 7110-QD
Supplied with 12' (30.5cm) 4 conductor PVC jacketed cable and a 4 PIN D.C. "Micro" metric style connector.

S. C. P/N EC-0055 (2 of 2)
S. C. P/N EC-0056 (2 of 2)

7000

WIRING DIAGRAMS

[illegible]

1. Select control.

SENSING MODE	COMPLEMENTARY OUTPUTS	TYPE & MODEL
INFRARED TRANS. BEAM		
	PNP (NO), PNP (NC)	42SMR-7101

To order Quick-Disconnect models add "-OD" to the end of the models numbered 425XX-7XXX-OD. See Page 183 for information about the OD models.

SENSING MODE	COMMENTS	TYPE & MODEL
INFRARED TRANS. BEAM	Use only with infrared receivers 42SMR-7100 and 7101	42SML-7100

To order Quick-Disconnect models add "-QD" to the end of the models numbered 42SXX-7XXX-QD. See Page 183 for information about the QD models.

3. Select optional accessories.

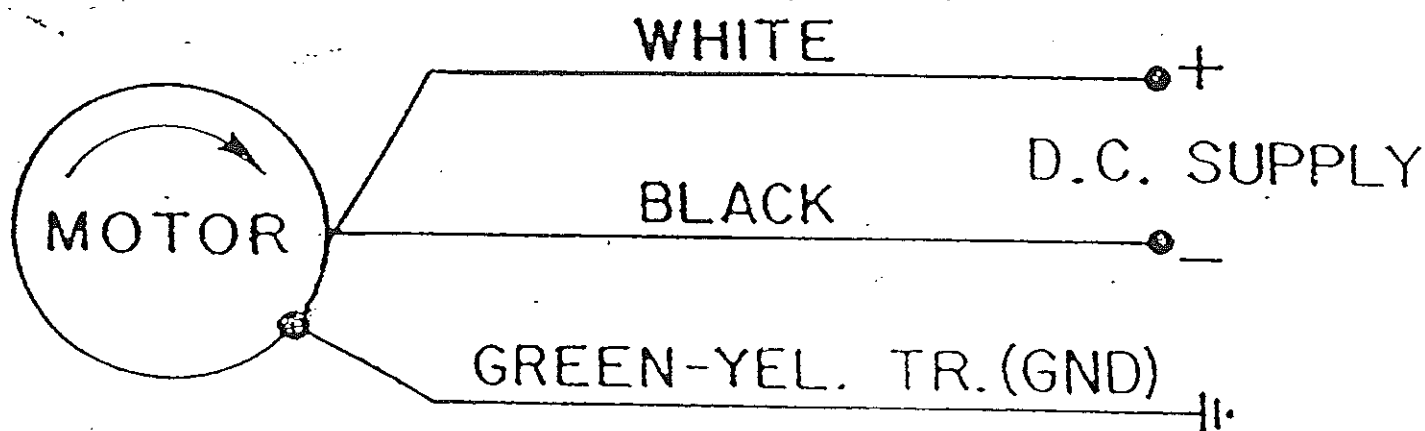
PART NUMBER	DESCRIPTION
60-2151	Side Mounting Assembly
60-2152	Universal Mounting Assembly

S.C.P/N = ED-0020 Infeed Drive Motor
ED-0044 Film Unwind Motor
ED-0045 Sideseal/Discharge Motor
ED-0071 Infeed Conveyor

MOTOR CONNECTION DIAGRAM

PM MOTORS & GEARMOTORS

2 WIRE REVERSIBLE



CLOCKWISE ROTATION
WAS T-101-G) VIEWING SHAFT.

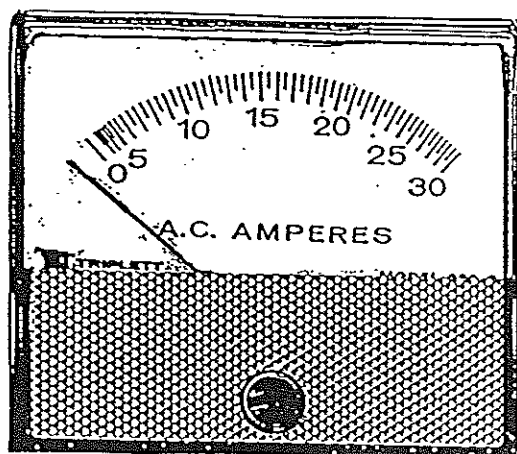
74 10101C

GROUND WIRE ($\frac{1}{2}$) OMITTED
BY CUSTOMER REQUEST ONLY

panel instruments

2 1/2

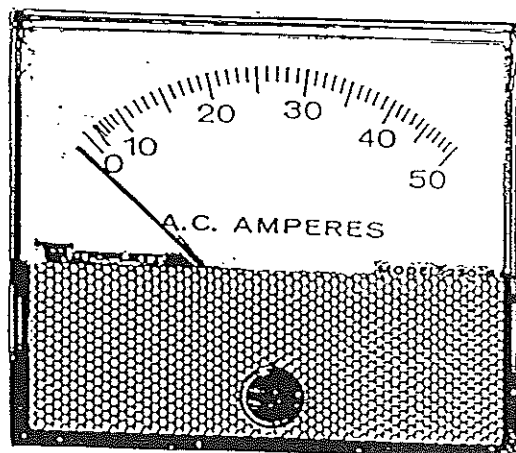
S.C.P/N = EE-0034



AC AMMETERS

Range	Ohms Res.	Catalog Numbers for Model			
		230-G	230-GL	231-S	237-S
0-1	.38	153-0001	53-1961	153-0348	153-0377
0-2	.092	153-0003	53-1962	153-0349	153-0378
0-3	.039	153-0005	53-1963	153-0350	153-0379
0-5	.014	153-0006	53-1964	153-0351	153-0380
0-10	.004	153-0065		153-0352	153-0381
0-15	.003	153-0066		153-0353	153-0382
0-25	.002	153-0068		153-0354	153-0383
0-30	.001	153-0069		153-0355	153-0384
0-50	.00035	153-0070		153-0356	153-0385

S.C.P/N = EE-0045

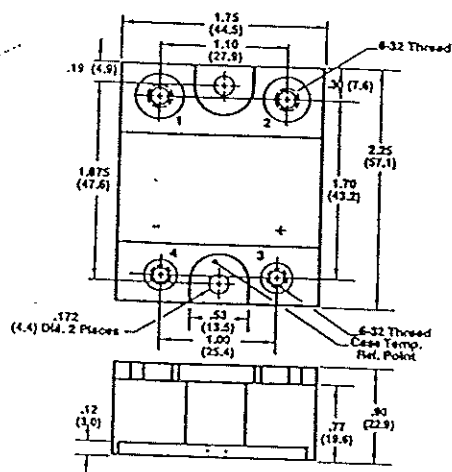




S.C.P/N = EJ-0009

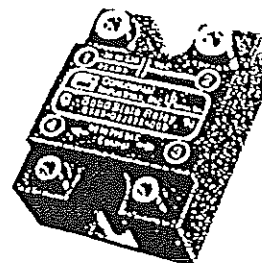
Dimensions

Inches (mm)



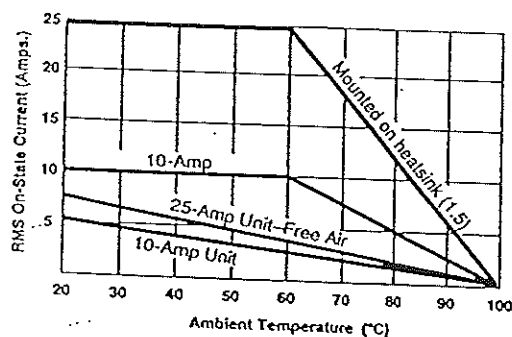
Features:

- Photo isolation
- 600 volt blocking voltage
- 4000 volt isolation
- Zero voltage turn-on
- Built-in snubber
- 100% tested at rated current
- High surge capability
- U.L. recognized
- C.S.A. certified



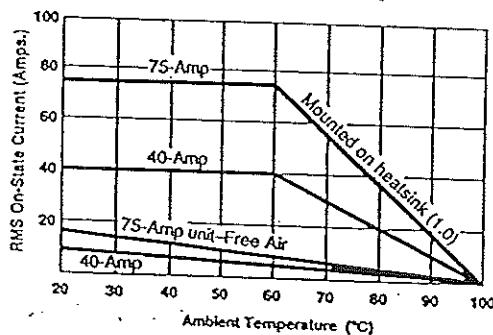
Derating Curve

10-Amp and 25-Amp

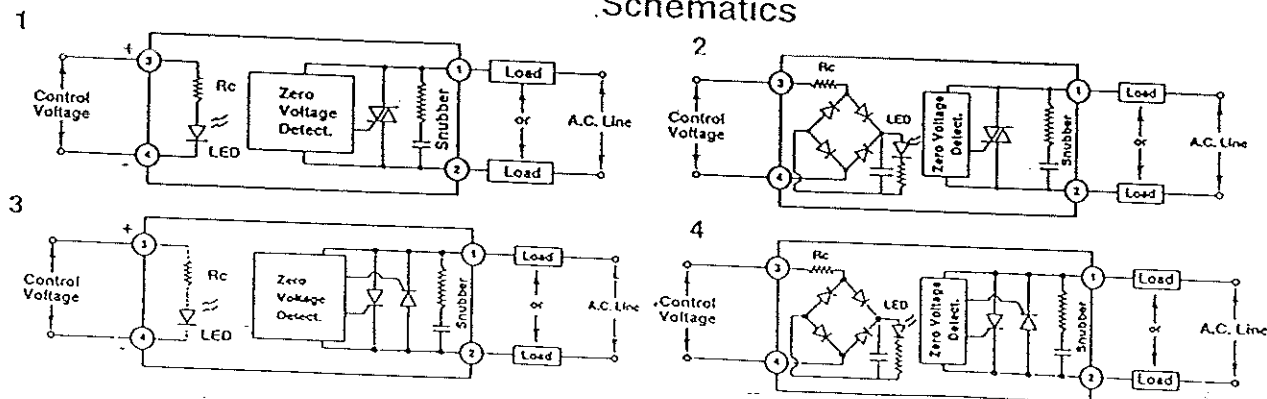


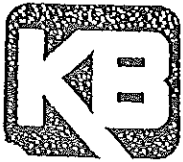
Derating Curve

40-Amp and 75-Amp.



Schematics





KB ELECTRONICS, INC., 73 Wortman Avenue, Brooklyn, New York 11207 (212) 257-3300
TWX (710) 584-2308

S.C. P/N=EJ-0016

"Right Control
for Your Application"

DATA SHEET D-182

KBVC Series Solid State D.C. Motor Speed Controls

Designed for
Shunt Wound & P.M. D.C. Motors
For Use With

- PUMPS
- CONVEYORS
- FOLDERS
- MIXERS

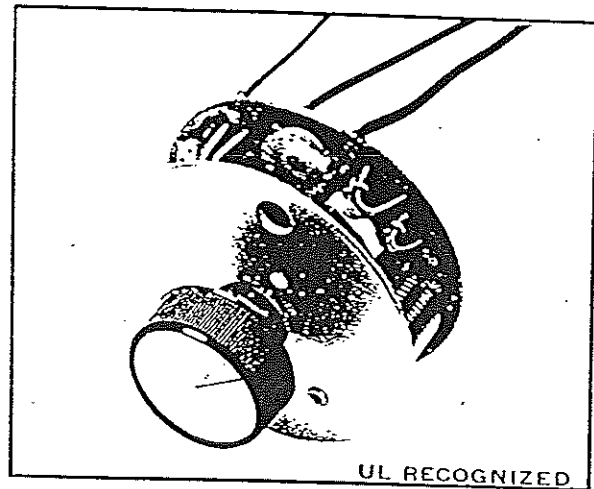
- Full-Wave Circuit With Feedback
- Replace Costly Auto-Transformer/
Rectifier Controls
- Operates From 50/60 Hz A.C. Power
- Designed and Priced for OEM Users

FEATURES AND OPTIONS

- Minimum Speed Adjustment
- Compact Modular Construction
- Self Contained On/Off Line Switch
- Transient Protection
- RFI Filter
- Separate Field Supply
- High Reliability and Low Cost

DESCRIPTION:

The KBVC series of full-wave controls are designed for applications where sophisticated controllability is not required. They offer very low cost, however, reliability and performance is not sacrificed.



These all-solid state controllers are fabricated with the latest and most reliable components. The KBVC series is designed to operate and control any DC shunt or PM motor from a standard AC 50/60 Hz powerline. A feedback circuit is provided to maintain constant motor speed under varying load conditions.

Many options and models are offered to provide the OEM user the necessary versatility and freedom of design.

The KBVC control has transient protection and an RFI filter. A minimum speed adjustment is standard on all models.

MODEL NO.	INPUT VOLTAGE (V.A.C 50/60 HZ)	MAX. LOAD CURRENT (RMS AMPS)	SURGE CURRENT (RMS AMPS)	MAX RATED HORSEPOWER	TYPICAL SPEED RANGE (RATIO)	TYPICAL REGULATION 10:1 SPEED RANGE (%)
KBVC-11	120	1.0	6.0	1/10	20:1	7.0
KBVC-14	120	4.0	15.0	1/3	20:1	7.0
KBVC-21	240	1.0	6.0	1/6	20:1	7.0
KBVC-24	240	4.0	15.0	3/4	20:1	7.0

Notes:

1. Field Circuit is omitted on PM Motors — Add "PM" to Model No. (Ex. KBVC-14PM) 2. Built in ON OFF Switch can be omitted — Add "NS" to Model No. (Control supplied with plain round shaft) 3. Leads. Standard leads are 8' long stripped 3/8" — Armature: Red — Pos. Black — Neg. Field: Yellow-Pos., Brown — Neg. 4. Quick-Disconnects are available upon request

Buck — Boost Encapsulated Transformers

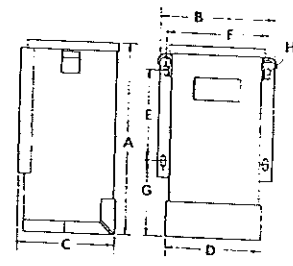
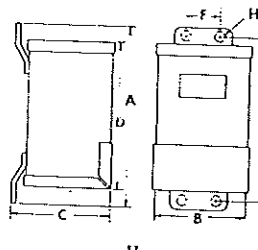
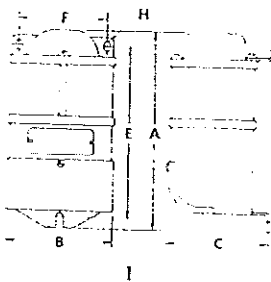
Table No. 2 - Low Voltage Powerformers

KVA	CATALOG NUMBER	DIMENSIONS IN INCHES								DIM DWG	WIR DIAG	WGT
		A	B	C	D	E	F	G	H			
Type SWH - Wall Mount - 120/240 V Pri. - 12/24 V Sec. - 115°C Rise - 50/60 Hz •												
.100	246-1101*	6 ³ / ₈	3 ³ / ₁₆	2 ²⁵ / ₃₂	—	5 ²⁵ / ₃₂	2 ¹ / ₂	—	3 ¹ / ₁₆ X 9 ⁹ / ₃₂	I	I	4.3
.150	246-1111*	7 ¹ / ₄	3 ⁷ / ₈	3 ¹ / ₂	—	6 ¹ / ₄	3 ¹ / ₄	—	7 ¹ / ₃₂ X 11 ¹¹ / ₃₂	I	I	5.3
.250	216-1121	9 ³ / ₈	4 ²⁵ / ₆₄	4 ³ / ₃₂	7 ¹¹ / ₁₆	8 ³ / ₈	2 ¹ / ₄	—	5 ¹ / ₁₆ X 7 ¹ / ₁₆	II	I	11.2
.500	216-1131	9 ³ / ₈	4 ²⁵ / ₆₄	4 ³ / ₃₂	7 ¹¹ / ₁₆	8 ³ / ₈	2 ¹ / ₄	—	5 ¹ / ₁₆ X 7 ¹ / ₁₆	II	I	13.6
.750	216-1141	11 ¹ / ₂	5 ⁹ / ₆₄	4 ²³ / ₃₂	9 ¹¹ / ₁₆	10 ¹ / ₂	2 ¹ / ₄	—	5 ¹ / ₁₆ X 7 ¹ / ₁₆	II	I	17.8
1.	216-1151	11 ¹ / ₂	5 ⁹ / ₆₄	4 ²³ / ₃₂	9 ¹¹ / ₁₆	10 ¹ / ₂	2 ¹ / ₄	—	5 ¹ / ₁₆ X 7 ¹ / ₁₆	II	I	23.3
1.5	216-1161	13	5 ⁵⁷ / ₆₄	5 ¹ / ₃₂	10 ¹⁵ / ₁₆	12	2 ¹ / ₄	—	5 ¹ / ₁₆ X 7 ¹ / ₁₆	II	I	26.5
2.	216-1171	13	5 ⁵⁷ / ₆₄	5 ¹ / ₃₂	10 ¹⁵ / ₁₆	12	2 ¹ / ₄	—	5 ¹ / ₁₆ X 7 ¹ / ₁₆	II	I	36
3.	216-1181	15 ³ / ₈	7 ¹ / ₂	6 ⁵ / ₄	13 ⁵ / ₃₂	14 ¹ / ₈	3 ¹ / ₂	—	11 ¹ / ₃₂ Dia.	II	I	58.5
5.	216-1191	16 ³ / ₁₆	12 ⁵ / ₈	8 ⁷ / ₃₂	9 ¹¹ / ₁₆	8 ¹ / ₄	11 ¹ / ₈	—	9 ¹ / ₁₆ X 13 ¹ / ₁₆	III	I	110.5
Type SWH - Wall Mount - 120/240 V Pri. - 16/32 V Sec. - 115°C Rise - 50/60 Hz •												
.100	246-1201*	6 ³ / ₈	3 ³ / ₁₆	2 ²⁵ / ₃₂	—	5 ²⁵ / ₃₂	2 ¹ / ₂	—	3 ¹ / ₁₆ X 9 ⁹ / ₃₂	I	I	4.3
.150	246-1211*	7 ¹ / ₄	3 ⁷ / ₈	3 ¹ / ₂	—	6 ¹ / ₄	3 ¹ / ₄	—	7 ¹ / ₃₂ X 11 ¹¹ / ₃₂	I	I	5.3
.250	216-1221	9 ³ / ₈	4 ²⁵ / ₆₄	4 ³ / ₃₂	7 ¹¹ / ₁₆	8 ³ / ₈	2 ¹ / ₄	—	5 ¹ / ₁₆ X 7 ¹ / ₁₆	II	I	11.2
.500	216-1231	9 ³ / ₈	4 ²⁵ / ₆₄	4 ³ / ₃₂	7 ¹¹ / ₁₆	8 ³ / ₈	2 ¹ / ₄	—	5 ¹ / ₁₆ X 7 ¹ / ₁₆	II	I	13.6
.750	216-1241	11 ¹ / ₂	5 ⁹ / ₆₄	4 ²³ / ₃₂	9 ¹¹ / ₁₆	10 ¹ / ₂	2 ¹ / ₄	—	5 ¹ / ₁₆ X 7 ¹ / ₁₆	II	I	17.8
1.	216-1251	11 ¹ / ₂	5 ⁹ / ₆₄	4 ²³ / ₃₂	9 ¹¹ / ₁₆	10 ¹ / ₂	2 ¹ / ₄	—	5 ¹ / ₁₆ X 7 ¹ / ₁₆	II	I	23.3
1.5	216-1261	13	5 ⁵⁷ / ₆₄	5 ¹ / ₃₂	10 ¹⁵ / ₁₆	12	2 ¹ / ₄	—	5 ¹ / ₁₆ X 7 ¹ / ₁₆	II	I	26.5
2.	216-1271	13	5 ⁵⁷ / ₆₄	5 ¹ / ₃₂	10 ¹⁵ / ₁₆	12	2 ¹ / ₄	—	5 ¹ / ₁₆ X 7 ¹ / ₁₆	II	I	36
3.	216-1281	15 ³ / ₈	7 ¹ / ₂	6 ⁵ / ₄	13 ⁵ / ₃₂	14 ¹ / ₈	3 ¹ / ₂	—	11 ¹ / ₃₂ Dia.	II	I	58.5
5.	216-1291	16 ³ / ₁₆	12 ⁵ / ₈	8 ⁷ / ₃₂	9 ¹¹ / ₁₆	8 ¹ / ₄	11 ¹ / ₈	—	9 ¹ / ₁₆ X 13 ¹ / ₁₆	III	I	110.5
Type SWH - Wall Mount - 240/480 V Pri. - 24/48 V Sec. - 115°C Rise - 50/60 Hz •												
.100	246-1401*	6 ³ / ₈	3 ³ / ₁₆	2 ²⁵ / ₃₂	—	5 ²⁵ / ₃₂	2 ¹ / ₂	—	3 ¹ / ₁₆ X 9 ⁹ / ₃₂	I	I	4.3
.150	246-1411*	7 ¹ / ₄	3 ⁷ / ₈	3 ¹ / ₂	—	6 ¹ / ₄	3 ¹ / ₄	—	7 ¹ / ₃₂ X 11 ¹¹ / ₃₂	I	I	5.3
.250	216-1421	9 ³ / ₈	4 ²⁵ / ₆₄	4 ³ / ₃₂	7 ¹¹ / ₁₆	8 ³ / ₈	2 ¹ / ₄	—	5 ¹ / ₁₆ X 7 ¹ / ₁₆	II	I	11.2
.500	216-1431	9 ³ / ₈	4 ²⁵ / ₆₄	4 ³ / ₃₂	7 ¹¹ / ₁₆	8 ³ / ₈	2 ¹ / ₄	—	5 ¹ / ₁₆ X 7 ¹ / ₁₆	II	I	13.6
.750	216-1441	11 ¹ / ₂	5 ⁹ / ₆₄	4 ²³ / ₃₂	9 ¹¹ / ₁₆	10 ¹ / ₂	2 ¹ / ₄	—	5 ¹ / ₁₆ X 7 ¹ / ₁₆	II	I	17.8
1.	216-1451	11 ¹ / ₂	5 ⁹ / ₆₄	4 ²³ / ₃₂	9 ¹¹ / ₁₆	10 ¹ / ₂	2 ¹ / ₄	—	5 ¹ / ₁₆ X 7 ¹ / ₁₆	II	I	23.3
1.5	216-1461	13	5 ⁵⁷ / ₆₄	5 ¹ / ₃₂	10 ¹⁵ / ₁₆	12	2 ¹ / ₄	—	5 ¹ / ₁₆ X 7 ¹ / ₁₆	II	I	26.5
2.	216-1471	13	5 ⁵⁷ / ₆₄	5 ¹ / ₃₂	10 ¹⁵ / ₁₆	12	2 ¹ / ₄	—	5 ¹ / ₁₆ X 7 ¹ / ₁₆	II	I	36
3.	216-1481	15 ³ / ₈	7 ¹ / ₂	6 ⁵ / ₄	13 ⁵ / ₃₂	14 ¹ / ₈	3 ¹ / ₂	—	11 ¹ / ₃₂ Dia.	II	I	58.5
5.	216-1491	16 ³ / ₁₆	12 ⁵ / ₈	8 ⁷ / ₃₂	9 ¹¹ / ₁₆	8 ¹ / ₄	11 ¹ / ₈	—	9 ¹ / ₁₆ X 13 ¹ / ₁₆	III	I	110.5

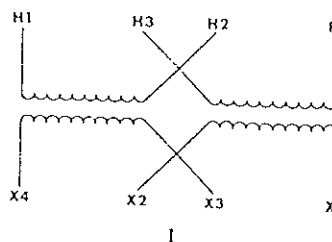
* Non-Encapsulated

• NOTE: 50 Hz Operation up to and including 2 KVA

Dimensions



Wiring Diagram



Temperature Controller Setting

S. C. P/N

EJ-0014

EJ-0084

Refer to manufacturer documentation included after Section 8

TO SET UP THE SERIES 965 WATLOW CONTROLLER

PROCEED AS FOLLOWS:

Setup Menu:		
To enter Setup Menu, hold the Up/Down (Δ/∇) keys simultaneously for three (3) seconds and proceed as follows:		
FUNCTION	GREEN DISPLAY	RED DISPLAY
LOC	LOC	O
In	In	J
C-F	C-F	F
rL	rL	32
rH	rH	400
Or1	Or1	ht
HSC	HSC	3
Or2 (EJ-0014)	Or2 (EJ-0014)	no
Or2 (EJ-0084)	Or2 (EJ-0084)	PrA
** HSA	** HSA	25
** LAI	** LAI	nLA
rP	rP	OFF
FL	FL	100
OSP	OSP	nor

Auto tune menu:

To calibrate the auto tuning feature set temperature set point to 300 degrees and proceed as follows:

FUNCTION	GREEN DISPLAY	RED DISPLAY
PB1	PB1	* DEFAULT (25 F)
rE1	rE1	* DEFAULT (0.000)
rA1	rA1	* DEFAULT (0.00)
Cl	Cl	.1
** ALO	** ALO	32
** AHI	** AHI	400
CAL	CAL	0
AUT	AUT	3

While unit is auto-tuning the lower display alternately flashes the set point and the AT prompt.

When the tuning is complete the display stops flashing (Approx. 3 mins.).

Now hold the Up/Down (Δ/∇) buttons simultaneously for three (3) seconds. LOC will appear in lower (green) display.

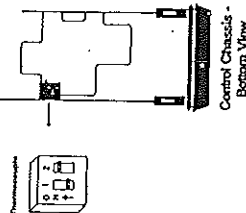
Set LOC to three (3). This will prevent operator access to Setup Menus. Only set point value is adjustable.

The display will return to the set point value after one (1) minute without key strokes.

* NOTE: DEFAULT indicates operator to accept the displayed value as is Do Not Change.

** Found in setup menu for EJ-0084 w/alarm option only.

How to Set the Input Type DIP Switch



DRAG SEAL HEAT CONTROL SETTINGS

SAME AS THE STANDARD SET-UP MENU EXCEPT FUNCTIONS LISTED BELOW:

FUNCTION	GREEN DISPLAY	RED DISPLAY	FUNCTION SETTING	DESCRIPTION	FUNCTION DESCRIPTION
** AHI	** AHI	600	600	ALARM HIGH	HIGH RANGE

AUTO TUNE CALIBRATION TEMPERATURE 450 DEGREES

** AHI	600	ALARM HIGH
--------	-----	------------

SHANKLIN PART NUMBER	DESCRIPTION	WATLOW PART NUMBER
EJ-0014	STANDARD CONTROL	965A-3CA0-00RG
EJ-0084	CONTROL W/ ALARM OPTION	965A-3CD0-00RG

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON DIMENSIONS		SHANKLIN CORPORATION WESTFORD ROAD AYER, MASSACHUSETTS	
FRACTIONS $\frac{1}{2}$	DECIMALS $\frac{1}{2}$	DRAWN J. King	TITLE WATLOW CONTROLLER SET-UP
ANGLES $\frac{1}{2}$	MACHINED FINISH $\sqrt{\text{RA}} \frac{1}{2}$	DESIGNED	FOR
DO NOT SCALE DRAWING REMOVE BURRS AND SHARP EDGES		APPROVED J. King	TEMPERATURE CONTROL
REVISIONS		DATE	NUMBER
HSA WAS SD 12-3-93 PKING		5-21-92	SPB-0024
I		REV.	I

IN (8043A) Proximity Switch

INSTALLATION
INSTRUCTIONS
JANUARY 1990

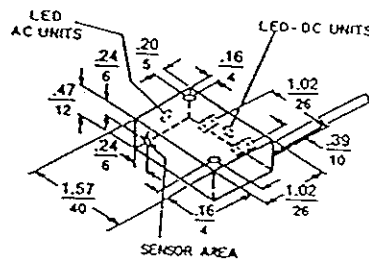
8043-000-04-00

DESCRIPTION:

The series IN (8043A) is a solid state proximity switch that senses all types of metal. It has a cable length of 2 m (6.56') and all models have an LED indicator. There is a

small cable strain relief accessory (part No. 80430250100) available for this model. Its small size permits installation in tight confined areas.

DIMENSIONS:

INCHES
MILLIMETERS

NOMINAL DETECTION RANGE:

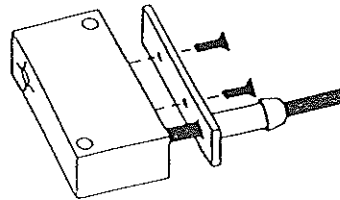
The specified nominal detection range of 2 mm (.079") assumes that the sensed object is made of steel and that there are no other metal objects close enough to interfere. For objects made of other metals, the nominal detection range will be reduced, so refer to the conversion factors shown. In order to achieve the maximum specified rate, reduce the nominal detection range by 50%.

CONVERSION FACTOR

Steel	=	1.00
Nickel	=	.85
Brass	=	.54
Aluminum	=	.50
Copper	=	.46
Stainless Steel	=	.45

MOUNTING:

Mounting is accomplished by the use of the two (2) thru holes (.128 dia.) which are clearance holes for 5-40 screws. Because of the short range of this model (2 mm or less) it is important to accurately position the sensor with respect to the object to be sensed. It is recommended that an adjustable bracket be fabricated to suit the application. The two (2) threaded brass inserts are used to mount the cable strain relief accessory with the M3 x 6 flat head screws supplied with the accessory.



PROXIMITY SENSOR FOR JAW CONTROL

INSTALLATION INSTRUCTION

S. C. P/N EP-0004 (2 of 3)

ADJUSTMENT TO RANGE:

With the object to be sensed in place, position the proximity switch so the object is centered and as close as possible to the target zone indicated on the label; staying within the limits as specified under "nominal detection range" and with power on and wired per the appropriate diagram below, the load should be *energized* for a normally open (NO) unit and *deenergized* for a

normally closed (NC) unit. Remove the object and make sure the load *deenergizes* for a normally open (NO) unit and *energizes* for a normally closed (NC) unit.

NOTE: The LED indicator will be **on** whenever the solid state switch is closed.

WIRING:

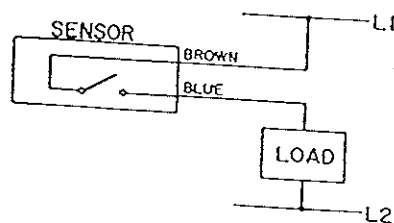
IMPORTANT: Solid state proximity switches have certain characteristics which may not allow direct interchangeability with mechanical switches.

1. Continuity testers or ohmmeters will not give accurate indications of switch condition and should not be used.
2. In the off condition, a *leakage current* exists which may energize or prevent deenergization of very light loads.

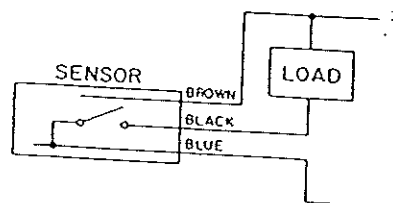
3. In the **on** condition, there must be a sufficient minimum load current to maintain the switch on.

4. There is a voltage drop across the switch in the on condition.

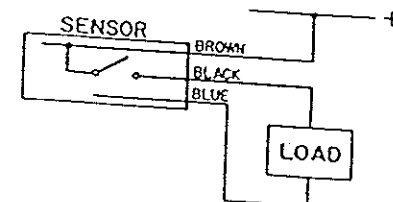
5. Check the specifications of the model you are using.



Two (2) Wire AC



Three (3) Wire DC
(Negative Switching)



Three (3) Wire DC

efector

a subsidiary of ifm electronic

efector, Inc. • 805 Springdale Drive, Whiteland Business Park
Exton, PA 19341

1-800-441-8246 (In PA, 215-524-2000)

INSTALLATION INSTRUCTIONS



efector, inc.
a subsidiary of ifm electronic

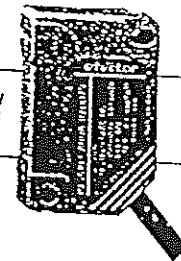
Type IN Inductive Proximity Switch

IN-2002-AB0A ————
IN-2002-BB0A ———— AC/
IN-2004-AB0A ———— DC
IN-2004-BB0A ————

IN-2002-FRKG ———— DC
IN-2004-FRKG *quadronorm* ———— PNP
IN-2004-FRKG ———— NPN

IN-3002-BPKG ———— DC
IN-3002-APKG ————
IN-3004-BPKG ————
IN-3004-APKG ————

IN-3002-ANKG ———— DC
IN-3004-ANKG ———— NPN



Description

A compact inductive proximity switch with an integral 2-meter cable. Available in 3-wire DC (both positive and (continued)

Technical Data at +20°C

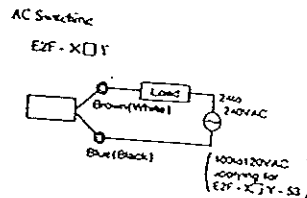
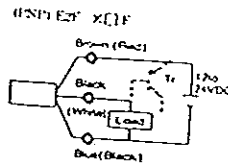
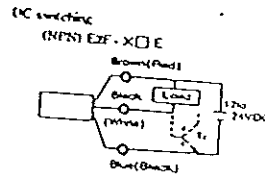
	<i>quadronorm</i> DC PNP/NPN	DC PNP	DC NPN	AC/DC
operating voltage	10-55 V DC (incl. residual ripple)	10-36 V DC	10-36 V DC	20-250 V AC, 50-60 Hz, 20-250 V DC
max. load current continuous	400 mA short-circuit and overload protection	250 mA	250 mA	350 mA AC up to -50°C 250 mA AC at +60°C 100 mA DC
inrush	400 mA	250 mA	250 mA	1:2.1 A/50 ms, 1:1 Hz
voltage drop (at max. load)	4.6 V	2.5 V	2.5 V	<6.5 V AC / <6 V DC
leakage current (2 wire)	0.5 mA			<1.3 mA at 120 V AC <0.8 mA at 24 V DC
supply current (3 wire)		15 mA	15 mA	
min. load current	4 mA			
max. switching rate	2 mm - 1400 Hz 4 mm - 1200 Hz	2 mm - 1400 Hz 4 mm - 1300 Hz	2 mm - 1400 Hz 4 mm - 1300 Hz	4 mA 25 Hz at AC 50 Hz at DC
switching status indication	LED			
housing rating	IP 65 (NEMA 3, 4, 6, 12, 13)			
ambient temperature	-25°C to +80°C (-13°F to +176°F)			
nominal sensing range s_n	2 mm, flush mountable; 4 mm, non-flush mountable			
switching hysteresis	1% - 15% of the sensing range			
correction factors (approx.)	IN-2002: mild steel 1, stainless steel 0.7, brass 0.4, aluminum 0.4, copper 0.2 IN-2004: mild steel 1, stainless steel 0.9, brass 0.6, aluminum 0.5, copper 0.4			
switching point drift/ repeatability	< ±10% of s_n over entire temperature range and voltage range / <1%			
housing	plastic: polybutyleneterephthalate			

OMRON

Model **E2F**
PROXIMITY SWITCH

INSTRUCTION MANUAL

OMRON Corporation 1990 All Rights Reserved.



リード線色変更のご案内

このたび、JIS規格の改正および、これに伴うIEC規格の改正をうけて、センサのリード線色の変更をさせていただきます。
皆様方におかれましては、直前何れのご面談をおかけいたしますが、主要ご関係の上、ご協力をお願い申し上げます。

NOTICE: SENSOR WIRE COLOUR CHANGE

Up to now, we have been supplying sensors with IEC standards wire colouring. But some of them do not conform to IEC standards.
As and from sept 1992, we will begin to change the wire colouring of all OMRON sensors so that they will conform to IEC standards.
We hope you will understand and accept this policy.
For more details, please contact your nearest OMRON sales office.
Thank you for your cooperation.

■ AVAILABLE TYPES (E2F□□: Add the appropriate code when placing your order. e.g., E2F-X1R5E1)
DC SWITCHING TYPE Table 1

Size		M8		M12		M18		M30	
Type		Shield	Non-Shield	Shield	Non-Shield	Shield	Non-Shield	Shield	Non-Shield
Detecting distance (mm)		1.5	2	2	5	5	10	10	18
S.C.P. provided	NPN	NO	E2F-X1R5E1	—	E2F-X2E1 •	E2F-X5ME1	E2F-X5E1 •	E2F-X10ME1	E2F-X18ME1
		NC	E2F-X1R5E2	—	E2F-X2E2 •	—	E2F-X5E2 •	—	—
	PNP	NO	E2F-X1R5F1	—	E2F-X2F1 •	E2F-X5MF1	E2F-X5F1 •	E2F-X10MF1	E2F-X18MF1
		NC	E2F-X1R5Y2	—	E2F-X2F2 •	—	E2F-X5F2 •	—	—

■ AC SWITCHING TYPE Table 2

Size		M8		M12		M18		M30	
Type		Shield	Non-Shield	Shield	Non-Shield	Shield	Non-Shield	Shield	Non-Shield
Detecting distance (mm)		1.5	2	2	5	5	10	10	18
Short-circuit protection	Not provided	NO	E2F-X1R5Y1	—	E2F-X2Y1 •	E2F-X5Y1 •	—	E2F-X10Y1 •	—
		NC	E2F-X1R5Y2	—	E2F-X2Y2 •	E2F-X5Y2 •	—	E2F-X10Y2 •	—
	Provided	NO	—	—	—	E2F-X5Y1-S3 •	—	E2F-X10Y1-S3 •	—
		NC	—	—	—	E2F-X5Y2-S3 •	—	E2F-X10Y2-S3 •	—

NOTE (1) When ordering AC switching type conforming to UL and CSA standards, add suffix code "US".
(2) The types identified with an asterisk are available with different frequencies, when using two sensors adjacent to each other.
(Add suffix "S" to the part number when placing your order.)

Table 4
NOTE:
Polyvinyl chloride insulated cable

E2F-X1R5□	3-0.14mm ² φ: 3.5mm Standard length: 2m
E2F-X2E□(P) E2F-X5ME□(P) E2F-X5E□(P) E2F-X10ME□(P) E2F-X18ME□(P)	3-0.5mm ² φ: 6mm Standard length: 2m
E2F-X1R5Y□	2-0.14mm ² φ: 3.5mm Standard length: 2m
E2F-X2Y□ E2F-X5Y□ E2F-X5Y□-S3 E2F-X10Y□ E2F-X10Y□-S3	2-0.5mm ² φ: 6mm Standard length: 2m

Extendable cable length is 200m max. (Independently through metallic conduit).

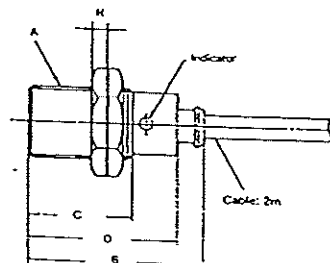


Table 3

	A	B	C	D	H
E2F-X5E□(P)	M18P=1.0	47	29	40	4
E2F-X5Y□	M18P=1.0	47	29	40	4
E2F-X5Y□-S3	M18P=1.0	57	39	48	4
E2F-X10E□(P)	M30P=1.5	57	38	50	5
E2F-X10Y□	M30P=1.5	57	38	50	5
E2F-X10Y□-S3	M30P=1.5	57	39	50	5
E2F-X18ME□(P)	M18P=1.0	47	29	40	4
E2F-X18ME□(P)	M30P=1.5	57	38	50	5

■ DIMENSIONS (Unit: mm)

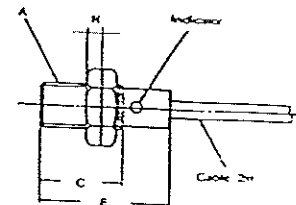
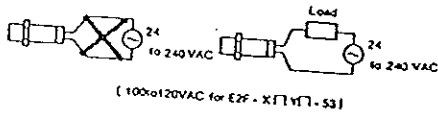


Table 2

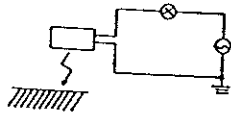
	A	B	C	H
E2F-X1R5E□(P)	M8P=1.0	30	20	4
E2F-X1R5Y□	M8P=1.0	40	30	4
E2F-X2E□(P)	M12P=1.0	35	24	4
E2F-X2Y□	M12P=1.0	40	25	4
E2F-X5ME□(P)	M12P=1.0	35	24	4

HINTS ON CORRECT WIRING

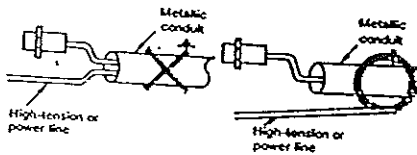
- Note that direct connection of a proximity switch to the power supply without load may result in damage to the proximity switch. Therefore be sure to connect the switch through a load.



- Connect a load to the ungrounded side of the AC power supply. In this way, no short-circuit will be caused at the power supply if by chance the proximity switch breaks down and its circuit gets short-circuited.



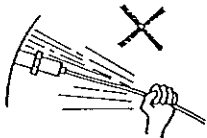
- If a high voltage or power line runs near the proximity switch cable be sure to wire the switch cable through a metallic conduit to prevent the switch from malfunctioning or damage.



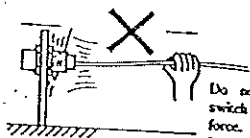
- Be sure to connect the proximity switch by processing its connecting cable end with a solderless terminal. (The solderless terminal is not supplied as an accessory.)

HINTS ON CORRECT USE

- Handling



Do not swing the proximity switch by its cable.

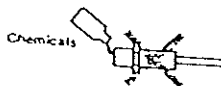


Do not pull the proximity switch with excessively large force. The maximum tensile strength is 16kg.



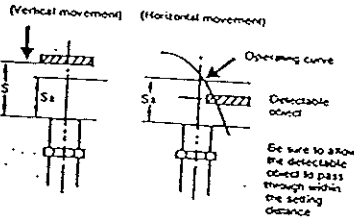
Do not allow the sensor to make contact with a detectable object or a hard substance or do not apply shock to the sensor.

- Avoid using the proximity switch in an atmosphere of chemicals, especially strong alkali acid (such as nitric acid, chromic acid, hot concentrated sulfuric acid, etc.)



- How to determine setting distance (for stable operation)
- The detecting distance and setting distance of the proximity switch will vary depending on the shape size and material of a object to be detected. Therefore confirm the proper detecting and setting distance beforehand.

- When a detectable object is smaller than the standard detectable object (turn), the detecting distance will become shorter. However, the detecting distance will not become longer even if an object larger than the standard detectable object is used.



S: Detecting distance
Sa: Setting distance
Sa = 0-0.8S

(For horizontal movement refer to the operating range diagram shown in the catalog to confirm the proper setting distance.)

- Cable length
Extendable cable length is 200m max.

- Avoid using the proximity switch in outdoor locations (subject to direct sunlight, rainwater, etc.)

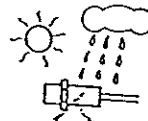
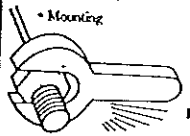


Table 5

Type	Strength kgf/cm (N/m)
E2F-X1RS	8 10.81
E2F-X2	0 10.81
E2F-X5	20 121
E2F-X10	20 121
E2F-X5M	8 10.81
E2F-X10M	20 121
E2F-X18M	20 121

Do not tighten the proximity switch excessively.



Mounting

- Effects of surrounding metals

When a metallic object other than the object to be detected exists in the area surrounding the detecting head the proximity switch may be affected by the surrounding metal and may not release properly. Even if the proximity switch releases properly, a change in the detecting distance may occur by temperature, etc. Therefore, be sure to provide a minimum distance from the surrounding metallic object, as specified in Table 7.

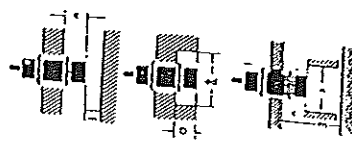


Table 6 Effects of surrounding metals (Unit:mm)

Type	E2F-X1RS	E2F-X2	E2F-X5	E2F-X10	E2F-X5M	E2F-X10M	E2F-X18M
Item							
f	0	0	0	0	15	22	30
d	8	12	18	30	40	55	90
D	0	0	0	0	15	22	30

- Mutual interference
When plural proximity switches are used, the juxtaposed switches may malfunction due to mutual interference. Therefore, be sure to provide a minimum distance between the two switches, as specified in Table 8.

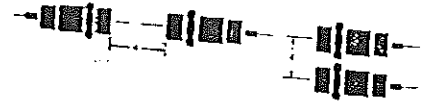


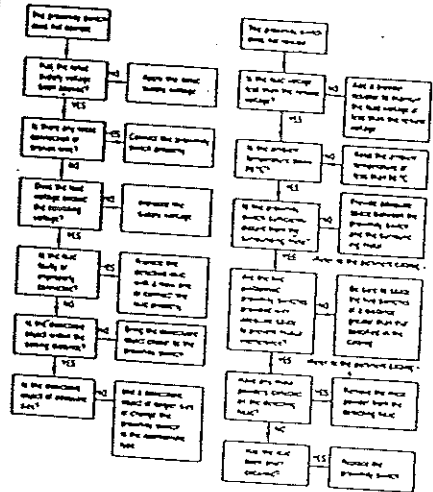
Table 7 Mutual interference (Unit:mm)

Type	E2F-X1RS	E2F-X2	E2F-X5	E2F-X10	E2F-X5M	E2F-X10M	E2F-X18M
Item							
A	21	30	30	30	30	30	30
B	15	20	20	20	20	20	20

NOTE: The values in parentheses apply to the alternate frequency (50/60Hz) type.
Refer to "AVAILABLE TYPES."

MAINTENANCE AND INSPECTION

Check the following items when the proximity switch does not operate upon putting a detectable object close to the switch or when the proximity switch does not release upon keeping the detectable object away from the switch.



SECTION 6. PNEUMATIC & MECHANICAL EQUIPMENT

6.1. LISTING OF PNEUMATIC AND MECHANICAL EQUIPMENT	1
6.2. MANUFACTURERS' INFORMATION	4

This section contains information about the purchased mechanical and pneumatic parts used on the F-5.

Note: SHANKLIN CORPORATION designs and manufactures most of its own mechanical components other than those which would be considered "off-the-shelf" (i.e., fasteners, chains, bearings, etc.). For specific part numbers, descriptions, and usage information, refer to the machine assembly drawings contained in Section 7 of this manual.

6.1. LISTING OF PNEUMATIC AND MECHANICAL EQUIPMENT

The list on the following page is of the major pneumatic and mechanical components used on the F-5. Manufacturers' information is included in the following pages.

PART NUMBER	ITEM	QUANTITY
BC-0005	1/4" Ball Bushing	4
BC-0025	1/2" Ball Bushing	4
BC-0028	3/4" Ball Bushing	4
BC-0053	Ball Bearing, 1/4" X 3/4"	6
BC-0055	Ball Bearing, 1/2" X 1-3/8"	2
BD-0117	Ribbed V Belt (Matched Pair)	2
F05-0149-006	Seal Blade, f, HS, Non-coated	1
F05-0149-007	Seal Blade, f, HS, Teflon Coated	1
J05-0466-002	1/4" Ball Connector	2
J05-0499-001	.050 Side Seal Wire	12
J05-1665-001	Cutting Blade	1
MA-0003	3/16" Hole Punch Die	2
MA-0034	10m Teflon Glass Tape 1/2"x36 yards	1
MA-0035	5m Teflon Glass Tape 2"x18yds	1
MA-0078	1/8" Park-Air Die (#99-430)	3
MA-0079	1/4" Park-Air Die (#99-431) opt.	3
MA-0083	1/8" Park-Air Punch (#99-400)	2
MA-0084	1/4" Park-Air Punch PN 9163 opt.	2
N01-0118-001	Calibrated Screen Control	1
N05-0363-001	Wire Foll. Block	1
N05-0365-002	Top Jaw Spacer	2
N05-0461-001	Side Seal Tracking Seal	2
N05-0473-001	Bottom Jaw Spacer	2
N05-0498-001	Wire Tensioner Block	1
N05-0499-001	End Seal Wire-Std.-.040 Diameter	6
N05-0922-001	Phenolic Pivot Mounting Bracket	1
N05-1053-001	Plated Bearing, 1/4" Bore	4
N05-1106-001	Top Jaw Guide	1
N05-1106-002	Top Jaw Guide	1
N05-1158-001	Phenolic Spring Mount	1
N05-2669-001	Bottom Wire Terminal Mounting Block	1
N05-2669-002	Top Wire Terminal Mounting Block	1
N05-3016-001	Idler V-Pulley, Diverging Belt	5
N05-0536-001	Flat Top Ceramic Bead	8
N06-0532-001	Ceramic Jaw Bead	10
RU-0037	1/16 x 3/4 x 36" Silicone Rubber	2
RU-0049	1/2 x 1/2 x 40" Black Neoprene	2
SA-0010	5/16 x 1 3/4" Compression Spring	2
SA-0018	3/8 x 2 1/4" Compression Spring	2

PART NUMBER	ITEM	QUANTITY
SA-0010	5/16" X 1-3/4" Compression Spring	2
SA-0014	3/8" X 1-1/2" Extension Spring	2
SA-0020	3/8" X 2" Extension Spring	2
SA-0021	3/8" X 2-1/2" Extension Spring	2
SA-0031	1" X 2" Compression Spring	2
SA-0051	7/16 x 3" Compression Spring	2
SA-0052	3/4 x 3" Compression Spring	2
SC-0005	3/4" Ball Bushing Retaining Ring	4
SC-0007	3/4" Ball Bushing Seals	4
SC-0020	7/8" Internal Snap Ring	2
SPA-0014-001	Cone Spring	2
SPA-0030-002	Bottom Jaw Pad - 1/6" Groove	1
SPA-0169-002	Tubular Heater	1
SPA-0230-002	Thermocouple Probe - 60"	1
SPA-0361-001	Perforator Pin	16
VA-0041	1/8" 3-Way Solenoid Valve, 24VDC, N.C.	1
VA-0044	1/8" 3-Way Solenoid Valve, 24VDC, N.O.	1

6.2. MANUFACTURERS' INFORMATION

The following pages contain Manufacturer's specification sheets for Shanklin purchased parts.

PART DESCRIPTION	PART NUMBER
Filter/Regulator/Lubricator/Gauge Assembly	PA-0106
Miniature Regulator 1/8" Air Line 0-125 PSI	PA-0109
Gear Reducer (Main Drive)	RB-0015
Speed Variator	SPA-0347-001
Flow Control Valve 1/4"	VA-0003
Needle Valve 1/8"	VA-0004
Solenoid Valve 3-Way 1/8"	VA-0041
Double Solenoid Valve for Jaw Cylinder	VA-0043



S.C.P/N = PA-0106

IS-C628

C628 Combination Unit

WARNING! The polycarbonate plastic material used to manufacture the plastic bowls and the sight glasses on the filter and lubricator may be attacked by certain chemicals. **DO NOT** use these units on systems with air supplied by a compressor lubricated with synthetic oils or oils containing phosphate esters or chlorinated hydrocarbons. These oils carry over into the air lines and chemically attack and possibly rupture the bowls and sight glasses. Also, **DO NOT** expose these units to materials such as carbon tetrachloride, trichlorethylene, acetone, paint thinner, cleaning fluids, or other harmful materials, for they too will cause the plastic to craze and/or rupture. For use in environments where any of these chemicals may be present, consult the factory for approval prior to installation.

Installation

Before installing, blow out pipe line to remove scale and other foreign matter. These units have DRYSEAL pipe threads; use pipe compound or tape sparingly to male threads only. Install units in pipeline so air will flow in direction indicated on bodies. Install as near as possible vertical to pipe line.

F602 FILTER

BOWL	MAX. PRESS	MAX. TEMP
PLASTIC	150 PSI	120°F
STEEL	300 PSI	180°F
STEEL OR ZINC W/SIGHTGLASS	250 PSI	150°F

Maintenance

To maintain maximum filtering efficiency and to avoid excessive pressure drop, the filter must be kept clean. On standard filters, open drain cock (turn clockwise) periodically and drain off any bowl accumulation before it reaches level of lower baffle. Bowl drainage is automatic in the "Piston Drain" model, however, manual draining can also be done by removing the bowl. A visible coating of dirt or condensate on the filter element surface or an excessive pressure drop is an indication that cleaning is necessary.

Cleaning

To clean, it is not necessary to remove filter from the line, disassembly is simple and does not require tools—use the drawings on the reverse side of this sheet as a guide. Before disassembly, shut off the air supply and depressurize filter. Clean all parts except plastic bowl and/or sight glass with alcohol and blow out filter body before reassembly. Wash filter element in alcohol and blow out from the inside. Plastic bowls or metal bowls with sight glass must be cleaned with household soap only.

"Auto Drain" Operation

"Auto Drain" filters are equipped with a float actuated device which automatically ejects liquid contaminants. If supplied in kit form, Part No. SA602MD-M3, the "Auto Drain" can be installed by simply removing the flange ring and bowl and then removing the draincock from the bowl. Insert the "Auto Drain" in place of the removed draincock and reassemble in reverse order. Maximum pressure: 175 PSI.

"Piston Drain" Operation

The "Piston Drain" mechanism is operated by the pressure drop created as air flow is initiated or as the air line is depressurized. In order to drain properly, there must be sufficient dynamic pressure drop to trigger the drain mechanism. The "Piston Drain" will not function with minimal flow and pressure variations or on constant flow applications. When supplied in kit form, remove bowl and replace with "Piston Drain" assembly. Maximum pressure: 175 PSI.

R119 REGULATOR

MAX PRESS 300 PSI
MAX TEMP 120°F

Reduced Pressure Adjustment

Clockwise turning of the adjusting screw increases the reduced or regulated pressure. With relieving-type regulators the reduced pressure follows the adjustment of the screw, with non-relieving regulators adjustment for lower reduced pressure will not be obtained until the reduced pressure system is "bled off" or until air flow starts.

Maintenance

If the air supply is kept clean, the regulator should provide long periods of uninterrupted service. Erratic regulator operation or loss of regulation is most always due to dirt in the disc area and cleaning is in order.

Cleaning

Depressurize regulator, remove bottom plug, spring, and disc. Clean parts with denatured alcohol, wipe off seat and blow out body with compressed air. Reassemble parts as a unit and screw into regulator before tightening bottom plug make sure disc is in center hole in body. Should regulator continue to malfunction, obtain repair kit and replace parts indicated.

L606 LUBRICATOR

BOWL	MAX. PRESS	MAX. TEMP
PLASTIC	150 PSI	120°F
STEEL	300 PSI	180°F
STEEL OR ZINC W/SIGHTGLASS	250 PSI	150°F

Lubricant

For average conditions, the use of high quality SAE #10 (S.U.V. > 150-200 SEC. @100°F) oil is recommended. Other lubricants as specified by the maker of the equipment to be lubricated may be used if not heavier than SAE #40 (S.U.V. 800 SEC. @100°F).

Filling

Lubricators can be filled while under pressure and without shutting down equipment—slowly remove either fill plug and fill to 1/4" to top of bowl using correct oil. For best results use a long spout oil can so that the tip can be inserted into top of bowl.

Adjustment

The "Dial Set" knob is factory set so that when turned to zero (0) no oil is delivered to the venturi for atomization and equipment is not being lubricated. To adjust oil drip rate, turn on the air, start flow and set knob to obtain the desired drip rate—visible through the sight glass. As a start, one to two drops per minute is suggested—correct lubrication being a matter of experience and demand. Clockwise rotation of knob decreases oil feed rate. To check lubrication hold thumbnail or a mirror near the equipment exhaust. A heavy film indicates over-lubrication and the drip rate should be reduced by turning knob to a lower setting.

Operation

For proper automatic fill operation the oil inlet pressure to lubricator must be maintained between 10 and 200 PSI above air pressure to lubricator.

Maintenance—Cleaning

If both air and oil are kept clean and the oil level never allowed below end of tube in the bowl the lubricator should provide long periods of unattended service. Cessation of oil dripping through the sight glass, irrespective of knob adjustment is an indication that cleaning is necessary.

To clean, it is not necessary to remove lubricator from the line. Depressurize and disassemble using drawing as a guide. In most instances cleaning is needed only in the oil metering area. Pull off adjusting knob and remove needle valve assembly by turning out large hex nut, remove needle valve seat and clean removed parts with alcohol—making sure hole in seat is clear. With a #57 drill make sure hole in bottom of sight glass area is open. Blow out lubricator body with compressed air before reassembly. Caution: Plastic bowls and metal bowls with sight glass must be cleaned with household soap only.

See other side for Replacement Parts List.

MINIATURE AIRLINE REGULATOR

1/8" & 1/4" PIPE SIZE

PRIMARY PRESSURE
250 PSI MAX. (17 BAR)

ADJUSTED PRESSURE
125 PSI MAX. (8.6 BAR)

TEMPERATURE RANGE
0° to 150°F (-18°C to 65°C)

OPERATING AND SAFETY PRECAUTIONS

WARNING

- Do not exceed the pressure or temperature ratings of this unit as specified.
- Shut-off and relieve air supply before disassembling unit.
- Secondary pressure adjustment ranges are not minimum or maximum secondary pressure limits. Regulators can be adjusted to zero psig secondary pressure and, generally, to pressures in excess of those specified. The use of these regulators to control pressure outside of the specified ranges is not recommended.

INSTALLATION

Install regulator upstream from lubricator and as close as possible to tool, cylinder, or pneumatic device. The regulator must be installed with the air flow through the unit in the direction as indicated by the arrow on the base. If the air line contains water, sludge, or foreign material, an Aro Airline Filter should be installed on the upstream side to protect regulator. After the regulator has been installed in airline, the adjustment screw should be turned counter-clockwise until it stops, to prevent over-pressurizing tool, cylinder, or pneumatic device when air supply is turned on.

TROUBLE SHOOTING

Shut-off and relieve air supply before disassembling unit. If the outlet pressure creeps or leaks slowly, check the seat or valve for foreign material, and replace if worn. If the regulator continuously bleeds air through the housing, check for dirt on the seat or valve. Replace if worn.

- INCLUDED IN REPAIR KIT 104158 (RELIEVING)
- INCLUDED IN REPAIR KIT 104159 (NON-RELV.)
- LUBRICATE WITH KEY-LUBE GREASE

THE ARO CORPORATION
ONE ARO CENTER, BRYAN, OHIO 43506-0151
PH 419-636-4242 • TWX 810-443-2994 • TELEX 266156 • FAX 419-636-2115

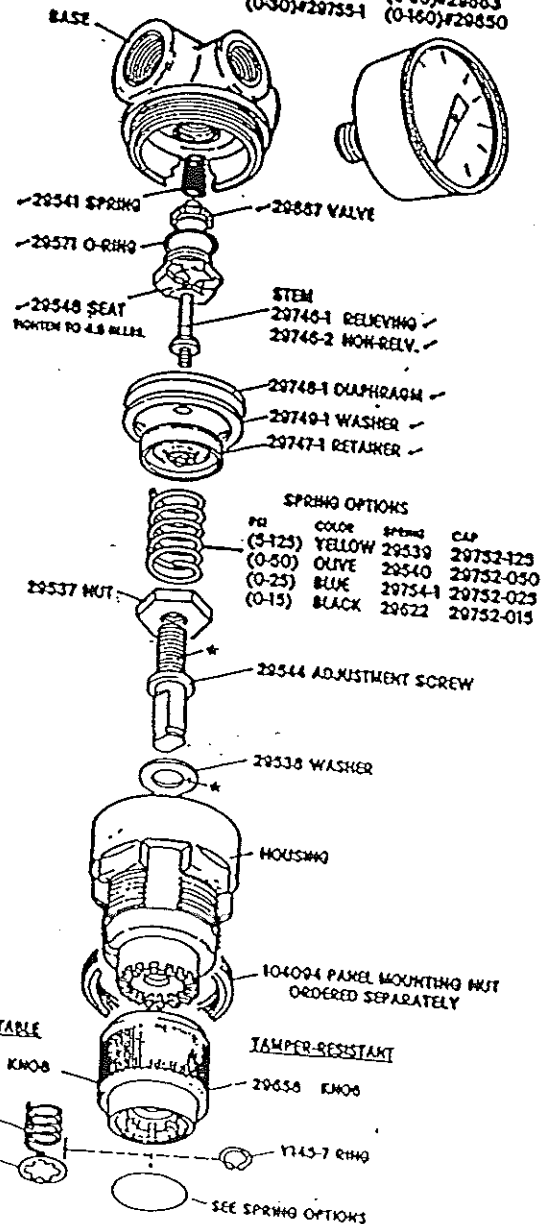


MODEL NO.

127122-000

C9051

GAUGE OPTIONS
ORDERED SEPARATELY
(0-15) #29846 (0-60) #29863
(0-30) #29753-1 (0-160) #29850



S.C. P/N RB-0015

S.C. P/N RB-0020

BOSTON
INCOM INTERNATIONAL INC. *Gear*

700 Series Worm Gear Speed Reducers

INSTALLATION, LUBRICATION, and OPERATION INSTRUCTIONS

These instructions must be read thoroughly before installing or operating speed reducers. File instructions for future reference and for ordering of replacement parts.

INSTALLATION, LUBRICATION, and OPERATION INSTRUCTIONS

WARNING

Boston Gear speed reducers are normally shipped without lubricant. They must be filled to the proper level with the recommended lubricant for your application before operation.

General Instructions

1. Leave protective sleeves on shafts for safer handling of speed reducers during installation. The sleeves are provided to protect your hands from potential sharp edges on keyways.
2. Align all shafts accurately. Improper alignment can result in failure. Use of flexible couplings is recommended to compensate for slight misalignment.
3. When mounting, use maximum possible bolt size and secure reducer to a rigid foundation. Periodic inspection of all bolts is recommended.
4. Auxiliary drive components (such as sprockets, gears, and pulleys) should be mounted on the shafts as close as possible to the housing to minimize effects of overhung loads. Avoid force fits that might damage bearings or gears. Projecting input shafts are furnished with a keyway and, except for Models 710, 715, and 724, with an axially tapped hole. Models 732 through 760 are supplied with axially tapped holes on both ends.
5. For hollow-shaft speed reducers, place speed reducer as close as possible to supporting bearing on driven shaft. Spot-drill driven shaft for set screws in severe applications. See kit instructions for reaction rod assembly.
6. Check and record gear backlash at installation and again at regular intervals. This should be done by measuring the rotary movement of the output shaft (rotating alternately clockwise and counterclockwise) at a suitable radius while holding the input shaft stationary. Gears should be replaced when the backlash exceeds four times the measurement taken at installation.
7. Gear drives are rated for 1750 input RPM and Class I Service (Service Factor 1.0), using Mobil SHC 634 synthetic lubricant. For lower input speeds or for different service classes or lubricants, see catalog for rating information.
8. Initial operating temperatures may be higher than normal during the break-in period of the gear set. FOR MAXIMUM LIFE, DO NOT ALLOW THE SPEED REDUCER TO OPERATE CONTINUOUSLY ABOVE 225°F. AT THE GEAR CASE. In event of overheating, check for overloads or high ambient temperatures. Keep shafts and vent plugs clean to prevent foreign particles from entering seals or gear housing.

Instructions for Flanged Models (NEMA C-Face Mounting)

RF700 (Coupling Input — One-Piece Sleeve Type)

1. Remove protective sleeve from input shaft.
2. Assemble the key provided and coat the reducer input shaft with anti-seize compound, also provided. (Any commercial anti-seize compound may be substituted.)
3. Slide the coupling half on the reducer input shaft until the coupling bottoms.
4. Assemble the key to the motor shaft and coat the shaft with anti-seize compound. Insert the motor shaft into the coupling bore.
5. Rotate the motor to proper position and firmly secure to flange with four hex-head cap screws.

F700 (Quill-Type Input)

1. Assemble the key to the motor shaft and coat the shaft with anti-seize compound. Insert the motor shaft into the reducer input shaft.
2. Rotate the motor to proper position and firmly secure to flange with four hex-head cap screws.

RF700 (Coupling Input — Flexible-Jaw Type FC) — Optional

1. Coat reducer input and motor shaft with anti-seize compound.
2. Position coupling half on input shaft with shaft flush to end of coupling bore.
3. Locate remaining half on motor shaft, with 1/32" clearance between jaw surfaces.
4. Tighten set-screws securely. For reversing applications, a thread-locking compound is recommended.
5. Install coupling insert and position motor. Rotate motor to proper position and firmly secure to flange.

CAUTION — If the motor does not readily seat itself, check to determine if key has moved axially along motor shaft, causing interference.

CAUTION

- For safe operation of any gear drive, all rotating shafts and auxiliary components must be shielded to conform with applicable safety standards. You must consider overall operational system safety at all times.
- When using a speed reducer to raise or lower a load, such as in hoisting applications, provision must be made for external braking. Under no conditions should a speed reducer be considered self-locking.
- Mounting of speed reducers in overhead positions may be hazardous. Use of external guides or supports is strongly recommended for overhead mounting.

RECOMMENDED LUBRICANTS

The table below indicates the type and viscosity of suitable lubricants and applicable AGMA numbers for speed reducers operating at various temperatures. It is important to use the proper type of oil since many oils are not suitable for the lubrication of worm gears. Different types of gears require different lubricants.

The lubricant must remain free from oxidation and contamination by water or debris, since only a very thin film of oil stands between efficient operation and failure. To ensure long service life, the speed reducer should be periodically drained (preferably while warm) and refilled to the proper level with a recommended gear oil.

Recommended oil-change intervals for Boston Gear speed reducers: Under normal environmental conditions, oil changes are suggested after the first 250 hours of operation, and thereafter at regular intervals of 2500 hours or every six months. Synthetic lubricants will allow extended lubrication intervals because of their increased resistance to thermal and oxidation degradation. If a synthetic lubricant is used, it should be changed after the first 1500 hours of operation, and thereafter at 5000-hour intervals.

CAUTION: Speed reducers must be relubricated more frequently when operated at high ambient or operating temperatures, in unusually contaminated environments, or with high loads.

Lubricants for Boston Gear 700 Series Worm Gear Speed Reducers

Ambient (Room) Temperature	Recommended Lubricant (or equivalent)	Viscosity Range SUS at 100°F.	Lubricant AGMA No.†	ISO Viscosity Grade	Boston Gear Catalog Nos. of Standard Lubricant Container Sizes††	
					1-quart	1-gallon
-30° to +125°F.* (-34° to +52°C.)	Mobil SHC 634* Synthetic	1950/2150	—	320/460	51493	51494
40° to 90°F. (4.4° to 32.2°C.)	Mobil 600W Cylinder Oil	1920/3200	7 or 7C	460	27300	51492
80° to 125°F. (26.7° to 51.7°C.)	Mobil Extra Hecla Super Cylinder Oil	2850/3600	8 or 8C	680	—	—

* Synthetic recommendation is exclusively for Mobil SHC 634.

** Mobil SHC 634 lubricant will perform at oil temperatures exceeding 225°F. However, factory should always be consulted before operating at higher temperatures, since damage may occur to oil seals and other components.

† Other lubricants corresponding to AGMA numbers are available from most major oil companies.

†† Boston Gear Distributors stock Mobil SHC 634 (synthetic) and Mobil 600W (cylinder oil) in both 1-quart and 1-gallon containers.

MOUNTING POSITIONS

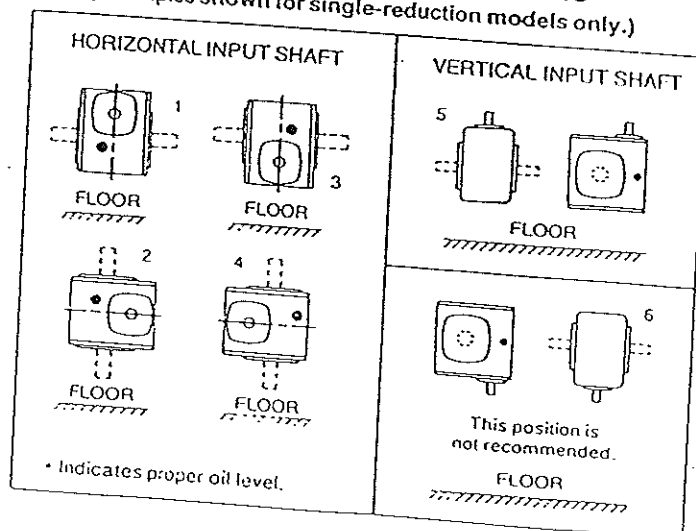
SINGLE-REDUCTION MODELS

Design flexibility permits mounting in any position shown, through proper location of the vented oil filler, level, and drain plugs when installed. Diagrams indicate proper location of the level plug. The vented filler plug should always be installed at the uppermost plug location, and the lowest plug should always be the drain.

DOUBLE-REDUCTION MODELS

The variety of mounting possibilities for double-reduction drives makes it impractical to illustrate positions for these models. In general, the vent filler is at the uppermost position, and the drain plug at the lowermost possible position. The oil level must be at the approximate centerline of the uppermost gear.

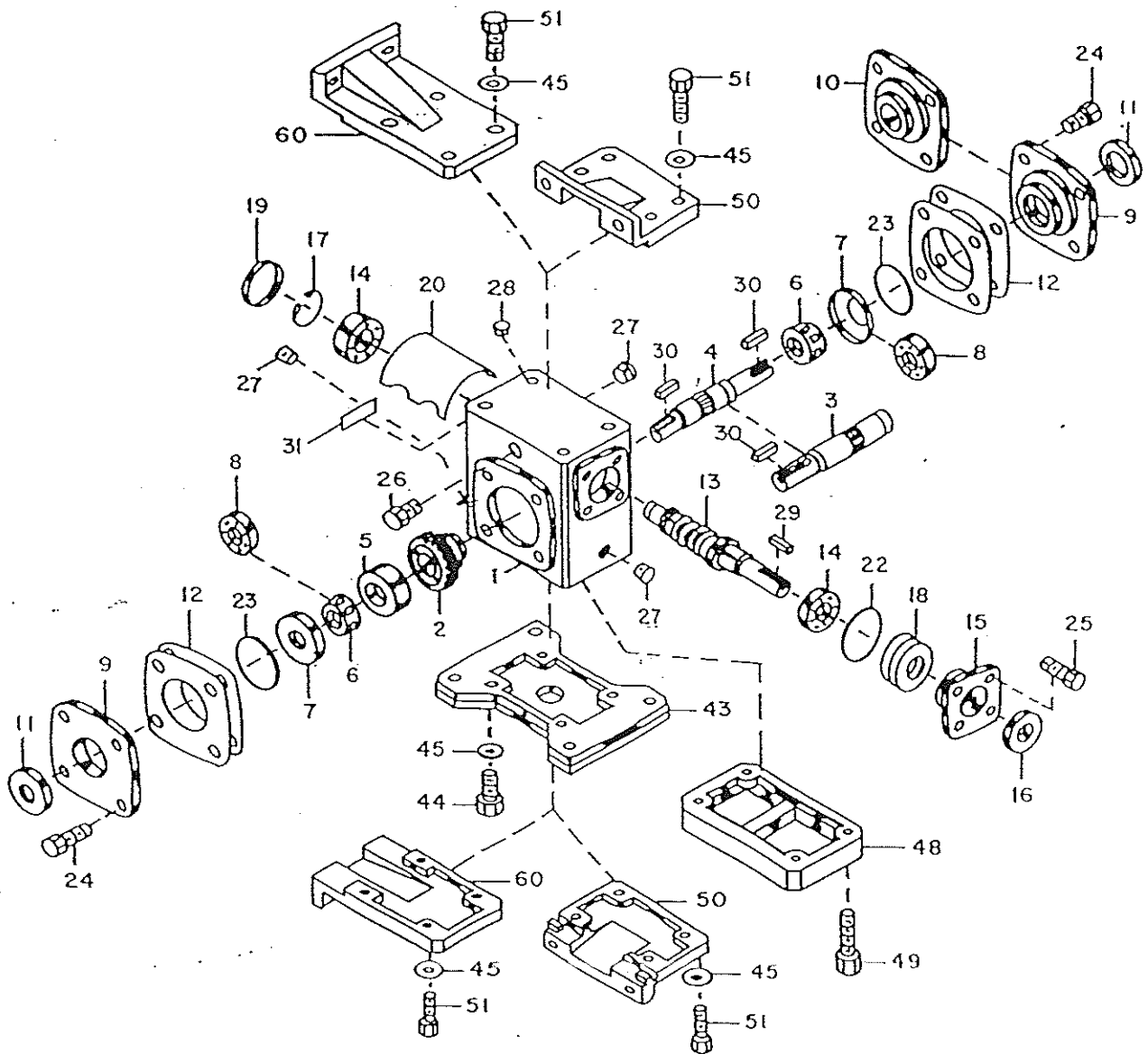
TYPICAL MOUNTING POSITIONS (Examples shown for single-reduction models only.)



SINGLE-REDUCTION MODELS

PARTS LIST

MODELS 710-760

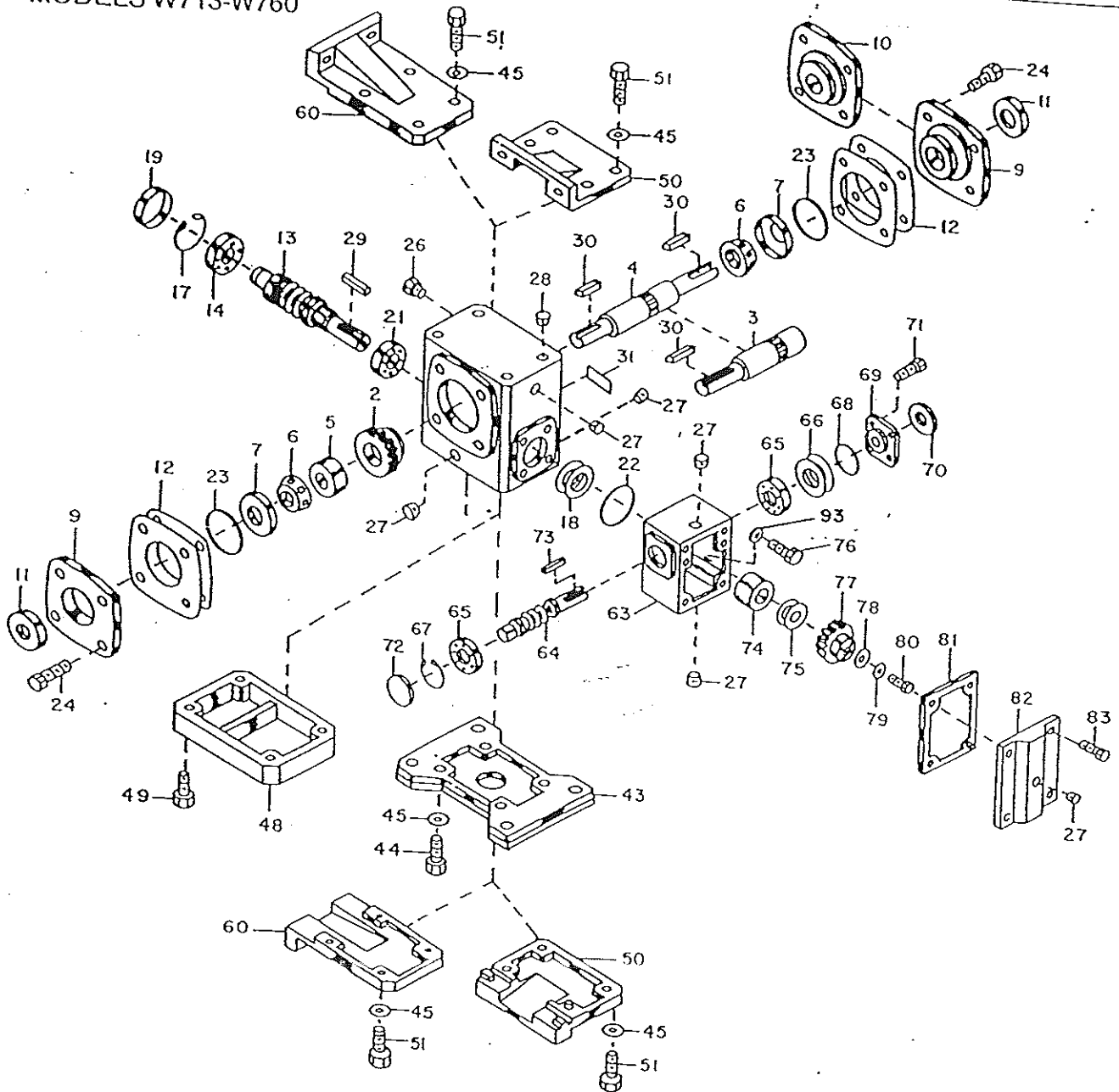


PART ORDERING INFORMATION

1. Be sure to provide complete Boston Gear catalog number from speed reducer nameplate, along with part description and number. For example: "One output oil seal, part no. 11, for RF718-30-B5-G."
2. Output shaft components for Boston Gear Models 710 through 726 are available only as complete assemblies that include parts 2, 3, 5, and 6 for single projecting shafts; and parts 2, 4, 5, and 6 for double projecting shafts. When ordering, specify "output shaft assembly" and full Boston Gear catalog number from nameplate.

DOUBLE-REDUCTION MODELS PARTS LIST

MODELS W713-W760

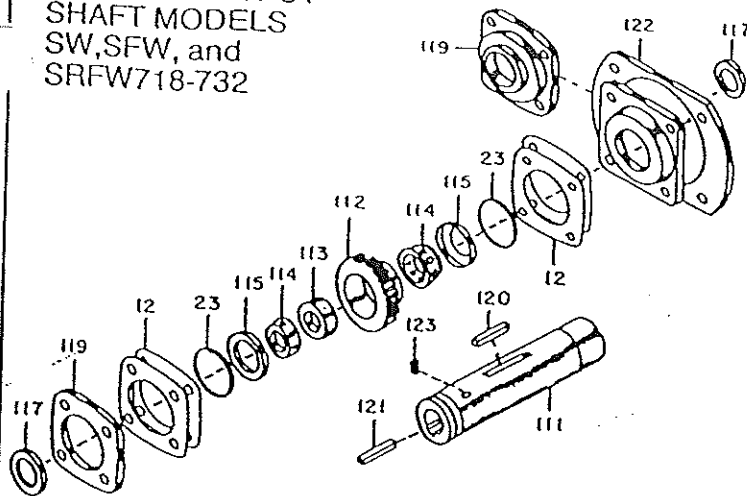


PART ORDERING INFORMATION

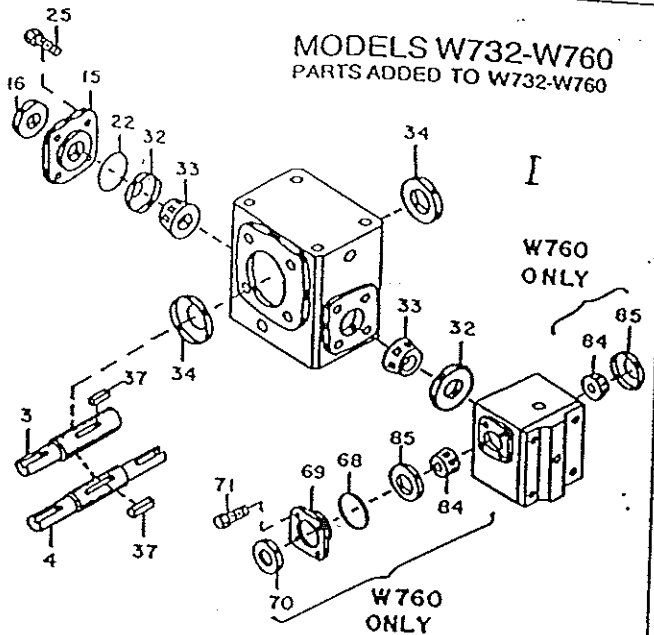
1. Be sure to provide complete Boston Gear catalog number from speed reducer nameplate, along with part description and number. For example: "One output oil seal, part no. 11, for W713-150-G."
2. Output shaft components for Boston Gear Models W713 through W726 are available only as complete assemblies that include parts 2, 3, 5, and 6 for single projecting shafts; and parts 2, 4, 5, and 6 for double projecting shafts. When ordering, specify "output shaft assembly" and full catalog number from nameplate.

OPTIONS AND ACCESSORIES

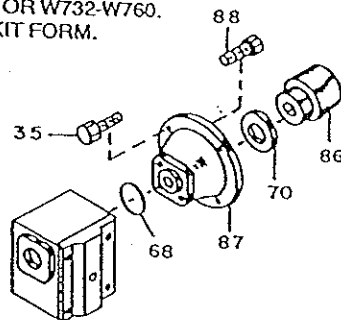
HOLLOW OUTPUT SHAFT MODELS SW, SFW, and SRFW718-732



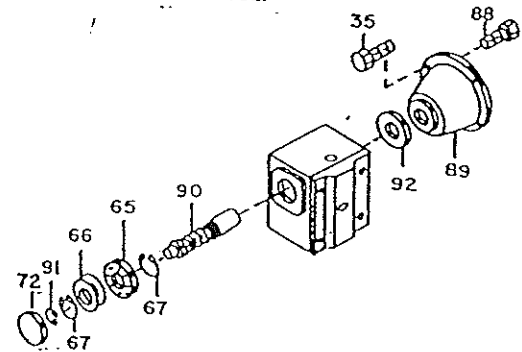
MODELS W732-W760 PARTS ADDED TO W732-W760



MODELS RFW713-RFW760 PARTS ADDED TO W713-W726 OR W732-W760. THESE PARTS AVAILABLE IN KIT FORM.



MODELS FW713-FW752 PARTS ADDED TO W713-W752.

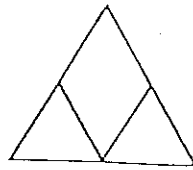


PART NO.	DESCRIPTION
1	HOUSING
2*	WORM GEAR
3*	SINGLE PROJECTING OUTPUT SHAFT
4*	DOUBLE PROJECTING OUTPUT SHAFT
5*	GEAR SPACER
6*	OUTPUT BEARING (CONE)
7	OUTPUT BEARING (CUP)
9	BEARING CARRIER (OPEN)
10	BEARING CARRIER (CLOSED)
11	OUTPUT OIL SEAL
12	ADJUSTMENT SHIMS
13	INTERMEDIATE WORM SHAFT
14	INTERM. BEARING - MODELS W713-W726
15	INTERM. BEARING RETAINER - MODELS W732-W760
16	INTERM. OIL SEAL - MODELS W732-W760
17	RETAINING RING - MODELS W713-W726
18	ADJUSTMENT SHIMS
19	BORE PLUG - MODELS W713-W726
21	INTERM. BEARING
22	INTERM. "O" RING
23	OUTPUT "O" RING
24	HEX HEAD CAP SCREW
25	HEX HEAD CAP SCREW
26	VENT PLUG
27	PIPE PLUG
28	PROTECTIVE CAP PLUG
29	INTERM. KEY
30	OUTPUT KEY

PART NO.	DESCRIPTION
31	NAMEPLATE
32	INTERM. BEARING (CUP) - MODELS W732-W760
33	INTERM. BEARING (CONE) - MODELS W732-W760
34	GREASE CUPS - MODELS W732-W760
35	HEX HEAD CAPSCREW
37	OUTPUT SHAFT KEY - MODELS W732-W760
43	HORIZONTAL BASE
44	HEX HEAD CAPSCREW
45	LOCKWASHER
48	RISE BLOCK
49	HEX HEAD CAPSCREW
50	VERTICAL BASE (HIGH OR LOW)
51	HEX HEAD CAPSCREW
60	VERTICAL BASE (ASSEMBLY X & Y)
63	ATTACHMENT HOUSING
64	INPUT WORM SHAFT
65	INPUT BEARING
66	ADJUSTMENT SHIMS
67	RETAINING RING
68	"O" RING
69	BEARING RETAINER
70	OIL SEAL
71	HEX HEAD CAP SCREW
72	BORE PLUG - MODELS W713-W732
73	INPUT WORM SHAFT KEY
74	GEAR SPACER
75	ADJUSTMENT SHIMS
76	HEX HEAD CAP SCREW
77	INTERMEDIATE WORM GEAR

PART NO.	DESCRIPTION
78	WASHER
79	LOCKWASHER
80	HEX HEAD CAPSCREW
81	ATTACHMENT COVER GASKET
82	ATTACHMENT COVER
83	HEX HEAD CAPSCREW
84	INPUT BEARING (CONE) - MODEL W760 ONLY
85	INPUT BEARING (CUP) - MODEL W750 ONLY
86	SLEEVE COUPLING
87	MOTOR FLANGE
88	HEX HEAD CAPSCREW
89	MOTOR FLANGE
90	INPUT WORM SHAFT
91	EXTERNAL RETAINING RING
92	OIL SEAL - MODELS FW713-FW732
93	WASHER
111	HOLLOW OUTPUT SHAFT
112	WORM GEAR
113	GEAR SPACER
114	OUTPUT BEARING (CONE)
115	OUTPUT BEARING (CUP)
117	OIL SEAL
119	BEARING CARRIER (OPEN)
120	KEY (EXTERNAL)
121	KEY (INTERNAL)
122	"V" TYPE BASE
123	SOCKET SETSCREW

* For Models W713 to W726, these parts are available only as complete assemblies. See Part Ordering Information, #2, at left.



ALKON

SERIES J

S.C.P/N=VA-0003 (JF-2)

S.C.P/N=VA-0004 (JN-1)

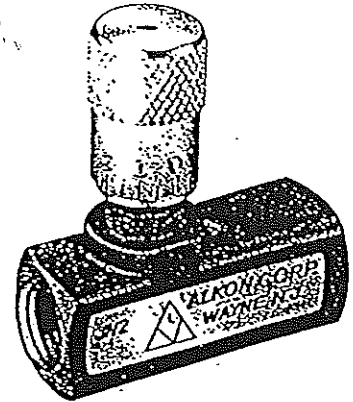
FEATURES FOR DESIGNED-IN QUALITY:

- POSITIVE NO-LEAK STEM SEAL
- 250 PSI AIR
- 3000 PSI HEAVY DUTY (OIL)
- 5000 PSI NON-SHOCK (OIL)
- PRECISION CALIBRATED DIAL TO DETERMINE AND ALLOW A RETURN TO REQUIRED FLOW SETTINGS
- SAFE POSITIVE STOP FOR NEEDLE TRAVEL
- ONE PIECE FORGED HOUSING
- 2 PSI CHECK CRACKING PRESSURE

OPTIONAL FEATURES INCLUDE:

- NICKEL PLATING FOR SERVICE WITH CORROSIVE MEDIA
- FRICTION O-RING FOR MICROMETER ADJUSTMENT
- VITON SEALS
- BRITISH STANDARD PARALLEL PIPE THREADS
- REMOVABLE KNOB

All this is available and at a price no higher than ordinary flow controls.

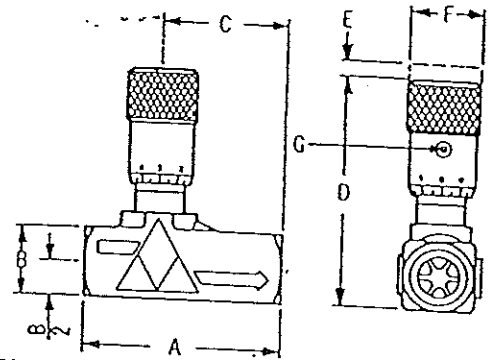


DESIGN FEATURES

- Aluminum control knob permits adjustment of flow with valve under pressure. The calibrated knob acting with the calibrated dial plate permits return to a previous setting.
- Locking set screw to prevent accidental movement of control knob.
- Needle retainer of cold drawn brass acts as a positive stop for the needle travel.
- Needle is heat treated, ground and polished 416 stainless steel.
- The Buna-N seal is standard (Viton seal available) and is backed up by one-piece Teflon ring to prevent extrusion.
- The body is a one-piece, high tensile strength brass forging.* Nickel plating is available for high corrosion resistance.
- Four stage needle provides the most sensitive flow metering from full-close to full-open with a 3° taper for finer metering requirements and 5° taper for higher flow rates.
- Needle valve has large unobstructed orifices.
- Ball of 440 stainless steel acts against a lapped seat to provide best sealing.
- The cage of 304 stainless steel acts as a spring support and as a ball guide and ball stop. The spring is 302 stainless steel wire.
- The check valve is in-line and has an orifice larger than the nominal pipe size. It operates at a low pressure differential, with no chatter and low friction loss.

*Note - 3/4" and 1" bodies are constructed from steel forgings.

Patents 3,421,547 and 3,441,249

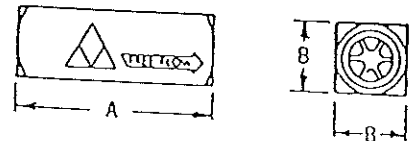
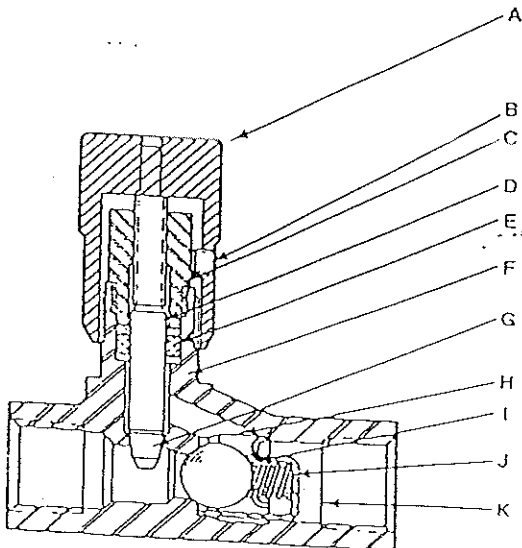


FLOW CONTROL VALVE

ALOK MODEL NO.		VALVE DIMENSIONS, INCHES												C. FACTOR			APPROX. WEIGHT	
BRASS BODY	NICKEL PLATED	PIPE SIZE NPT	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
JF1	JF1N	1/8	1.468	.562	.913	1.803	.250	.687	1/2"	.206	.125	.60	.30	.19				
JF2	JF2N	1/4	1.937	.687	1.232	2.000	.250	.687	1/2"	.281	.187	1.30	.60	.28				
JF3	JF3N	3/8	2.312	.875	1.545	2.531	.300	.937	1/2"	.421	.250	2.85	1.08	.54				
JF4	JF4N	1/2	3.250	1.250	2.117	3.218	.375	1.250	1/2"	.515	.375	4.96	1.75	1.75				
—	JF6N	3/4	4.000	1.750	2.625	3.906	.375	1.250	1/2"	.718	.500	9.00	3.20	2.32				
—	JF8N	1	4.000	1.750	2.625	3.906	.375	1.250	1/2"	.718	.500	9.20	3.20	2.20				

NEEDLE VALVE

ALOK MODEL NO.			VALVE DIMENSIONS, INCHES													C. FACTOR												
BRASS BODY	NICKEL PLATED	PIPE SIZE NPT	A	B	C	D	E	F	G MAX. SIZE	H ORifice	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
JN1	JN1N	1/8	1.468	.562	.913	1.803	.250	.687	1/2"	.125																		
JN2	JN2N	1/4	1.937	.687	1.232	2.000	.250	.687	1/2"	.187																		
JN3	JN3N	3/8	2.312	.875	1.545	2.531	.300	.937	1/2"	.250																		
JN4	JN4N	1/2	3.250	1.187	2.117	3.218	.375	1.250	1/2"	.375																		
-	JN6N	3/4	4.000	1.750	2.625	3.906	.375	1.250	1/2"	.500																		
-	JN8N	1	4.000	1.750	2.625	3.906	.375	1.250	1/2"	.500																		



CHECK VALVE

ALOK MODEL NO.	BRASS BODY	NICKEL PLATED	PIPE SIZE NPT	A	B	ORIFICE	C	FACTOR
JC1	JC1N	1/8	1.468	.562	.206	.64		
JC2	JC2N	1/4	1.937	.687	.281	1.35		
JC3	JC3N	3/8	2.312	.875	.421	3.22		
JC4	JC4N	1/2	3.250	1.250	.515	4.95		
-	JC6N	3/4	4.000	1.750	.718	9.00		
-	JC8N	1	4.000	1.750	.718	9.20		

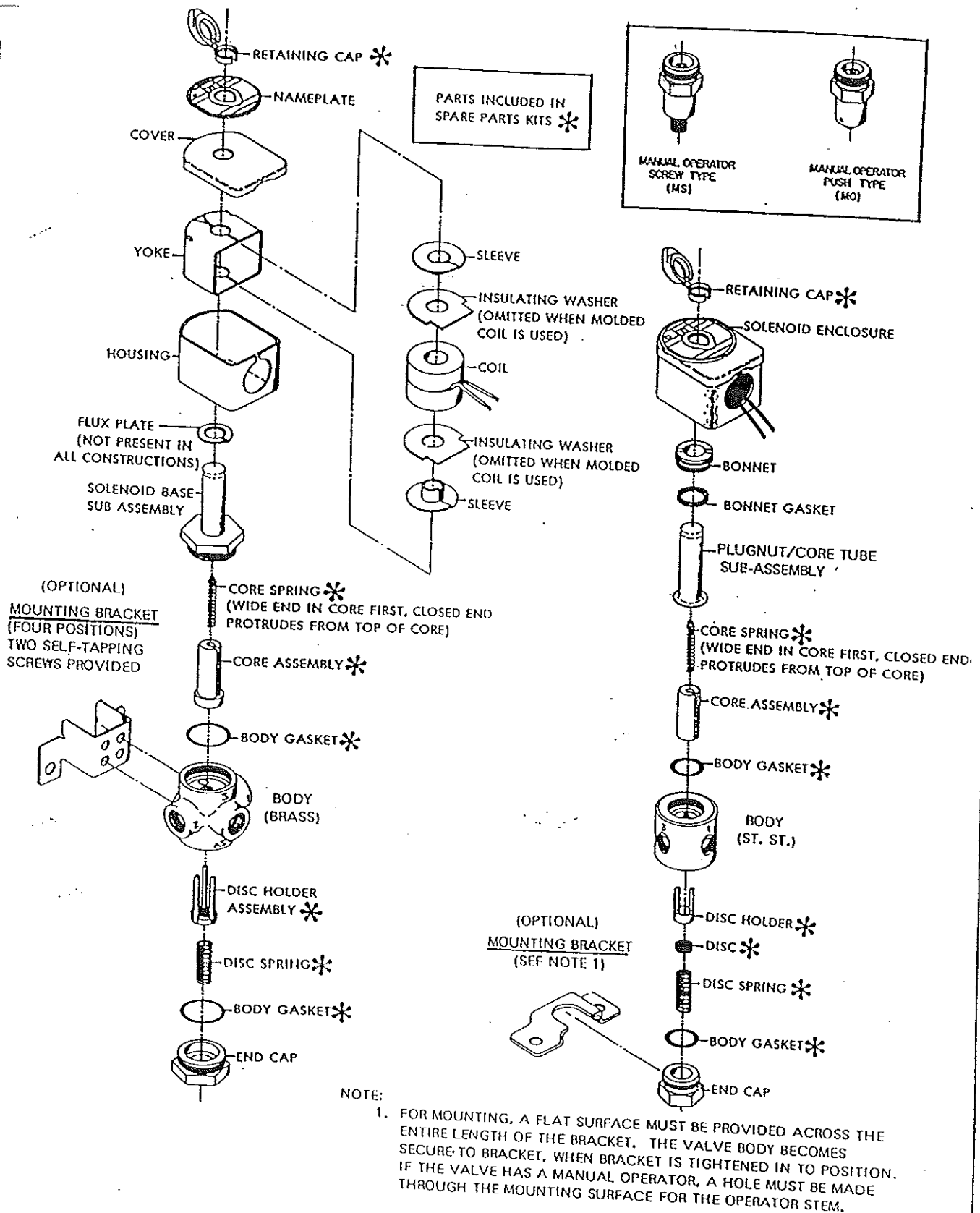


Figure 2

Bulletin 8320



ASCO Valves
Automatic Switch Co.

FLORHAM PARK, NEW JERSEY 07932

FORM NO. V-5291R2

PRINTED IN U. S. A.

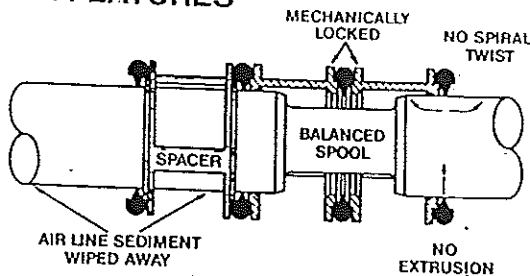
1969

5/2 5 PORT
2 POSITION**5/3** 5 PORT
3 POSITION

COMPACT SERIES FEATURES

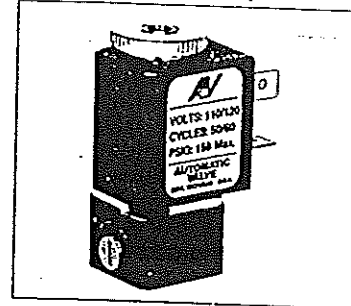
FLOW: Cv .7- 4.5
Kv 10.2-65.3
SIZE: 1/8 - 1/2

EXCLUSIVE FEATURES



TAPERED TEE-SEAL® AUTOMATIC RELIABILITY

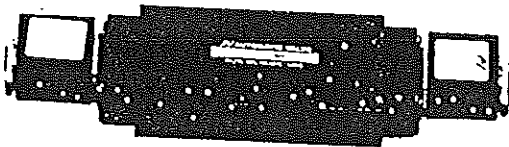
- Bi-directional lip flexes to clean spool during shifting action-eliminating Monday morning sticking problems.
- Tested tough and proven reliable by a leading car maker.
 - exceeded 10 million cycles when run dry with 10 cc's of sand injected every 24 hours.
 - exceeded 30 million cycles with lubricated service.
- Bubble tight for both air and vacuum service.
- 50 micron filtration is all that is needed ...no need to buy expensive 2-5 micron filters.
- Molded from super tough Carboxylated Nitrile. Provides five times the abrasion resistance and service life of Buna-N seals.



SOLENOID PILOT DESIGN FOR LONG LIFE

- Coil is guaranteed against burnout for the life of the valve.
- Three way pilot uses full air line pressure to shift valve spool.
- Pilot internally supplied when pressure at port 1 (P) is 35 (2) to 150 PSIG (10 Bar).
- Coil hermetically sealed in an integral, watertight molded unit.
- Coil is UL and CSA recognized.

STANDARD FEATURES



- Balanced spool construction allows ports to be plugged for 2 or 3 way, or restricted for inexpensive cylinder speed control
- Lubricated or non-lubricated service
- Manual override aids in machine set-up
- Nema 4 and Nema 7 solenoid pilot, remote air pilot and manual operators
- Weather proof plug-in coil permits instant valve replacement without disconnecting wiring
- Variety of electrical connectors with or without indicator lights
- Optional sintered solenoid exhaust muffler (A7007-010)
- Optional sandwich mounted flow control and pressure regulators
- L Series inline model provides compact package and mounts to a one piece manifold base
- T100's use of GE's Valox offers low friction, corrosion resistance, self-sealing ports and lighter weight
- Electrical terminal strip in T100 manifold sub-base

L07 L07 Series • Max Cv .7
L20 L20 Series • Max Cv 2.0
L45 L45 Series • Max Cv 4.5
T10 T100 Series • Max Cv 1.1

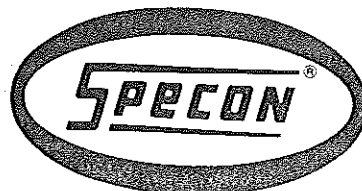
0 Line Mount/Less Base
2 Sub-Base Side Ports • T100
3 Sub-Base Side + Bottom • T100
4 Mid Side Ports • T100
5 Mid Side + Bottom • T100

0 Less Base • T100
2 1/2-L07 • T100
3 1/4-L20 • T100
4 3/8-L20
5 1/2-L45

L20 0 3 A A WR - A - 1206

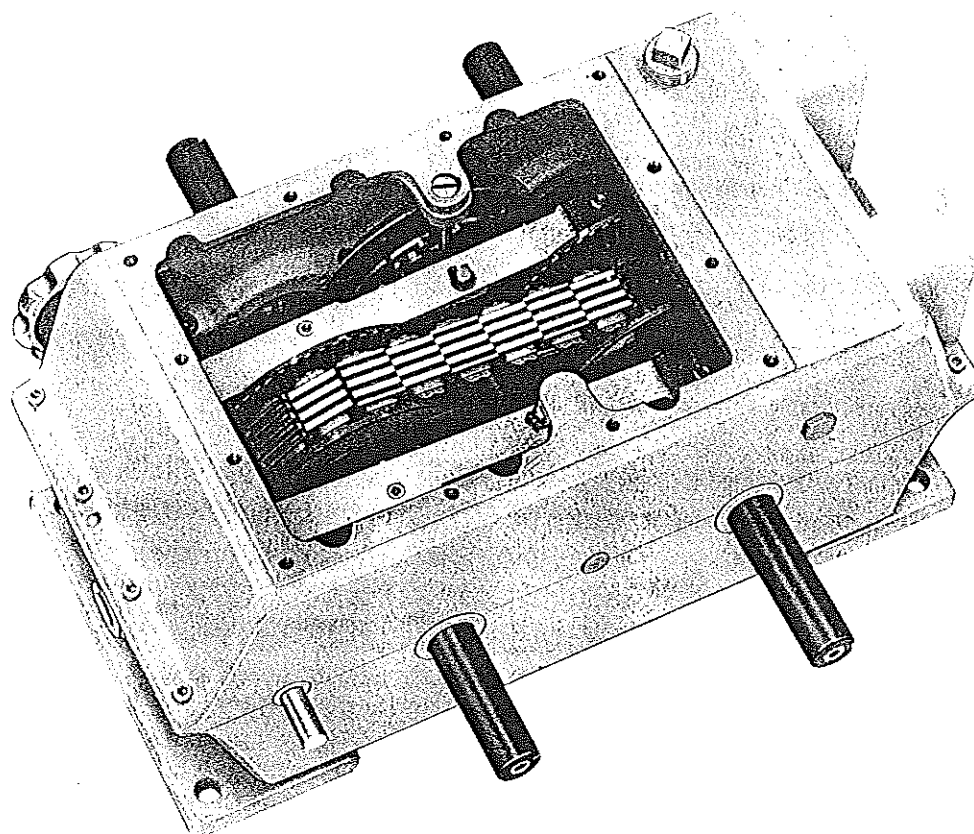
A 2 Posn Spool • Sol + Air
B 2 Posn Spool • Manual
C 3 Posn • Blocked Center
D 3 Posn • Exhaust Center
E 3 Posn • Pressure Center
A Design Change • Single Bore
B Design Change • Double Bore
A Remote Air Pilot
F Hand Lever • Line Mount
G Hand Lever • Mid Mount
I Palm Button
K Foot Pedal
L Foot Treadle
P Indoor Solenoid • 1/2"
S Weather-Proof Sol • 1/2"
W Weather-Proof Sol • Plug-in
Y Explosion-Proof Sol • 1/2"

Voltage
A Viton Seals
B External Pilot • Solenoid
C Sintered Operator Exhaust
D Dust Proofing
F Potted Solenoid • P + Y
K Lights • S Sol 120/60 + 24 VDC
N Nickel Plated Metal
T High Temperature Coil • P + Y
V 1/2" Solenoid Exhaust
1,2,4 Non-Std Solenoid Override
C 3 Posn Spring Center • Manual
D 3 Posn Spring Center • Sol + Air
M 2 Posn Detent • Manual
N 3 Posn Detent • Manual
R 2 Posn Spring • All



VARI-CHAIN VARIABLE SPEED TRANSMISSION

Installation, Operating and Maintenance Instructions



The VARI-CHAIN variable speed transmission is infinitely adjustable to any speed setting within its rated speed range.



FAIRCHILD
INDUSTRIAL PRODUCTS COMPANY

3920 WEST POINT BLVD. WINSTON-SALEM, NC 27103-6708
Tel 910-659-3400 FAX 910-659-9323



FM NO. 25571

For total control when the power's on.



Specifications

See Catalog Bulletin 207D

Principles of Operation

The Specon VARI-CHAIN Variable Speed Transmission consists of an all metal chain containing packages of slats, which engage themselves in grooved wheel-faces and thus effectively provide a variable pitch all metal chain. The variable pitch all metal chain locates itself and establishes a pitch radius in the wheel-faces depending upon the opening between the wheel-faces. If the wheel-faces are moved in close together, the chain rides out near the top of the wheel-faces and establishes itself with a relatively large pitch diameter. If the wheel-faces are

further apart, the chain rides down near the center of the wheel-faces, thus establishing a relatively small pitch diameter.

The resultant speed relationship between the variable speed shaft of the unit and the constant speed shaft of the unit is a function of the ratio of the pitch diameters of the chain at the variable speed grooved wheels and the constant speed grooved wheels.

Installation

The VARI-CHAIN transmission (Figure 1) should be firmly secured to a flat, rigid foundation. The transmission can be secured with bolts through the clearance holes in the feet. The feet can be removed (*) and the tapped holes in the transmission can be used for mounting. The mounting feet of the transmission base should rest firmly on the foundation before bolting down. Use shims to level. Align shafts accurately. When using a direct coupling connection, a flexible coupling is recommended. If connected by gearing, chain or belt, the pulley, gear or sprocket should be mounted on the input and/or output shaft as close to the housing as possible. Use pulley, sprocket or gear with a pitch diameter of at least three times the shaft diameter. On Style I VARI-CHAIN transmissions either shaft can be used as the constant speed shaft or input shaft. The input shaft can be operated in either clockwise or counter-clockwise direction. The input and output shaft will rotate in the same direction in Style I transmission. In Style II, Style II/II or Style IV transmissions, relative rotation will be altered by the number of gear stages in the input and/or output section of the transmission. Input and output shafts are identified and required direction of rotation is identified when critical. (*) Sizes 0, 1/2, and 1-72 have integrally cast feet.

Lubrication

All Specon VARI-CHAIN transmissions are shipped without oil. Before starting, add the specified quantity of oil. Use an AGMA 4EP grade oil. (See Table 1 for acceptable oils.) Check oil level at the sight gage. Oil should be at the specified level with the transmission stationary. After the first fifty hours of operation and every 2000 hours thereafter, change the oil. Oil can be added to the transmission either through the breather plug on the top or through the inspection cover. Before refilling with new oil, flush the transmission with a light weight machine oil. Do not use any paraffin oil or solvents.

Table 1—Acceptable Oils

Name of Manufacturer	Name of Lubricant*
Amoco	Permaseal EP 70
Atlantic Richfield Co.	Pennant NL S-700
Boron Oil Company	Gearep 85
Exxon Company, USA	Spartan EP 150
Gulf	S 70
Mobil Oil Company	Mobilgear 629
Shell Oil Company	Omala 69
Standard Oil Co. of CA.	Chevron NL Gear Compound 150
Sun Oil Co.	Sunep 1060
Texaco Inc.	Meropa 150

*All oils meet current standards for AGMA 4 EP gear lubricants.

Adjustment

Ratio Setting

The transmission nameplate indicates the model number, speeds, size and chain number of the transmission. Table 2 shows chain part numbers for the various speed ranges. A speed range less than available from a particular chain can be set by adjusting the ratio limiting device on the control screw(s) of the transmission. Newer model VARI-CHAIN units are shipped with chains, part numbers as identified in Table 3. Orders for replacement chains will be filled with chains identified in Table 3.

On model sizes 1 thru 5 threaded split clamps are locked on the control screw with a socket head screw. The ratio is reduced by moving the split clamps in toward the pivot blocks. The socket head screw on the stop nuts can be loosened with a hex wrench inserted through the inspection cover of the transmission. Be

sure to retighten limit nut locking screws before replacing inspection cover.

On the 0-1/2 VARI-CHAIN a hex-socket set screw (49) threaded into the control pivot block (52) is made to contact a pin (50) that is pressed into the control screw (Figure 2(a)). There are two such assemblies; one in each control pivot block to limit each end of the range. It is possible to reach one limiting device through the inspection cover but to properly limit both ends of the range, the upper housing (vertical-front housing) must be removed. See sections on disassembly and reassembly. Newer model VARI-CHAIN units are equipped with a control screw stop configuration as shown in Figure 2(b). Orders for replacement control screw stops will be filled by stops identified as Figure 2(b). In no case should the ratio range be set to exceed the rated range of a chain in any VARI-CHAIN transmission.

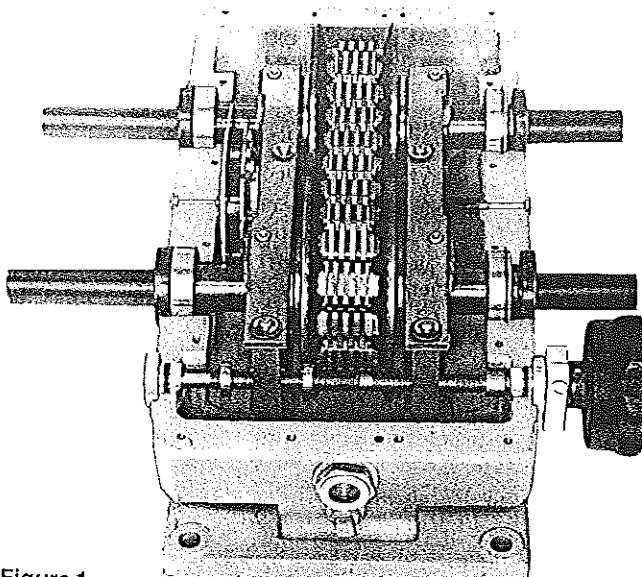


Figure 1

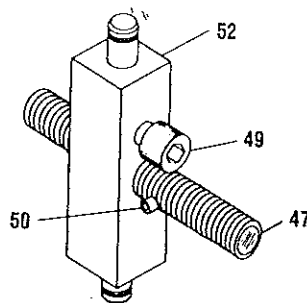


Figure 2(a)

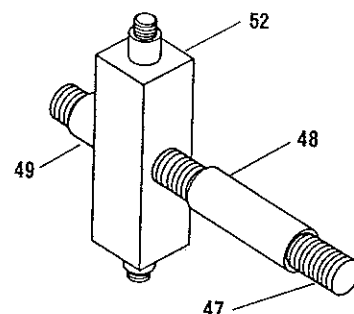


Figure 2(b)

Table 2—Chain Data

MODEL #	CHAIN #	PITCH	CHAIN WIDTH (NEW)	MIN. CHAIN WIDTH
02	026	.748	1.25"	1.17"
03	025	.748	1.25"	1.17"
04	025	.748	1.25"	1.17"
05	024	.748	1.25"	1.17"
1/2-2	031	.748	1.25"	1.17"
1/2-3	029	.748	1.25"	1.17"
1/2-4	029	.748	1.25"	1.17"
12	127	1.00	1.45"	1.34"
13	126	1.00	1.45"	1.34"
14	126	1.00	1.45"	1.34"
15	125	1.00	1.45"	1.34"
16	125	1.00	1.45"	1.34"
12-72,79	224	1.126	1.52"	1.38"
13-72,79	223	1.126	1.52"	1.38"
14-72,79	223	1.126	1.52"	1.38"
15-72,79	125	1.00	1.45"	1.34"
16-72,79	125	1.00	1.45"	1.34"
22	231	1.126	1.52"	1.38"
23	230	1.126	1.52"	1.38"
24	230	1.126	1.52"	1.38"
25	229	1.126	1.52"	1.38"
26	229	1.126	1.52"	1.38"
32	337	1.126	1.74"	1.59"
33	336	1.126	1.74"	1.59"
34	336	1.126	1.74"	1.59"
35	335	1.126	1.74"	1.59"
36	335	1.126	1.74"	1.59"
42	435	1.500	2.22"	2.06"
43	434	1.500	2.22"	2.06"
44	434	1.500	2.22"	2.06"
45	433	1.500	2.22"	2.06"
46	433	1.500	2.22"	2.06"
52	544	1.500	2.78"	2.60"
53	543	1.500	2.78"	2.60"
54	543	1.500	2.78"	2.60"
55	542	1.500	2.78"	2.60"
56	542	1.500	2.78"	2.60"

Table 3—Chain Data

MODEL #	CHAIN #	PITCH	CHAIN WIDTH (NEW)	MIN. CHAIN WIDTH
02	00232	.591	1.21"	1.13"
03	00431	.591	1.21"	1.13"
04	00431	.591	1.21"	1.13"
05	00530	.591	1.21"	1.13"
1/2-2	05238	.591	1.21"	1.13"
1/2-3	05436	.591	1.21"	1.13"
1/2-4	05436	.591	1.21"	1.13"
12	21227	.980	1.48"	1.38"
13	21625	.980	1.48"	1.38"
14	21625	.980	1.48"	1.38"
15	21625	.980	1.48"	1.38"
16	21625	.980	1.48"	1.38"
12-72,79	21227	.980	1.48"	1.38"
13-72,79	21625	.980	1.48"	1.38"
14-72,79	21625	.980	1.48"	1.38"
15-72,79	21625	.980	1.48"	1.38"
16-72,79	21625	.980	1.48"	1.38"
22	32231	1.126	1.74"	1.60"
23	22434	.980	1.48"	1.38"
24	22434	.980	1.48"	1.38"
25	22633	.980	1.48"	1.38"
26	22633	.980	1.48"	1.38"
32	33237	1.126	1.74"	1.60"
33	33436	1.126	1.74"	1.60"
34	33436	1.126	1.74"	1.60"
35	33635	1.126	1.74"	1.60"
36	33635	1.126	1.74"	1.60"
42	44237	1.409	2.29"	2.14"
43	44435	1.409	2.29"	2.14"
44	44435	1.409	2.29"	2.14"
45	44634	1.409	2.29"	2.14"
46	44634	1.409	2.29"	2.14"
52	55247	1.409	2.75"	2.58"
53	55445	1.409	2.75"	2.58"
54	55445	1.409	2.75"	2.58"
55	55644	1.409	2.75"	2.58"
56	55644	1.409	2.75"	2.58"

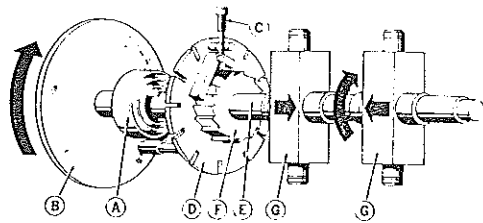


Figure 3—Models 1 thru 5

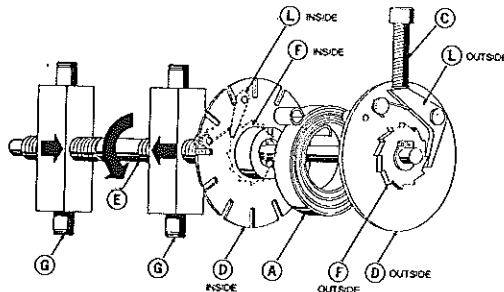


Figure 4—Models 0 and 1/2

Automatic Chain Tensioning and Chain Wear Indicator

There are two types of automatic chain tensioning devices used in the VARI-CHAIN transmission. Figure 3 and Figure 4 illustrate the chain tensioning device found in VARI-CHAIN Models 1 thru 5 and Models 0 and 1/2 respectively. Although there are differences in the construction of the two tensioning devices, the principle of operation is the same.

A spiral spring (A) is used to exert torque on the pivot block screw (E). When the chain is new, the spiral spring is fully torqued. As wear occurs on the chain slats, the pivot block screw, which supports the two pivot blocks (G), turns under the effect of the spiral spring and compensates for wear on the chain. The chain remains under correct tension until it is completely worn out.

The progressive wear of the chain can easily be checked during oil change operations. An indicator wheel (B) is used on VARI-CHAIN Model sizes 1 thru 5 to give an indication of the wear that has occurred to the chain. Once the 1/4 (or replace chain) mark is reached, the tensioning device is blocked by stops located on the tension flange (D) and the indicator wheel. No more tightening action takes place. The amount of wear on the chain in the 0, 1/2 VARI-CHAIN Model sizes must be determined by examining the chain. The chain in any VARI-CHAIN should not be allowed to wear beyond the recommended minimum chain width (see Table 1 or 2). Usually maximum wear will occur when the pivot block screw has made slightly less than one revolution.

Chain & Chain Wear

Under normal applications and usage of the Specon VARI-CHAIN transmission, the chain will be the primary wearing part.

As the wheel faces are at a greater hardness than the chain slats, the tips of the slats will wear first. Wear on the tips of the slats will reduce chain width. Chain wear may also occur on link connecting pins and bushings. The overall wear on the chain will produce a chain slackening which is automatically compensated for by the built-in automatic chain tensioner. During the life of the chain, no adjustments for chain slackening or chain tension are necessary.

A chain wear indicator plate is included in the automatic chain tensioner assembly for Model sizes 1 thru 5. This plate turns as the chain wears and the marking 0, 1/4, 1/2, 3/4, and 1 on the plate indicates the relative wear.

Accurate Turn Indicator—Setting

All Specon VARI-CHAIN transmissions have an indicator located in the control handwheel (Figure 5). This indicator shows control screw turns and thus relates input/output speed ratio. A higher degree of repeatability is assured since control screw turns and parts of turns are indicated. This indicator handwheel design now is used for all sizes of VARI-CHAIN transmissions.

As shipped, control screw clamp is locked. Indicator setting is at "0". (On VARI-CHAIN units, this indicates 1:1 setting.) (On MDD units, this indicates "Zero" draw.)

Handling during shipment can tumble the indicator's gravity mechanism giving a false reading. If indicator is not on "0", loosen two set screws in hub and re-zero. When indicator is properly calibrated, speed may be changed by loosening lock clamp and turning control screw (handwheel). **CAUTION—INPUT POWER SHAFT MUST BE ROTATING.** Zero position may be relocated to suit the VARI-CHAIN's specific usage.

Typical indicator handwheel assembly shows (+) for clockwise rotation. Should (+) be desirable for counter-clockwise rotation, proceed as follows:

- (1) With handwheel stationary, note exact reading.
- (2) Remove ring (R).
- (3) Remove crystal.
- (4) Remove (2) faceplate mounting screws (F).
- (5) Remove from rear of plate (P) two stick on (+) and (−) decals. Carefully place decals over the original symbols to correctly indicate the direction of rotation.
- (6) Reassemble, taking care to locate line in crystal at original position.

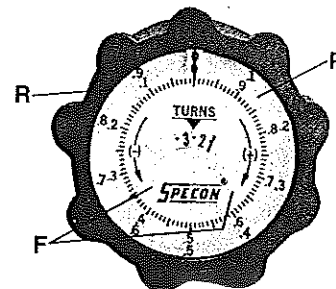


Figure 5

Operation

WARNING: Do not turn the handwheel to change speed or ratio of the VARI-CHAIN transmission when unit is stopped. Speed changes must be made only while the VARI-CHAIN transmission is running.

Ratio range, maximum and minimum RPM, maximum and minimum power capacities, and input RPM are shown on the nameplate located on the transmission. For lower than rated input speeds, output speeds and power capacities are reduced proportionally.

Output speed is adjusted by turning the indicator handwheel. The Rating Table in Catalog #207 gives total number of turns required for full range adjustment on all size transmissions. When shipped, the transmission is in the 1:1 ratio when indicator setting is zero.

Maintenance

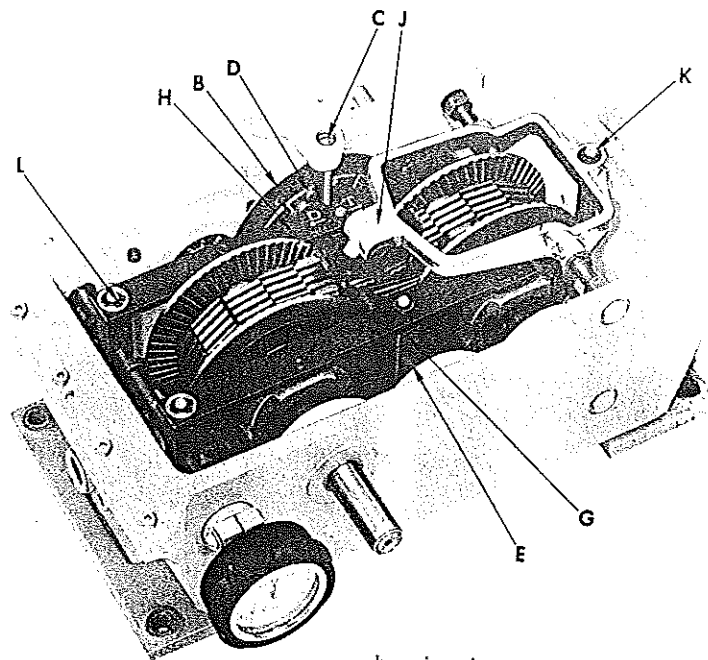


Figure 6

Disassembly

To remove the upper housing, take off inspection cover and remove blocking screw (C) (Figure 6). Remove the bolts at each end of the transmission and eight bolts inside the transmission. Six of these bolts can be removed through the inspection cover. On size 0 and 1/2 units remove two 10-24 bolts in housing holes on either side of blocking screw. These screws are located in housing counter bolts. The remaining two can be reached through the oil breather plug hole on each side of the nameplate. The top shoe (J) will be removed with the upper half of the housing. Caution should be exercised in removing the spring support rod (K) to retain the spring and washer with the spring support rod. Remove two dowel pins (Locator No. 103) page 6 or roll pins (Locator No. 132) page 7.

The entire internal assembly can now be removed from the lower housing. The control screw assembly can now be removed by removing the snap rings from each end of the control pivot blocks (L). With the control assembly removed, care should be exercised so as not to destroy the position relationship of the two control pivot blocks. Do not turn one pivot block independent of the other. In order to complete the disassembly of the internals, the control levers (H) must be removed. Remove only the top set or bottom set of control levers at any given time. This retains the position relationship of the adjustable pivots (G) on the pivot block screw (E). If it is necessary to remove both top and bottom control levers, exercise care to maintain the relative position of the two adjustable pivots on the pivot block screw. During disassembly, note should be taken of the relative location of all parts so that each individual part can be reassembled correctly to the correct adjoining part.

Reassembly

Reassemble the individual internal assembly taking care to insure that individual parts are assembled into the exact location from which they were removed. The entire internal assembly including the control screw can be made up before it is inserted into the lower housing.

The wave spring washer (53) Parts List size 1-5, on the control screw brushings (56), must go on the outside of the transmission housing and care must be taken to insure that they are not pinched between the housing halves. (This applies to sizes 1-5 only.)

Locate lower end of spring support rod (24) Parts List size 0-1/2 and size 1-5, in the hole of bottom shoe bracket (18). Compress spring and washer until drilled hole in rod is exposed and insert a piece of wire to hold the compression, allowing wire to lay across top of chain. Apply non-hardening permatax to the mating surfaces of both housing halves. While lowering top half of

housing, locate upper end of shoe level rod in hole of upper shoe bracket.

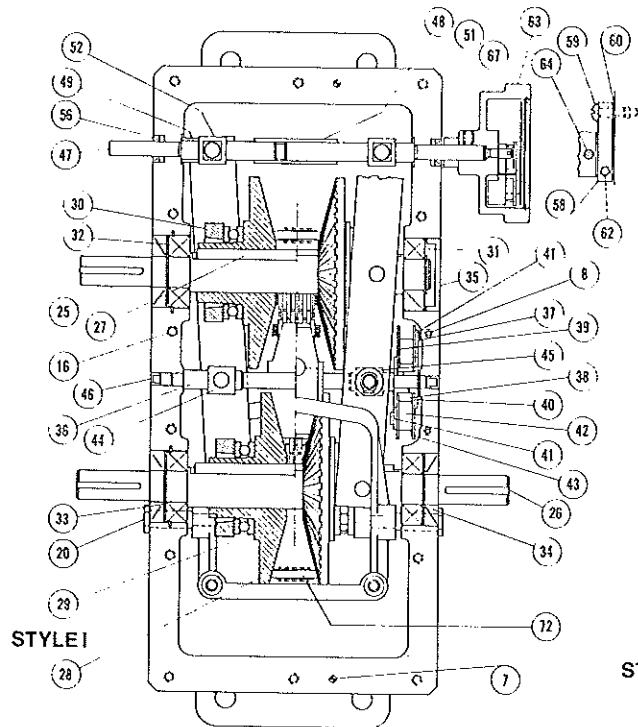
Insert dowel pins (7). Secure bolts and remove wire from transmission. Recheck chain tensioner setting in accordance with chain tensioner instructions.

Installing New Chain

- Set transmission at 1:1 ratio, indicator setting at zero. (Remember change ratio only when transmission is running.)
- Disconnect motor or drive.
- Remove inspection plate.
- Support upper shoe (J) (Figure 6) in position away from chain. (Except size 0, which has no tensioning shoes.)
- Remove blocking screw (C).
- Turn tension flange (D) in direction marked "D" as shown on control lever (H) to slacken chain. (Use screwdriver in slots of flange.)
- Using blocking pin as reference, rotate flange through two revolutions.
- Locate connecting pin in chain and remove.
- Using old connecting pin, attach one end of new chain to end of old chain.
- Pull old chain out of transmission and thread new chain around wheel faces into transmission.
- Withdraw old connecting pin, separating old and new chain. Connect the ends of new chain with the new connecting pin using new washer and cotter pin.
- Refer to Figure 3 and 4. Turn tension flange (D) in direction marked "T" (clockwise rotation) until wheel faces are snug against the chain. For VARI-CHAIN Models 1 thru 5 continue clockwise rotation of the tension flange (using screwdriver in slots) until ratchet sounds cease indicating the automatic tension spring is fully loaded. Back off tension flange (D) to line up stops with blocking screw (C). For VARI-CHAIN Models 0 and 1/2, proceed by inserting blocking screw into the outside tension flange (D), thus blocking rotation of the outside tension flange (D) and releasing outside ratchet (L). Finally load spiral spring (A) by turning the inside tension flange (D) in a counter-clockwise direction until ratchet sounds cease. Rotate the transmission by hand during this setting.
- Continue to rotate the transmission a few times by hand to free the slats. For transmissions equipped with the indicator disc, the "0" mark on the indicator should be positioned just to the left of the blocking screw. After running approximately one hour, recheck indicator plate and reset "0" slightly to the left of the blocking screw if necessary. (This will prevent premature chain wear indications.)
- Replace inspection cover, reconnect motor or drive and proceed with normal usage.

**SPECON VARI-CHAIN PARTS
LIST & LOCATOR NUMBERS
SIZE 0 & 1/2**

NOTE: Specify Model Number, and Serial
Number when ordering parts.



STYLE I

Loc. No.	Description	Quan.
3	a) Lower Housing (Horiz)	1
	b) Back Housing (Vert)	1
4	a) Upper Housing (Horiz)	1
	b) Front Housing (Vert)	1
5	Inspection Cover	1
6	Soc. Hd. Cap Screw	10
7	Dowel Pins	2
8	Soc. Hd. Cap Screw	2
9	Soc. Hd. Cap Screw	10
10	Drain Plug	1
11	Sight Gage	1
12	Vent Plug	1
13	Pipe Plug	1
14	Eye Bolt	2
*15	Shoe Pin (On 1/2 only)	2
16	Soc. Hd. Cap Screw	2
*17	Shoe (On 1/2 only)	2
*18	Shoe Bracket	
	(On 1/2 only)	2
20	Shoe Lever Pin	4
	(On 1/2 only)	
22	Shoe Support Spring	4
	(On 1/2 only)	

*NOTE: Supplied as sub-assemblies only.

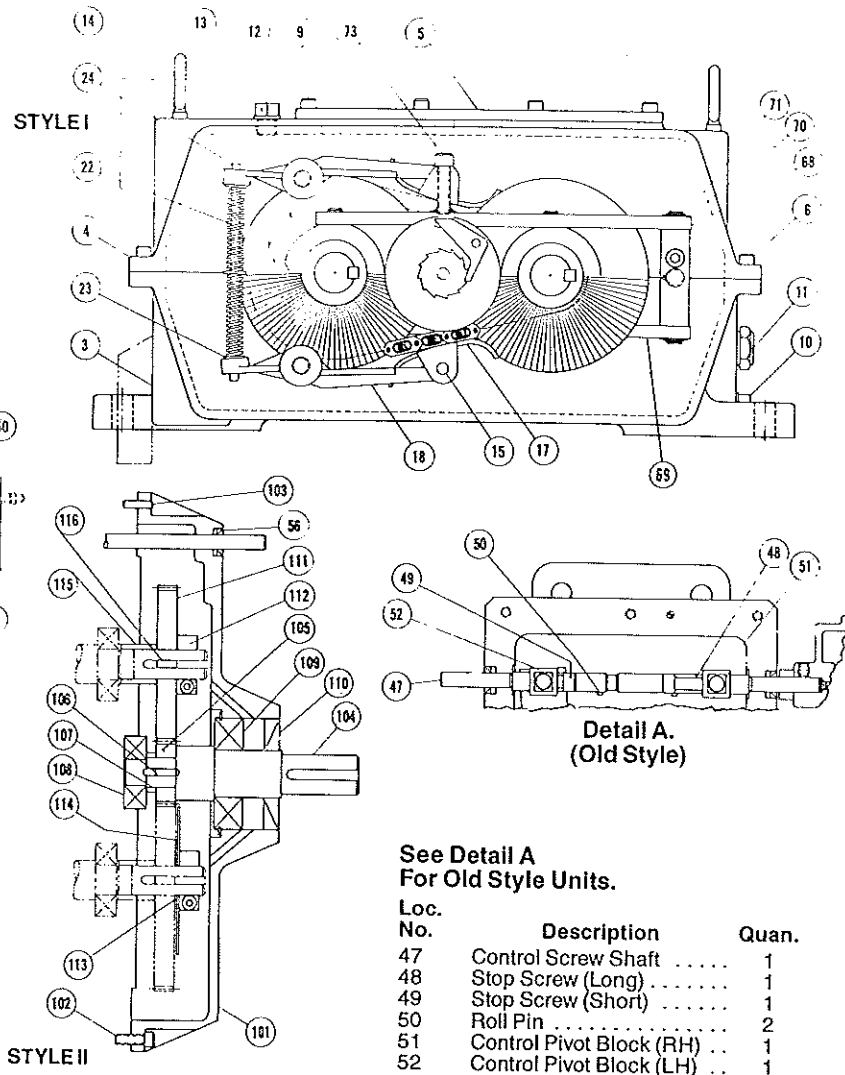
**NOTE: Sold in sets of 4 only

STYLE II

Loc. No.	Description	Quan.
101	Housing	1
102	Soc. Hd. Cap Screw	14
103	Dowel Pin	2
104	Shaft	1
105	Gear (On Input/Output Shaft)	1

Loc. No.	Description	Quan.
23	Washer (On 1/2 only)	4
24	Spring Support Rod	
	(On 1/2 only)	2
25	Shaft - Single Extended	1-2
26	Shaft - Double Extended	1-2
27	Key	2
**28	Wheelface	4
**29	Thrust Bearings	4
30	Thrust Yoke	4
31	Bearing	2
32	Bearing	2
33	Snap Ring	4
34	Seal	2-4
35	Closure	0-2
*36	Pivot Block Screw	1
*37	Ratchet Lever Pin & Torsion Spring	2
*38	Spring Coupling Ring	1
*39	Inside Adjusting Flange	1
*40	Tension Ratchet Gear	2
*41	Ratchet Lever	1
*42	Set - 1 Inside, 1 Outside Tension Spring & Pin	1

Loc. No.	Description	Quan.
106	Key/Pin	1
107	Spacer	1
108	Bearing	1
109	Bearing	1
110	Seal	1
111	Gear	1



**Detail A.
(Old Style)**

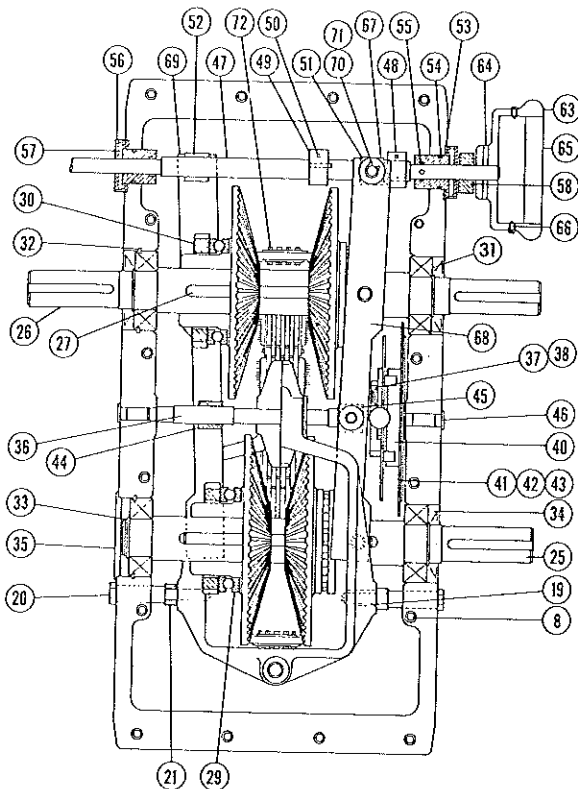
See Detail A
For Old Style Units.

Loc. No.	Description	Quan.
47	Control Screw Shaft	1
48	Stop Screw (Long)	1
49	Stop Screw (Short)	1
50	Roll Pin	2
51	Control Pivot Block (RH)	1
52	Control Pivot Block (LH)	1

Loc. No.	Description	Quan.
*43	Outside Adjusting Flange	1
*44	Pivot Block, LH	1
*45	Pivot Block, RH	1
46	Closure	2
47	Control Screw Shaft	1
48	Stop Spacer (Long)	1
49	Stop Spacer (Short)	1
51	Control Pivot Block (RH)	1
52	Control Pivot Block (LH)	1
56	Seal	2
58	Clamp Lock	1
59	Screw	1
60	Lockwasher	1
62	Soc. Hd. Cap Screw	1
63	Indicator Handwheel Assembly	1
64	Hex. Soc. Set Screw	2
67	Control Pivot Block Insert	4
**68	Control Lever (Upper)	2
**69	Control Lever (Lower)	2
70	Washer	8
71	Snap Ring	8
72	Chain	1
73	Blocking Screw	1

**SPECON VARI-CHAIN PARTS
LIST & LOCATOR NUMBERS
SIZE 1, 2, 3, 4 & 5**

NOTE: Specify Model Number, and Serial Number
when ordering parts.



STYLE I

Loc. No.	Description	Quan.
1	Mounting Foot	2
2	Button Hd. Screw	4
3	Lower Housing	1
4	Upper Housing	1
5	Inspection Cover	1
6	Soc. Hd. Cap Screw	8
7	Dowel Pins	2
8	Soc. Hd. Cap Screw	8
9	Soc. Hd. Cap Screw	12
10	Drain Plug	1
11	Sight Gage	1
12	Vent Plug	1
13	Pipe Plug	1
14	Eye Bolt	2
*15	Shoe Pin	2
*16	Shoe Bushing	2
*17	Shoe	2
*18	Shoe Bracket	2
*19	Shoe Bracket Bushing	4
20	Shoe Lever Pin	4
***21	Bushing	4
22	Shoe Support Spring	2
23	Washer	2
24	Spring Support Rod	1

*NOTE: Supplied as sub-assemblies only.

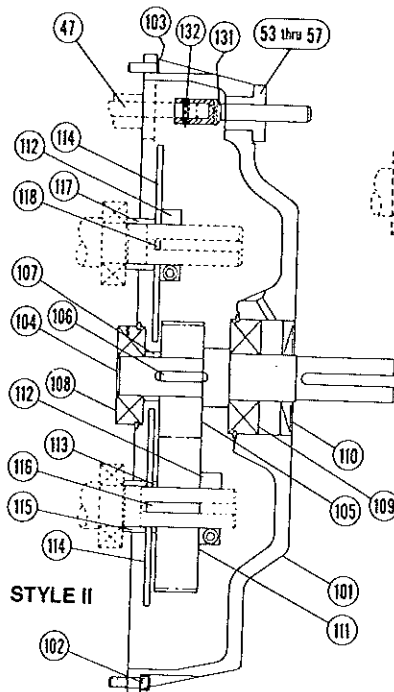
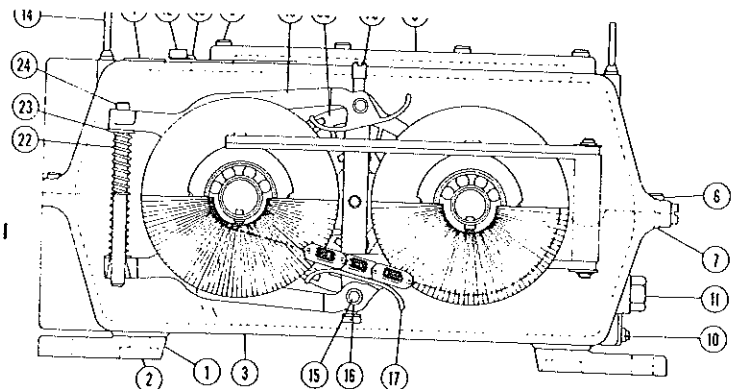
**NOTE: Sold in sets of 4 only.

***NOTE: Used on size 3 only.

STYLE II

Loc. No.	Description	Quan.
101	Housing Assembly	1
102	Soc. Hd. Cap Screw	12
103	Dowel Pin	2
104	Shaft	1
105	Gear	1
106	Key	1
107	Spacer	1
108	Bearing	1

STYLE I



STYLE II

Loc. No.	Description	Quan.
25	Shaft — Single Extended	1-2
26	Shaft — Double Extended	1-2
27	Key	2
**28	Wheelface	4
**29	Thrust Bearings	4
30	Thrust Yoke	4
31	Bearing	2
32	Bearing	2
33	Snap Ring	4
34	Seal	2
35	Closure	2
*36	Pivot Block Screw	1
*37	Ratchet Wheel Hub	1
*38	Roll Pin	1
*39	Tension Flange Assembly	1
40	Tension Spring	1
*41	Bellville Washer	1
*42	Indicator Disc	1
*43	Snap Ring	1
*44	Pivot Block, LH	1
*45	Pivot Block, RH	1
46	Closure	2
47	Control Screw Shaft	1
48	Adjustable Stop	1

Loc. No.	Description	Quan.
49	Adjustable Stop	1
50	Soc. Hd. Screw	2
51	Control Pivot Block, RH	1
52	Control Pivot Block, LH	1
53	Wave Spring Washer	2
54	"O" Ring	2
55	"O" Ring	2
56	Bushing	2
57	Roll Pin	2
58	Clamp Lock	1
59	Screw	1
60	Lockwasher	2
62	Soc. Hd. Screw	1
63	Indicator Handwheel	1
64	Hex. Soc. Set Screw	2
67	Control Pivot Block Insert	4
**68	Control Lever (Upper)	2
**69	Control Lever (Lower)	2
70	Washer	8
71	Snap Ring	8
72	Chain	1
73	Blocking Screw	1

Drawing Number	Drawing Title
H05-0036	Connecting Rod Assembly
H05-0091	Conv. Infeed Plate Assembly
H05-0092	Conv. Exit Plate Assembly
H05-0096	Hole Punch Switch Assembly
H05-0097	Lug Switch Assembly LS-16
H05-0098	Torque Limiter Assembly
H05-0219	Drive Roll - Unwind
H05-0220	Nip Roll - Unwind
H08-0020	Transfer Roller (Carriage End Seal)
H08-0021	Air Supply Assembly
H08-0058	Selvage Winder Spindle Drawing
H08-0060	Selvage Winder Bearing Housing Drawing
H08-0062	Pneumatic Cylinder Assembly, 115V Only
H08-0080	Pin Perforator Head Assembly Drawing
H08-0081	Pin Perforator Assembly Drawing
H08-0112	Adj. Height Roller Assembly
H08-0113	Adj. Idler Roller & Take Up Roller (Carriage)
H08-0115	Carriage Driven Roller
H08-0128	End Jaw Housing – Front (Right Side)
H08-0129	End Jaw Housing – Rear (Left Side)
H08-0188	Carriage Drive Roller (Replaces E08-056)
M08-0027	Bearing Block Assembly
M08-0068	Left End Jaw Housing 8" Height Extension
M08-0069	Right End Jaw Housing 8" Height Extension
M08-0071	Jaw Height Safety Switch Drawing

7.2. HOT WIRE DRAWINGS

Drawing Number	Drawing Title
A05-0292	Bottom Jaw Connecting Rod
B05-0151	Hot Wire Top Jaw Drawing
B08-0061	Hot Wire Top Jaw - Narrow
B08-0094	Hot Wire Top Jaw - Basic
E08-0062	Hot Wire Bottom Jaw Drawing
E08-0119	Hot Wire Bottom Jaw Manual Drawing
E08-0154	Hot Wire Bottom Jaw – Narrow
E08-0155	Hot Wire Bottom Jaw – Narrow

7.3. HOT KNIFE DRAWINGS

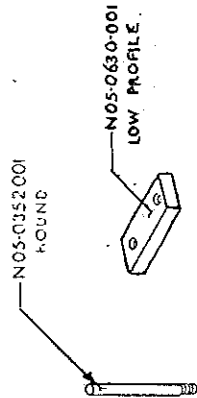
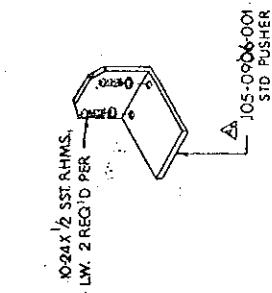
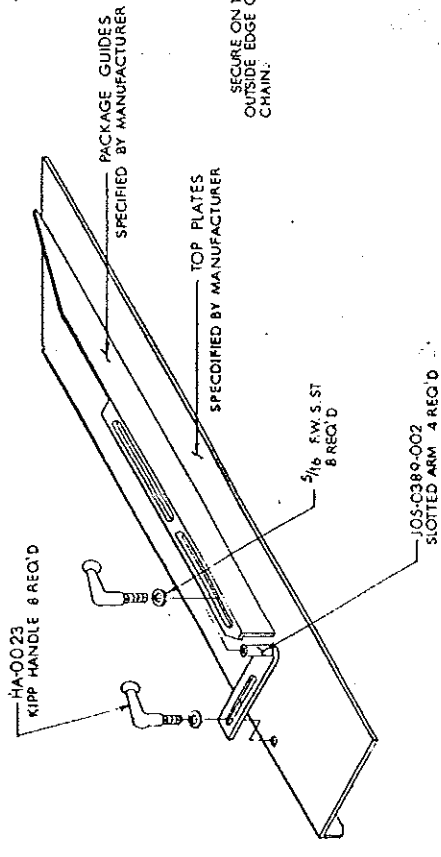
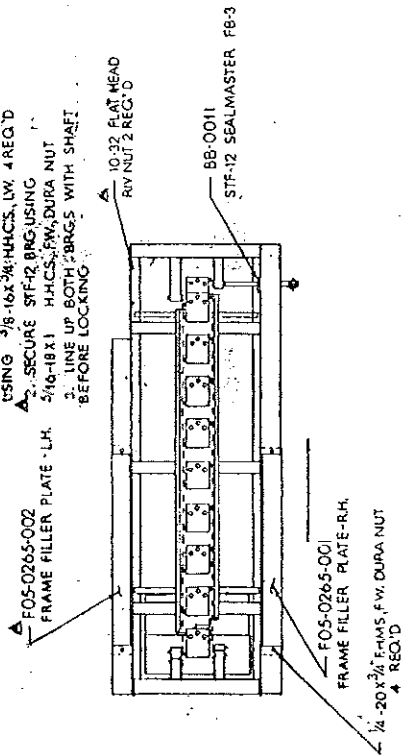
Drawing Number	Drawing Title
A05-0292	Bottom Jaw Connecting Rod
B05-0152	Basic Top Jaw Wide Fin Assembly
B05-0153	Basic Top Jaw Wide Fin Assembly
F05-1093	Hole Location / Jaw Leveling
H08-0004	Hot Knife Jaw Drawing
SPB-0024-001	Watlow Temperature Control Settings

7.4. COOL CUT DRAWINGS

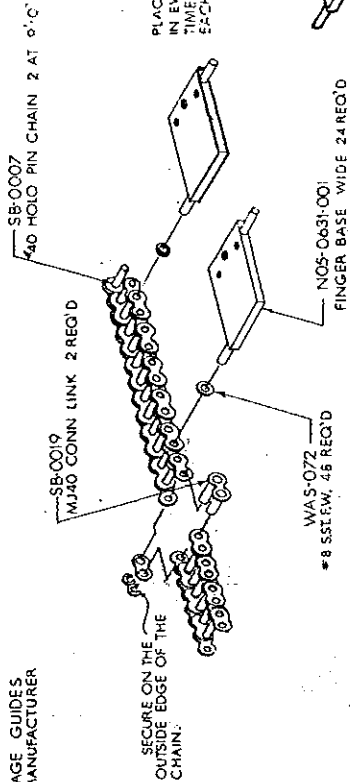
Drawing Number	Drawing Title
A05-0292	Bottom Jaw Connecting Rod
A08-0094	Jaw Carriage Leveling Drawing
B08-0064	Cool Cut Jaw – Basic
E05-0280	Heated BottomJaw Drawing
SPB-0024-001	Watlow Temperature Control Drawing

NOTES FOR ASSY

1. SECURE FRAME FILLER PLATES USING $\frac{3}{8}$ -16X $\frac{3}{4}$ HHCS, LW, 4 REQ'D
2. SECURE STIFF-12 BRG USING $\frac{5}{16}$ -18X1 HHCS, FW, DURA NUT
3. LINE UP BOTH BRGS WITH SHAFT BEFORE LOCKING



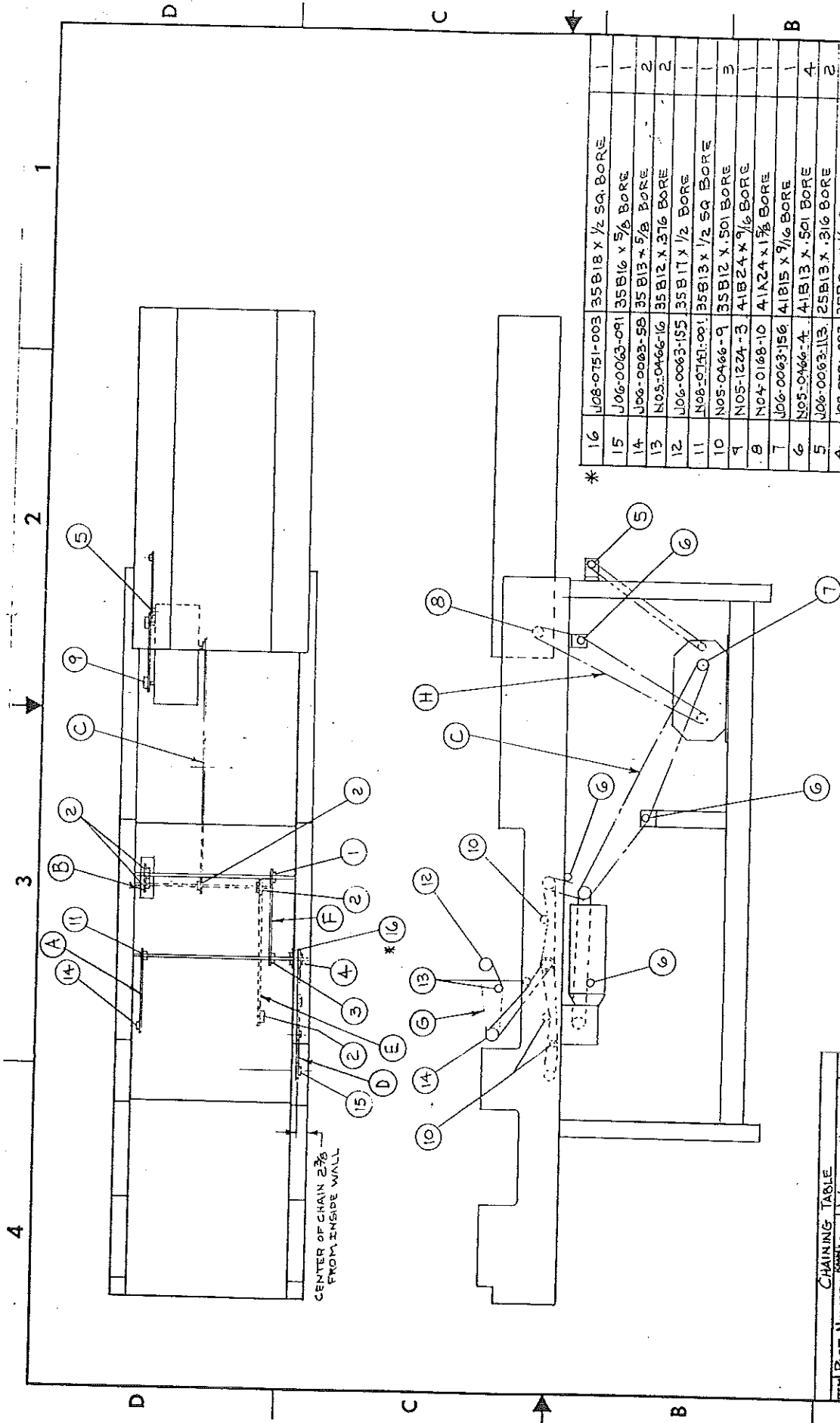
PRODUCT PUSHERS
TYPE AND HEIGHT ARE DETERMINED BY THE MANUFACTURER



NOTE FOR ASSY
PLACE FINGER BASES WITH PINS IN EVERY 10 HOLES AT THE SAME TIME LEAVE 4 HOLES BETWEEN EACH BASE.

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805-0051-B



CHAINING TABLE

ITEM	PART NUMBER	QUANTITY	WHERE USED
A	58-0003-001	1	58-2714 SIDE SEAL CONVEYOR
B	58-0010-003	1	41 23 1/2 TAKE-OFF SHAFT TO JACK SHAF
C	58-0010-005	1	41 80 TAKE-OFF SHAFT TO JACK SHAF
D	58-0003-002	1	41 35 3/8 TAKE-OFF SHAFT TO VARIATOR
E	58-0010-001	1	41 34 1/2 CARRIAGE
F	58-0003-003	1	41 35 3/8 MAIN MOTOR
G	58-0003-005	1	41 25 3/8 JACK SHAF TO SQ. SHAF
H	58-0010-006	1	41 30 SQ. SEAL
			41 50 VARIATOR TO INFEED

CHAIN PITCH
 # 41 : 500
 # 40 : 500
 # 35 : 375
 # 25 : 250

* OPTION FOR HIGH PROFILE

*** SPROCKET LIST**

ITEM	PART NO	DESCRIPTION	QTY
16	J08-0751-003	35B18 X 1/2 SQ. BORE	1
15	J06-0063-091	35B16 X 5/8 BORE	1
14	J06-0063-58	35B13 X 5/8 BORE	2
13	N03-0466-16	35B12 X 3/16 BORE	2
12	J06-0063-155	35B11 X 1/2 BORE	1
11	N08-0743-001	35B13 X 1/2 SQ. BORE	1
10	N05-0466-9	35B12 X .501 BORE	3
9	N05-1224-3	41B24 X 9/16 BORE	1
8	N04-0168-10	41A24 X 1 1/8 BORE	1
7	J06-0063-156	41B15 X 9/16 BORE	1
6	N05-0466-4	41B13 X .501 BORE	4
5	J06-0063-113	25B13 X .316 BORE	2
4	J08-0751-002	35B20 X 1/2 SQ. BORE	2
3	J08-0751-001	35B15 X 1/2 SQ. BORE	5
2	J06-0063-34	41B15 X 3/4 BORE	1
1	J06-0063-60	35B15 X 3/4 BORE	1

SHANKLIN CORPORATION
 WERTFORD ROAD
 AYER, MASSACHUSETTS

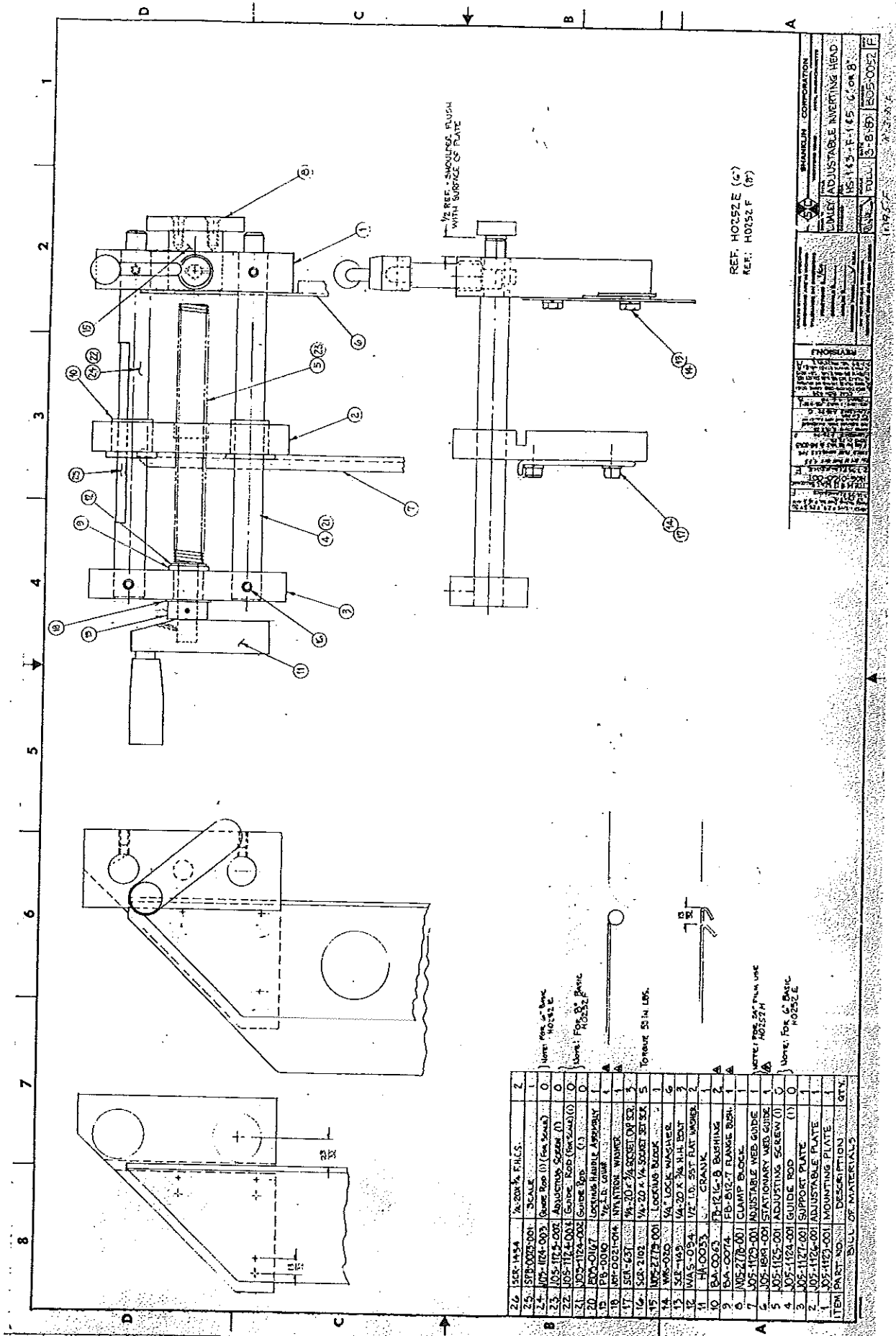
CHAIN DRIVE LAYOUT

REVISIONS

NO.	DATE	DESCRIPTION
1	11-19-90	FOR F-5 W/SQ. SIDE SEAL SHAF

APPROVED *[Signature]* **DATE** 11-19-90 **BY** R-292

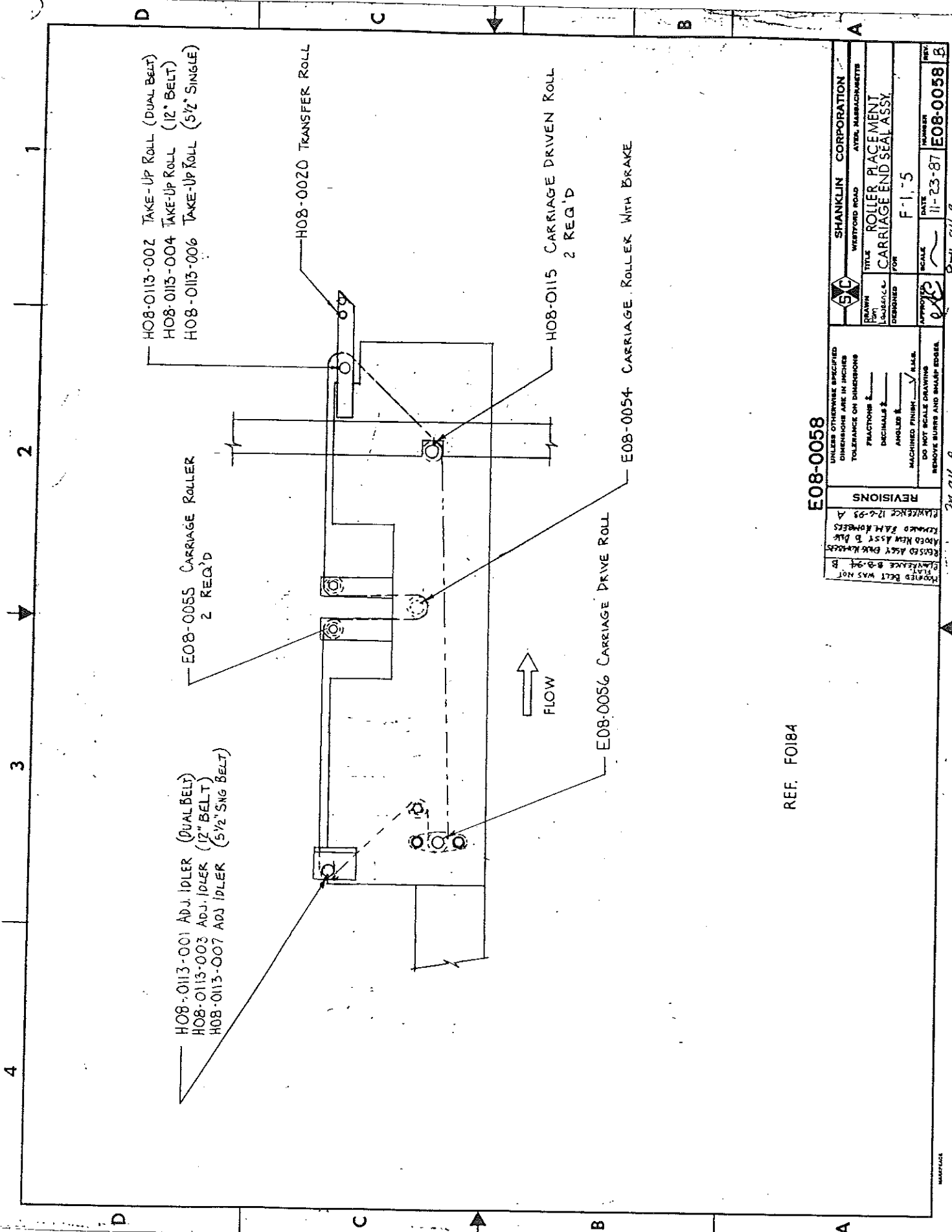
UNLESS OTHERWISE SPECIFIED
 DIMENSIONS ARE IN INCHES
 TOLERANCES ON DIMENSIONS
 FRACTIONS ±.005
 DECIMALS ±.002
 ANGLES ±.005
 MACHINED FINISH
 DO NOT SCALE DRAWING
 REMOVE BURRS AND SHARP EDGES



ITEM NO.	DESCRIPTION	QTY.
24	SCR-1454 1/2-20 X 1/2 IN. FLGS.	2
23	SPR-0025-001 SCALE	1
22	105-1124-001 Guide Rod (For Scale)	0
21	105-1124-001 Guide Rod (For Scale)	0
20	105-1124-001 Guide Rod (For Scale)	0
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5	105-1124-001 Guide Rod (For Scale)	0
4	105-1124-001 Guide Rod (For Scale)	0
3	105-1124-001 Guide Rod (For Scale)	0
2	105-1124-001 Guide Rod (For Scale)	0
1	105-1124-001 Guide Rod (For Scale)	0

REF. H0152E (C)
REF. H0152F (B)

SHANKLIN CORPORATION	
UNITS ADJUSTABLE INVERTING HEAD	
NS-143-F-145-C on 8"	
REV.	13-B-89 EDS-0052

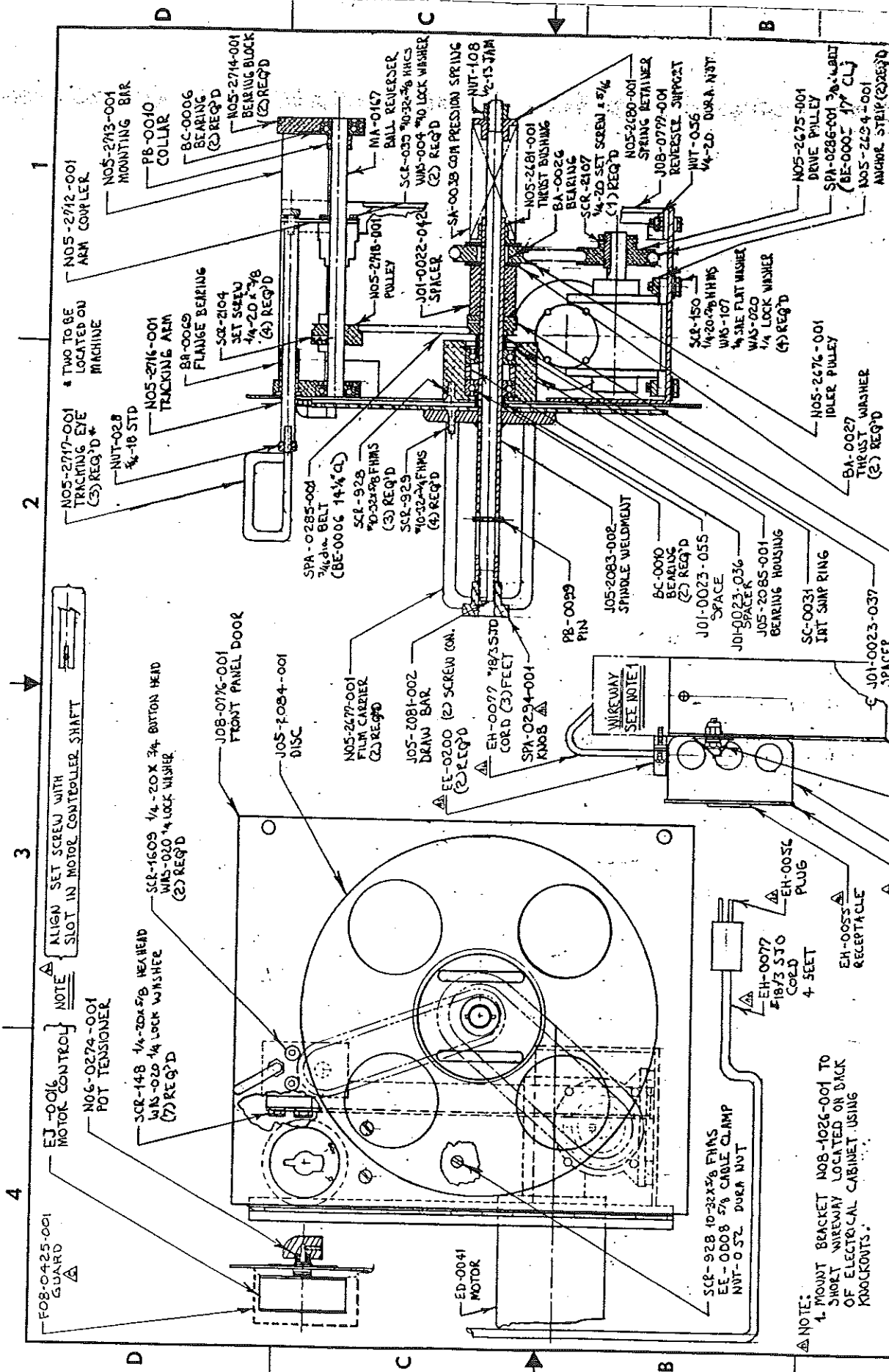


REF. FO184

E08-0058

SHANKLIN CORPORATION WESTFORD ROAD AYER, MASSACHUSETTS	
DRAWN TITLE SCALE DATE NUMBER	ROLLER PLACEMENT CARRIAGE END SEAL ASSY FOR F-1, 5 11-23-87 E08-0058
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON DIMENSIONS FRACTIONS ± DECIMALS ± ANGLES ± MACHINED FINISH ☒ ALL DO NOT SCALE DRAWING REMOVE BURRS AND SHARP EDGES	
REVISIONS REVISION 12-6-95 A REMOVED ROLLER ROLLERS ADDED NEW ASST. TO DR REVISION 8-2-94 B HOOPED BELT WAS NOT PLACED	

MANUFACTURE



E08-0089 REFERENCE F0205

SHANKLIN CORPORATION
WESTFORD ROAD
ATLANTA, GEORGIA

FRONT PANEL DOOR F-1115

REVISIONS

NO.	DATE	DESCRIPTION
1	1958-01-15	ISSUED FOR FABRICATION
2	1958-01-15	REVISIONS
3	1958-01-15	REVISIONS
4	1958-01-15	REVISIONS
5	1958-01-15	REVISIONS
6	1958-01-15	REVISIONS
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98	1958-01-15	REVISIONS
99	1958-01-15	REVISIONS
100	1958-01-15	REVISIONS

NOTES:

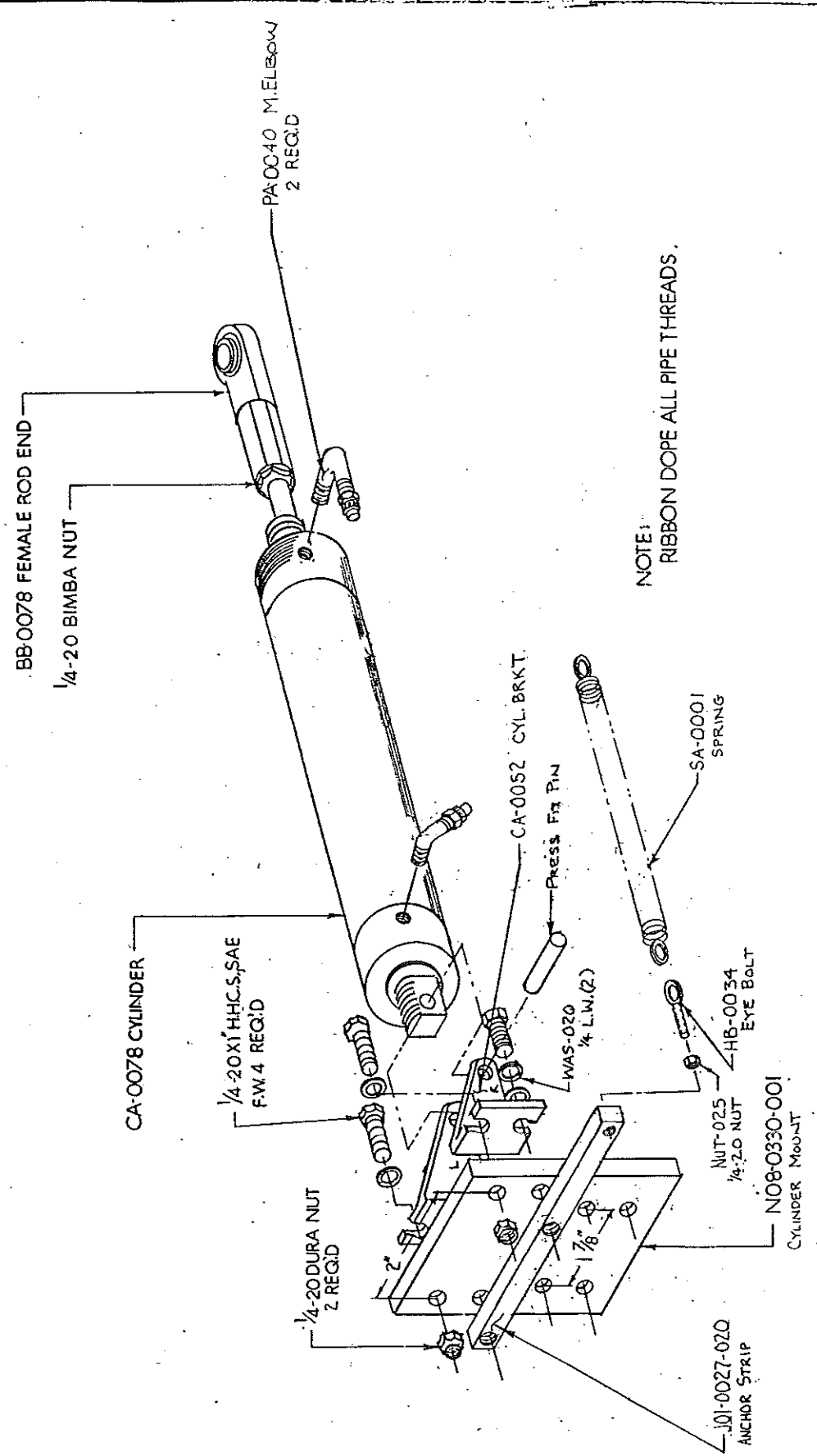
1. MOUNT BRACKET NOS-1026-001 TO SHORT WIREWAY LOCATED ON BACK OF ELECTRICAL CABINET USING KNOCKOUTS.

SCALE: 1/2" = 1"

DATE: MAY 1, 1951

EC8-0089

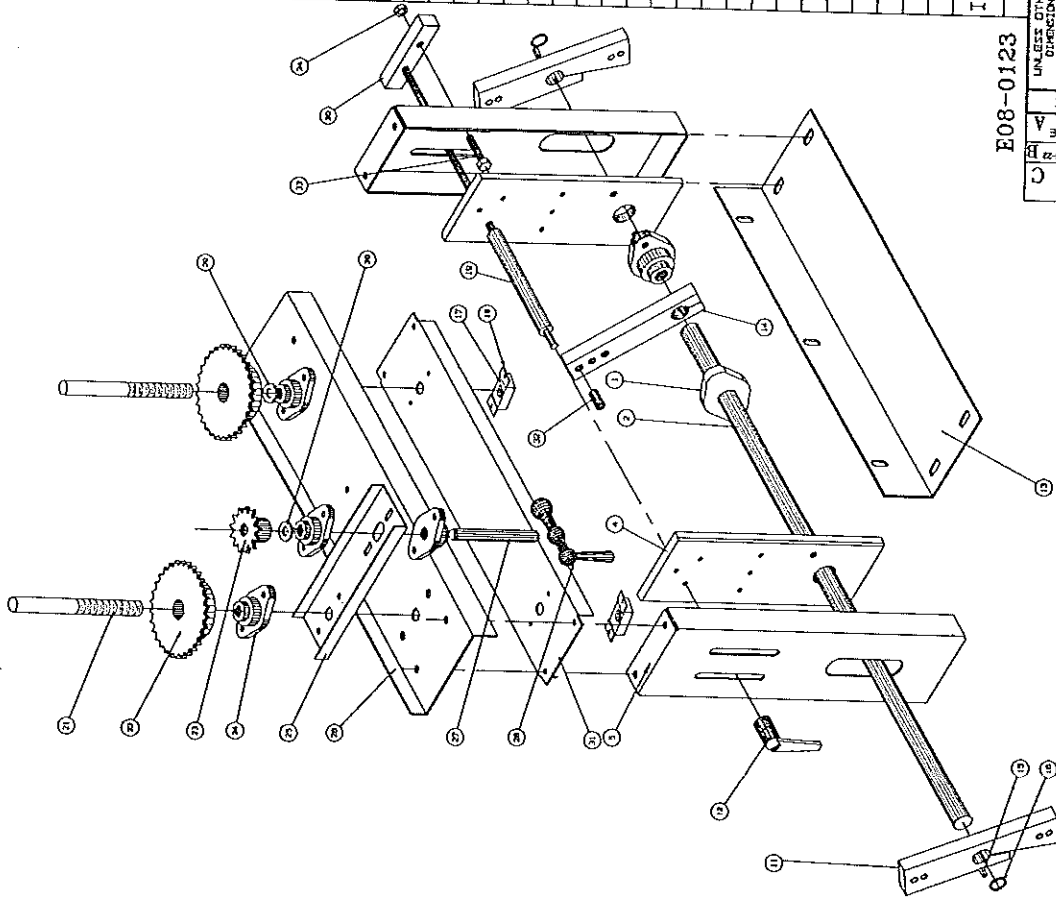
4 3 2 1



NOTE:
RIBBON DOPE ALL PIPE THREADS.

SHANKLIN CORPORATION 1000 SHANKLIN DRIVE AUSTIN, TEXAS 78701		DATE 2-26-93	REV F-ALL
DESCRIPTION HIGH SPEED CYLINDER ASSY		FIG NO E08-0122	
DESIGNED BY J. L. SHANKLIN		DATE 2-26-93	
CHECKED BY J. L. SHANKLIN		DATE 2-26-93	
APPROVED BY J. L. SHANKLIN		DATE 2-26-93	
REVISIONS 1. 12-8-93 R. L. SHANKLIN 2. 12-8-93 R. L. SHANKLIN 3. 12-8-93 R. L. SHANKLIN		DATE 2-26-93	

97-12-94A

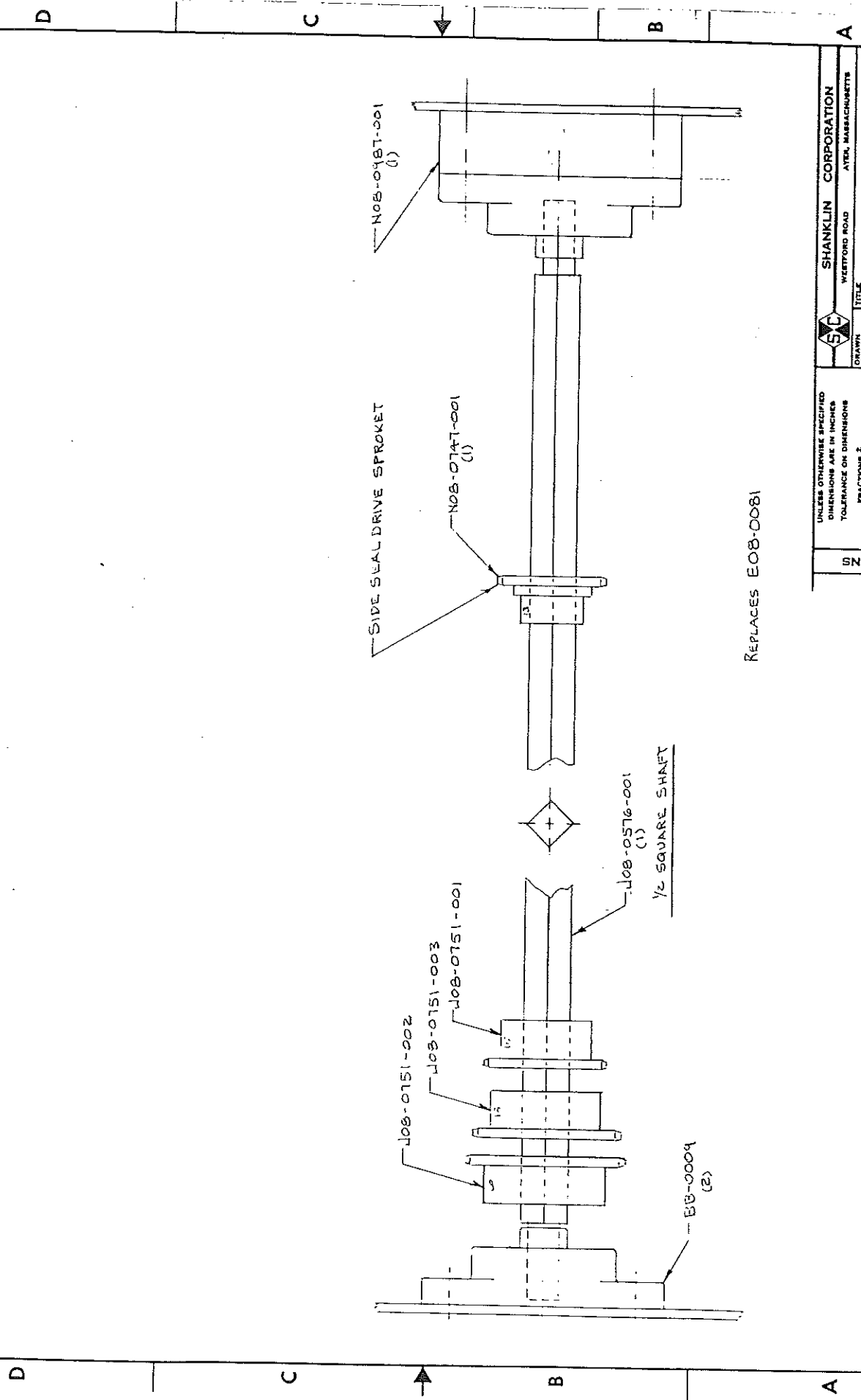


34	NUT-104	NUT-136	3/8-16 HEX JAW NUT	1
33	SCR-193	SCR-091	3/8-16 * 1-3/4 HEX HEAD SCREW	1
32	J01-0022-003	J01-0022-003	SPACER	1
31	N05-0462-001	N05-0462-003	MOUNTING PLATE	1
30	J01-0021-025	J01-0021-025	WASHER 3/16 THK	1
29	J01-0021-026	J01-0021-026	WASHER #14 GA	1
28	N05-0160-001	N05-0160-001	BALL CRANK	1
27	N05-0558-001	N05-0558-002	ROLLER SHAFT	1
26	J08-0099-001	J08-0099-002	TOP SUPPORT	1
25	J08-0389-001	J08-0389-002	CRANK OUT RIGGER	1
24	BB-0004	BB-0114	2 HOLE FLANGE BEARING	4
23	J06-0063-161	J01-0013-012	SPROCKET 35B13	1
22	N05-0419-002	N05-0419-003	SPROCKET 35B25	2
21	N05-0417-001	N05-0417-002	TRAVELING SCREW	2
20	N05-2880-001	N05-2880-001	CLAMPING TEE ASSY	1
19	J01-0022-046	J01-0022-046	SPACER 20 1/4 LG	1
18	N05-0224-001	N05-0224-001	NUT RETAINER	2
17	N05-1918-001	N05-1918-002	ADJUSTING NUT	2
16	SC-0022	SC-0060	SHAP RING	2
15	N01-0008-009	N01-0045-009	KEY	2
14	N08-0036-001	N08-0036-001	JAW CRANK	1
13	N08-0100-001	N08-0100-002	MOUNTING ANGLE	1
12	HA-0093	HA-0093	KIPP HANDLE 3/8-16	1
11	N05-0359-001	N05-0359-001	JAW CRANK PAIR	1
10				
9				
8				
7				
6				
5	J05-2279-001	J05-2279-001	SIDE SUPPORT	2
4	N05-0455-001	N05-0455-001	SHAFT MOUNTING PLATE	1
3				
2	N05-0428-001	N05-0428-003	JAW TOGGLE SHAFT	1
1	BB-0012	BB-0113	FLANGE BEARING UNIT	2
	PART NO. -CS	PART NO. -SST		
	REF F0013A	REF F0013A		
ITEM			DESCRIPTION	QTY.

E08-0123

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON DIMENSIONS		SHANKLIN CORPORATION WESTFORD ROAD AYER, MASSACHUSETTS	
REVISIONS	DATE	BY	CHKD
1	7-27-94	J. ORSINI	J. ORSINI
2	8-15-94	J. ORSINI	J. ORSINI
3	8-15-94	J. ORSINI	J. ORSINI
4	8-15-94	J. ORSINI	J. ORSINI
5	8-15-94	J. ORSINI	J. ORSINI
6	8-15-94	J. ORSINI	J. ORSINI
7	8-15-94	J. ORSINI	J. ORSINI
8	8-15-94	J. ORSINI	J. ORSINI
9	8-15-94	J. ORSINI	J. ORSINI
10	8-15-94	J. ORSINI	J. ORSINI
11	8-15-94	J. ORSINI	J. ORSINI
12	8-15-94	J. ORSINI	J. ORSINI
13	8-15-94	J. ORSINI	J. ORSINI
14	8-15-94	J. ORSINI	J. ORSINI
15	8-15-94	J. ORSINI	J. ORSINI
16	8-15-94	J. ORSINI	J. ORSINI
17	8-15-94	J. ORSINI	J. ORSINI
18	8-15-94	J. ORSINI	J. ORSINI
19	8-15-94	J. ORSINI	J. ORSINI
20	8-15-94	J. ORSINI	J. ORSINI
21	8-15-94	J. ORSINI	J. ORSINI
22	8-15-94	J. ORSINI	J. ORSINI
23	8-15-94	J. ORSINI	J. ORSINI
24	8-15-94	J. ORSINI	J. ORSINI
25	8-15-94	J. ORSINI	J. ORSINI
26	8-15-94	J. ORSINI	J. ORSINI
27	8-15-94	J. ORSINI	J. ORSINI
28	8-15-94	J. ORSINI	J. ORSINI
29	8-15-94	J. ORSINI	J. ORSINI
30	8-15-94	J. ORSINI	J. ORSINI
31	8-15-94	J. ORSINI	J. ORSINI
32	8-15-94	J. ORSINI	J. ORSINI
33	8-15-94	J. ORSINI	J. ORSINI
34	8-15-94	J. ORSINI	J. ORSINI

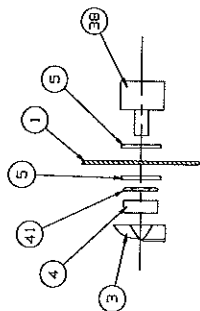
4 3 2 1



SIDE SEAL DRIVE SPROKET

REPLACES EOB-0081

SHANKLIN CORPORATION WESTFORD ROAD ATEL, MASSACHUSETTS		TITLE SIDE SEAL DRIVE SHAFT L.O.		REV E08-0157	
DESIGNED FOR F-1 & F-5	SCALE 1" = 1'-0"	DATE 8-17-94	DRAWN LARGE		
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON DIMENSIONS FRACTIONS ± .005 DECIMALS ± .001 ANGLES ± .001		DO NOT SCALE DRAWING REMOVE BURNS AND SHARP EDGES			
REVISIONS					



PARTIAL SECTION A-A
SCALE: NONE

FILLER PLATE REFERENCE CHART		
DESCRIPTION	PARTS LIST DRAWING NUMBER	
H. K. WASTIC SEALER	F04444	505-0267
H. K. WASTIC SEALER	F04444	505-0268
H. K. WASTIC SEAL	F04444	505-0270
H. K. WASTIC SEAL	F04444	505-0269
H. K. WASTIC SEAL	F04444	505-0271
H. K. WASTIC SEAL	F04444	505-0270
H. K. WASTIC SEAL	F04444	505-0271

FOR CIEL DET. JAN. 1978 PARTS LIST DRAWING NUMBER 138-1210-0000

NOTES:

- A** EXPOSE 1/8" OF BARE METAL AROUND MOUNTING HOLE, USE AN INTERNAL TOOTH LOCKWASHER BETWEEN THE MOUNTING NUT AND THE PANEL.
- A** REMOVE FUSES; FUS01 & FUS02 AND REPLACE WITH ITEM S1).

XX
"JAMES O'NEAL, EDITOR"

(XX) "RESEARCH AND DEVELOPMENT"

B08-0146
REF: F0440B

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCE ON DIMENSIONS

INDIS

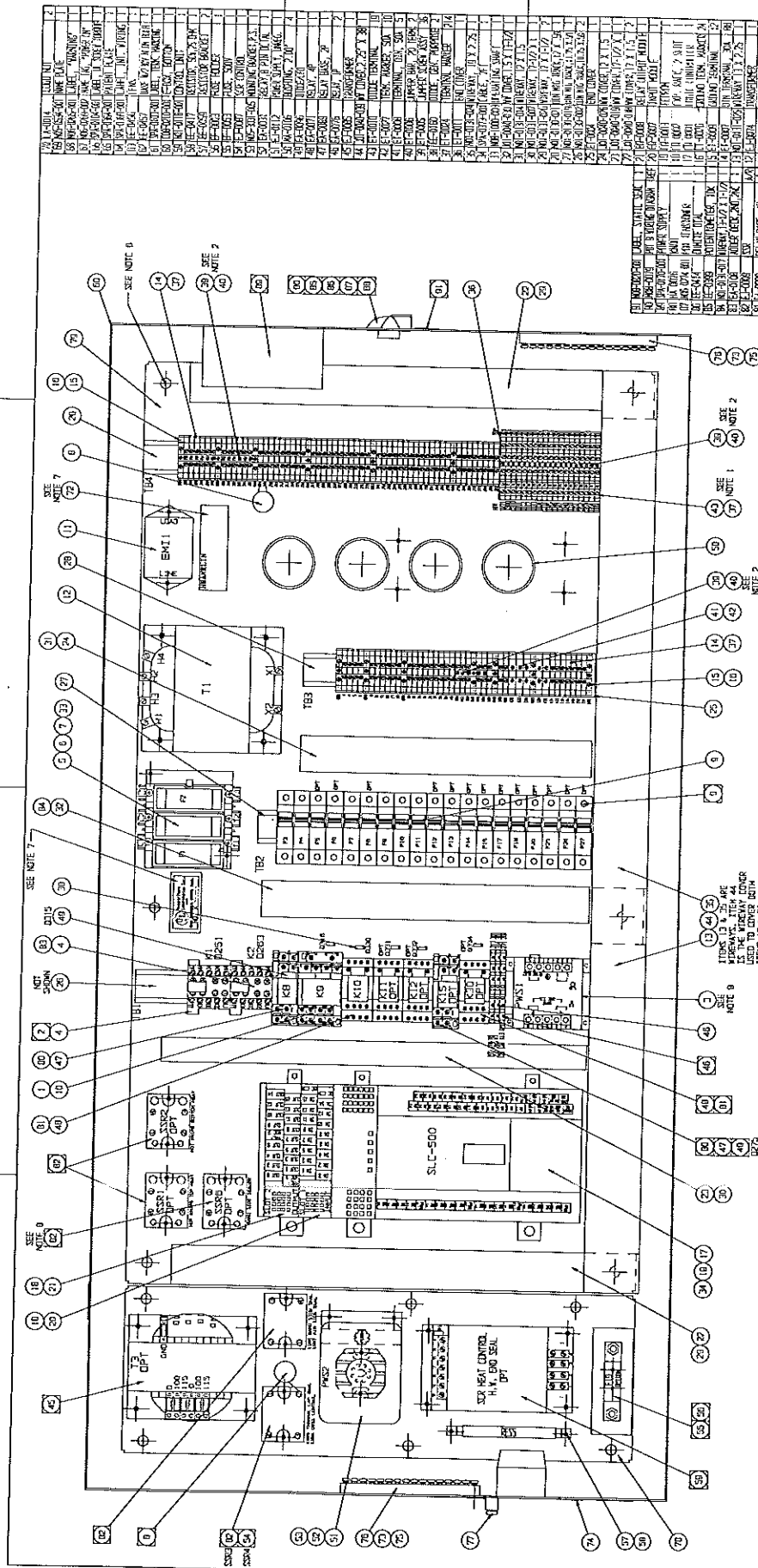
TOLERANCE ON DIMENSIONS

FRACTIONS ± _____

DECIMALS ± _____

REVIS
MACHINED FINISH

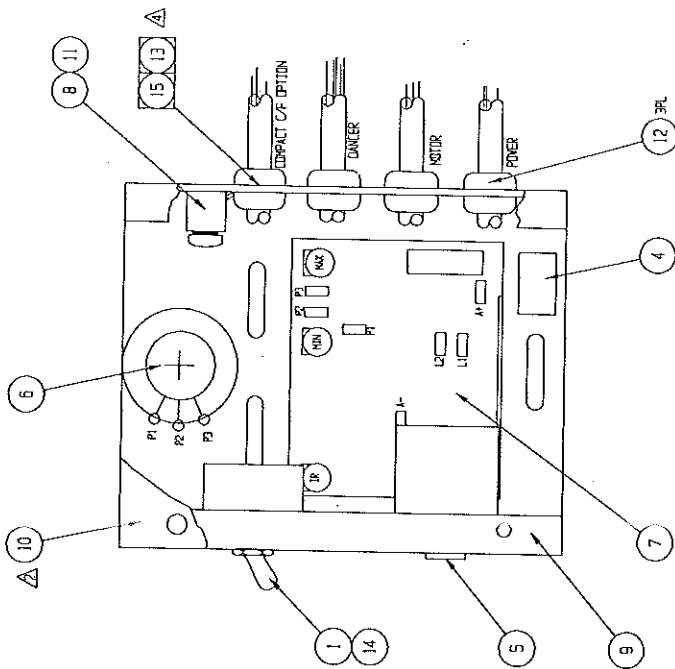
DO NOT SCALE DRAWING
REMOVE PIPES AND CHASES FIRST



NOTES:	
1.	REMOVE TAB FROM UPPER LEVEL JUMPER SEPARATOR.
2.	CUT JUMPER BAR (ITEM 40) FOR NUMBER OF TERMINAL JUMPERS REQUIRED.
3.	EXPLODE LAMP RING OF BASE METAL AROUND MOUNTING HOLE FOR T1, T2, AND T3. MOUNT EACH DIN RAIL WITH AN INTERNAL TIGHT LOCK WASHER BETWEEN RAIL AND PANEL.
4.	ITEM NUMBERS 51 - 71 ARE NOT SHOWN AND CAN BE FOUND ON THE ORDER.
5.	SEE DRAWING MOD-0007 & MOD-0008 FOR LABEL PLACEMENT.
6.	EXPLODE 1/2" RING OF BASE METAL AROUND MOUNTING HOLE. USE AN INTERNAL TIGHT LOCK WASHER BETWEEN THE MOUNTING NUT AND PANEL.
7.	THESE LABELS ARE ADDED AT FINAL ASSEMBLY.
8.	MOUNT SENS HERE 1/2" BAND SIDE SEAL AND AIR SIDE SEAL ARE INSTALLED.
9.	INSTALL A JUMPER BETWEEN TERMINALS 4 AND 5.

REVISIONS	
REV	DESCRIPTION
1	ISSUED FOR PRODUCTION
2	REVISION 1
3	REVISION 2
4	REVISION 3
5	REVISION 4
6	REVISION 5
7	REVISION 6
8	REVISION 7
9	REVISION 8
10	REVISION 9
11	REVISION 10
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BOM-0147	
REV	DESCRIPTION
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94	REVISION 93
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96	REVISION 95
97	REVISION 96
98	REVISION 97
99	REVISION 98
100	REVISION 99



- NOTES:
1. ATTACH WIRE LEADS TO THE REVERSING SWITCH AT WIRE POINT 1, 2, & 3. WITH THE DANGER SWITCH IN THE "ON" POSITION, THE MOTOR WILL RUN. MAX SPEED POT UNTIL THE VOLT METER READS 50 VOLTS D.C., AT WHICH POINT LEADS TO THE MOTOR.
 2. DRAWING IS SHOWN WITH ITEM 10 (POTENTIOMETER COVER) REMOVED FOR CLARITY.
 3. ITEM NUMBERS 2 & 3 POINT TO ITEM 10 (POTENTIOMETER COVER) AND ARE NOT SHOWN.
 4. INSTALL ITEM 13 (ABLE PLUG) WHEN CENTER REVERSED OPTION IS NOT USED.

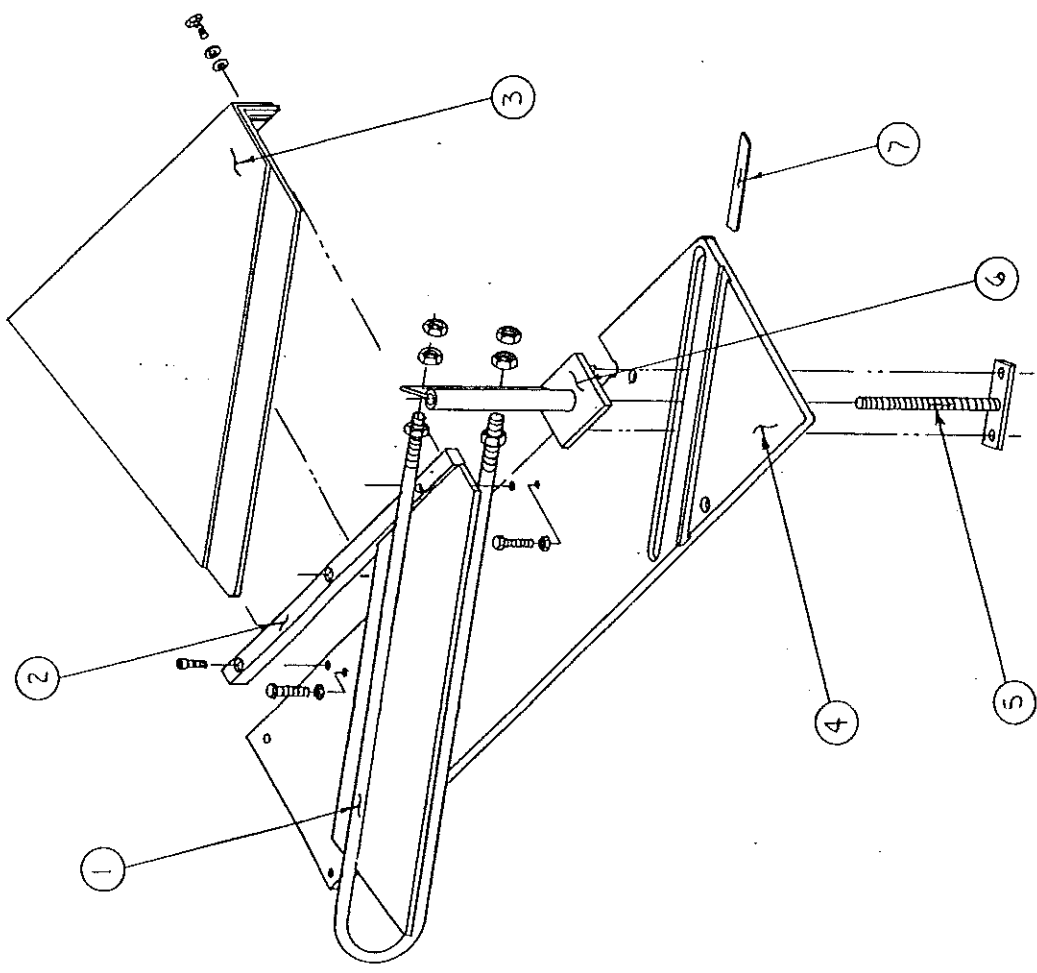
REFER TO SCHEMATICS: 3FF017 & 3ES017
REFER TO WIRE RUN LIST: WL-8110

E05-0209
REF: H0076J

ITEM	DESCRIPTION	QTY
1	17 HS-011	1
2	17 HS-012	1
3	17 HS-013	1
4	17 HS-014	1
5	17 HS-015	1
6	17 HS-016	1
7	17 HS-017	1
8	17 HS-018	1
9	17 HS-019	1
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11	17 HS-021	1
12	17 HS-022	1
13	17 HS-023	1
14	17 HS-024	1
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75	17 HS-085	1
76	17 HS-086	1
77	17 HS-087	1
78	17 HS-088	1
79	17 HS-089	1
80	17 HS-090	1
81	17 HS-091	1
82	17 HS-092	1
83	17 HS-093	1
84	17 HS-094	1
85	17 HS-095	1
86	17 HS-096	1
87	17 HS-097	1
88	17 HS-098	1
89	17 HS-099	1
90	17 HS-100	1
91	17 HS-101	1
92	17 HS-102	1
93	17 HS-103	1
94	17 HS-104	1
95	17 HS-105	1
96	17 HS-106	1
97	17 HS-107	1
98	17 HS-108	1
99	17 HS-109	1
100	17 HS-110	1

SHANKLIN CORPORATION		DATE	10/08/93	REV	C
WESTPORT ROAD		SCALE	1/1	E05-0209	
TITLE		CONTROL ASSEMBLY			
DESIGNED	BY	DEMAND FEED UNITS, HS & F			
CHECKED	BY				
APPROVED	BY				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON DIMENSIONS FRACTIONS ± 1/64 DECIMALS ± .015 ANGLES ± °					
DO NOT SCALE DRAWING MACHINE DIMS AND SHARP EDGES					
REVISIONS					
A	10/08/93	1	1	1	1
B	10/08/93	1	1	1	1
C	10/08/93	1	1	1	1

4 3 2 1



ITEM	PART NUMBER	DESCRIPTION	QTY
8	HA-0032	KIPP HANDLE	1
7	J08-0467-001	SCALE	1
6	J05-0067-001	INV. HD. MIE. POST	1
5	J05-2153-001	LOCKING ROD	1
4	J05-0089-001	SLIDE PLATE	1
3	J05-0086-001	INV. HEAD TABLE	1
2	J05-1530-001	SUPPORT BAR	1
1	J05-0528-	INV. HEAD (SHO)	0

SHANKLIN CORPORATION WESTFORD ROAD ATEL, MASSACHUSETTS	
DRAWN BY CHECKED BY DESIGNED BY	TITLE INV. HEAD TABLE ASSY. FOR
APPROVED BY DATE 10-25-93	SCALE HS, F
REVISIONS	

UNLESS OTHERWISE SPECIFIED
 DIMENSIONS ARE IN INCHES
 TOLERANCE ON DIMENSIONS
 FRACTIONS ±
 DECIMALS ±
 ANGLES ±
 MACHINED FINISH ☒ FILE
 DO NOT SCALE DRAWING
 REMOVE BURRS AND SHARP EDGES

7/1-94
 11-7-94

4 3 2 1

NOTE FOR ASSY.
OIL BEARINGS LIGHTLY WITH
SAE NO. 10 NON-DETERGENT
OIL.

J01-0003-43 PIN

J05-0401-1 DANCER FRAME

SC-0010 SNAPPING
2 REQ'D

BC-0053 BEARING
2 REQ'D

N05-1018-1 ROLLER MOUNT
2 REQ'D

SCR-214
1/2-13 x 1/2 H.R.C.S.
NUT-063
1/2-13 Dura Nut

J01-0007-066 ROLLER
1 1/2 x 27

(4) 1/4-20X5/8 HH, DURA NUT
SCR-148
NUT-056

BC-0055 KILLIAN BEARING (2 REQ'D)

SCR-2102
1/4-20 x 1/2 SET SCREW
2 REQ'D

5D-0100
TIMING BELT

SEE DETAIL BELOW

DANCER FRAME
H0076A

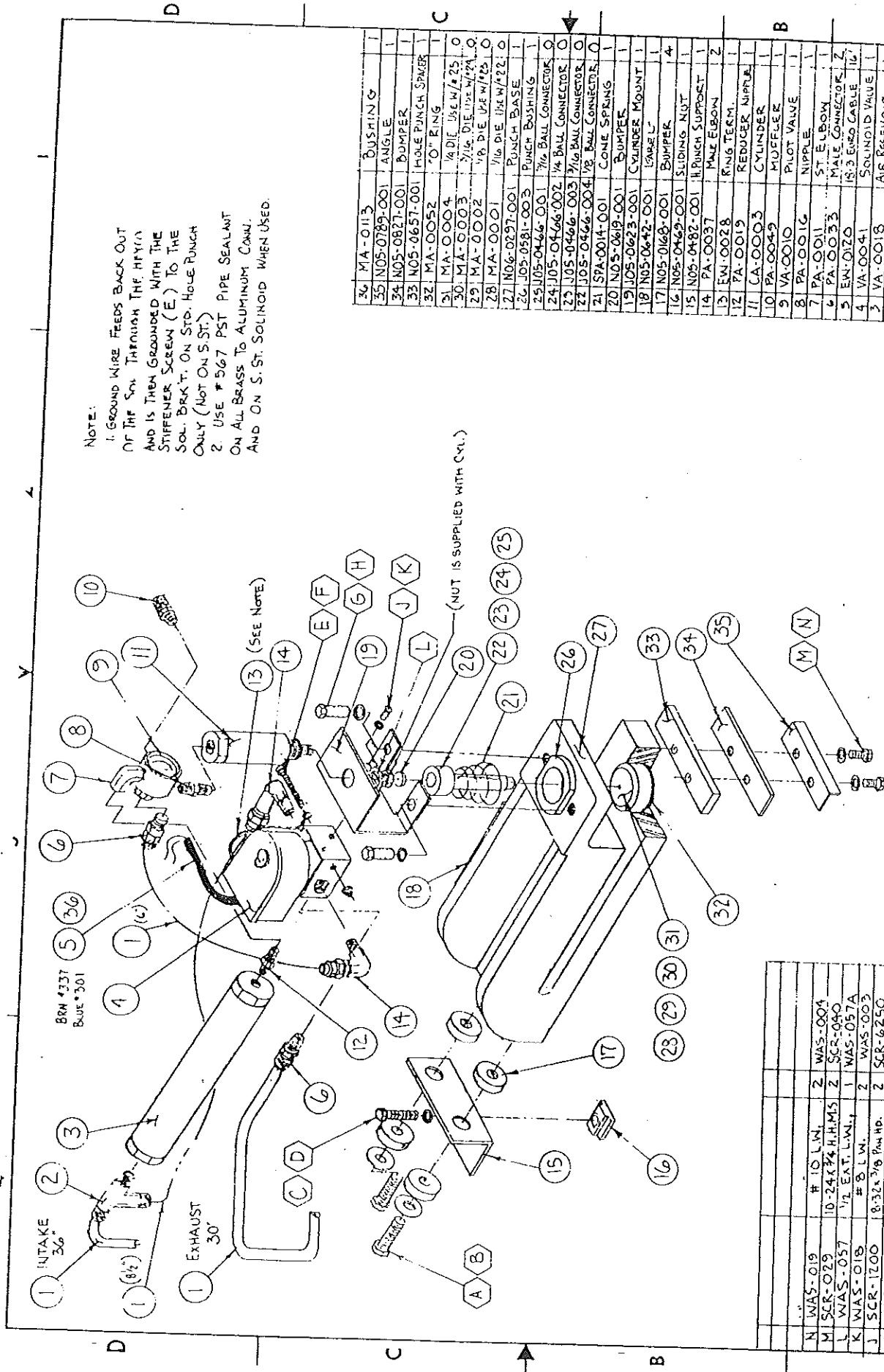


DETAIL A

- NOTES:
1. WHEN ORDERING PARTS USE DRAWING NUMBER PLUS PART NUMBER. EXAMPLE: E05-0061 & J01-0007-53
 2. SPECIFY MODEL NO. & SERIAL NO. OF MACHINE WHEN ORDERING PARTS.

E05-0230

SHANKLIN CORPORATION WESTFORD ROAD ATLANTA, GEORGIA 30326		H0076	
TITLE DANCER ROLL ASSY.		DATE 3-3-95	
DRAWN BY J. J. JONES		SCALE 1" = 1"	
CHECKED BY J. J. JONES		NUMBER E05-0230	
MACHINING FINISH DO NOT SCALE DRAWING REMOVE BURRS AND SHARP EDGES		REV. 1	

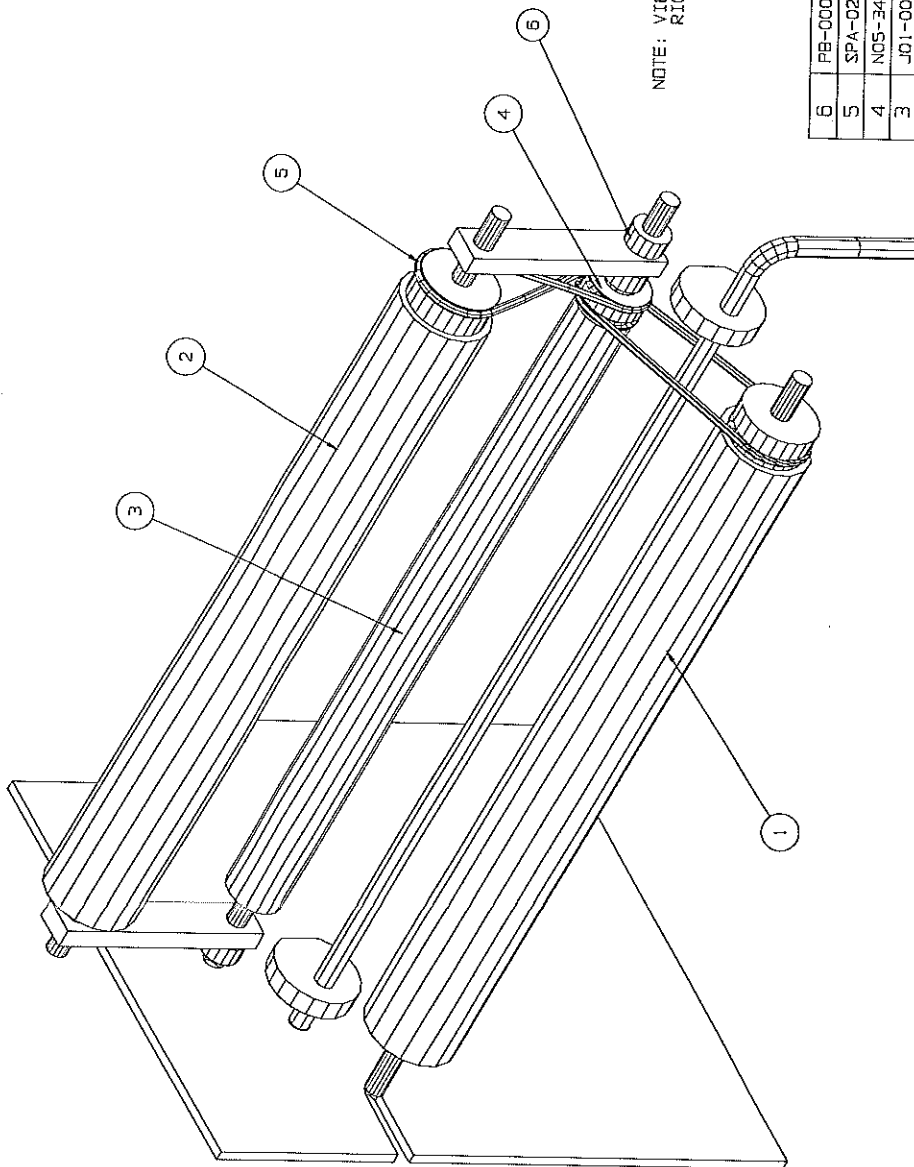


NOTE:

1. GROUND WIRE FEEDS BACK OUT OF THE SOL THROUGH THE HYDRA AND IS THEN GROUNDED WITH THE STIFFENER SCREEN (E) TO THE SOL. BRKT. ON STD. HOLE PUNCH ONLY (NOT ON S. ST.)
2. USE #567 PST PIPE SEALANT ON ALL BRASS TO ALUMINUM CONJ. AND ON S. ST. SOLINOID WHEN USED.

ITEM	DESCRIPTION	QTY
36	MA-0113 BUSHING	1
35	NOS-0789-001 ANGLE	1
34	NOS-0827-001 BUMPER	1
33	NOS-0657-001 HOLE PUNCH SPACER	1
32	MA-0052 70" RING	1
31	MA-0004 1/4" DIE USE W/ #25	0
30	MA-0003 1/4" DIE USE W/ #24	0
29	MA-0002 1/4" DIE USE W/ #23	0
28	MA-0001 1/4" DIE USE W/ #22	0
27	NOS-0897-001 PUNCH BASE	1
26	NOS-0581-003 PUNCH BUSHING	1
25	NOS-0466-001 1/4" BALL CONNECTOR	0
24	NOS-0466-002 1/4" BALL CONNECTOR	0
23	NOS-0466-003 1/4" BALL CONNECTOR	0
22	NOS-0466-004 1/4" BALL CONNECTOR	0
21	SPA-0014-001 CONE SPRING	1
20	NOS-0819-001 BUMPER	1
19	NOS-0623-001 CYLINDER MOUNT	1
18	NOS-0642-001 LABEL	1
17	NOS-0168-001 BUMPER	4
16	NOS-0469-001 SLIDING NUT	1
15	NOS-0482-001 H. PUNCH SUPPORT	1
14	PA-0037 RING TERM.	2
13	EW-0028 RING TERM.	1
12	PA-0019 REDUCER NUT	1
11	CA-0003 CYLINDER	1
10	PA-0049 MUFFLER	1
9	VA-0010 PILOT VALVE	1
8	PA-0016 NIPPLE	1
7	PA-0011 ST. ELBOW	1
6	PA-0033 MALE CONNECTOR	2
5	EW-0120 1/2" EMO CABLE	16
4	VA-0041 SOLINOID VALVE	1
3	VA-0018 AIR RESERVOIR	1
2	PA-0042 TEE	1
1	PA-0104 1/4" AIR HOSE	7'

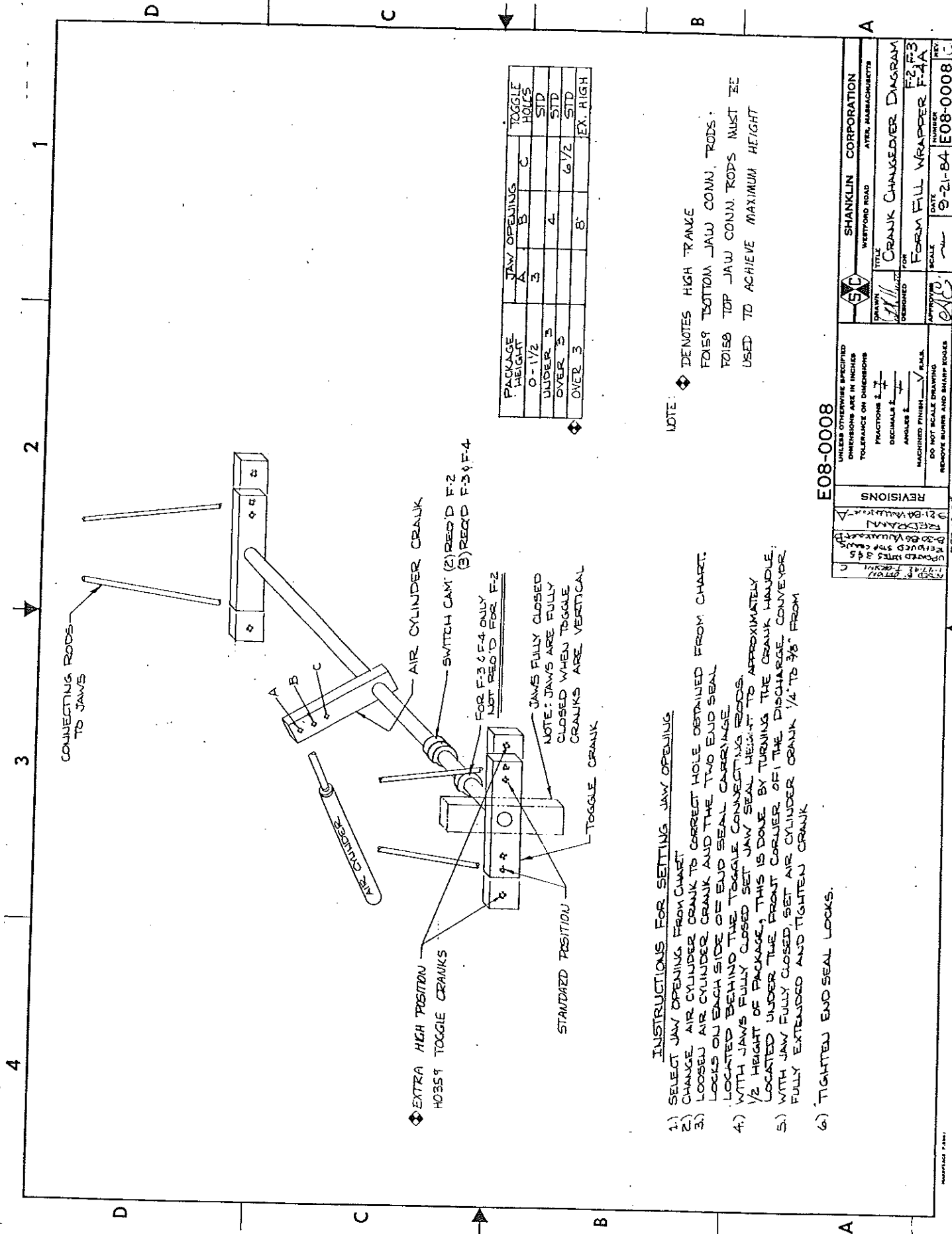
SHANKLIN CORPORATION WESTFORD ROAD AYER, MASSACHUSETTS	
DATE	3/16/95
SCALE	1/2
TITLE HOLE PUNCH ASSEMBLY	
STD. & SST. HS-1 24VOLT	
APPROVED	DESIGNED
REVISIONS	REVISIONS
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON DIMENSIONS FRACTIONS 1/16, 1/8, 1/4, 1/2, 3/4, 1, 2, 3, 4, 5, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 150, 152, 154, 156, 158, 160, 162, 164, 166, 168, 170, 172, 174, 176, 178, 180, 182, 184, 186, 188, 190, 192, 194, 196, 198, 200, 202, 204, 206, 208, 210, 212, 214, 216, 218, 220, 222, 224, 226, 228, 230, 232, 234, 236, 238, 240, 242, 244, 246, 248, 250, 252, 254, 256, 258, 260, 262, 264, 266, 268, 270, 272, 274, 276, 278, 280, 282, 284, 286, 288, 290, 292, 294, 296, 298, 300, 302, 304, 306, 308, 310, 312, 314, 316, 318, 320, 322, 324, 326, 328, 330, 332, 334, 336, 338, 340, 342, 344, 346, 348, 350, 352, 354, 356, 358, 360, 362, 364, 366, 368, 370, 372, 374, 376, 378, 380, 382, 384, 386, 388, 390, 392, 394, 396, 398, 400, 402, 404, 406, 408, 410, 412, 414, 416, 418, 420, 422, 424, 426, 428, 430, 432, 434, 436, 438, 440, 442, 444, 446, 448, 450, 452, 454, 456, 458, 460, 462, 464, 466, 468, 470, 472, 474, 476, 478, 480, 482, 484, 486, 488, 490, 492, 494, 496, 498, 500, 502, 504, 506, 508, 510, 512, 514, 516, 518, 520, 522, 524, 526, 528, 530, 532, 534, 536, 538, 540, 542, 544, 546, 548, 550, 552, 554, 556, 558, 560, 562, 564, 566, 568, 570, 572, 574, 576, 578, 580, 582, 584, 586, 588, 590, 592, 594, 596, 598, 600, 602, 604, 606, 608, 610, 612, 614, 616, 618, 620, 622, 624, 626, 628, 630, 632, 634, 636, 638, 640, 642, 644, 646, 648, 650, 652, 654, 656, 658, 660, 662, 664, 666, 668, 670, 672, 674, 676, 678, 680, 682, 684, 686, 688, 690, 692, 694, 696, 698, 700, 702, 704, 706, 708, 710, 712, 714, 716, 718, 720, 722, 724, 726, 728, 730, 732, 734, 736, 738, 740, 742, 744, 746, 748, 750, 752, 754, 756, 758, 760, 762, 764, 766, 768, 770, 772, 774, 776, 778, 780, 782, 784, 786, 788, 790, 792, 794, 796, 798, 800, 802, 804, 806, 808, 810, 812, 814, 816, 818, 820, 822, 824, 826, 828, 830, 832, 834, 836, 838, 840, 842, 844, 846, 848, 850, 852, 854, 856, 858, 860, 862, 864, 866, 868, 870, 872, 874, 876, 878, 880, 882, 884, 886, 888, 890, 892, 894, 896, 898, 900, 902, 904, 906, 908, 910, 912, 914, 916, 918, 920, 922, 924, 926, 928, 930, 932, 934, 936, 938, 940, 942, 944, 946, 948, 950, 952, 954, 956, 958, 960, 962, 964, 966, 968, 970, 972, 974, 976, 978, 980, 982, 984, 986, 988, 990, 992, 994, 996, 998, 1000	



NOTE: VIEW OF UNWIND IS SHOWN WITHOUT
RIGHT HAND SIDE FOR CLARITY

ITEM	PART NO.	DESCRIPTION	QTY.
6	PB-0003	COLLAR	3
5	SPA-0285-001	ROUND BELT 203/16 X 14 1/4	2
4	NOS-3404-001	ROUND BELT PULLEY	1
3	J01-0007-051	ROLLER 1 1/2 X 26 3/16	1
2	J01-0053-012	NIP UNWIND ROLL 27 3/8 LG	1
1	J01-0053-012	UNWIND DR. ROLL 27 3/8 LG	1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON DIMENSIONS		SHANKLIN CORPORATION WESTFORD ROAD AYER, MASSACHUSETTS	
FRACTIONS ± 1/64	DECIMALS ± .005	TITLE	DRIVEN NIP ROLLS ASSY
ANGLES ± °	MACHINED FINISH	DATE	7-18-95
DO NOT SCALE DRAWING REMOVE BURRS AND SHARP EDGES		SCALE	1/2
REVISIONS		APPROVED	HS & F UNWINDS
A 08/19/95 PLANT		E05-0252B	
B 08/19/95 PLANT		E05-0252B	



PACKAGE HEIGHT	JAW OPENING	TOGGLE HOLES
0 - 1/2	A	C
UNDER 3	3	STD
OVER 3	4	STD
OVER 3	6 1/2	STD
OVER 3	8	EX. HIGH

NOTE: ♦ DENOTES HIGH TRAKE
FO159 BOTTOM JAW CONN. RODS:
FO158 TOP JAW CONN. RODS MUST BE
USED TO ACHIEVE MAXIMUM HEIGHT

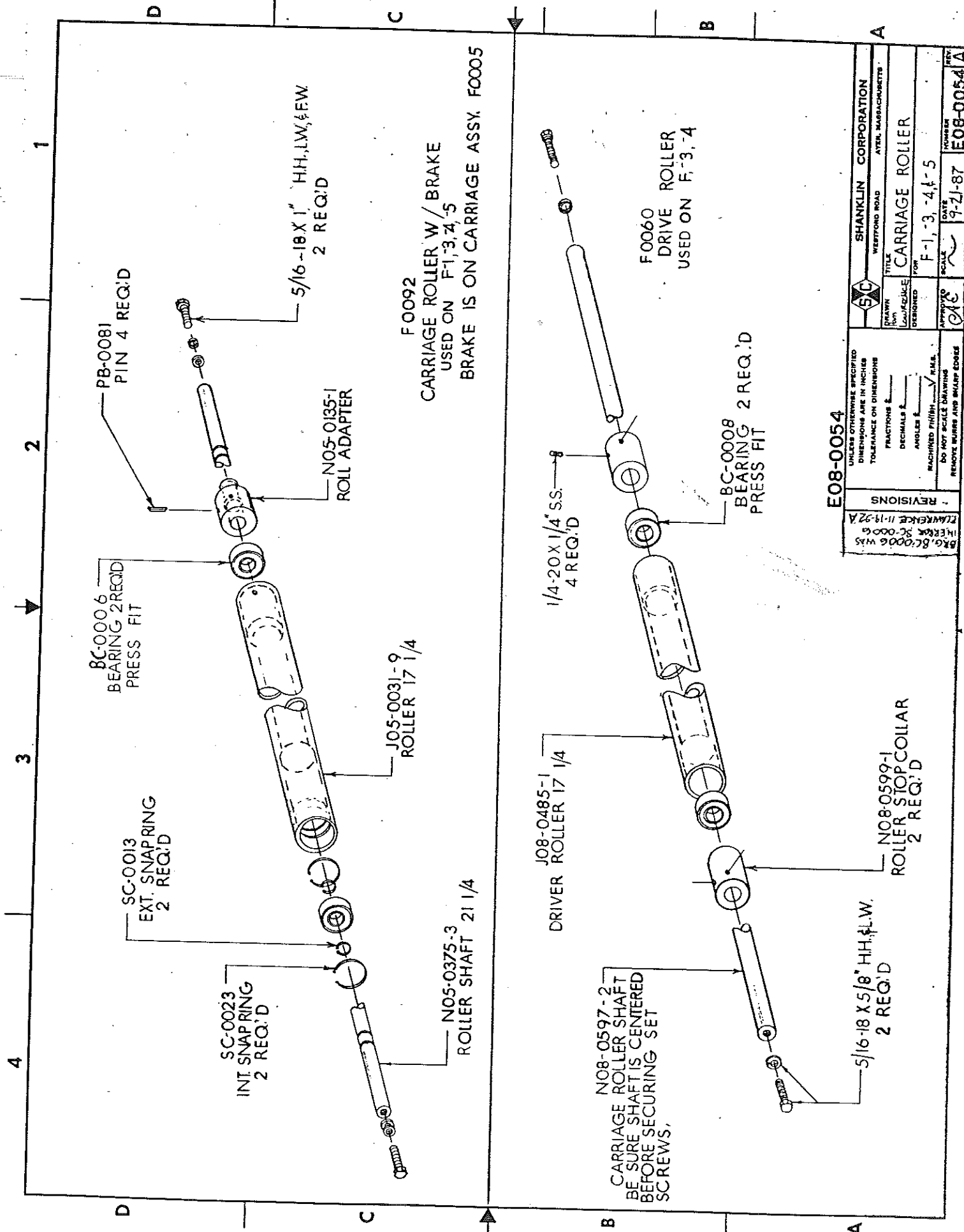
INSTRUCTIONS FOR SETTING JAW OPENING

- 1) SELECT JAW OPENING FROM CHART
- 2) CHANGE AIR CYLINDER CRANK TO CORRECT HOLE OBTAINED FROM CHART.
- 3) LOOSEN AIR CYLINDER CRANK AND THE TWO END SEAL LOCKS ON EACH SIDE OF END SEAL CARTRIDGE.
- 4) LOCATED BEHIND THE TOGGLE CONNECTING RODS. 1/2 HEIGHT OF PACKAGE, THIS IS DONE BY TURNING THE CRANK HANDLE. LOCATED UNDER THE FRONT CORNER OF THE DISCHARGE CONVEYOR.
- 5) WITH JAW FULLY CLOSED, SET AIR CYLINDER CRANK 1/4" TO 3/8" FROM FULLY EXTENDED AND TIGHTEN CRANK
- 6) TIGHTEN END SEAL LOCKS.

E08-0008

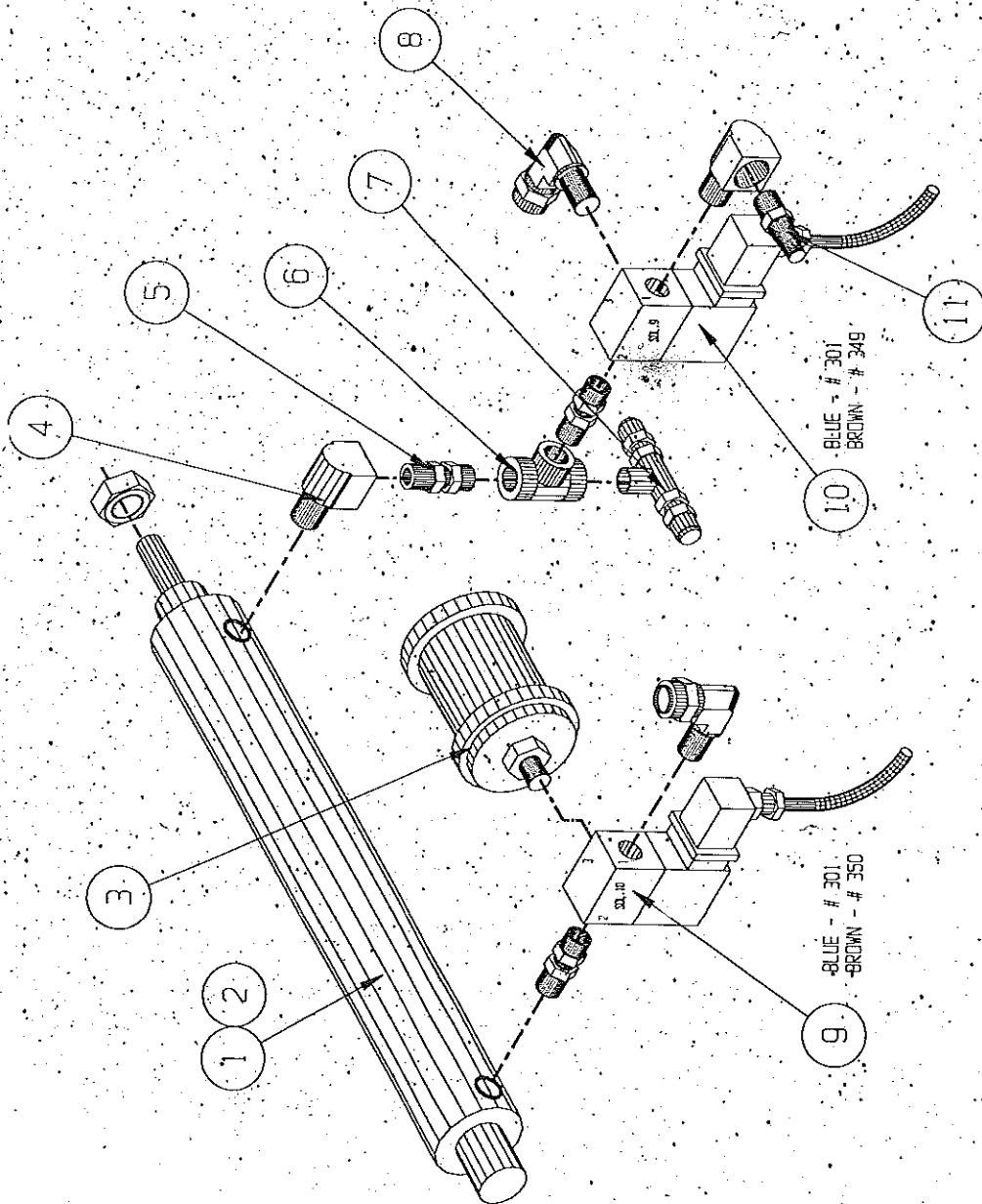
SHANKLIN CORPORATION WESTFORD ROAD AYER, MASSACHUSETTS		TITLE CRANK CHANGED OVER DIAGRAM FOR FORM FILL WRAPPER F-2A		DATE 9-21-84	REV C
DRAWN J. H. H. / J. H. H.		CHECKED J. H. H. / J. H. H.		APPROVED J. H. H. / J. H. H.	NUMBER E08-0008
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON DIMENSIONS		FRACTIONS 1/2 DECIMALS 1/16 ANGLES 1/2		DO NOT SCALE DRAWING REMOVE BURRS AND SHARP EDGES	
REVISIONS					
A 9-21-84 V. H. H. / J. H. H.					
B 9-21-84 V. H. H. / J. H. H.					
C 9-21-84 V. H. H. / J. H. H.					
D 9-21-84 V. H. H. / J. H. H.					

F-1,3,7,5



E08-0054

SHANKLIN CORPORATION WESTFORD ROAD WESTFORD, MASSACHUSETTS	
DESIGNED BY J. J. SHANKLIN	CHECKED BY J. J. SHANKLIN
TITLE CARRIAGE ROLLER	
FOR F-1, -3, -4, -5	
APPROVED BY J. J. SHANKLIN	DATE 9-21-87
SCALE E08-0054A	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON DIMENSIONS FRACTIONS $\pm$ DECIMALS $\pm$ ANGLES $\pm$ MACHINED FINISH $\sqrt{\text{RMS}}$ DO NOT SCALE DRAWING REMOVE BURRS AND SHARP EDGES	
REVISIONS REV. 1 DATE 11-19-82 BY J. J. SHANKLIN REASON BKG. BC-0006 WAS HEREIN SC-0006	

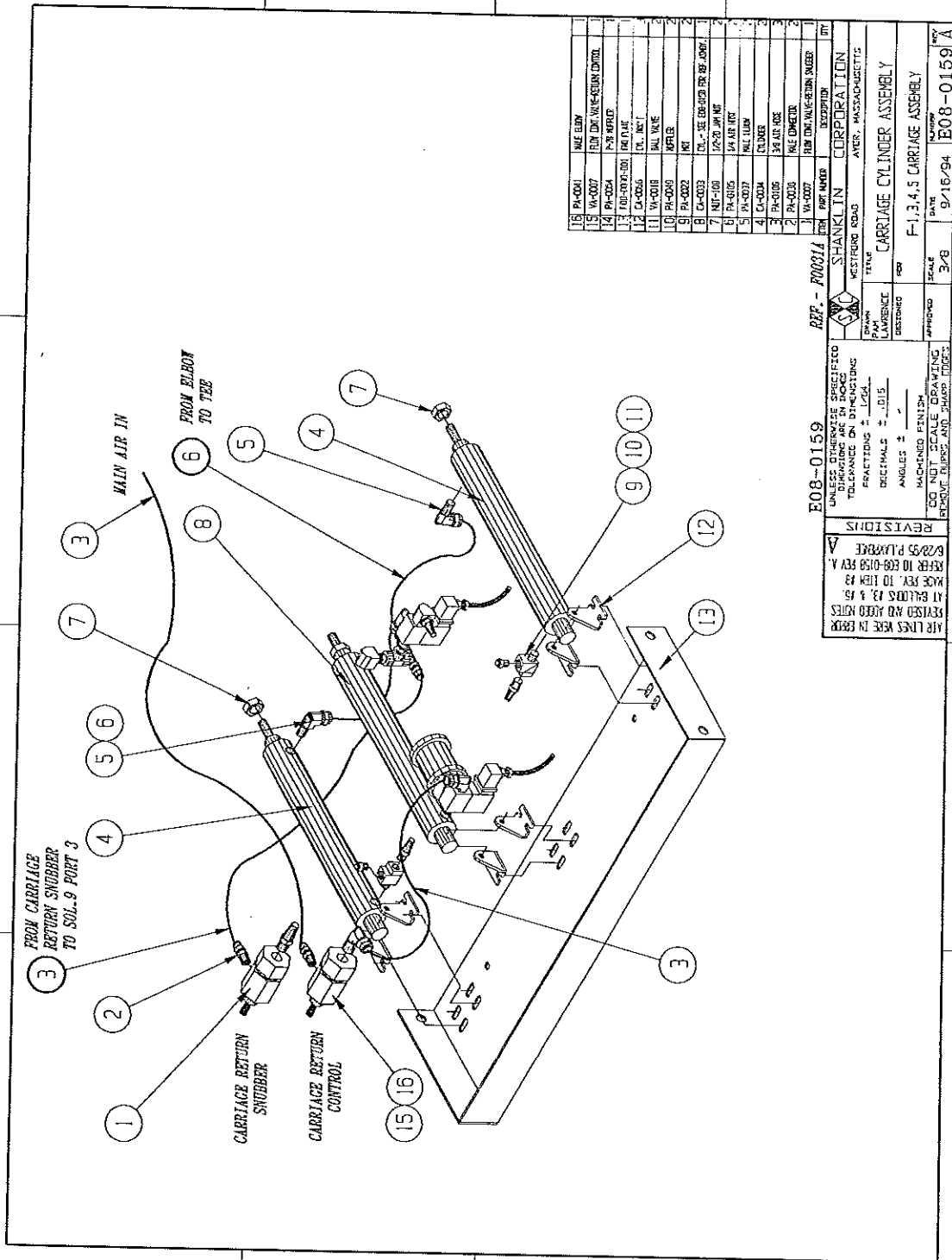


1	PA-0049	1/8" MUFFLER	1
2	VA-0046	24V VALVE SOL. 9	1
3	VA-0046	24V VALVE SOL. 10	1
4	PA-0040	MALE ELBOW	2
5	PA-0044	NUT	1
6	PA-0003	TEE	1
7	PA-0016	HEX NIP	3
8	PA-0011	ST. ELBOW	2
9	PA-0113	MUFFLER NUT	1
10	NIP-109	1/2-20 JAM NUT	1
11	CA-0033	CYLINDER	1

SHANKLIN CORPORATION WESTFORD ROAD AYER, MASSACHUSETTS	
TITLE PNEUMATICS ASSEMBLY	DATE 9/14/94
DRAWN PAM LAMRENCE	SCALE 3/4
DESIGNED FOR P-1,3,4,5 CARRAGE CYLINDER ASSEMBLY	REV E08-0158 A

REV	DESCRIPTION	DATE
1	TURNED WIRE CORRECTION ON SOL. 9, & SOL. 10 180 DEG. (TO POINT DOWN)	6/28/95 P. LARRENCE

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON DIMENSIONS
FRACTIONS $\pm 1/32$
DECIMALS $\pm .015$
ANGLES $\pm$
MACHINED FINISH
DO NOT SCALE DRAWING
REMOVE BURRS AND SHARP EDGES



16	PA-001	MALE ELBOW	1
15	VA-007	FROM CARRIAGE RETURN SNUBBER	1
14	PA-004	PA-004	1
13	LOH-003-001	PA-004	1
12	CA-005	TEE JOINT	1
11	VA-008	MALE WIRE	1
10	PA-006	APRIL	1
9	PA-002	TEE	1
8	CA-003	TEE - SEE END OF THE JOINT	1
7	NT-100	1/2-20 JPM ME	1
6	PA-005	PA-005	1
5	PA-007	PA-007	1
4	CA-004	ELBOW	1
3	PA-006	PA-006	1
2	PA-003	PA-003	1
1	VA-007	FROM CARRIAGE RETURN SNUBBER	1

REF - P00014

E08-0159

UNDER DEVELOPMENT
DIMENSIONS ARE IN INCHES
TOLERANCES ON DIMENSIONS
FRACTIONS ± 1/64
DECIMALS ± .015
ANGLES ± °

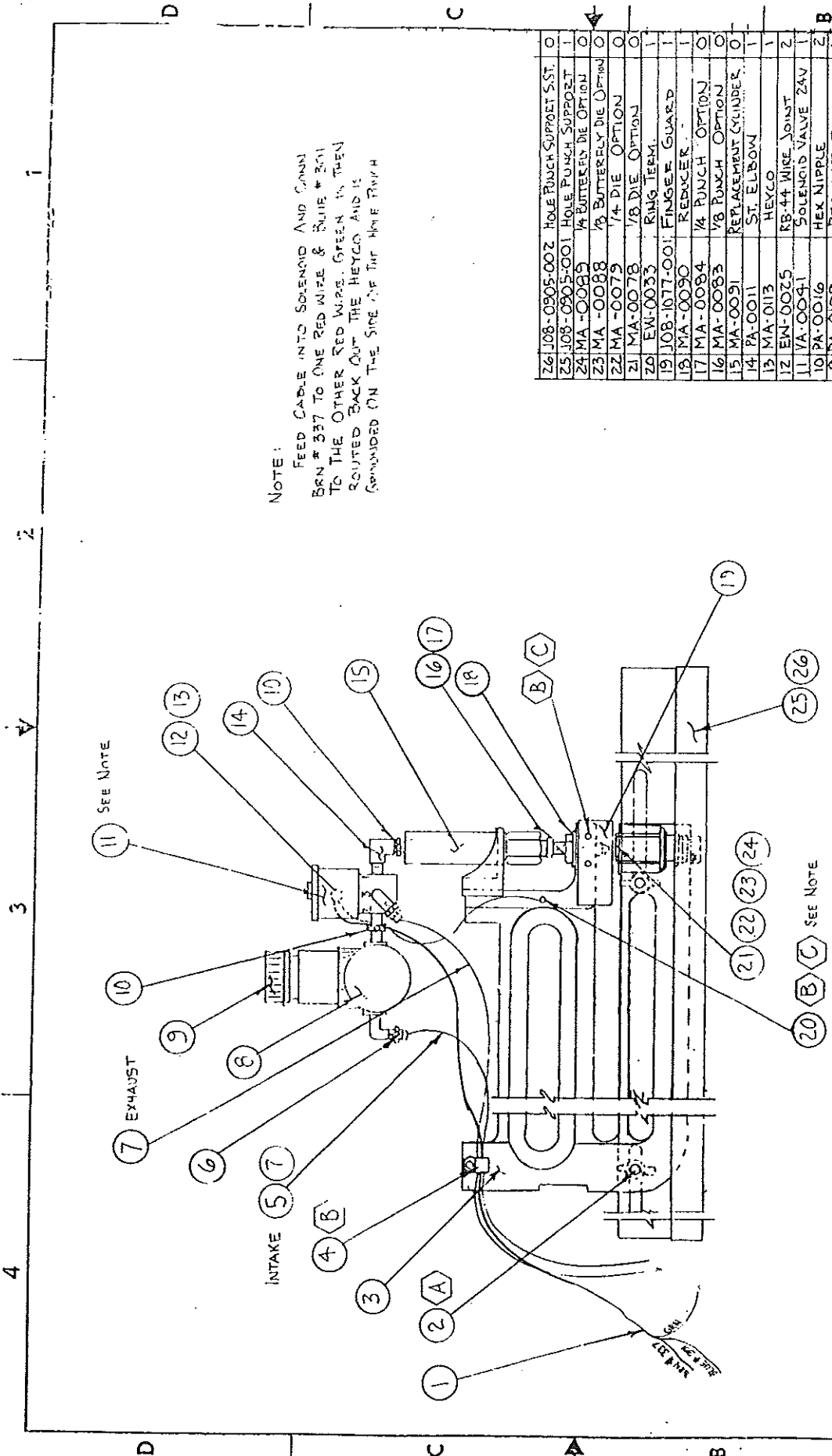
REVISIONS

DATE 9/16/94

SCALE 3/8

DATE 9/16/94

REV E08-0159 A



NOTE: FEED CABLE INTO SOLENOID AND CANNI BRN # 337 TO ONE RED WIRE & BLUE # 301 TO THE OTHER RED WIRE. GREEN IS THEN ROUTED BACK OUT THE HEYCO AND IS GROUND ON THE SIDE OF THE HOLE PUNCH

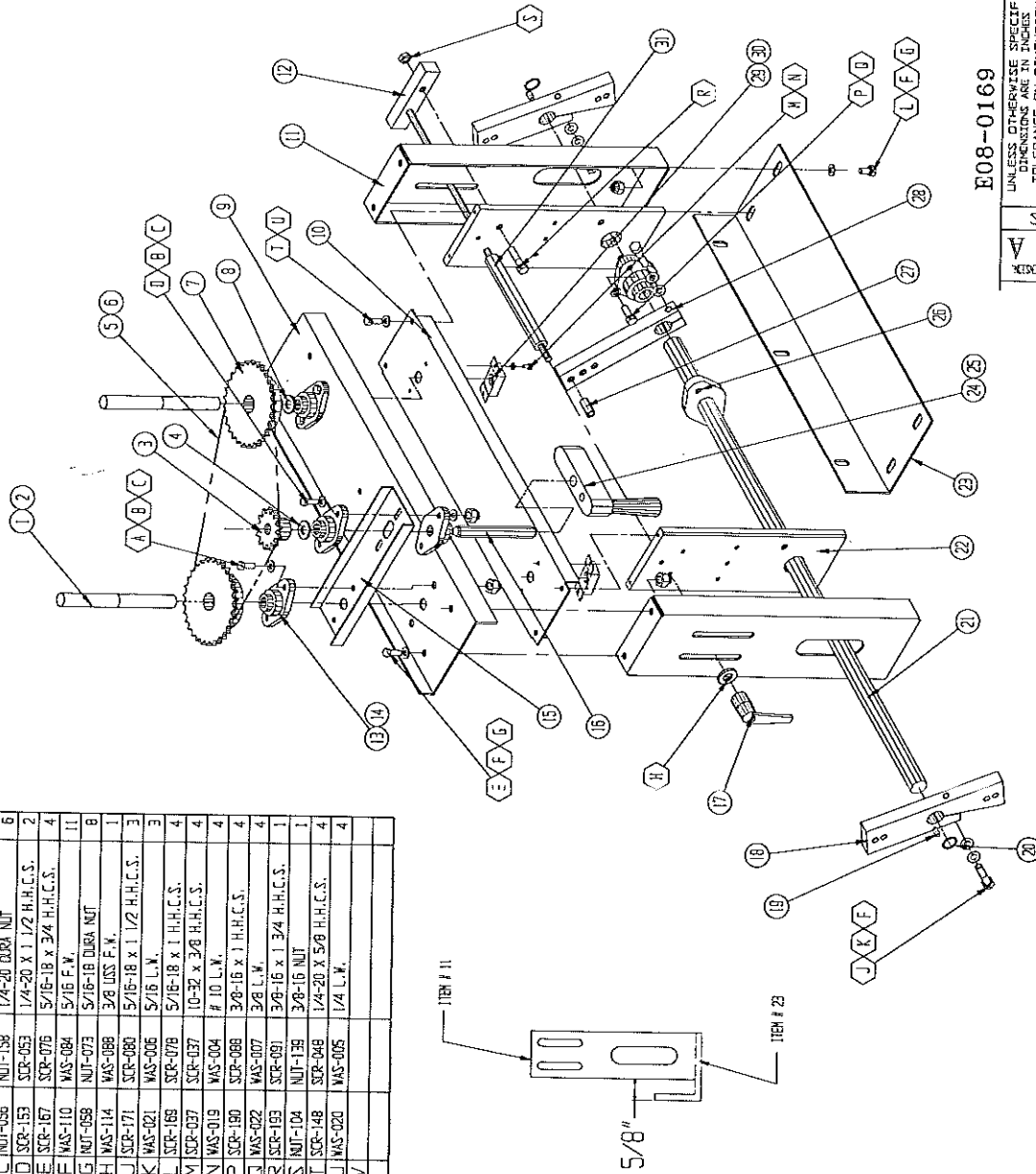
26	JOB-0905-002	HOLE PUNCH SUPPORT SST.	0
25	JOB-0905-001	HOLE PUNCH SUPPORT	1
24	MA-0085	1/4 BUTTERFLY DIE OPTION	0
23	MA-0088	3/8 BUTTERFLY DIE OPTION	0
22	MA-0079	1/4 DIE OPTION	0
21	MA-0078	1/8 DIE OPTION	0
20	EW-0033	RING TERM.	1
19	JOB-1077-001	FINGER GUARD	1
18	MA-0090	REDUCER	1
17	MA-0084	1/4 PUNCH OPTION	0
16	MA-0083	1/8 PUNCH OPTION	0
15	MA-0091	REPLACEMENT CYLINDER	0
14	PA-0011	ST. ELBOW	1
13	MA-0113	HEYCO	1
12	EW-0025	RB-44 WIRE JOINT	2
11	VA-0041	SOLENOID VALVE 2AV	1
10	PA-0016	HEX NIPPLE	2
9	PA-0109	REGULATOR	1
8	EE-0036	PRESSURE GAUGE	1
7	PA-0104	AIR TUBE 1'	2
6	PA-0037	MALE ELBOW	2
5	PA-0104	AIR TUBE 6'6" (15.7)	1
4	EE-0008	CABLE CLAMP	1
3	NOS-1738-001	PARK AIR HOLE PUNCH	1
2	N01-0121-001	THUMB SCREW	2
1	EW-0120	EURO CABLE 18-3 16FT	1
0		DESCRIPTION	0

SHANKLIN CORPORATION	
DATE	11-30-94
SCALE	1:1.5, 1:1.3, 1
APPROVED	
DESIGNED	
PARK AIR HOLE PUNCH ASSY	
E08-0160A	

REVISIONS	
1	REVISED AS SHOWN
2	REVISED AS SHOWN
3	REVISED AS SHOWN
4	REVISED AS SHOWN
5	REVISED AS SHOWN
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24	REVISED AS SHOWN
25	REVISED AS SHOWN
26	REVISED AS SHOWN

HARDWARE	
ITEM	DESCRIPTION
1	WAS-010 #8 LOCKWASHER
2	SCR-416 B-32X8 INNS
3	WAS-079 1/4 PLAT WASHER
4	WAS-079 1/4 PLAT WASHER
5	WAS-079 1/4 PLAT WASHER
6	WAS-079 1/4 PLAT WASHER
7	WAS-079 1/4 PLAT WASHER
8	WAS-079 1/4 PLAT WASHER
9	WAS-079 1/4 PLAT WASHER
10	WAS-079 1/4 PLAT WASHER
11	WAS-079 1/4 PLAT WASHER
12	WAS-079 1/4 PLAT WASHER
13	WAS-079 1/4 PLAT WASHER
14	WAS-079 1/4 PLAT WASHER
15	WAS-079 1/4 PLAT WASHER
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18	WAS-079 1/4 PLAT WASHER
19	WAS-079 1/4 PLAT WASHER
20	WAS-079 1/4 PLAT WASHER
21	WAS-079 1/4 PLAT WASHER
22	WAS-079 1/4 PLAT WASHER
23	WAS-079 1/4 PLAT WASHER
24	WAS-079 1/4 PLAT WASHER
25	WAS-079 1/4 PLAT WASHER
26	WAS-079 1/4 PLAT WASHER

ITEM	PART NUMBER	S.S.T. PART #	DESCRIPTION	QTY
A	SCR-152	SCR-052	1/4-20 X 1 1/4 H.H.C.S.	4
B	WAS-107	WAS-075	1/4 F.W.	8
C	NUT-056	NUT-158	1/4-20 DURA NUT	6
D	SCR-153	SCR-053	1/4-20 X 1 1/2 H.H.C.S.	2
E	SCR-167	SCR-076	5/16-18 X 3/4 H.H.C.S.	2
F	WAS-110	WAS-084	5/16 F.W.	11
G	NUT-058	NUT-073	5/16-18 DURA NUT	8
H	WAS-114	WAS-088	3/8 USS F.W.	1
J	SCR-171	SCR-080	5/16-18 X 1 1/2 H.H.C.S.	3
K	WAS-021	WAS-006	5/16 L.W.	3
L	SCR-169	SCR-078	5/16-18 X 1 H.H.C.S.	4
M	SCR-037	SCR-037	10-32 X 3/8 H.H.C.S.	4
N	WAS-019	WAS-004	# 10 L.W.	4
P	SCR-180	SCR-088	3/8-16 X 1 H.H.C.S.	4
Q	WAS-022	WAS-007	3/8 L.W.	4
R	SCR-193	SCR-091	3/8-16 X 1 3/4 H.H.C.S.	1
S	NUT-104	NUT-136	3/8-16 NUT	1
T	SCR-148	SCR-048	1/4-20 X 5/8 H.H.C.S.	4
LJ	WAS-020	WAS-005	1/4 L.W.	4
V				



31	J01-0022-046	J01-0022-046	SPACER 20 1/4 LG	1
30	N05-0024-001	N05-0024-001	NUT RETAINER	2
29	N05-1918-002	N05-1918-002	ADJUSTING NUT	2
28	N08-0036-001	N08-0036-001	JAW CRANK	1
27	J01-0022-003	J01-0022-003	SPACER	1
26	BB-0012	BB-0013	FLANGE BEARING UNIT	2
25	SCR-2102	SCR-2105	1/4-20 X 1/4 SET SCREW	1
24	N05-0160-001	N05-0160-001	CRANK	1
23	N08-0100-001	N08-0100-002	MOUNTING ANGLE	1
22	N05-0455-001	N05-0455-001	SHAFT MOUNTING PLATE	1
21	N05-0428-001	N05-0428-003	JAW TOGGLE SHAFT	1
20	SC-0022	SC-0050	SNAP RING	2
19	N01-0009-008	N01-0046-008	KEY	2
18	N05-0359-001	N05-0359-001	JAW CRANK PAIR	1
17	HA-0083	HA-0093	KIPP HANDLE 3/8-16	1
16	N05-0599-001	N05-0599-002	TOLER SHAFT	1
15	J08-0389-001	J08-0389-002	CRANK OUT BEGGER	1
14	HA-0078	HA-0079	NO TEG. HAY TITTING	2
13	BB-0004	BB-0114	2 HULL TLEAL BEARING	4
12	N05-2880-001	N05-2880-001	CLAMPING TEE-ASSY	1
11	J05-2279-001	J05-2279-001	SIDE SUPPORT	2
10	N05-0462-001	N05-0462-003	MOUNTING PLATE	1
9	J08-0089-001	J08-0089-002	TOP SUPPORT	1
8	J01-0021-026	J01-0021-028	WASFR 1/4 (A)	1
7	N05-0419-002	N05-0419-003	SPROCKET 35/625	2
6	SB-0016	SB-0016	# 35 CONN. LINK	1
5	SB-0003-0023	SB-0003-023	# 35 CHAIN 45 3/8	1
4	J01-0021-025	J01-0021-025	WASHER 3/16 THK	1
3	J08-0083-161	J01-0013-012	SPROCKET 35/613	1
2	PR-0081	PR-0091	SEL-LDC PIN	2
1	N05-0417-001	N05-0417-002	TRAVERSING SCREW	2
ITEM	PART NUMBER	S.S.T. PART NUMBER	DESCRIPTION	QTY

E08-0169		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON DIMENSIONS	
A		FRACTIONS ±	DECIMALS ±
		ANGLES ±	
		MACHINED FINISH	
		DO NOT SCALE DRAWING	
		REMOVE BURRS AND SHARP EDGES	

REVISIONS	DATE	BY	APP'D
1	5/18/95	LAURENCE	

SHANKLIN CORPORATION		WESTFORD ROAD		AYER, MASSACHUSETTS	
DRAWN BY		TITLE		SCALE	
LAURENCE		JAW HEIGHT ASSY.		NONE	
DATE		NUMBER		REV	
5/18/95		E08-0169		A	

SUB-ASSEMBLY DRAWING

5 4 3 2 1

NOTE:
 1. ACTIVATE CAM ON THE MICROSWITCH
 TO ACTIVATE ONLY ONE WAY TOWARD
 THE INFEED.

N05-0543-001
 SLIDE BLOCK

N05-0542-001
 GUIDE ROD 2 REQ'D

N05-0951-001
 SWITCH ACTUATOR

SC-0016
 SNAP RING 4 REQ'D

EB-0068
 SWITCH ACTUATOR
 EB-0061
 MICROSWITCH
 WHT TO PIN 4 BLK TO PIN 3

J05-0145-001
 END SUPPORT 2 REQ'D

N05-1011-001
 LOCKING KNOB
 10-24X1 3/4 RHMS

EE-0201

3/8 90° 2 SCREW CONN.

EE-0200

2 SCREW CONN.

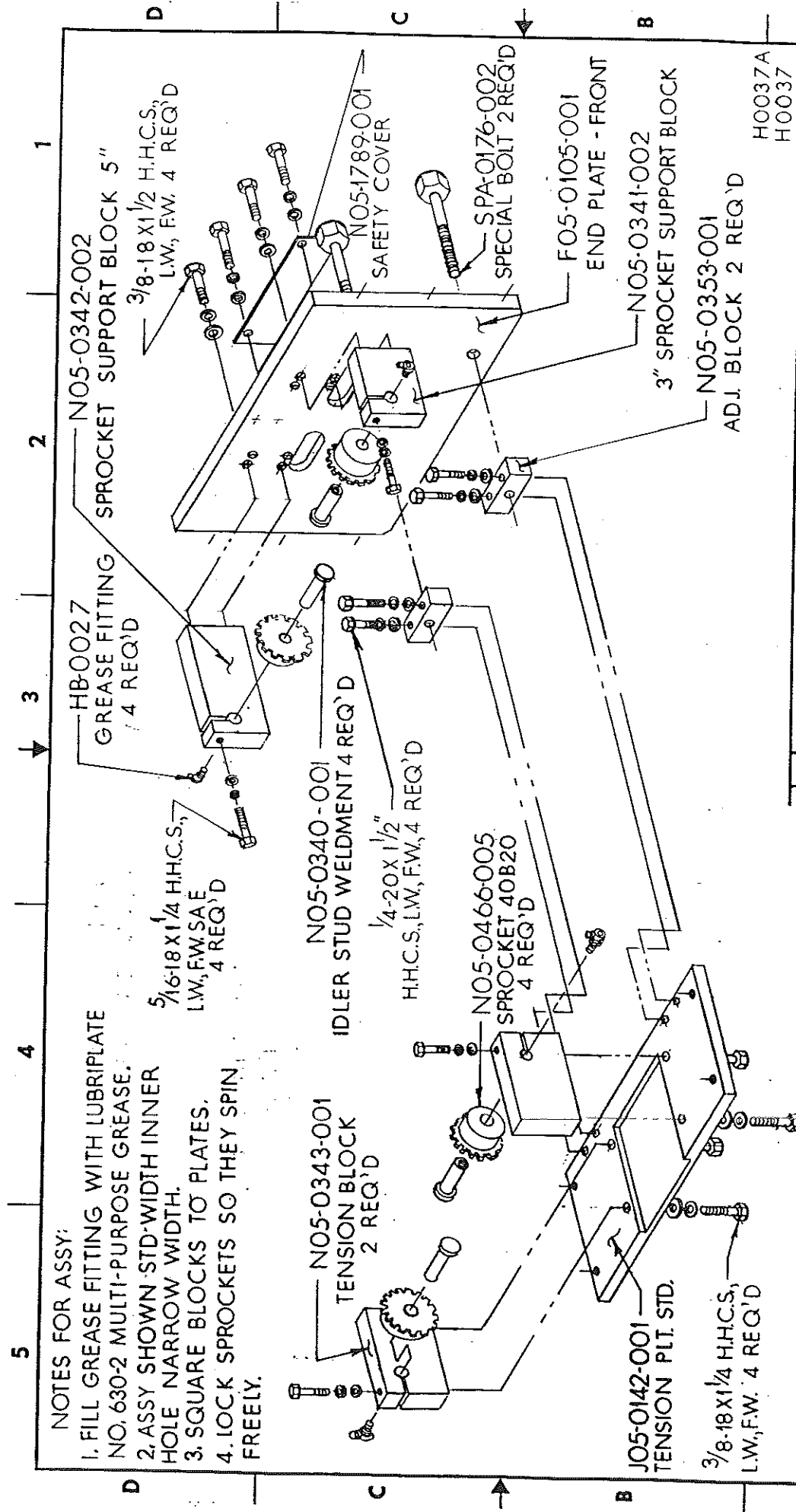
EH-0081
 RETRACTILE CORD

N05-0467-001
 SPIROL CORD BRACKET

H0065

SHANKLIN CORPORATION WESTFORD ROAD AYER, MASSACHUSETTS		TITLE HOLE PUNCH SWITCH ASSY	
DRAWN P.M. LAWRENCE	DESIGNED	FOR 48 FT. CONV. HS-1;3-4,F-4,-5	SCALE 1/2" = 1"
REVISIONS A. R.H.M.S. WAS 1 1/2" LONG As Added wiring Info. As Added NOTE 1 B. Lawrence 8/18/87		DATE 1-16-89	NUMBER H05-0096
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON DIMENSIONS FRACTIONS ± DECIMALS ± ANGLES ± MACHINED FINISH ☒ R.M.S. DO NOT SCALE DRAWING REMOVE BLURS AND SHARP EDGES		APPROVED [Signature]	
R-S-90			

7189A

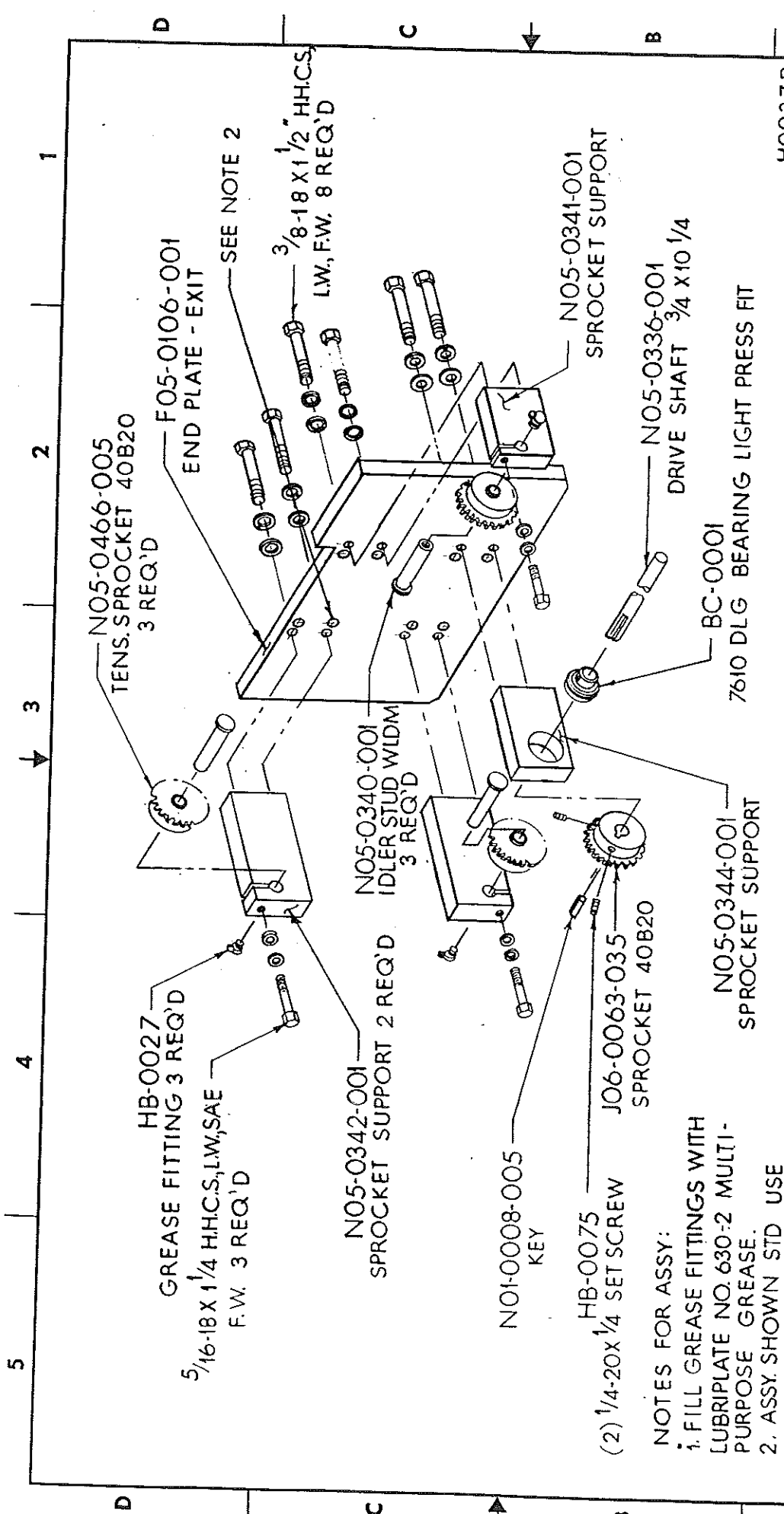


NOTES FOR ASSY:

1. FILL GREASE FITTING WITH LUBRIPATE NO. 630-2 MULTI-PURPOSE GREASE.
2. ASSY SHOWN STD-WIDTH INNER HOLE NARROW WIDTH.
3. SQUARE BLOCKS TO PLATES.
4. LOCK SPROCKETS SO THEY SPIN FREELY.

REVISIONS			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON DIMENSIONS	SHANKLIN CORPORATION WESTFORD ROAD AYER, MASSACHUSETTS		
FRACTIONS ±	DRAWN	TITLE	REV.
DECIMALS ±	DESIGNED	CONV. INFEED PLATE ASSY	NO. 0091
ANGLES ±	APPROVED	FOR	DATE
MACHINED FINISH ☒ R.M.S.	SCALE	HS ALL F-4, 5	1-26-89
DO NOT SCALE DRAWING REMOVE BURRS AND SHARP EDGES	NUMBER		

H0037A
H0037



NOTES FOR ASSY:

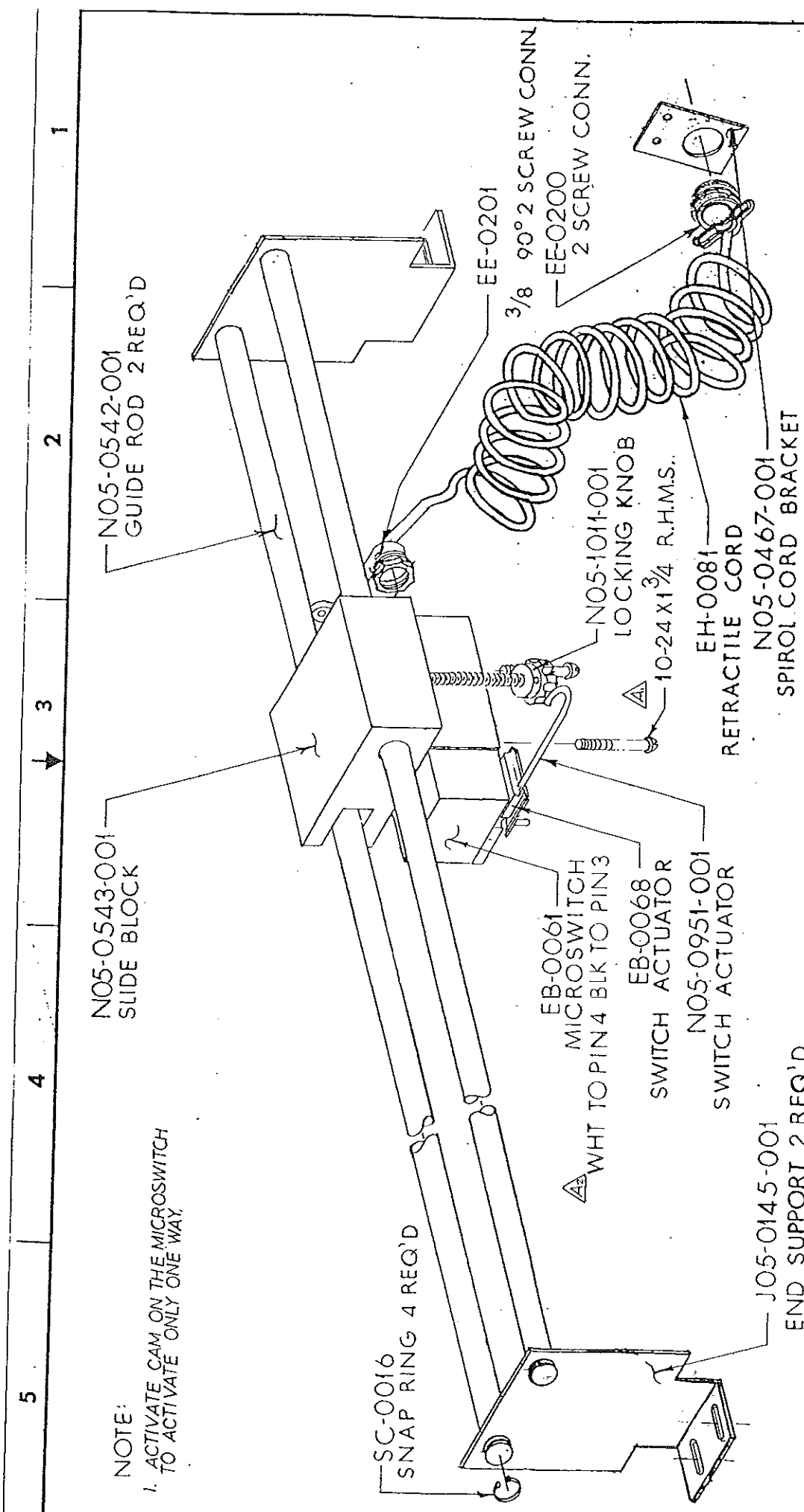
1. FILL GREASE FITTINGS WITH LUBRIPLATE NO. 630-2 MULTI-PURPOSE GREASE.
2. ASSY SHOWN STD USE INNER HOLES FOR NARROW WIDTH.
3. SQUARE BLOCK TO PLATE.
4. LOCK SPROCKET SO THEY MOVE FREELY.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON DIMENSIONS		SHANKLIN CORPORATION WESTFORD ROAD AYER, MASSACHUSETTS	
DRAWN Bam	TITLE CONV. EXIT PLATE ASSY. STD.	SCALE 1/4" = 1"	DATE 2-2-89
DESIGNED Lawrence	FOR	APPROVED CAG	NUMBER H05-0092
MACHINED FINISH ☒ R.M.S.		HS-1 F-5	
DO NOT SCALE DRAWING REMOVE BURRS AND SHARP EDGES		REV.	
REVISIONS			

H0037 B

R-3-89

WACCI

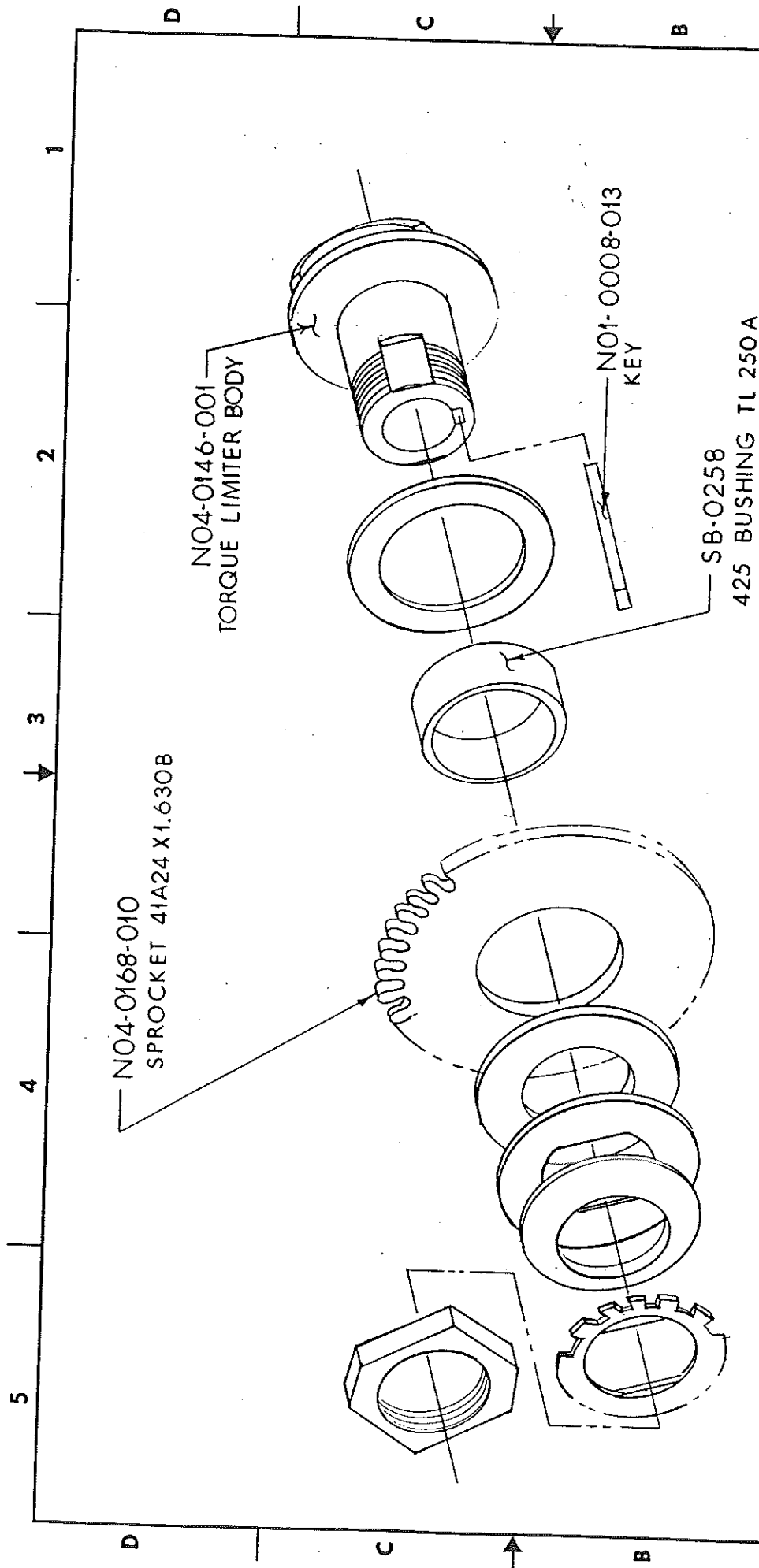


REVISIONS		SHANKLIN CORPORATION	
A, R.I.M.S. was 1/2" long.		WESTFORD ROAD AYER, MASSACHUSETTS	
A ₂ Added wiring info.		TITLE LUG SWITCH ASSY	
A ₂ Added NOTE 1.		LS-16 F LS-14 HS	
Pencil reference 8/1/59		FOR DESIGNED	
		R-3-89	
		488 FT. CONV. HS-1-3-4, F-4-5	
		SCALE 1/2" = 1"	
		DATE 12-6-89	
		NUMBER H05-0097	
		REV. A	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCE ON DIMENSIONS

FRACTIONS ±
DECIMALS ±
ANGLES ±

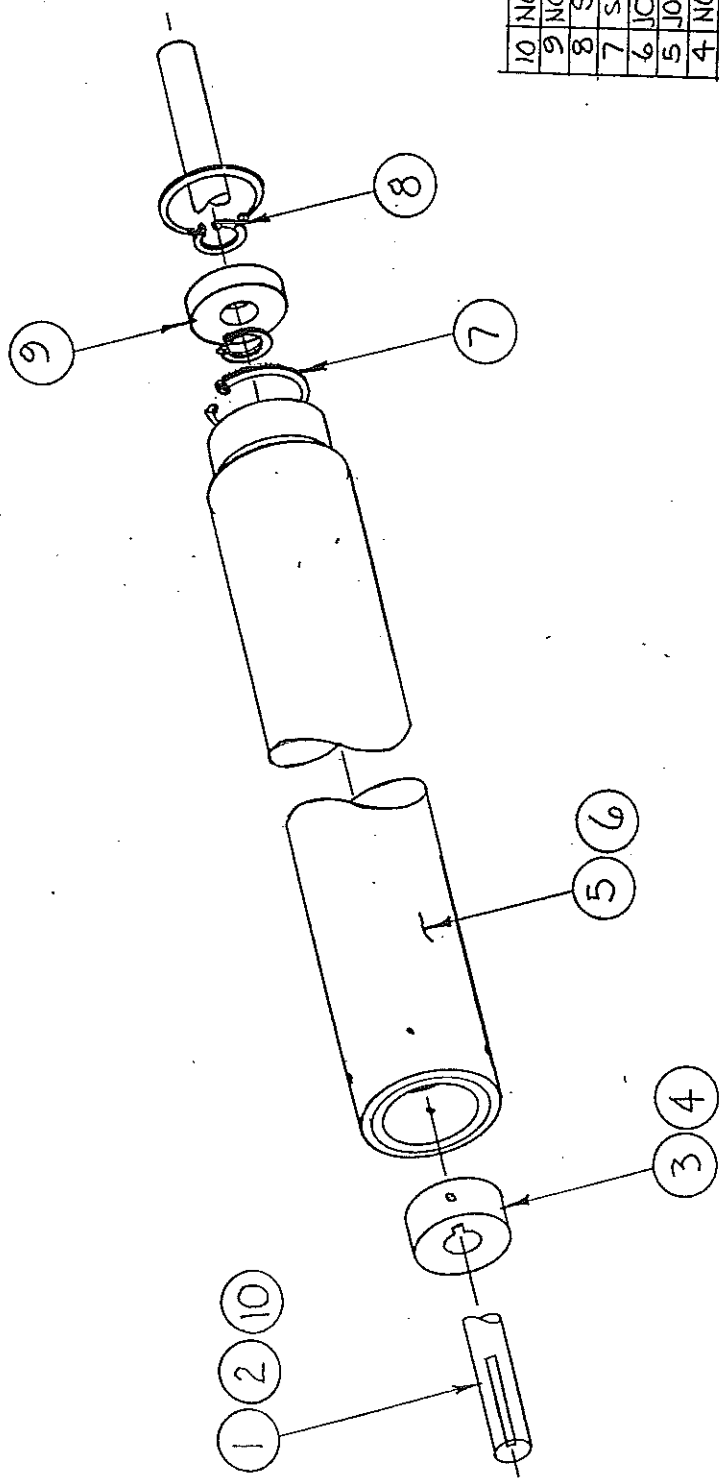
MACHINED FINISH ☒ R.M.S.
DO NOT SCALE DRAWING
REMOVE BURRS AND SHARP EDGES



H0037C

SHANKLIN CORPORATION WESTFORD ROAD AYER, MASSACHUSETTS		TITLE TORQUE LIMITER ASSY		DATE 2-14-89		NUMBER H050098	
DRAWN L. J. JONES		DESIGNED FOR		APPROVED P. J. JONES		SCALE 1/2	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON DIMENSIONS FRACTIONS $\pm$ DECIMALS $\pm$ ANGLES $\pm$		MACHINED FINISH $\checkmark$ R.M.S.		DO NOT SCALE DRAWING REMOVE BURRS AND SHARP EDGES		REV.	

REVISIONS

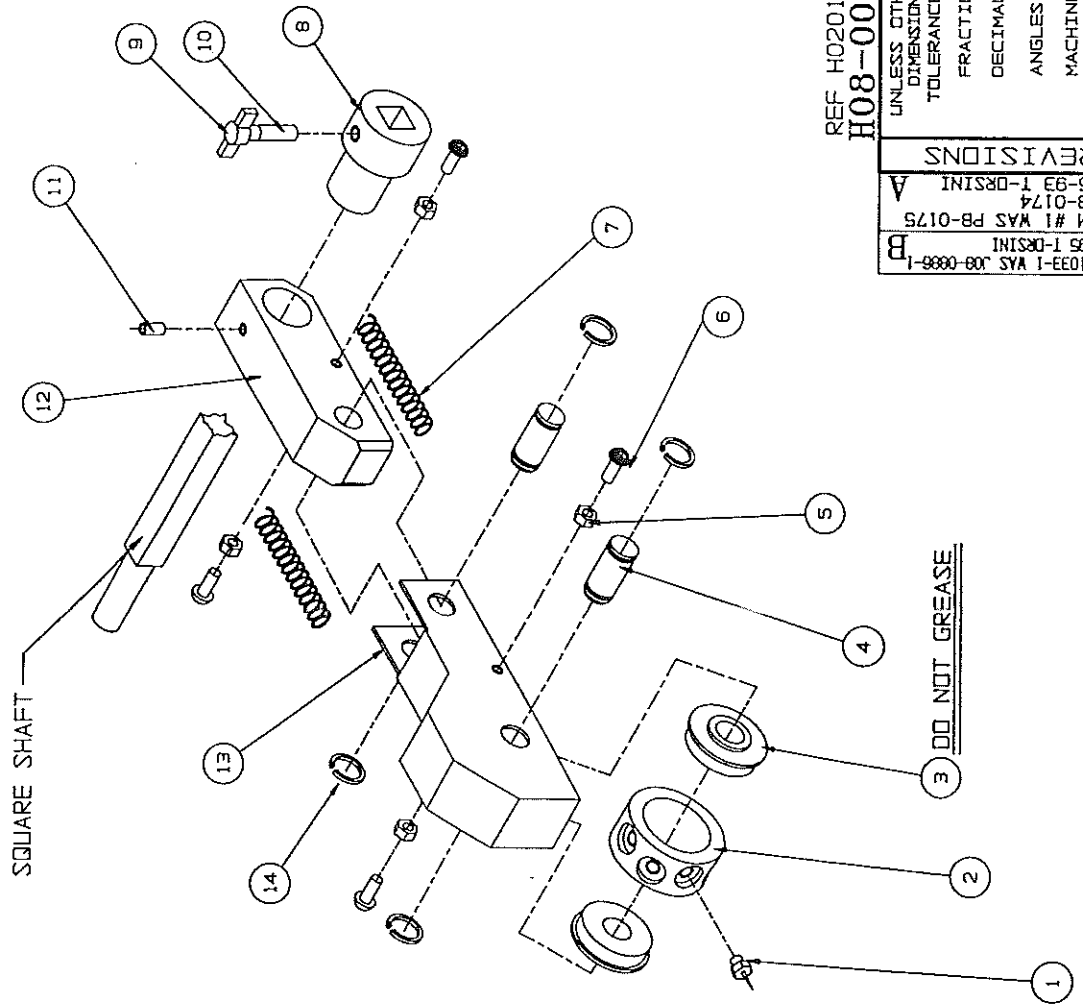


ITEM	PART NUMBER	DESCRIPTION	QTY
10	N01-0008-006	KEY	1
9	N05-0268-001	ROLL INSERT	1
8	SC-0016	EXT. SNAP RING	2
7	SC-0031	INT. SNAP RING	2
6	J01-0053-011	DR. ROLL (URETH)	0
5	J05-2842-002	DR. ROLL 27 3/8	1
4	N05-0267-001	KEYED INSERT	1
3	PB-0087	PIN	4
2	HB-0031	KEY	1
1	N05-1896-001	SHAFT	1

SC SHANKLIN CORPORATION WESTFORD ROAD AYER, MASSACHUSETTS	
DRAWN JAM LAWRENCE DESIGNED	TITLE DRIVE ROLL-NIP ROLL UNWIND FOR F-1-5, HS-1, 3
APPROVED 	SCALE ~
DATE 6-19-96	NUMBER H05-0219
REV. 	

UNLESS OTHERWISE SPECIFIED
 DIMENSIONS ARE IN INCHES
 TOLERANCE ON DIMENSIONS
 FRACTIONS ±
 DECIMALS ±
 ANGLES ±
 MACHINED FINISH ☒ R.M.S.
 DO NOT SCALE DRAWING
 REMOVE BURRS AND SHARP EDGES

REVISIONS



ITEM	PART NO.	DESCRIPTION	QTY.
14	SC-0052	SNAP RING EXT 1/2	4
13	N08-1107-001	PERFORATOR HOUSING	1
12	J08-0885-001	UPPER ARM	1
11	SCR-2106	1/4-20 X 1/4 LG SET SCR	1
10	SCR-536	1/4-20 X 5/8 LG SHCS	1
9	HA-0009	SCREW CAP KNOB	1
8	N08-1188-001	SHAFT ADAPTER	1
7	SA-0020	EXTENSION SPRING	2
6	SCR-329	#10-32 X 1/2 LG RHMS	4
5	NUT-004	#10-32 HEX NUT	4
4	J01-0014-019	PIN 1/2 DIA X 1 1/2 LG	2
3	N05-1053-002	PLATED BEARING(BC-0055)	2
2	J08-1033-001	PERFORATOR RING	1
1	SPA-0361-001	PERFORATOR PIN	8

REF H0201J
H08-0080

BILL OF MATERIALS

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCE ON DIMENSIONS

FRACTIONS ±
DECIMALS ±
ANGLES ±

MACHINED FINISH
DO NOT SCALE DRAWING
REMOVE BURRS AND SHARP EDGES

REV	NUMBER	DATE	DESCRIPTION
1	1	1-15-93	1-DRSIN
2	2	1-15-93	1-DRSIN
3	3	1-15-93	1-DRSIN
4	4	1-15-93	1-DRSIN
5	5	1-15-93	1-DRSIN
6	6	1-15-93	1-DRSIN
7	7	1-15-93	1-DRSIN
8	8	1-15-93	1-DRSIN
9	9	1-15-93	1-DRSIN
10	10	1-15-93	1-DRSIN
11	11	1-15-93	1-DRSIN
12	12	1-15-93	1-DRSIN
13	13	1-15-93	1-DRSIN
14	14	1-15-93	1-DRSIN

SHANKLIN CORPORATION
WESTFORD ROAD
AYER, MASSACHUSETTS

TITLE
PIN PERFORATOR HEAD ASSY

FOR
ALL MACHINES

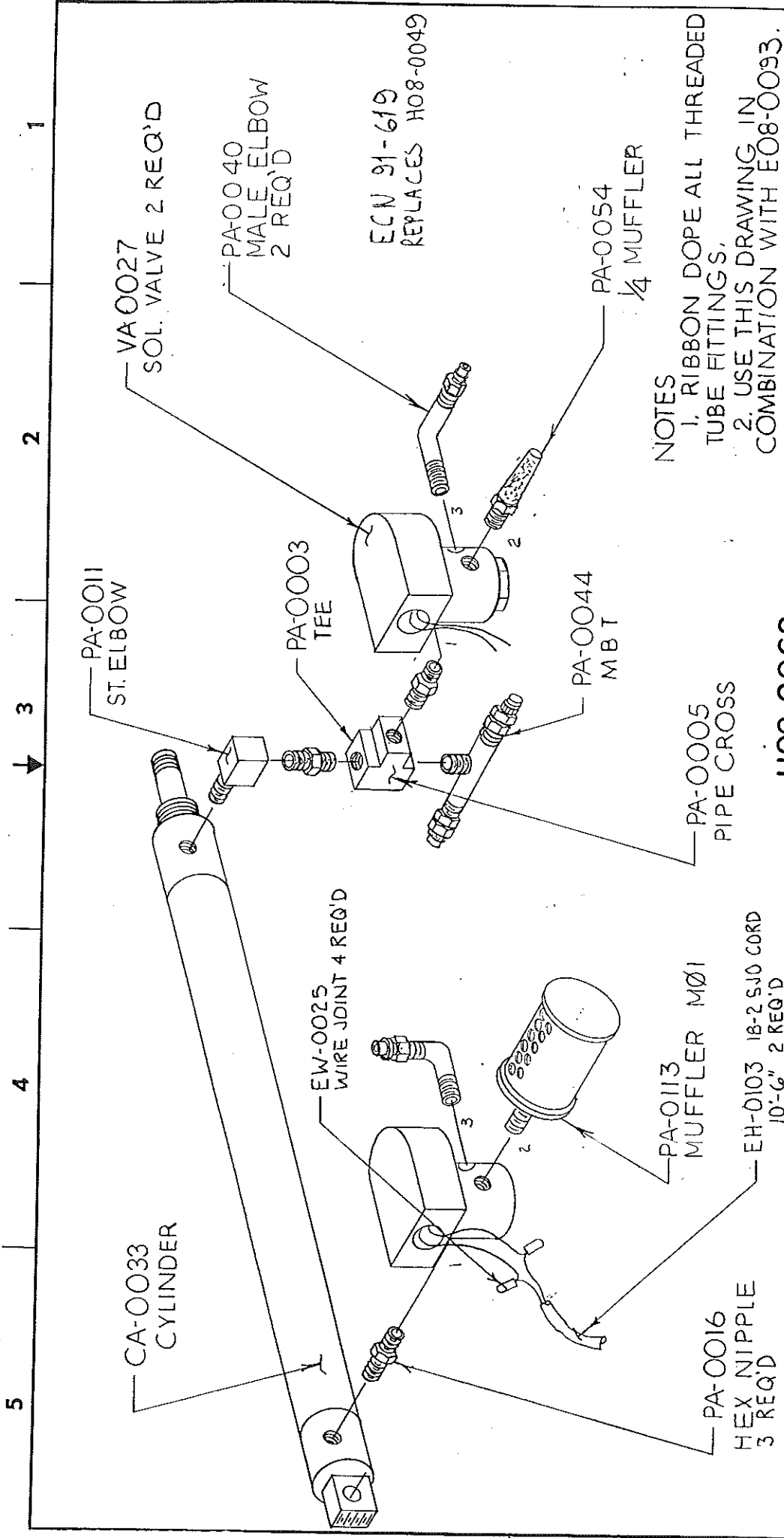
SCALE
1/2

DATE
9-24-92

NUMBER
H08-0080

REV
B

m95B

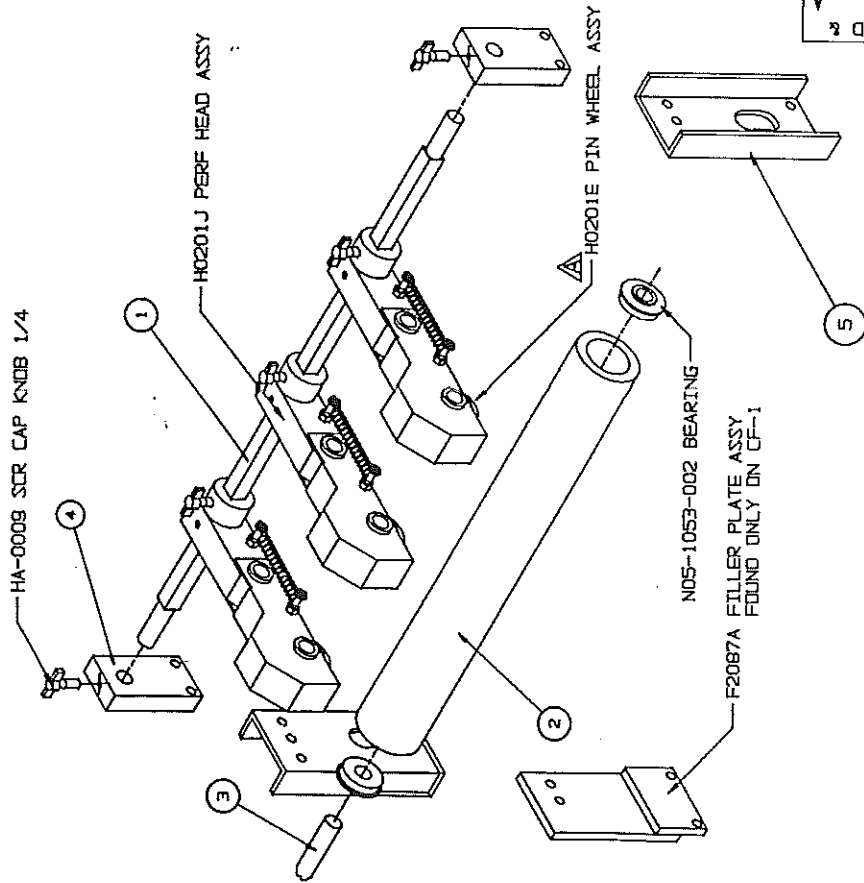


NOTES
 1. RIBBON DOPE ALL THREADED TUBE FITTINGS.
 2. USE THIS DRAWING IN COMBINATION WITH E08-0093.

H08-0062

SHANKLIN CORPORATION		WESTFORD ROAD ATER, MASSACHUSETTS	
DRAWN	DESIGNED	TITLE	FOR
W. Shanklin	W. Shanklin	PNEUMATICS ASSY.	CARRIAGE CYL. ASSY.
APPROVED		DATE	NUMBER
C. A. E.		NOV. 18, 1931	H08-0062 A

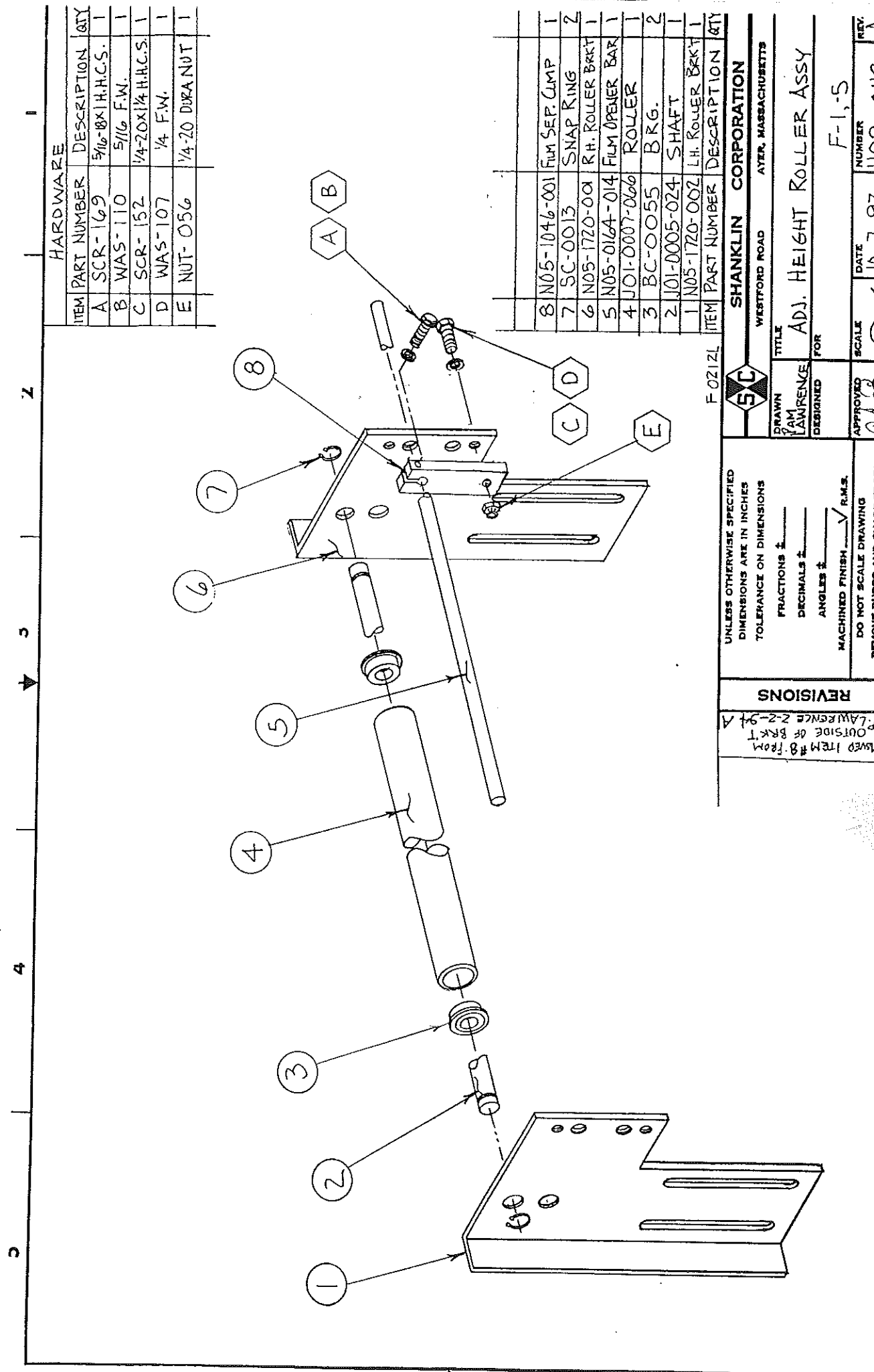
REVISIONS	
ADDED 18-2 SJ0 CORD 10'-6" 2 REQ'D WHT-#20 BLK-#61	ADDED 18-2 SJ0 CORD 10'-6" 2 REQ'D WHT-#20 BLK-#61
ADDED 18-2 SJ0 CORD 10'-6" 2 REQ'D WHT-#20 BLK-#61	ADDED 18-2 SJ0 CORD 10'-6" 2 REQ'D WHT-#20 BLK-#61
ADDED 18-2 SJ0 CORD 10'-6" 2 REQ'D WHT-#20 BLK-#61	ADDED 18-2 SJ0 CORD 10'-6" 2 REQ'D WHT-#20 BLK-#61

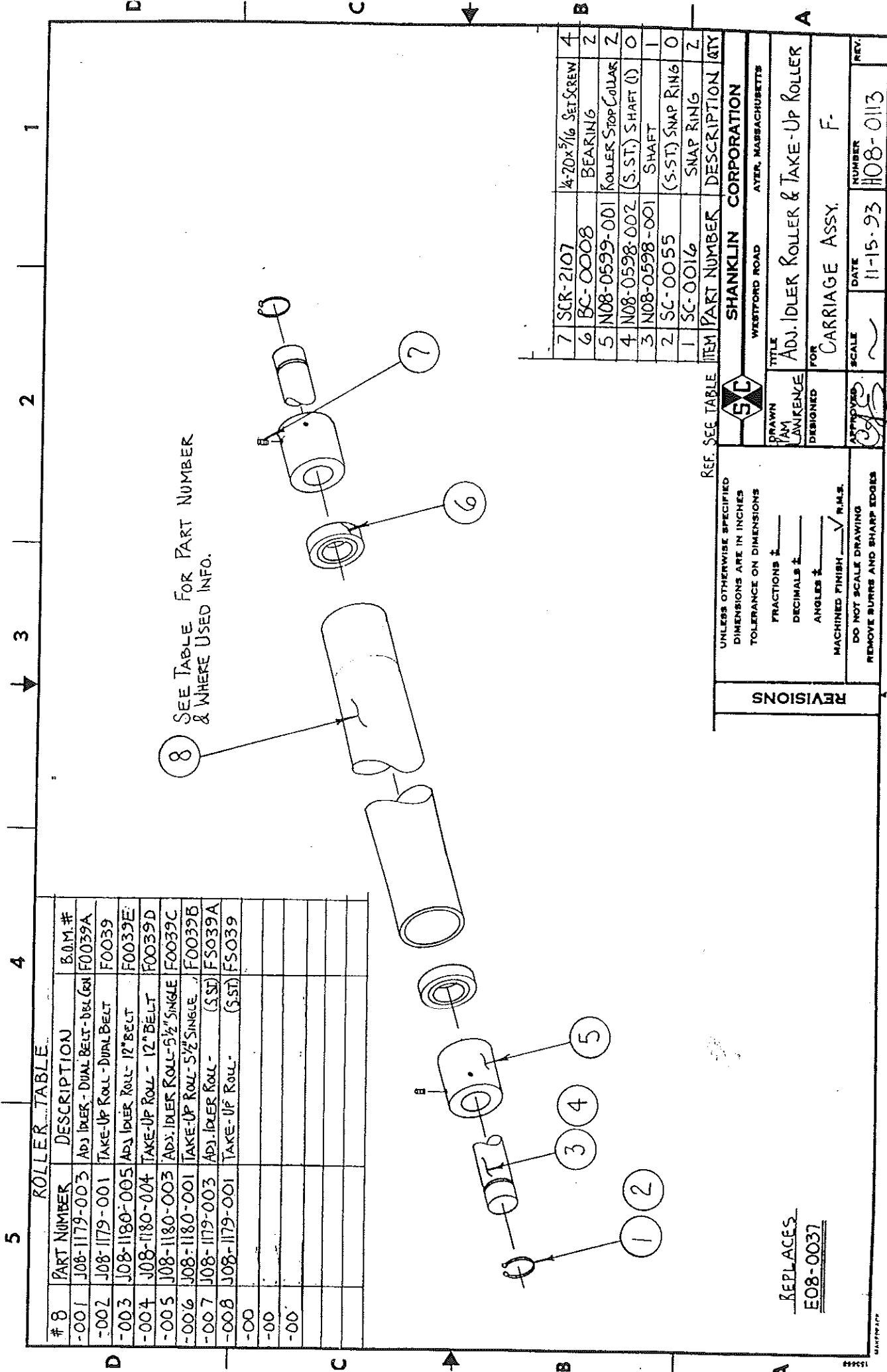


PART NO.	ITEM	PART NO.	DESCRIPTION	QTY.
F2091	5	NOT REQUIRED		
	4	N08-1110-001	MOUNTING BLOCK	2
	3	EXISTING .5 DIA SHAFT		1
	2	N08-0586-004	RUBBER ROLLER 2 X 32.18	1
	1	J08-0576-008	SQUARE SHAFT 1/2 X 39.25	1
H0156D	5	NOT REQUIRED		
	4	J05-2359-001	PERFORATOR MOUNT	2
	3	EXISTING .5 DIA SHAFT		1
	2	N08-0586-001	RUBBER ROLLER 2 X 42	1
	1	J08-0576-007	SQUARE SHAFT 1/2 X 50.87	1
H0201H	5	NOT REQUIRED		
	4	N08-1110-001	MOUNTING BLOCK	2
	3	EXISTING .5 DIA SHAFT		1
	2	N08-0586-003	RUBBER ROLLER 2 X 26	1
	1	J08-0576-004	SQUARE SHAFT 1/2 X 35.5	1
F0143D	5	N08-1122-001	PIN PERFORATOR MOUNT	2
	4	N08-1110-001	MOUNTING BLOCK	2
	3	EXISTING .5 DIA SHAFT		1
	2	N08-0586-002	RUBBER ROLLER 2 X 41	1
	1	J08-0576-005	SQUARE SHAFT 1/2 X 46.25	1
A7093	5	NOT REQUIRED		
	4	J05-2358-001	PERFORATOR MOUNT	2
	3	N01-0050-006	SHAFT .5 X 33.75	1
	2	N08-0586-004	RUBBER ROLLER 2 X 32.18	1
	1	J08-0576-006	SQUARE SHAFT 1/2 X 35.5	1
A-27	1	J08-0576-006	SQUARE SHAFT 1/2 X 35.5	1
PART NO.	ITEM	PART NO.	DESCRIPTION	QTY.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON DIMENSIONS		SHANKLIN CORPORATION WESTFORD ROAD AYER, MASSACHUSETTS	
FRACTIONS $\pm$		TITLE PIN PERFORATOR ASSY	
DECIMALS $\pm$		FOR	
ANGLES $\pm$		ALL MACHINES	
MACHINED FINISH		APPROVED	
DO NOT SCALE DRAWING REMOVE BURRS AND SHARP EDGES		SCALE NONE	
REVISIONS		DATE 9-25-92	
H0201E WAS H0201D & H0201G 1-15-93 T-DRSINI		NUMBER H08-0081	
		REV A	

011 73A





ROLLER TABLE		
# 8	PART NUMBER	DESCRIPTION
-001	J08-1179-003	ADJ. IDLER - DUAL BELT - BEL. COLL.
-002	J08-1179-001	TAKE-UP ROLL - DUAL BELT
-003	J08-1180-005	ADJ. IDLER ROLL - 12" BELT
-004	J08-1180-004	TAKE-UP ROLL - 12" BELT
-005	J08-1180-003	ADJ. IDLER ROLL - 5 1/2" SINGLE
-006	J08-1180-001	TAKE-UP ROLL - 5 1/2" SINGLE
-007	J08-1179-003	ADJ. IDLER ROLL - (SST)
-008	J08-1179-001	TAKE-UP ROLL - (SST)
-009		
-010		
-011		
-012		
-013		
-014		
-015		
-016		
-017		
-018		
-019		
-020		

ITEM	PART NUMBER	DESCRIPTION	QTY
7	SCR-2107	1/4-20x3/16 SET SCREW	4
6	BC-0008	BEARING	2
5	N08-0599-001	ROLLER STOP COLLAR	2
4	N08-0598-002	(S.S.T.) SHAFT (1)	0
3	N08-0598-001	SHAFT	1
2	SC-0055	(S.S.T.) SNAP RING	0
1	SC-0016	SNAP RING	2

REF. SEE TABLE

SHANKLIN CORPORATION

WESTFORD ROAD
AYER, MASSACHUSETTS

DRAWN
BY
JAM

UNREK
DESIGNED

TITLE
ADJ. IDLER ROLLER & TAKE-UP ROLLER

FOR
CARRIAGE ASSY.

APPROVED
DATE
11-15-93

SCALE
F.

NUMBER
108-0113

REV.

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCE ON DIMENSIONS

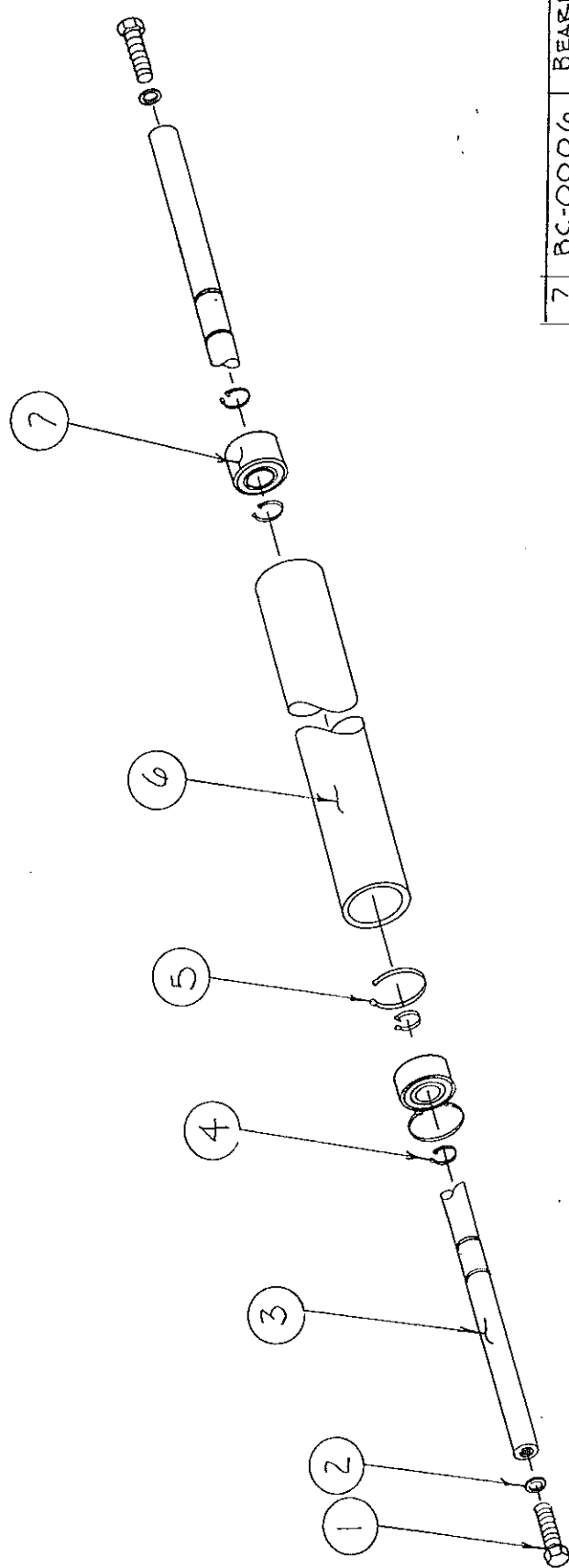
FRACTIONS ±
DECIMALS ±
ANGLES ±

MACHINED FINISH ☒ R.M.E.
DO NOT SCALE DRAWING
REMOVE BURRS AND SHARP EDGES

REVISIONS

REPLACES
E08-0037

5 4 3 2 1



7	BC-00006	BEARING	2
6	J05-0031-009	ROLLER	1
5	SC-0023	SNAP RING	2
4	SC-0013	SNAP RING	4
3	N05-0375-004	SHAFT	1
2	WAS-	5/16 L.W.	2
1	SCR-	5/16-18x5/8 HCS	2
ITEM	PART NUMBER	DESCRIPTION	QTY

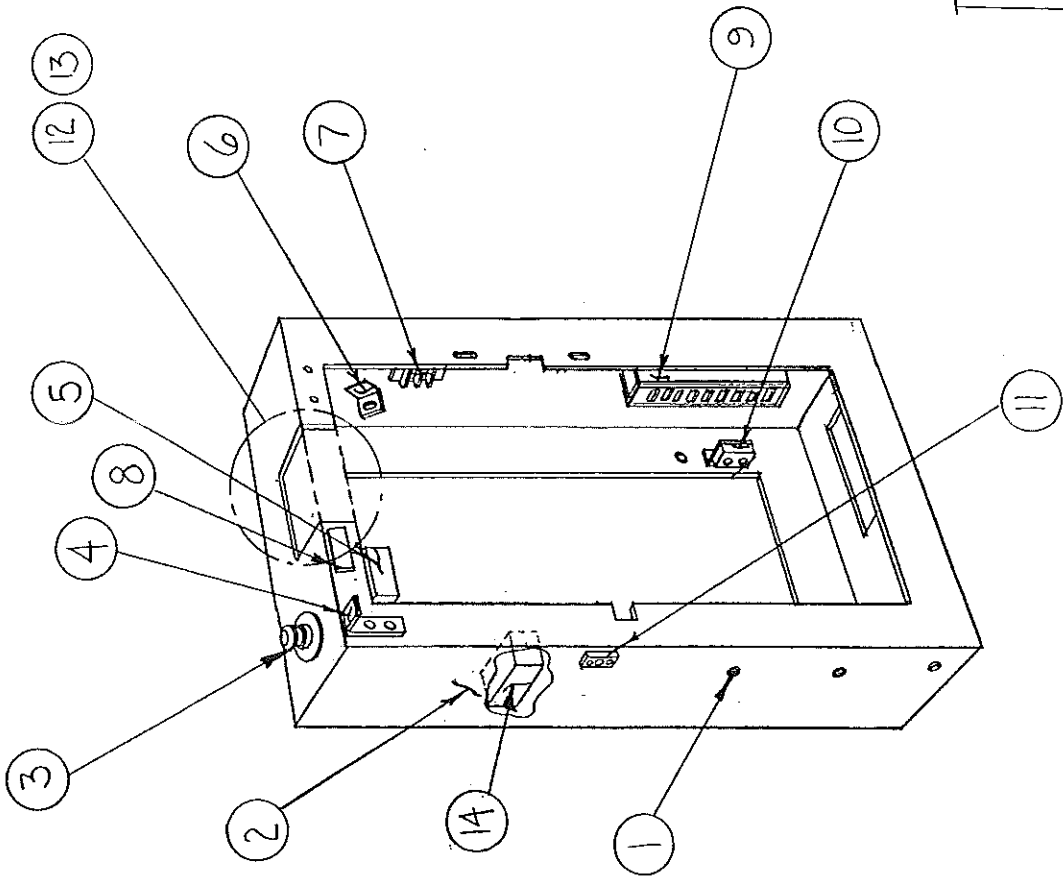
F0038

SHANKLIN CORPORATION	
WESTFORD ROAD ATER, MASSACHUSETTS	
DRAWN PAM LAWRENCE	TITLE CARRIAGE DRIVEN ROLLER
DESIGNED	FOR
APPROVED PAM	SCALE ~
DATE 12-6-93	NUMBER H08-0115
REV.	F-ALL

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCE ON DIMENSIONS
FRACTIONS ±
DECIMALS ±
ANGLES ±
MACHINED FINISH ☒ R.M.S.
DO NOT SCALE DRAWING
REMOVE BURRS AND SHARP EDGES

REVISIONS

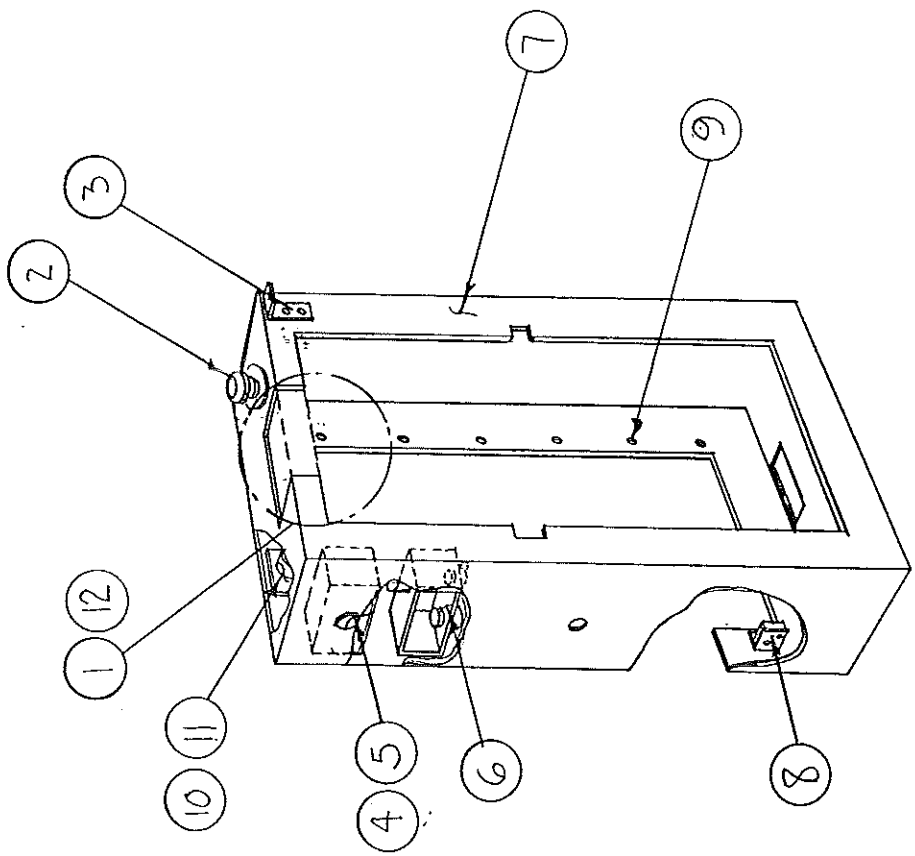
5 4 3 2 1



14	M08-0072	Handy Box (Bot. Jaw)	1
13	M08-0069	Jaw Height Ext. N	0
12	J08-0778-001	End Jaw Cab. Removers	0
11	M08-0006	Emergency F-15 Only	1
10	M08-0063	LS-6 Safety Switch	1
9	M08-0003	Wiring Duct	1
8	N05-0636-001	Warning Label	1
7	H08-0087	End Seal Heat Convl	0
6	H08-0087	Strain Relief	1
5	M08-0061	LS-7 Hood Safety	1
4	M08-0006	Hood Support	1
3	M08-0064	Emergency Stop	1
2	C08-0011-001	Rt. Jaw Housing	1
1	HB-0050	1/4-20 FL. HD. Riv Nut	3
ITEM PART NUMBER		DESCRIPTION	QTY

SHANKLIN CORPORATION WESTFORD ROAD AVER, MASSACHUSETTS	
DRAWN PAM LAWRENCE DESIGNED	TITLE RIGHT SIDE END JAW HOUSING ASSY. FOR
APPROVED CAG	DATE 11-17-94
SCALE ~	NUMBER F-1,3,4,5
DO NOT SCALE DRAWING REMOVE BURRS AND SHARP EDGES	REV. A
REVISIONS 12-15-94 PAM LAWRENCE A	

5 4 3 2 1

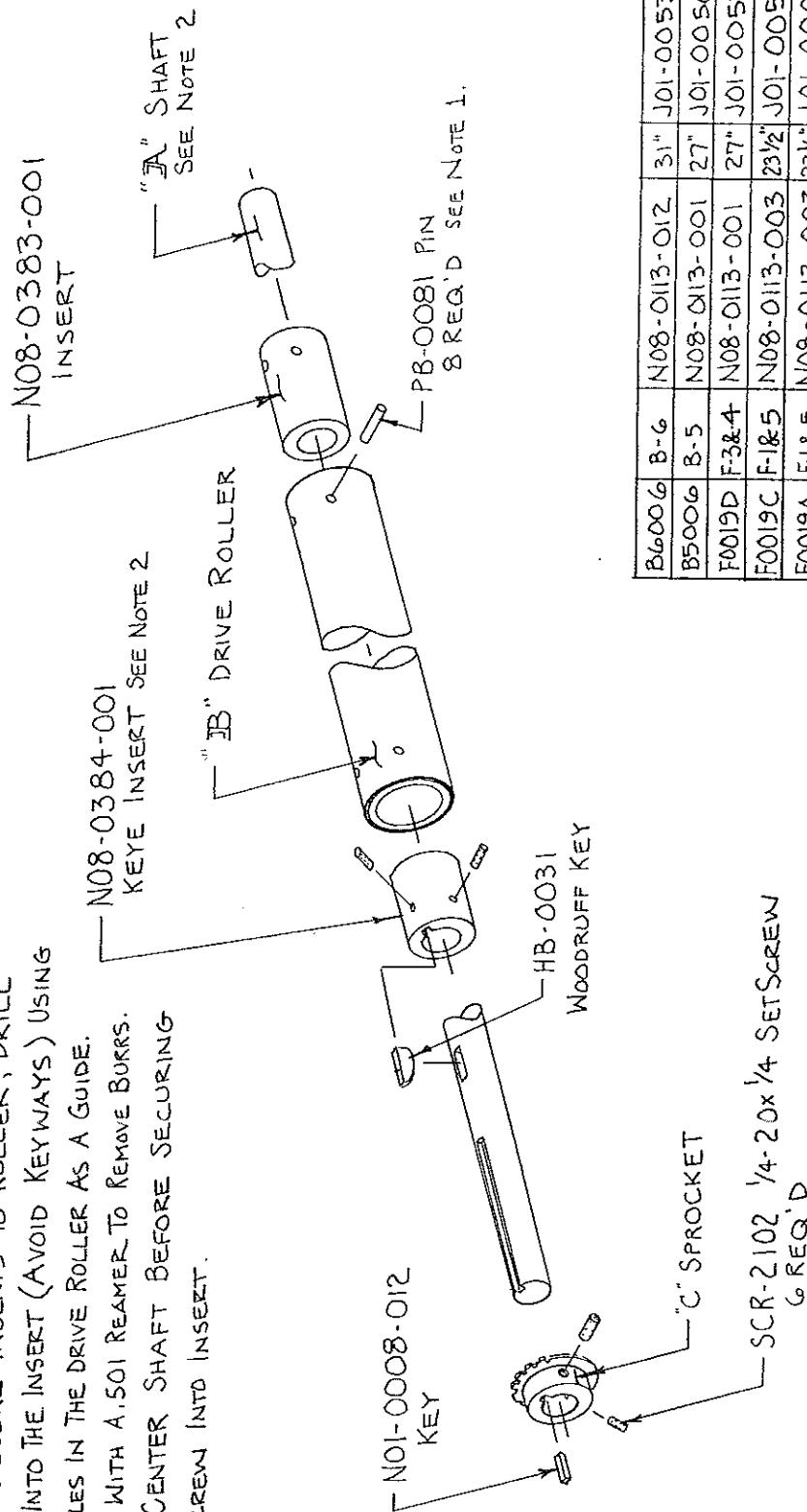


ITEM	PART NUMBER	DESCRIPTION	QTY.
12	M08-0068	JAW HEIGHT EXT.	0
11	N05-2783-001	PLATE F-3, 8-4	1
10	J05-2160-001	HOSE ADPT. F-1 8-5	1
9	M08-0006	DOOR ASSY	1
8	M08-0065	LS-8 SAFETY SWITCH	1
7	C08-0011-002	LEFT JAW HOUSING	1
6	M08-0066	HANDY BOX	1
5	M08-0070	F-1-5 SCRAP	1
4	M08-0062	F-3-4 HOLE PUNCH	1
3	M08-0006	HOOD SUPPORT	1
2	M08-0064	EMERG. STOP	1
1	J08-0779-001	END JAW (AS RE-WORK)	0

		SHANKLIN CORPORATION WESTFORD ROAD AYER, MASSACHUSETTS	
DRAWN JAM LANCE	TITLE END JAW HOUSING - REAR (LEFT) SIDE	DATE 11-17-94	NUMBER F-1,3,4,5
DESIGNED FOR	SCALE ~	REV. 11 94	REV.
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON DIMENSIONS FRACTIONS $\pm$ DECIMALS $\pm$ ANGLES $\pm$ MACHINED FINISH ☒ R.M.S. DO NOT SCALE DRAWING REMOVE BURRS AND SHARP EDGES		REVISIONS	

NOTE

1. TO SECURE INSERTS TO ROLLER, DRILL HOLES INTO THE INSERT (AVOID KEYWAYS) USING THE HOLES IN THE DRIVE ROLLER AS A GUIDE. REAM WITH A.501 REAMER TO REMOVE BURRS.
2. CENTER SHAFT BEFORE SECURING SET SCREW INTO INSERT.



PART	QTY	DESCRIPTION	UNIT	DATE	REV
B6006	B-6	N08-0113-012	31"	J01-0053-031	J06-0063-091
B5006	B-5	N08-0113-001	27"	J01-0050-001	J06-0063-091
F0019D	F-3&4	N08-0113-001	27"	J01-0053-001	J06-0063-091
F0019C	F-1&5	N08-0113-003	23 1/2"	J01-0053-022	J06-0063-091
F0019A	F-1&5	N08-0113-003	23 1/2"	J01-0008-002	J06-0063-091
F0019	F-3&4	N08-0113-001	27"	J01-0008-002	J06-0063-091
PARENT	WHERE USED	SHAFT LENGTH			

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES

TOLERANCE ON DIMENSIONS

FRACTIONS ±

DECIMALS ±

ANGLES ±

MACHINED FINISH ☒ R.M.S.

DO NOT SCALE DRAWING

REMOVE BURRS AND SHARP EDGES

REVISIONS



SHANKLIN CORPORATION

WESTFORD ROAD AVER, MASSACHUSETTS

DRAWN

DESIGNED

FOR

APPROVED

DATE

SCALE

NUMBER

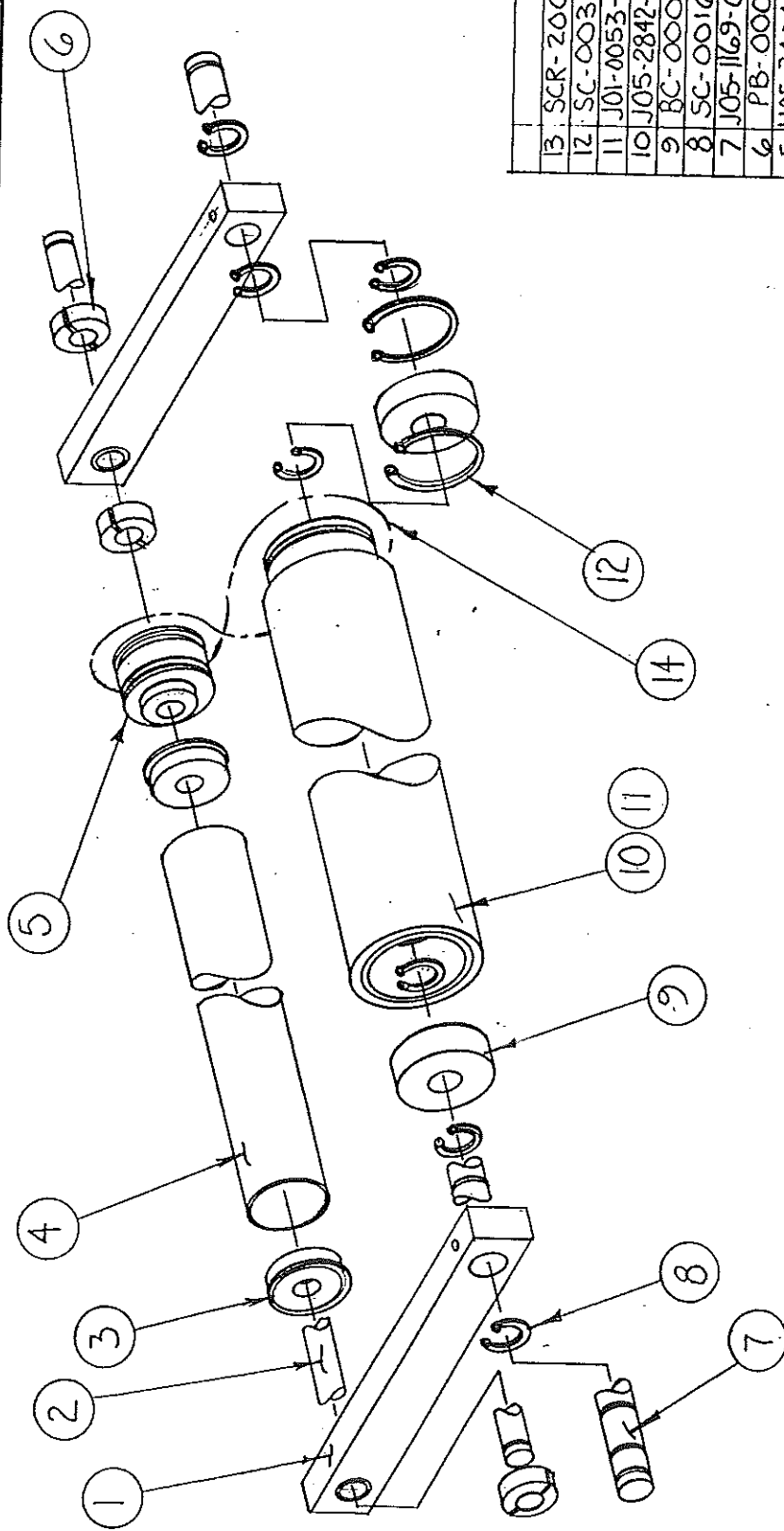
REV

TITLE
CARRIAGE DRIVE ROLLER

F-ALL, B-5, B-6

3/26/97

H08-0188



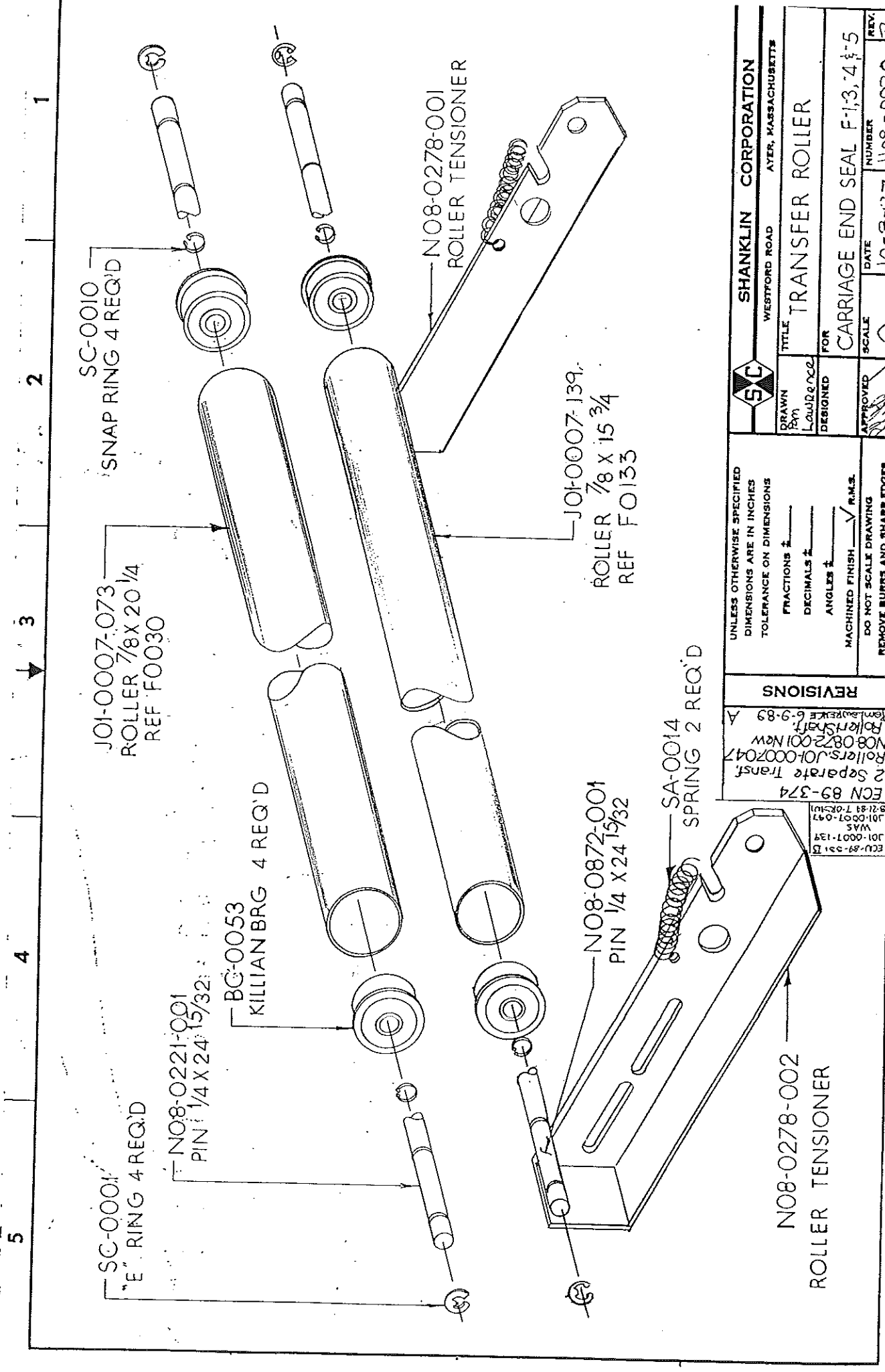
H0032D
H0140B

ITEM	PART NUMBER	DESCRIPTION	QTY.
13	SCR-2061	10-32x 1/4 SET SCREW	2
12	SC-0031	SNAP RING	2
11	J01-0053-012	NIP ROLL (URETH)	0
10	J05-2842-001	RUBBER ROLL	1
9	BC-0009	BEARING	2
8	SC-0016	EXT. SNAP RING	7
7	J05-1169-001	IDLER SHAFT 3/8x2 1/2	1
6	PB-0003	COLLAR	3
5	N05-3404-001	RD. BELT PULLEY	1
4	J01-0007-132	ROLLER	1
3	BC-0055	BEARING .5x1.35	2
2	J01-0005-023	SHAFT 1/2x30 1/16	1
1	N08-0638-001	PIVOT ARM	2
ITEM	PART NUMBER	DESCRIPTION	QTY.

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCE ON DIMENSIONS
FRACTIONS ±
DECIMALS ±
ANGLES ±
MACHINED FINISH ☒ R.M.S.
DO NOT SCALE DRAWING
REMOVE BURRS AND SHARP EDGES

REVISIONS

SC SHANKLIN CORPORATION WESTFORD ROAD AYER, MASSACHUSETTS	
DRAWN PAM LAWRENCE DESIGNED	TITLE NIP ROLL ASSEMBLY FOR NIP ROLL UNWIND F-1-5, HS-1-3
APPROVED [Signature] SCALE 1" = 1"	DATE 6-20-96 NUMBER H05-0220 REV. 1



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON DIMENSIONS		REVISIONS	
FRACTIONS ±		ECN 89-374	2 Separate Trans.
DECIMALS ±		Rollers JOI-0007047	NO8 0822-001 New
ANGLES ±		Roller Shaft:	Roller Shaft: 6-9-89
MACHINED FINISH ☒ R.M.S.		9-21-89 T-02-101	
DO NOT SCALE DRAWING		ECN-89-374	
REMOVE BURRS AND SHARP EDGES			

		SHANKLIN CORPORATION WESTFORD ROAD AYER, MASSACHUSETTS	
DRAWN BY L. W. D.	DESIGNED FOR	TITLE TRANSFER ROLLER	REV.
SCALE ~	DATE 10-8-87	NUMBER H08-0020	REV.
APPROVED 	FOR CARRIAGE END SEAL F-1,3,4 & 5	SCALE ~	REV.

5

4

3

2

1

NOTE: RIBBON DOPE ALL TAPERED
PIPE THREADS. USE 1/4" ALLEN
WRENCH ON PLUGS.
USE HARDWARE PROV. WITH
BRKT TO MT. ON THE LUBE FILTER REG.

PA-0067
PLUG 7 REQ'D

PA-0041
ELBOW 3 REQ'D

PA-0017 HEX NIP

AA
APPLY EVENLY TO THE LAST
HOLE ON THE OILER

PA-0103
BRKT

USE HARDWARE PROV. WITH
BRKT TO MT. ON THE LUBE FILTER REG.

PA-0012
90° ELBOW

PA-0118
MANIFOLD

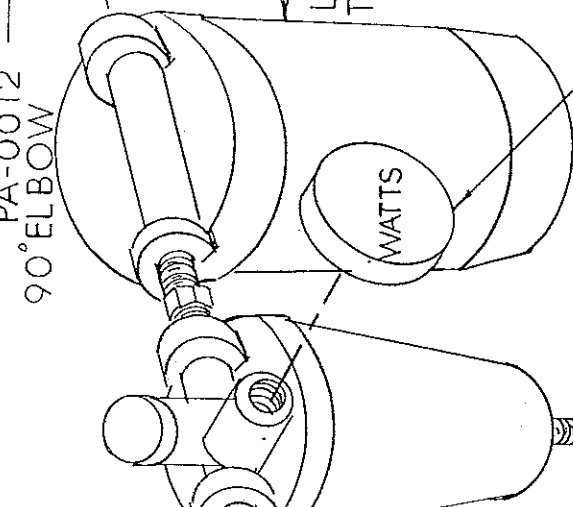
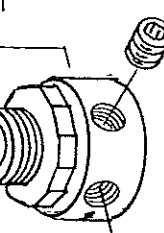
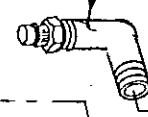
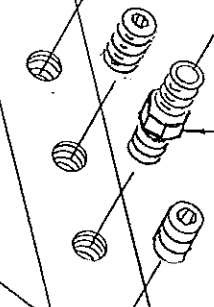
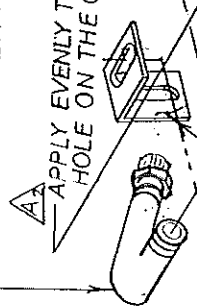
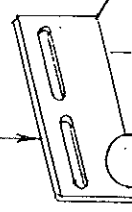
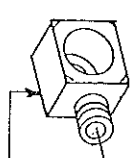
NO9-0183-001
BRKT

10-32 X 1 1/2 H.H.C.S
#10 F.W. 2 REQ'D
10-32 DURA NUT

PA-0017
HEX NIP

PA-0110
WATTS REG.

EE-0036
PRESSURE GAUGE



PA-0106
LUBE FILTER REG.
TIGHTEN BY HAND

EE-0037
GAUGE

SUPERCEDES
EO8-0047

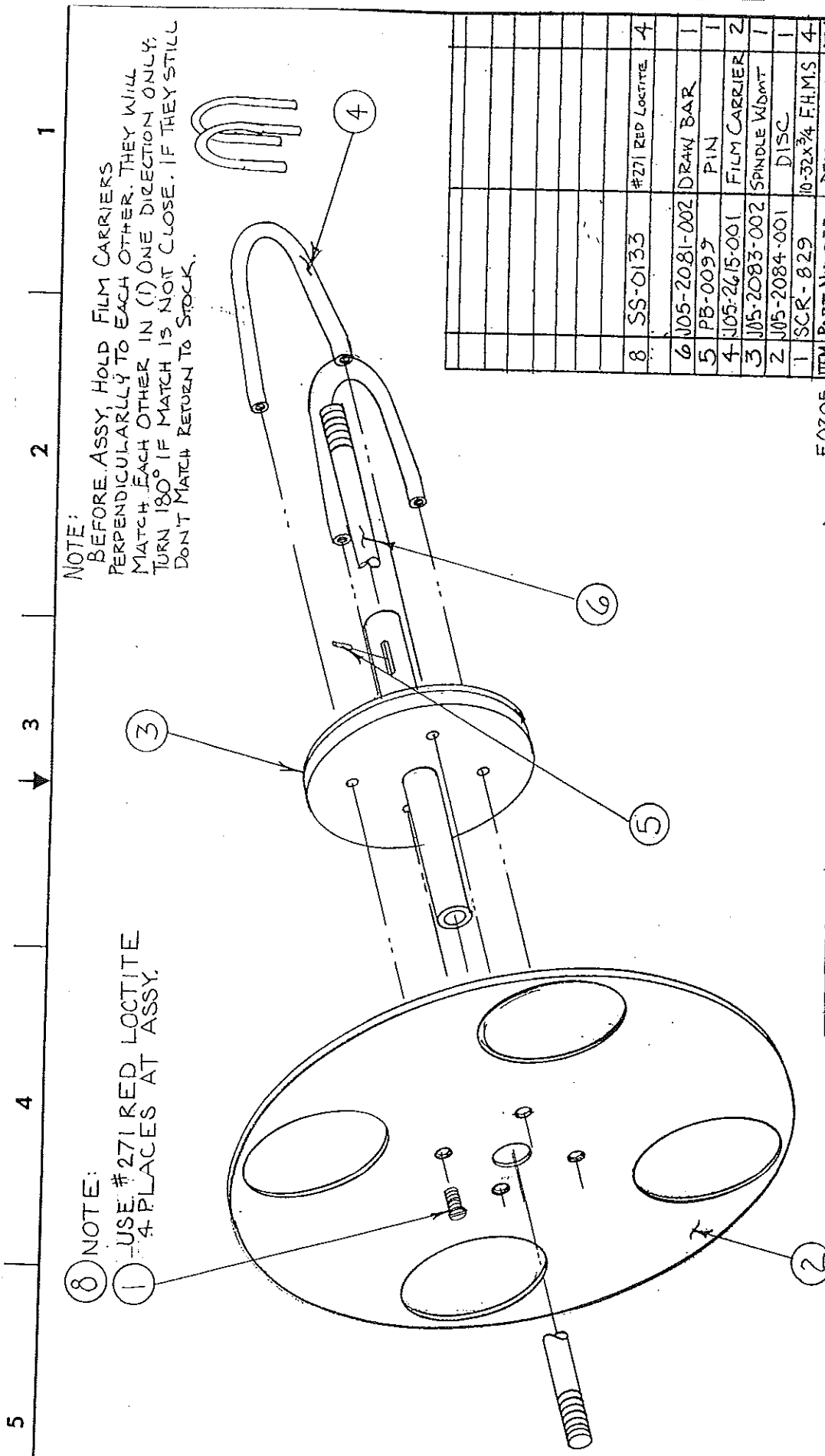
REF. H0020

REVISIONS

A	REV. PART NO. PA-0103	1/28/91	1/28/91
B	REV. PART NO. PA-0103	1/28/91	1/28/91
C	REV. PART NO. PA-0103	1/28/91	1/28/91
D	REV. PART NO. PA-0103	1/28/91	1/28/91

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON DIMENSIONS	FRACTIONS ± DECIMALS ± ANGLES ±	MACHINED FINISH ☒ R.M.S.
DO NOT SCALE DRAWING REMOVE BURRS AND SHARP EDGES		

SHANKLIN CORPORATION WESTFORD ROAD AYER, MASSACHUSETTS	TITLE AIR SUPPLY ASSY	FOR F-1, -5	DATE 11-9-87	NUMBER H08-0021	REV. D
DRAWN Lawrence	DESIGNED	APPROVED Lawrence	SCALE		



NOTE:
BEFORE ASSY, HOLD FILM CARRIERS
PERPENDICULARLY TO EACH OTHER. THEY WILL
MATCH EACH OTHER IN (1) ONE DIRECTION ONLY.
TURN 180° IF MATCH IS NOT CLOSE. IF THEY STILL
DON'T MATCH RETURN TO STOCK.

NOTE:
1 USE #271 RED LOCTITE
4 PLACES AT ASSY.

ITEM	PART NUMBER	DESCRIPTION	QTY
8	SS-0133	#271 RED LOCTITE	4
6	U05-2081-002	DRAW BAR	1
5	PB-0099	PIN	1
4	U05-2615-001	FILM CARRIER	2
3	U05-2083-002	SPINDLE WDMT	1
2	U05-2084-001	DISC	1
1	SCR-829	10-32X3/4 F.H.M.S.	4

FOZOS

		SHANKLIN CORPORATION WESTFORD ROAD AYER, MASSACHUSETTS	
DRAWN P.M. L. DUNN DESIGNED	TITLE SPINDLE SUB-ASSY.	FOR DOOR STYLE - SALVAGE WINDER F-1A, F-5A	REV. D
APPROVED 	SCALE 1" = 1"	DATE 10-29-91	NUMBER 408-0058

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCE ON DIMENSIONS

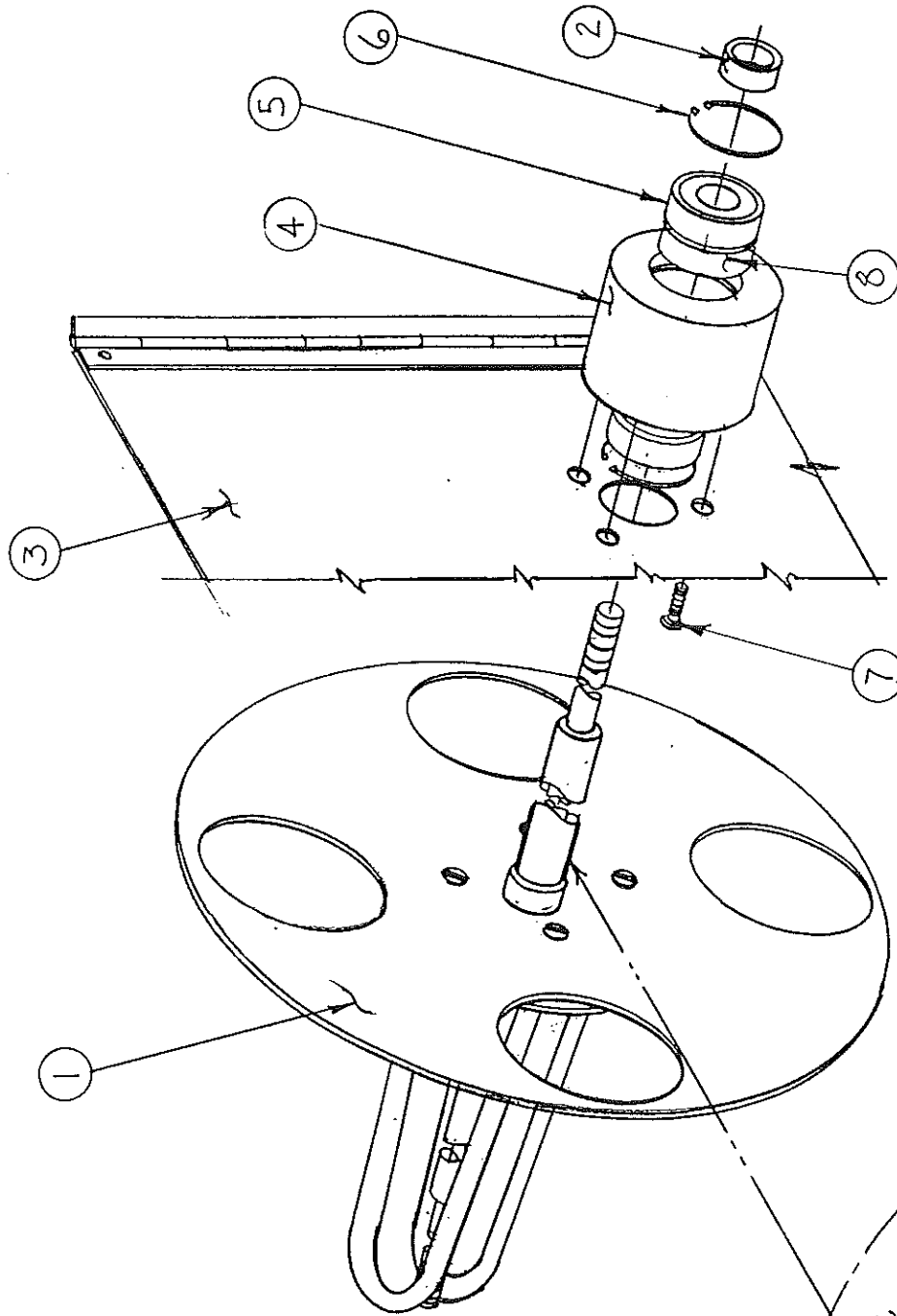
FRACTIONS ±
DECIMALS ±
ANGLES ±

MACHINED FINISH ☒ R.M.S.
DO NOT SCALE DRAWING
REMOVE BURRS AND SHARP EDGES

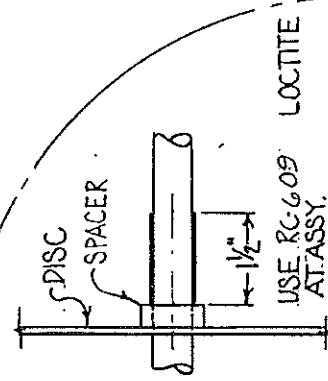
REVISIONS

REVISION 1	3/26/90 PLAWANCE D
REVISION 2	ADDED NOTE
REVISION 3	ADDED NOTE
REVISION 4	ADDED NOTE
REVISION 5	ADDED NOTE
REVISION 6	ADDED NOTE
REVISION 7	ADDED NOTE
REVISION 8	ADDED NOTE
REVISION 9	ADDED NOTE
REVISION 10	ADDED NOTE

ITEM #4 WAS N05-2677-1
3/26/90 PLAWANCE D

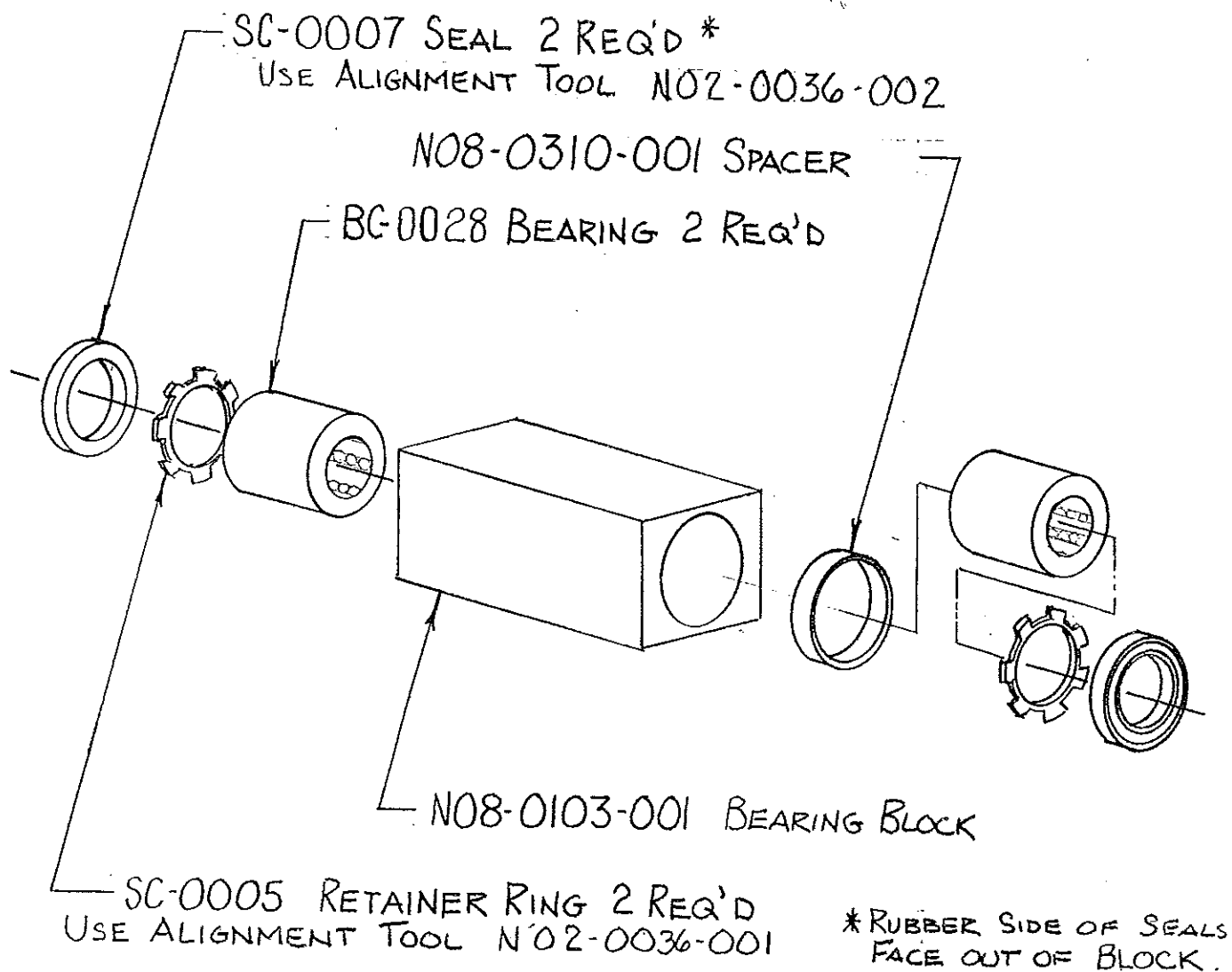


USE #271 RED
LOCTITE 3 PLACES AT ASSY.



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON DIMENSIONS		FRACTIONS $\pm$		DECIMALS $\pm$		ANGLES $\pm$		MACHINED FINISH $\sqrt$ R.M.S.		DO NOT SCALE DRAWING REMOVE BURRS AND SHARP EDGES	
DRAWN JAM LAURENCE		DESIGNED		FOR		APPROVED		SCALE		DATE	
TITLE BRG HOUSING SUB-ASSY		PART NUMBER		DESCRIPTION		QTY		REV.		NUMBER	
SHANKLIN CORPORATION WESTFORD ROAD AYER, MASSACHUSETTS		101-0023-036		SPACER		1		10-29-91		H08-0060	
7		SCR-928		10-32x5/8 F.H.M.S.		3					
6		SC-0031		SNAP RING		2					
5		BC-0010		BRG		2					
4		105-2085-001		BRG HOUSING		1					
3		108-0776-001		DOOR		1					
2		101-0023-037		SPACER		1					
1		H08-0058		SPINDLE ASSY.		1					
REV.		PART NUMBER		DESCRIPTION		QTY					

31 21 11-12 91



REVISIONS

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCE ON DIMENSIONS

FRACTIONS $\pm$ _____

DECIMALS $\pm$ _____

ANGLES $\pm$ _____

MACHINED FINISH ☒ R.M.S.

DO NOT SCALE DRAWING
REMOVE BURRS AND SHARP EDGES



SHANKLIN CORPORATION

WESTFORD ROAD

AYER, MASSACHUSETTS

DRAWN
PAM
LAWRENCE

TITLE

BEARING BLOCK ASSY.

DESIGNED

FOR

F-1,-3,-4,&-5 CARRIAGE

APPROVED

[Signature]

SCALE

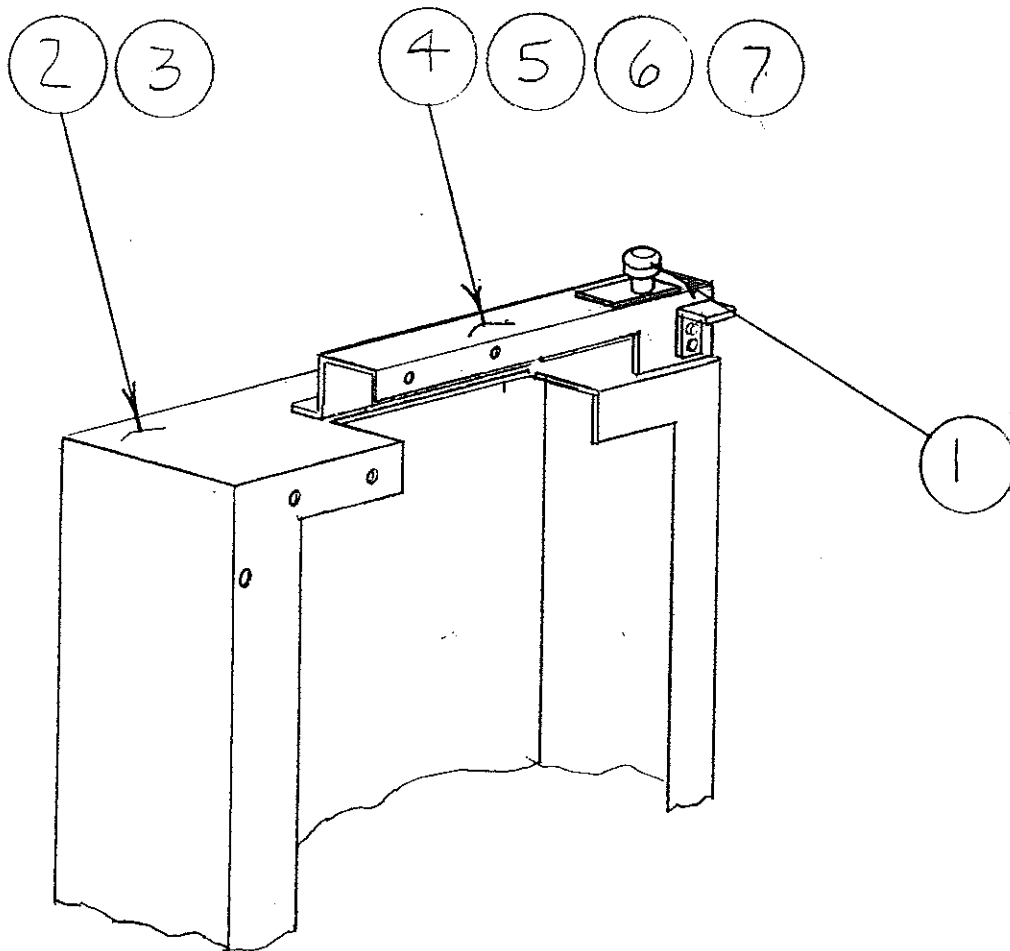
DATE

9-17-90

NUMBER

M08-0027

REV.



7	F08-0359-001	HINGE MT. F-3,-4	1
6	J05-1768-001	HINGE SUPPORT F-1,5	1
5	F08-0358-002	LH HSG EXT. F-3,4	1
4	F05-0747-002	LH HSG EXT. F-1,5	1
3	C08-0179-002	LH JAW HSG HT. EXT F-3,-4	1
2	C08-0179-001	LH JAW HSG HT. EXT. F-1,-5	1
1	M08-0064	EMERG. STOP ASMBY	1
ITEM	PART NUMBER	DESCRIPTION	QTY.

F0292F
F0292G

REVISIONS

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCE ON DIMENSIONS

FRACTIONS $\pm$ _____

DECIMALS $\pm$ _____

ANGLES $\pm$ _____

MACHINED FINISH ☒ R.M.S.

DO NOT SCALE DRAWING
REMOVE BURRS AND SHARP EDGES



SHANKLIN CORPORATION

WESTFORD ROAD

AYER, MASSACHUSETTS

DRAWN
PAM
LAWRENCE

DESIGNED

TITLE

END JAW HSG. 8" HT. EXT. (LEFT)

FOR

F-1,5,-3,4

APPROVED

CLB

SCALE

~

DATE

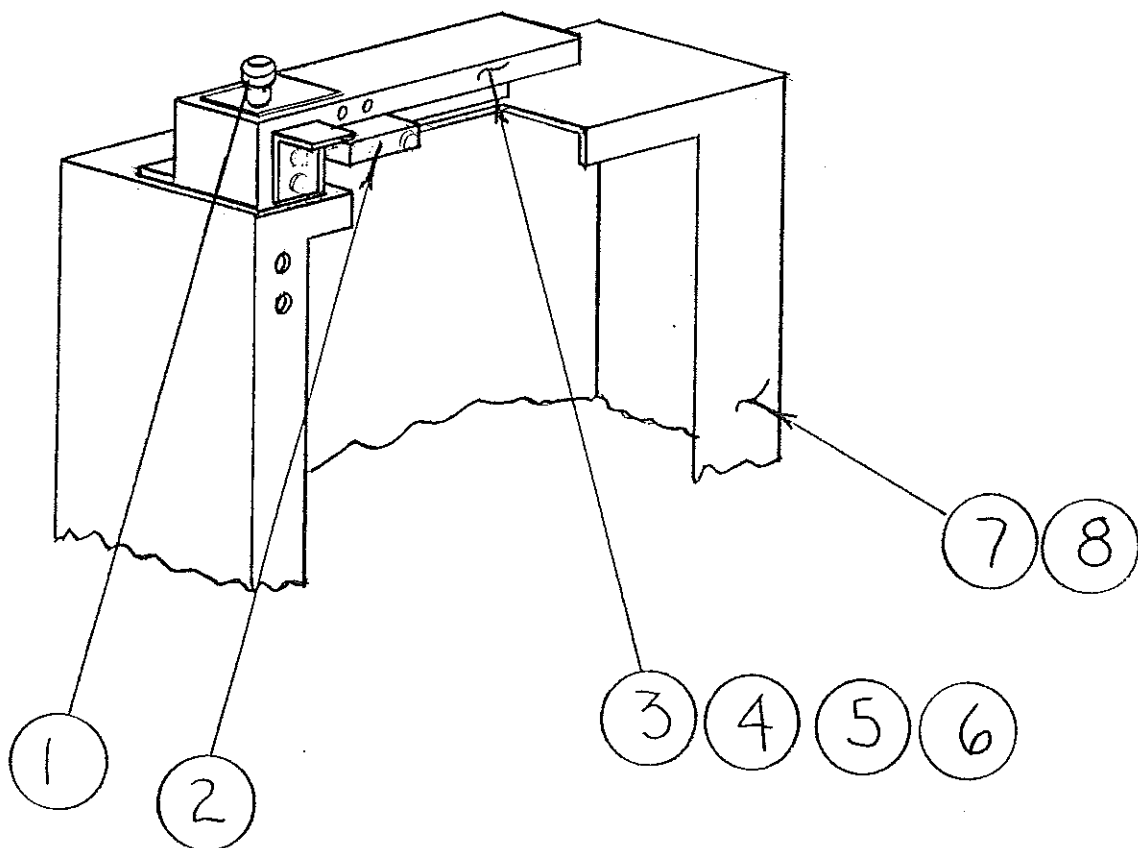
11-18-94

NUMBER

M08-0068

REV.

ITEM	PART NUMBER	DESCRIPTION	
1	M08-0064	EMEG. STOP	1
2	M08-0061	LS-7 HOOD SAFETY	1
3	F05-0747-001	F-1,-5 HSG. EXT.	1
4	F08-0358-001	F-3,-4 HSG. EXT.	1
5	F08-0323-001	F-1,-5 HOOD SUP. MT. (NOT SHOWN)	1
6	F08-0361-001	F-3,-4 HOOD SUP. (NOT SHOWN)	1
7	C08-0165-001	F-1,-5 RT JAW HSG-H.T. EXT.	1
8	C08-0165-003	F-3,-4 RT JAW HSG-H.T. EXT.	1



F0292F
F0292G

REVISIONS

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCE ON DIMENSIONS

FRACTIONS $\pm$ _____

DECIMALS $\pm$ _____

ANGLES $\pm$ _____

MACHINED FINISH ☒ R.M.S.

DO NOT SCALE DRAWING
REMOVE BURRS AND SHARP EDGES



SHANKLIN CORPORATION

WESTFORD ROAD

AYER, MASSACHUSETTS

DRAWN
PAM
LAWRENCE

TITLE

END JAW HSG 8" HT. EXT. (RIGHT)

DESIGNED

FOR

F-1,5,-3,4

APPROVED

SCALE

DATE

NUMBER

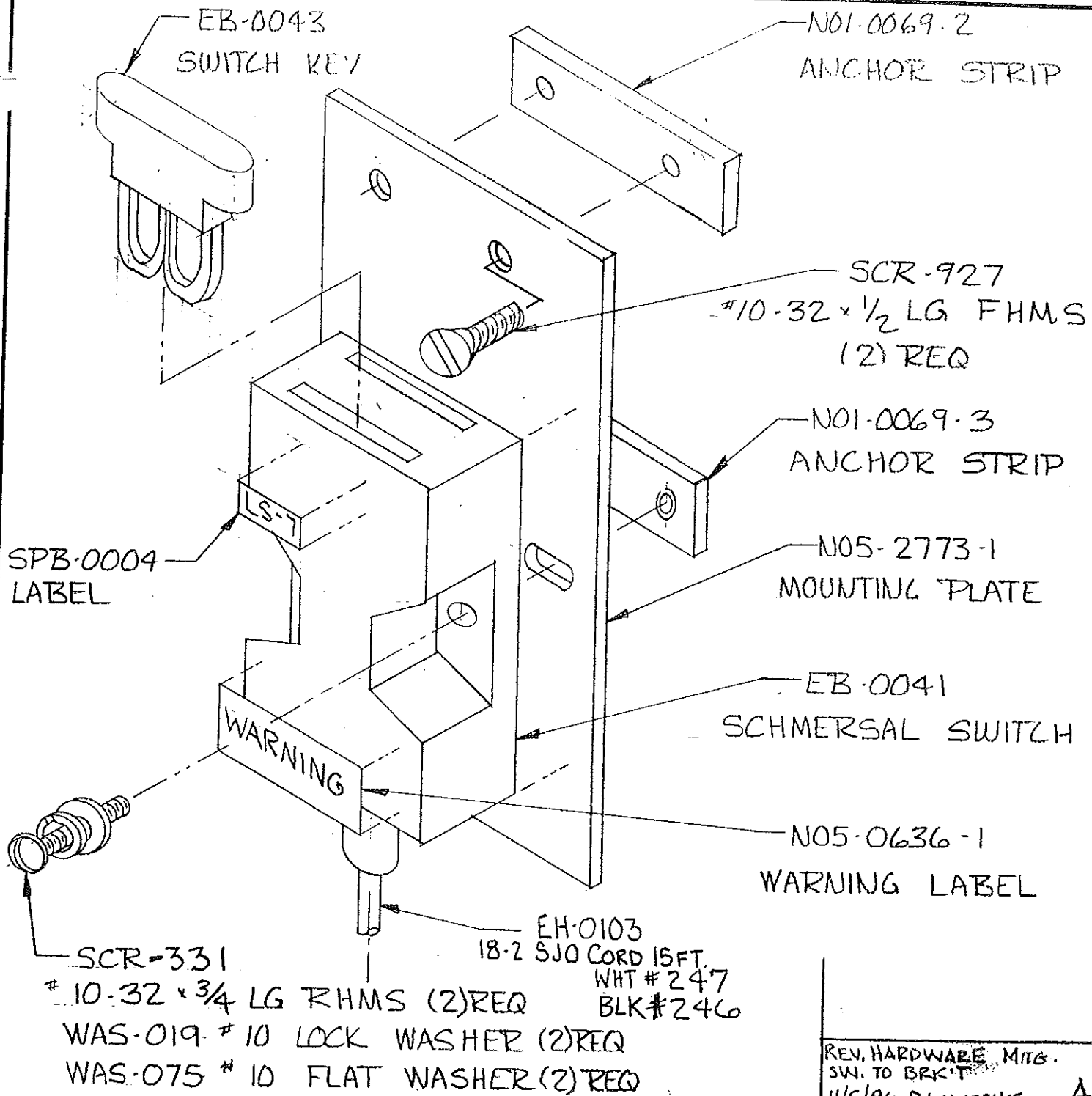
REV.

[Signature]

[Wavy line]

11-18-94

M08-0069



REV. HARDWARE MITG.
SW. TO BRKT
11/5/96 P. LAWRENCE

A

F02935

REVISIONS

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCE ON DIMENSIONS

FRACTIONS $\pm$

DECIMALS $\pm$

ANGLES $\pm$

MACHINED FINISH ☒ R.M.S.

DO NOT SCALE DRAWING
REMOVE BURRS AND SHARP EDGES



SHANKLIN CORPORATION

WESTFORD ROAD

AYER, MASSACHUSETTS

DRAWN
PAM
LAWRENCE

TITLE
END JAW HSG. SWITCH ASSY

DESIGNED

FOR
HEIGHT EXT. END JAW HSG. F-ALL

APPROVED

SCALE
NONE

DATE

11-23-94

NUMBER

MOB-0071

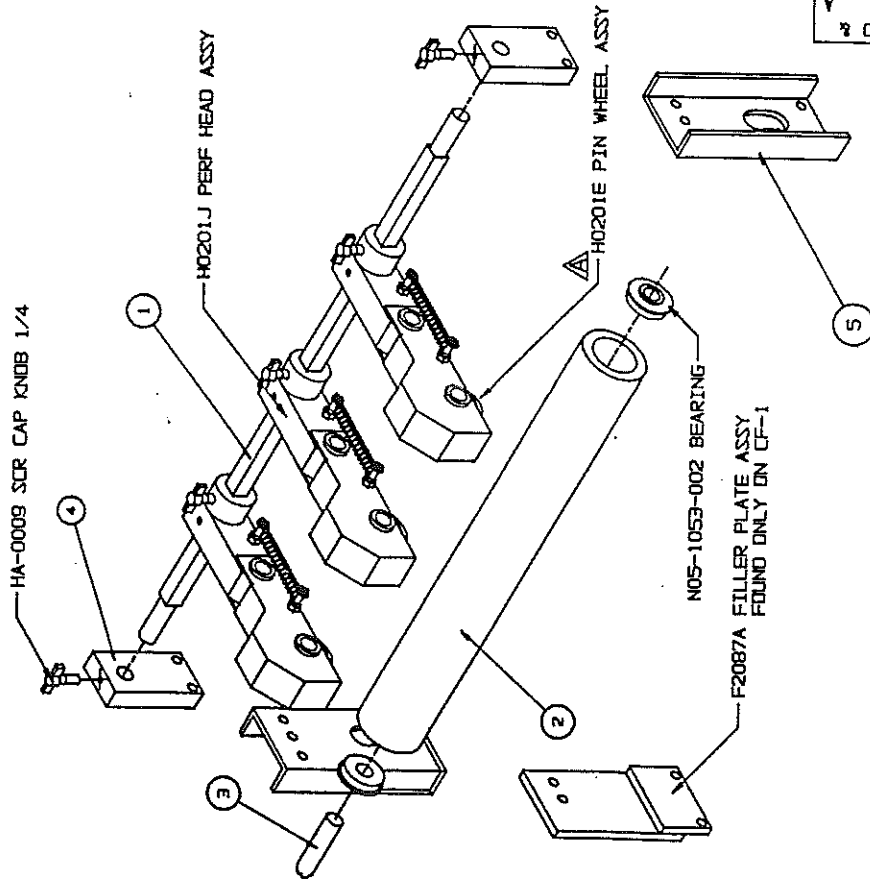
REV.

A

148997

MAKEPEACE

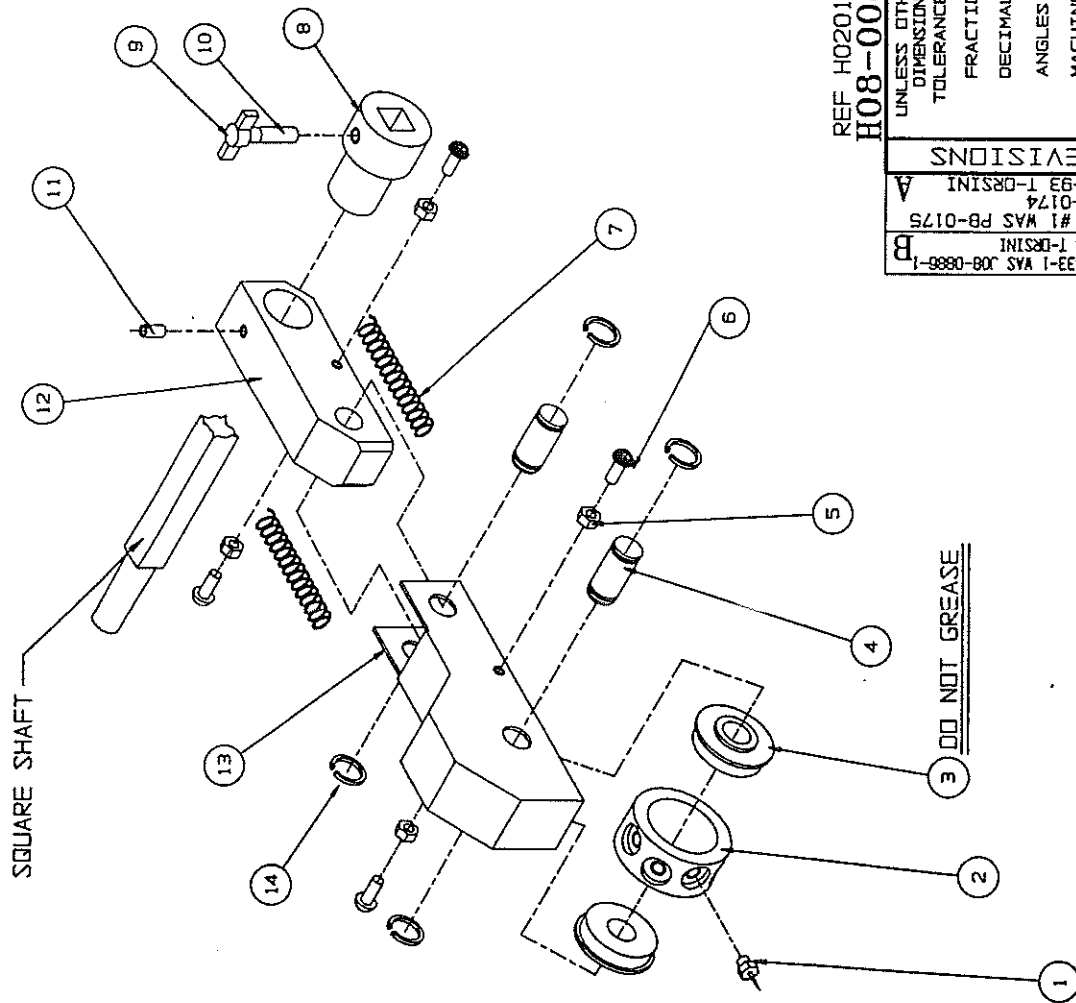
MAILED



F2091 CF-1 30"	5		NOT REQUIRED	
	4	N08-1110-001	MOUNTING BLOCK	2
	3		EXISTING .5 DIA SHAFT	1
	2	N08-0586-004	RUBBER ROLLER 2 X 32.18	1
	1	J08-0576-008	SQUARE SHAFT 1/2 X 39.25	1
H01560 HS-2,4	5		NOT REQUIRED	
	4	J05-2359-001	PERFORATOR MOUNT	2
	3		EXISTING .5 DIA SHAFT	1
	2	N08-0586-001	RUBBER ROLLER 2 X 42	1
	1	J08-0576-007	SQUARE SHAFT 1/2 X 50.87	1
H0201H F-1,5	5		NOT REQUIRED	
	4	N08-1110-001	MOUNTING BLOCK	2
	3		EXISTING .5 DIA SHAFT	1
	2	N08-0586-003	RUBBER ROLLER 2 X 26	1
	1	J08-0576-004	SQUARE SHAFT 1/2 X 35.5	1
F0143D F-3,4	5	N08-1122-001	PIN PERFORATOR MOUNT	2
	4	N08-1110-001	MOUNTING BLOCK	2
	3		EXISTING .5 DIA SHAFT	1
	2	N08-0586-002	RUBBER ROLLER 2 X 41	1
	1	J08-0576-005	SQUARE SHAFT 1/2 X 46.25	1
A7093 A-27	5		NOT REQUIRED	
	4	J05-2358-001	PERFORATOR MOUNT	2
	3	N01-0050-006	SHAFT .5 X 33.75	1
	2	N08-0586-004	RUBBER ROLLER 2 X 32.18	1
	1	J08-0576-006	SQUARE SHAFT 1/2 X 35.5	1
PART NO.	ITEM	PART NO.	DESCRIPTION	QTY.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON DIMENSIONS		BILL OF MATERIALS	
FRACTIONS ±	DECIMALS ±	APPROVED	SCALE
ANGLES ±	MACHINED FINISH	DRSINI	NONE
DO NOT SCALE DRAWING REMOVE BURRS AND SHARP EDGES		DESIGNED	DATE
REVISIONS		9-25-92	
H0201E WAS H0201D & H0201G 1-15-93 T-DRSINI		NUMBER	
		H08-0081 A	
		REV	
		ALL MACHINES	
		PIN PERFORATOR ASSY	
		TITILE	
		SHANKLIN CORPORATION	
		WESTFORD ROAD AYER, MASSACHUSETTS	

73A



ITEM	PART NO.	DESCRIPTION	QTY.
14	SC-0052	SNAP RING EXT 1/2	4
13	N08-1107-001	PERFORATOR HOUSING	1
12	J08-0885-001	UPPER ARM	1
11	SCR-2106	1/4-20 X 1/4 LG SET SCR	1
10	SCR-536	1/4-20 X 5/8 LG SHCS	1
9	HA-0009	SCREW CAP KNOB	1
8	N08-1188-001	SHAFT ADAPTER	1
7	SA-0020	EXTENSION SPRING	2
6	SCR-329	#10-32 X 1/2 LG RHMS	4
5	NUT-004	#10-32 HEX NUT	4
4	J01-0014-019	PIN 1/2 DIA X 1 1/2 LG	2
3	N05-1053-002	PLATED BEARING (BC-0055)	2
2	J08-1033-001	PERFORATOR RING	1
1	SPA-0361-001	PERFORATOR PIN	8

REF H0201J

H08-0080

BILL OF MATERIALS

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCE ON DIMENSIONS

FRACTIONS ±

DECIMALS ±

ANGLES ±

MACHINED FINISH

DO NOT SCALE DRAWING
REMOVE BURRS AND SHARP EDGES

REV	DATE	NUMBER	REV
1	9-24-92	H08-0080	B

REV	DATE	NUMBER	REV
1	9-24-92	H08-0080	B

REV	DATE	NUMBER	REV
1	9-24-92	H08-0080	B

REV	DATE	NUMBER	REV
1	9-24-92	H08-0080	B

REV	DATE	NUMBER	REV
1	9-24-92	H08-0080	B

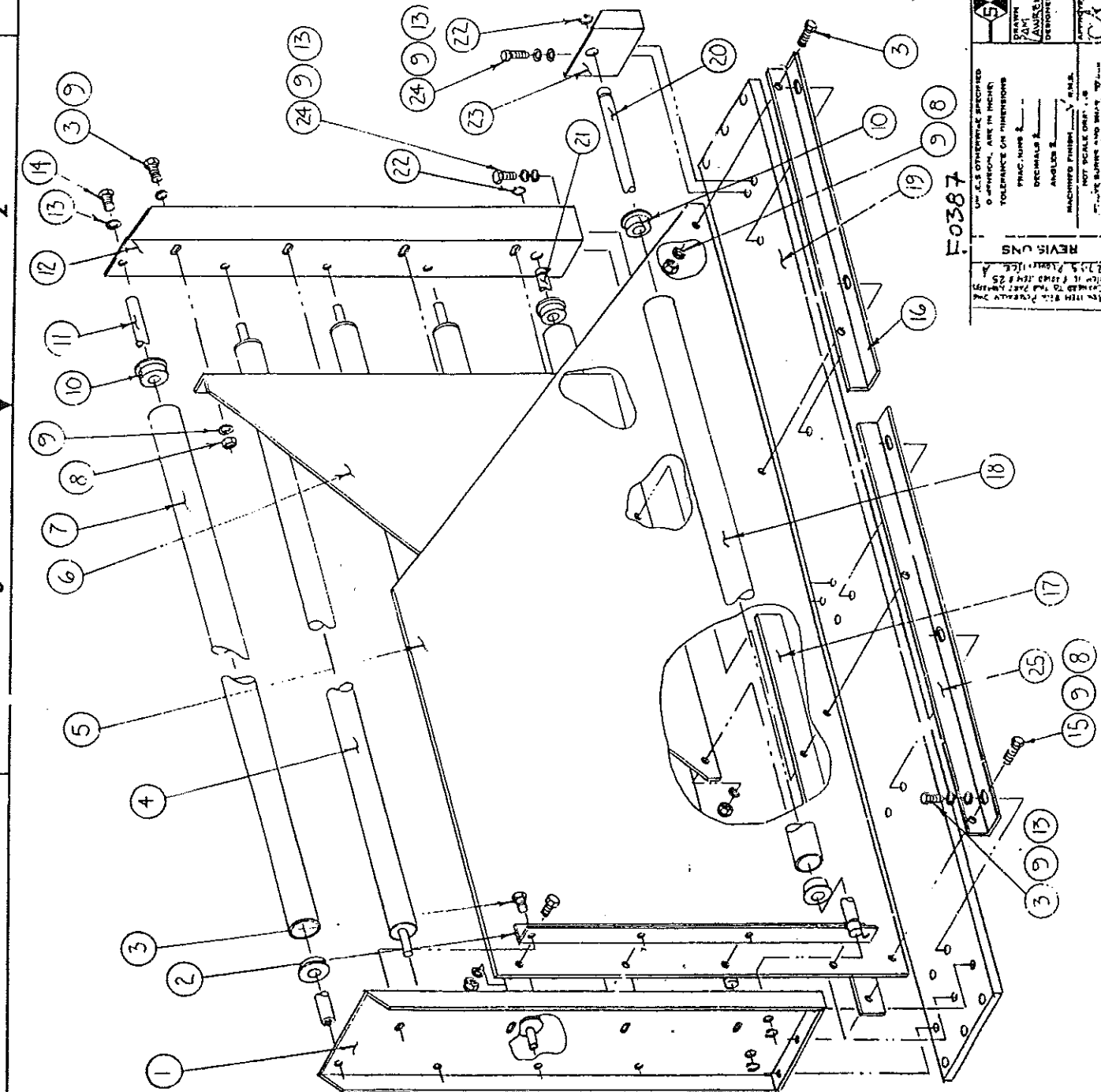
REV	DATE	NUMBER	REV
1	9-24-92	H08-0080	B

REV	DATE	NUMBER	REV
1	9-24-92	H08-0080	B

REV	DATE	NUMBER	REV
1	9-24-92	H08-0080	B

m95B

1 2 3 4



ITEM	PART NUMBER	DESCRIPTION	QTY
25	J05-2003-004	F. ANG BRKT	1
24	SCR-168	3/16-18x3/8 H.C.S.	7
23	J05-2117-001	ROLLER SUPPORT	1
22	SC-0013	SNAP RING	4
21	J01-0005-045	SHAFT 3/32x1/16	1
20	J01-0005-044	SHAFT 3/32x1/16	1
19	J05-2043-001	MNT. PLATE	1
18	J01-0007-154	ROLLER 1/2x17/16	1
17	J05-2002-001	FORMING ANG. BRKT	1
16	J05-2003-002	FORMING ANG. BRKT	1
15	SCR-169	3/16-18x1/2 H.C.S.	2
14	SCR-165	3/16-18x1/2 H.C.S.	2
13	WAS-021	3/16 L.W.	11
12	J05-2004-002	FORMING ANG. SUPP	1
11	J05-2638-001	SHAFT 1/2x24 3/4	1
10	BC-0053	BEARING	6
9	WAS-110	3/16 F.W.	32
8	NUT-058	3/16-18 DINKA NUT	16
7	J01-0007-156	ROLLER 1/2x24 3/4	2
6	F05-0891-001	FORMING ANG. BLK	1
5	F05-0886-001	FORMING ANG. FRONT	1
4	KA-0004	INTER ROLL	2
3	SCR-167	3/16-18x1/2 H.C.S.	21
2	J05-2004-001	FORMING ANG. BRKT	1
1	J05-2042-002	FORMING ANG. SUP	1

STAN-KLIN CORPORATION
STEFFORD ROAD
ATLANTA, GEORGIA

REVISIONS

REV. 1
DATE 5-17-93
BY JES

DESCRIPTION
CENTER FOLDER ASSY
FOR COMP. C/FOLDER GF126271-5-15
DUAL COMP. C/FOLDER 115137F-5

SCALE
1" = 1"

DATE
5-17-93

REV
JES

QTY
1

ITEM PART NUMBER
F0387

DESCRIPTION
CENTER FOLDER ASSY

FOR COMP. C/FOLDER GF126271-5-15

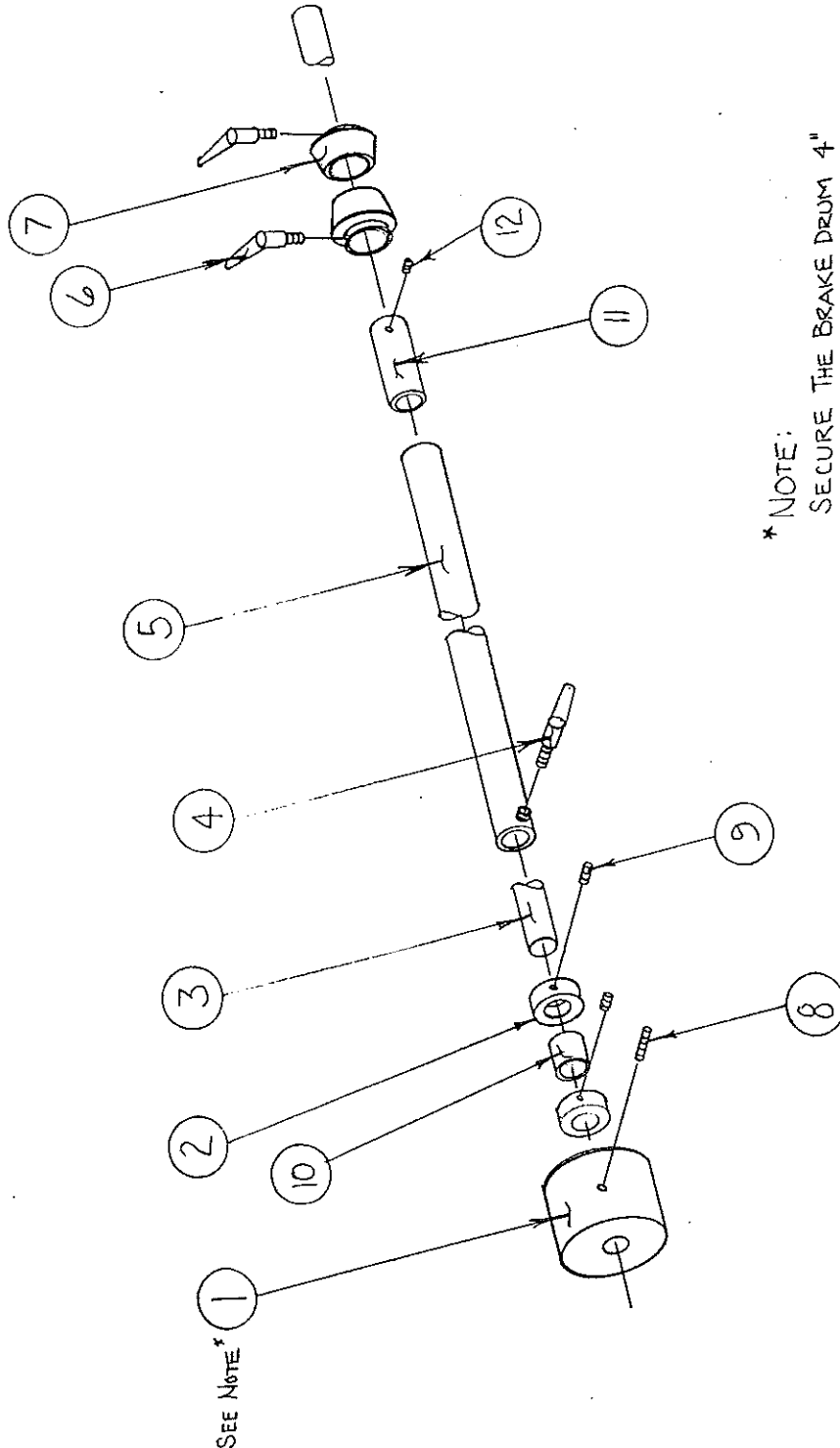
DUAL COMP. C/FOLDER 115137F-5

SCALE
1" = 1"

DATE
5-17-93

BY
JES

QTY
1



* NOTE:
SECURE THE BRAKE DRUM 4"
FROM THE END OF THE SPINDLE

ITEM	PART NUMBER	DESCRIPTION	QTY.
12	SCR-815	8-32 x 3/8 SET SCREW	1
11	N05-3017-001	SPINDLE BRG	1
10	N05-2986-001	SPINDLE BRG	1
9	SCR-2131	5/16-18 x 1/4 SET SCREW	2
8	SCR-2132	5/16-18 x 3/8 SET SCREW	1
7	J05-0428-003	FILM CHUCK 1 1/4	2
6	HA-0024	KIPP HANDLE	2
5	J05-2120-001	LOCKING TUBE	1
4	HA-0023	KIPP HANDLE	1
3	N05-2732-001	SPINDLE	1
2	PB-0017	COLLAR	2
1	N05-2733-001	BRAKE DRUM	1

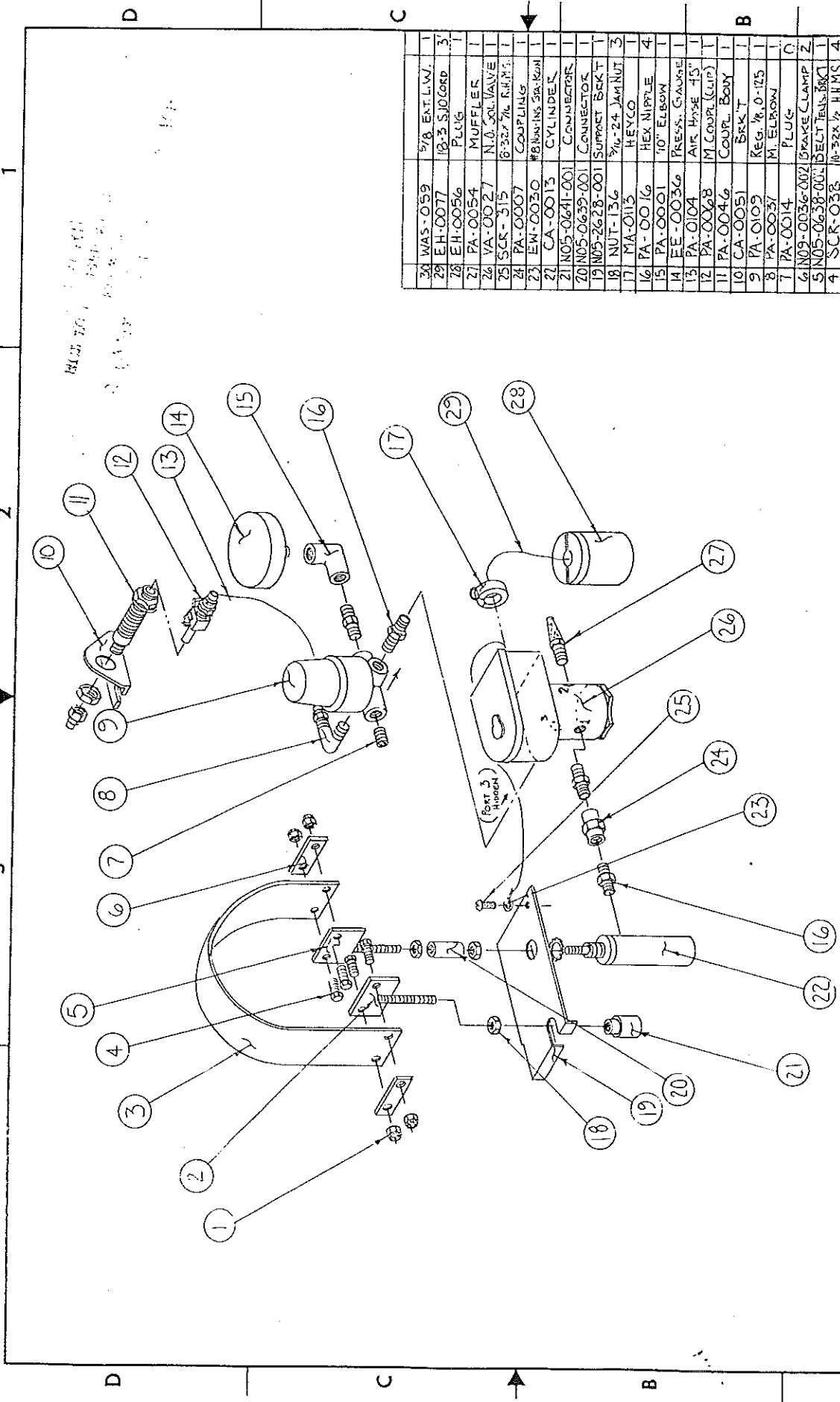
F0233A

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON DIMENSIONS	
FRACTIONS $\pm$	DECIMALS $\pm$
ANGLES $\pm$	MACHINED FINISH $\sqrt{\text{R.M.S.}}$
DO NOT SCALE DRAWING REMOVE BURRS AND SHARP EDGES	

REVISIONS	
Added Item # 12 as Mfg'd	12-22-94 PLANNING
Added Item # 10, 11, and 12	12-22-94 PLANNING
Added Item # 12 as Mfg'd	12-22-94 PLANNING

SHANKLIN CORPORATION WESTFORD ROAD AYER, MASSACHUSETTS	
TITLE SPINDLE	FOR COMPACT CENTERFOUNDER
DRAWN JAM	DESIGNED
APPROVED CAG	SCALE ~
DATE 3-24-92	NUMBER H05-0143
REV. B	

4 3 2 1

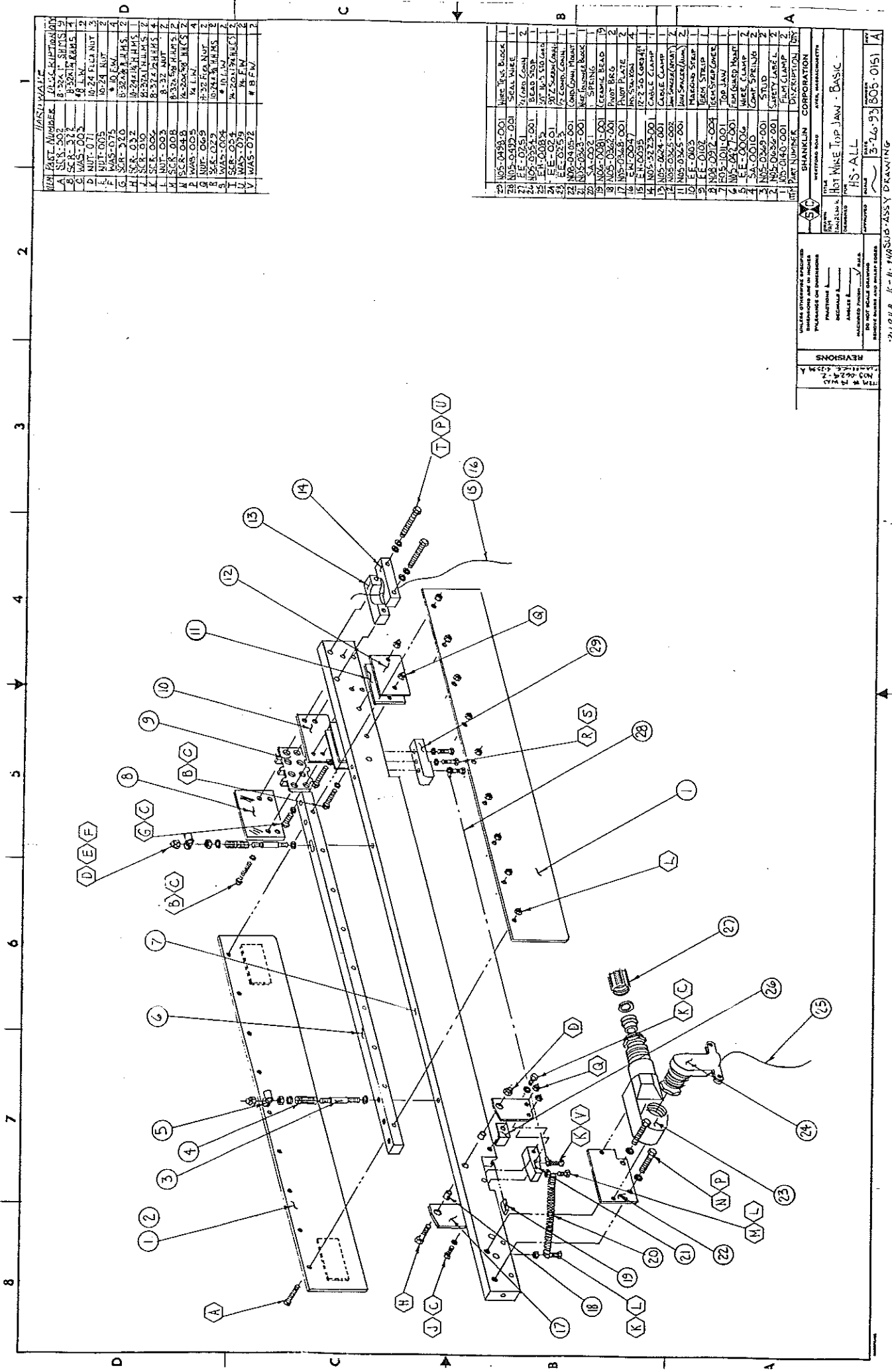


BLK 261
1944-45
2-1-50

ITEM	PART NUMBER	DESCRIPTION	QTY
29	WAS-059	5/8 EXT. L.W.	1
28	EH-0017	1/2-3 SJOORD	3
27	EH-0056	PLUG	1
26	PA-0054	MUFFLER	1
25	VA-0027	N.O. SOL. VALVE	1
24	SCR-315	6-32x 1/2 R.H.M.S.	1
23	EW-0007	COUPLING	1
22	CA-0030	#8 NUTS STA. RUN	1
21	CA-0013	CYLINDER	1
20	N05-0641-001	CONNECTOR	1
19	N05-0639-001	CONNECTOR	1
18	N05-2628-001	SUPPORT BRKT	1
17	NUT-136	3/16-24 Jam Nut	3
16	MA-0113	KEYCO	1
15	PA-0016	HEX NIPPLE	4
14	EE-0036	10" ELBOW	1
13	PA-0104	PRESS. GAUGE	1
12	PA-0028	AIR HOSE -15"	1
11	PA-0046	M. COUPL. BODY	1
10	CA-0051	BRKT	1
9	PA-0103	REG. 1/8, 0-125	1
8	PA-0037	M. ELBOW	1
7	PA-0014	PLUG	0
6	N09-0036-002	BRAKE CLAMP	2
5	N05-0638-001	BELT TENS. BRKT	1
4	SCR-038	10-32x 1/2 H.H.M.S.	4
3	N05-2741-001	BRAKE STRAP	1
2	N05-0638-001	BELT TENS. BRKT	1
1	NUT-150	10-32 DIA NUT	4

SHANKLIN CORPORATION	
WETTER ROAD	AVON, MASSACHUSETTS
TITLE: BRAKE PNEUMATICS ASSY	
DESIGNED BY: [Signature]	FOR: COMP. C/FOLDER CFI, F5, H55, JA27
APPROVED BY: [Signature]	DATE: 8-26-92
SCALE: 1"=1'-0"	NUMBER: E08-0109
REVISIONS	
REVISED SOLIDWORKS TO SHOW HIDDEN PORT	
PLACEMENT 4/12/94 A	

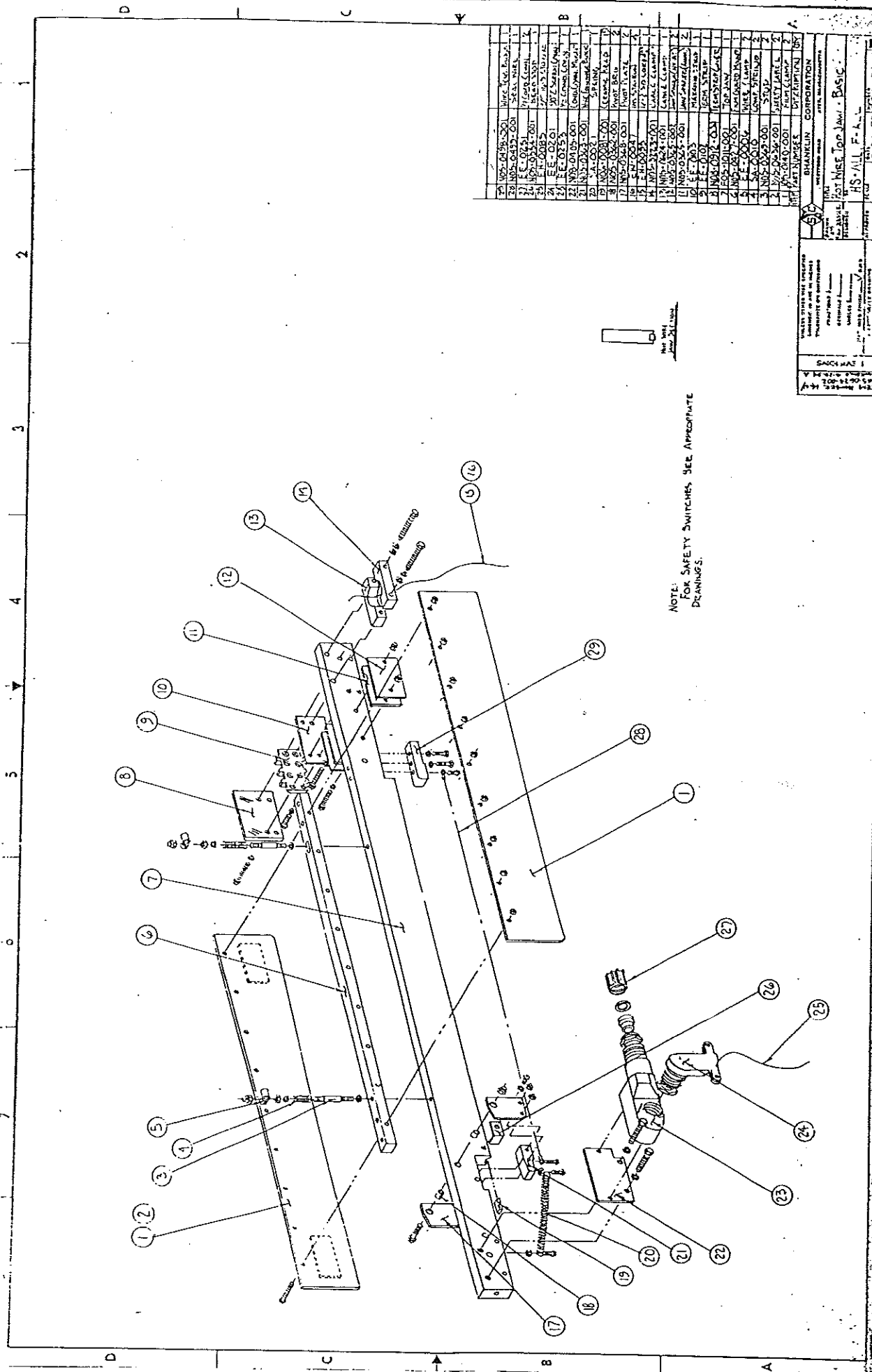
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON DIMENSIONS
FRACTIONS 1/16
DECIMALS 0.001
ANGLES 1/2
MACHINED FINISH - V
DO NOT SCALE DRAWING
REMOVE BURRS AND SHARP EDGES



ITEM	PART NUMBER	PLATE	PLATE EXTENSION
A	SR-002	B-32	SR-002
B	SR-003	B-32	SR-003
C	SR-004	B-32	SR-004
D	SR-005	B-32	SR-005
E	SR-006	B-32	SR-006
F	SR-007	B-32	SR-007
G	SR-008	B-32	SR-008
H	SR-009	B-32	SR-009
I	SR-010	B-32	SR-010
J	SR-011	B-32	SR-011
K	SR-012	B-32	SR-012
L	SR-013	B-32	SR-013
M	SR-014	B-32	SR-014
N	SR-015	B-32	SR-015
O	SR-016	B-32	SR-016
P	SR-017	B-32	SR-017
Q	SR-018	B-32	SR-018
R	SR-019	B-32	SR-019
S	SR-020	B-32	SR-020
T	SR-021	B-32	SR-021
U	SR-022	B-32	SR-022
V	SR-023	B-32	SR-023
W	SR-024	B-32	SR-024
X	SR-025	B-32	SR-025
Y	SR-026	B-32	SR-026
Z	SR-027	B-32	SR-027

20	N05-0438-001	WIRE TIE BUCKS	1
21	N05-0439-001	SWAY WHITE	2
22	EE-0745	3/4" CARP. NAIL	2
23	N05-0440-001	BEAD SPRING	2
24	EE-0083	30" X 5/8" CARP.	1
25	EE-0211	30" X 2" COMB. CONN.	1
26	N05-0441-001	COMB. CONN. PLANT	1
27	N05-0442-001	FR. INSULATED BUCK	1
28	SA-002	1" SPRING	1
29	N05-0081-001	CEMENT BEAD	1
30	N05-0368-001	PIVOT BRG	2
31	N05-0369-001	PIVOT PLATE	2
32	SA-0047	5/8" X 3/4" NUT	4
33	EE-H00035	1/2" X 3/4" COMB. PL.	1
34	N05-3273-001	CABLE CLAMP	1
35	N05-3624-001	CABLE CLAMP	1
36	N05-0365-001	2" DIA. WHEEL (PIVOT)	2
37	N05-0365-002	2" DIA. WHEEL (PIVOT)	2
38	N05-0365-003	2" DIA. WHEEL (PIVOT)	2
39	EE-0003	1/2" X 3/4" COMB. PL.	1
40	EE-0003	1/2" X 3/4" COMB. PL.	1
41	N05-0372-001	1/2" X 3/4" COMB. PL.	1
42	N05-0372-002	1/2" X 3/4" COMB. PL.	1
43	N05-0372-003	1/2" X 3/4" COMB. PL.	1
44	N05-0372-004	1/2" X 3/4" COMB. PL.	1
45	N05-0372-005	1/2" X 3/4" COMB. PL.	1
46	N05-0372-006	1/2" X 3/4" COMB. PL.	1
47	N05-0372-007	1/2" X 3/4" COMB. PL.	1
48	N05-0372-008	1/2" X 3/4" COMB. PL.	1
49	N05-0372-009	1/2" X 3/4" COMB. PL.	1
50	N05-0372-010	1/2" X 3/4" COMB. PL.	1
51	N05-0372-011	1/2" X 3/4" COMB. PL.	1
52	N05-0372-012	1/2" X 3/4" COMB. PL.	1
53	N05-0372-013	1/2" X 3/4" COMB. PL.	1
54	N05-0372-014	1/2" X 3/4" COMB. PL.	1
55	N05-0372-015	1/2" X 3/4" COMB. PL.	1
56	N05-0372-016	1/2" X 3/4" COMB. PL.	1
57	N05-0372-017	1/2" X 3/4" COMB. PL.	1
58	N05-0372-018	1/2" X 3/4" COMB. PL.	1
59	N05-0372-019	1/2" X 3/4" COMB. PL.	1
60	N05-0372-020	1/2" X 3/4" COMB. PL.	1
61	N05-0372-021	1/2" X 3/4" COMB. PL.	1
62	N05-0372-022	1/2" X 3/4" COMB. PL.	1
63	N05-0372-023	1/2" X 3/4" COMB. PL.	1
64	N05-0372-024	1/2" X 3/4" COMB. PL.	1
65	N05-0372-025	1/2" X 3/4" COMB. PL.	1
66	N05-0372-026	1/2" X 3/4" COMB. PL.	1
67	N05-0372-027	1/2" X 3/4" COMB. PL.	1
68	N05-0372-028	1/2" X 3/4" COMB. PL.	1
69	N05-0372-029	1/2" X 3/4" COMB. PL.	1
70	N05-0372-030	1/2" X 3/4" COMB. PL.	1
71	N05-0372-031	1/2" X 3/4" COMB. PL.	1
72	N05-0372-032	1/2" X 3/4" COMB. PL.	1
73	N05-0372-033	1/2" X 3/4" COMB. PL.	1
74	N05-0372-034	1/2" X 3/4" COMB. PL.	1
75	N05-0372-035	1/2" X 3/4" COMB. PL.	1
76	N05-0372-036	1/2" X 3/4" COMB. PL.	1
77	N05-0372-037	1/2" X 3/4" COMB. PL.	1
78	N05-0372-038	1/2" X 3/4" COMB. PL.	1
79	N05-0372-039	1/2" X 3/4" COMB. PL.	1
80	N05-0372-040	1/2" X 3/4" COMB. PL.	1
81	N05-0372-041	1/2" X 3/4" COMB. PL.	1
82	N05-0372-042	1/2" X 3/4" COMB. PL.	1
83	N05-0372-043	1/2" X 3/4" COMB. PL.	1
84	N05-0372-044	1/2" X 3/4" COMB. PL.	1
85	N05-0372-045	1/2" X 3/4" COMB. PL.	1
86	N05-0372-046	1/2" X 3/4" COMB. PL.	1
87	N05-0372-047	1/2" X 3/4" COMB. PL.	1
88	N05-0372-048	1/2" X 3/4" COMB. PL.	1
89	N05-0372-049	1/2" X 3/4" COMB. PL.	1
90	N05-0372-050	1/2" X 3/4" COMB. PL.	1
91	N05-0372-051	1/2" X 3/4" COMB. PL.	1
92			

[illegible]



29	NO. 0435-001	Weld. Top Jaw	1
28	NO. 0435-001	Weld. Top Jaw	1
27	NO. 0435-001	Weld. Top Jaw	1
26	NO. 0435-001	Weld. Top Jaw	1
25	NO. 0435-001	Weld. Top Jaw	1
24	NO. 0435-001	Weld. Top Jaw	1
23	NO. 0435-001	Weld. Top Jaw	1
22	NO. 0435-001	Weld. Top Jaw	1
21	NO. 0435-001	Weld. Top Jaw	1
20	NO. 0435-001	Weld. Top Jaw	1
19	NO. 0435-001	Weld. Top Jaw	1
18	NO. 0435-001	Weld. Top Jaw	1
17	NO. 0435-001	Weld. Top Jaw	1
16	NO. 0435-001	Weld. Top Jaw	1
15	NO. 0435-001	Weld. Top Jaw	1
14	NO. 0435-001	Weld. Top Jaw	1
13	NO. 0435-001	Weld. Top Jaw	1
12	NO. 0435-001	Weld. Top Jaw	1
11	NO. 0435-001	Weld. Top Jaw	1
10	NO. 0435-001	Weld. Top Jaw	1
9	NO. 0435-001	Weld. Top Jaw	1
8	NO. 0435-001	Weld. Top Jaw	1
7	NO. 0435-001	Weld. Top Jaw	1
6	NO. 0435-001	Weld. Top Jaw	1
5	NO. 0435-001	Weld. Top Jaw	1
4	NO. 0435-001	Weld. Top Jaw	1
3	NO. 0435-001	Weld. Top Jaw	1
2	NO. 0435-001	Weld. Top Jaw	1
1	NO. 0435-001	Weld. Top Jaw	1

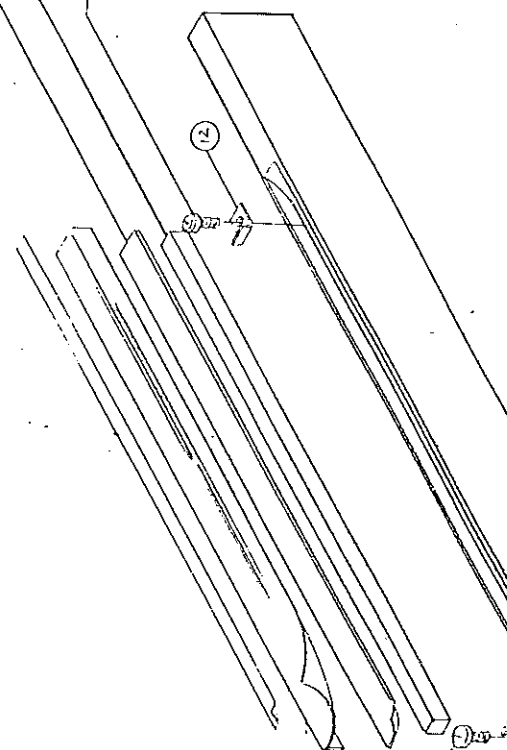
SHANKLIN CORPORATION
 1000 N. 10th St.
 Milwaukee, Wis. 53233
 (414) 333-1000
 FAX (414) 333-1001
 E-Mail: info@shanklin.com
 Web: www.shanklin.com

Part Name: **Top Jaw - Basic**
 Part Number: **NO. 0435-001**
 Revision: **1**
 Date: **10/1/00**

Drawn by: **W. J. ...**
 Checked by: **...**
 Approved by: **...**

1 2

- (14) MA-0116 RED SILICONE RUBBER
- (15) MA 0127 BLACK NEOPRENE #192
- (16) 8-32 X 3/8 RH, L W (2 REQ'D)

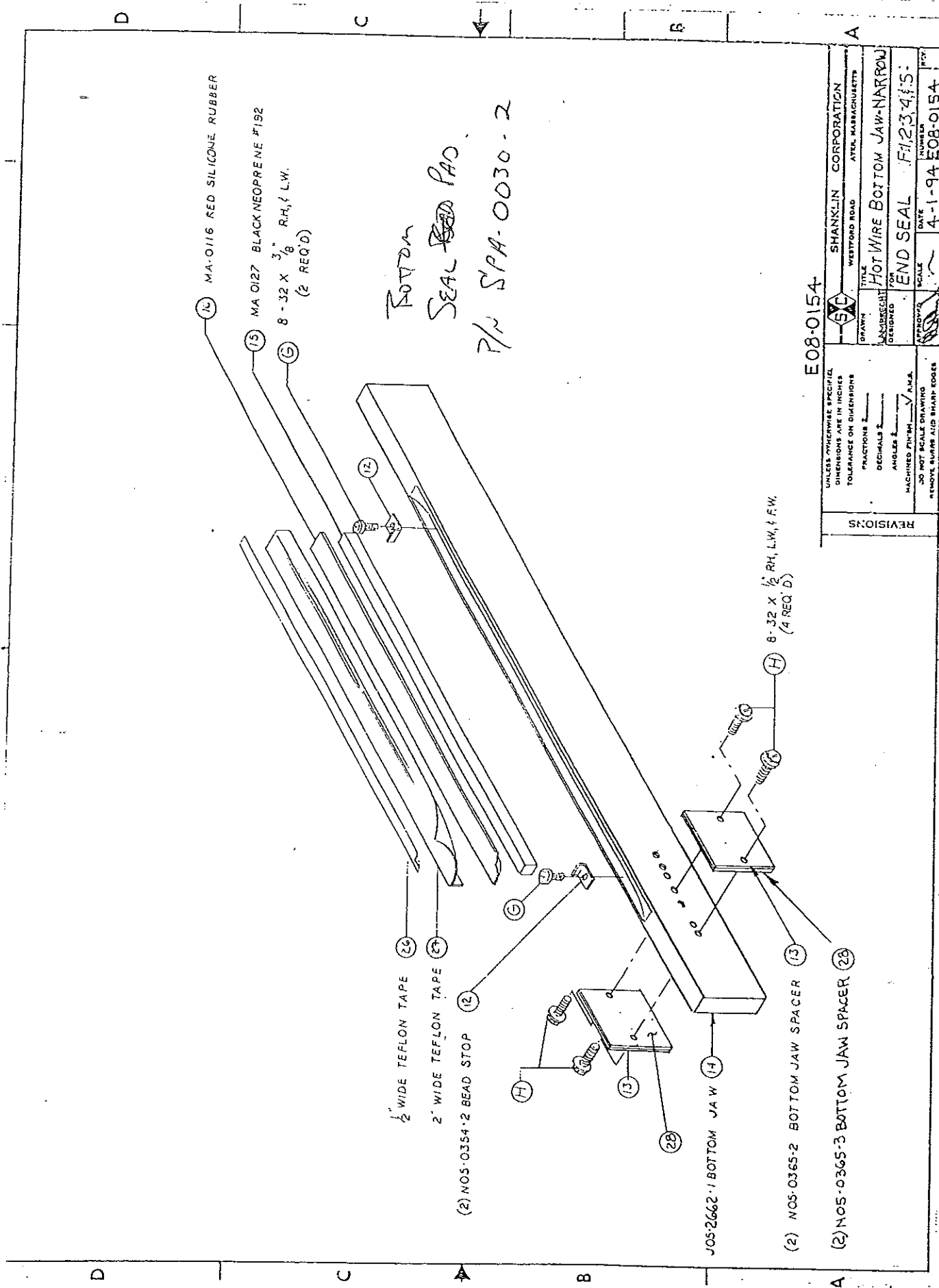


E08-0119

FOI07

SHANKLIN CORPORATION WESTFORD ROAD AYER, MASSACHUSETTS	
DESIGNED BY 1/13/92	TITLE Hot Wire Bottom Jaw
APPROVED BY 01/13/92	DATE 1-8-92
END SEAL F123415	
E080119	

REVISIONS	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON DIMENSIONS	
FRACTIONS 1/16	
DECIMALS 1/100	
ANGLES 1/16	
MACHINED FINISH	✓ R.M.S.
DO NOT SCALE DRAWING	
REMOVE BURRS AND SHARP EDGES	



Bottom
SEAL ~~PAO~~ PAO
P/N SPA-0030-2

E08-0154

SHANKLIN CORPORATION WESTFORD ROAD AVEN, MASSACHUSETTS	
DESIGNED	DATE
DRAWN	SCALE
TITLE Hot Wire Bottom Jaw-Narrow	
END SEAL F1123415	
APPROVED	DATE
MANUFACTURED	SCALE
DO NOT SCALE DRAWING REMOVE SHARP AND BLUNT EDGES	
MANUAL DRAWING	

REVISIONS

- (2) NOS-0354-2 BEAD STOP
- (2) NOS-0365-2 BOTTOM JAW SPACER
- (2) NOS-0365-3 BOTTOM JAW SPACER
- JOS-2662-1 BOTTOM JAW
- 8-32 X 1/2 RH, LW, LFW (4 REQ'D)
- 1/2" WIDE TEFLON TAPE
- 2" WIDE TEFLON TAPE
- 12 MA-0116 RED SILICONE RUBBER
- 15 MA 0127 BLACK NEOPRENE #192
- 8-32 X 3/8 RH, L.W. (2 REQ'D)

SECTION 7. ASSEMBLY DRAWINGS

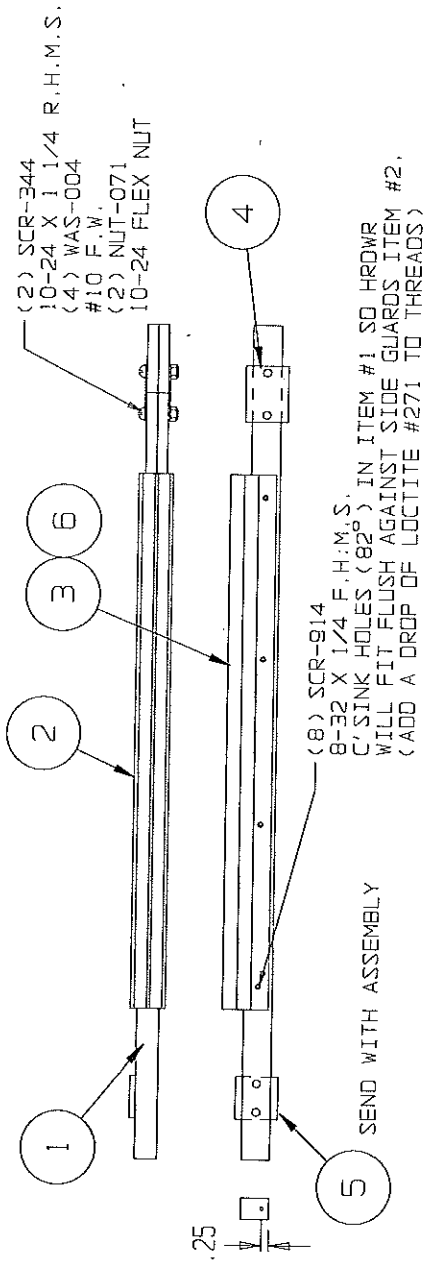
This section contains the assembly drawings applicable to your machine. The drawings are contained in alphanumeric order.

7.1. BASIC MACHINE DRAWINGS	1
7.2. HOT WIRE DRAWINGS	2
7.3. HOT KNIFE DRAWINGS	3
7.4. COOL CUT DRAWINGS	3

7.1. BASIC MACHINE DRAWINGS

Drawing Number	Drawing Title
B05-0051	Standard Infeed Conveyor
B05-0052	Adjustable Inverting Head
B08-0132	Carriage Assembly
B08-0146	Top Electric Box
B08-0147	Electric Box
D08-0034	Chain Drive Layout
E05-0209	Unwind Control Assembly
E05-0210	Inverting Head Table Assembly
E05-0230	Dancer Roller Drawing
E05-0231	Hole Punch Drawing
E05-0252	Driven Nip Rolls
E08-0008	Crank Changeover Diagram
E08-0054	Carriage Roller
E08-0058	Roller Placement (Carriage End Seal Assembly)
E08-0089	Selvedge Winder Drawing
E08-0121	High Speed Valve Assembly
E08-0122	High Speed Cylinder Assembly
E08-0123	Jaw Height Assembly
E08-0157	Side Seal Drive Shaft
E08-0158	Pneumatics Assembly
E08-0159	Carriage Cylinder Assembly
E08-0160	Park Air Hole Punch Assembly
E08-0169	Jaw Height Assembly Drawing

~~ CONTINUED ~~



ITEM	DESCRIPTION	QTY.	PVC *SRC*	POLY & DLEF *SRC*	POLY CUT WIRE *SRC*	WIDE FIN SEAL
1	BOTTOM JAW	1	J08-1192-001	J08-1192-001	J08-1192-001	F0135C
2	PAD CLAMP	2	J08-0091-003	J08-0091-003	J08-0091-003	J08-1192-001
3	BOTTOM JAW PAD	1	SPA-0030-002	SPA-0030-003	SPA-0030-001	J08-0091-003
4	JAW SPACER	2	N05-0365-002	N05-0365-002	N05-0365-002	SPA-0030-002
5	PILLOW BLOCK SPACER	1	N05-0366-003	N05-0366-003	N05-0366-003	N05-0365-002
6	FELT PAD	0	N/A	N/A	N/A	N05-0366-003
						N05-0155-010

		SHANKLIN CORPORATION	
WESTFORD ROAD		AYER, MASSACHUSETTS	
DRAWN	TITLE	BOTTOM JAW ASSEMBLY	
VALUADIT	FOR	HOT KNIFE	
DESIGNED	SCALE	F-2 & F-3	
APPROVED	DATE	5/14/85	
DO NOT SCALE DRAWING REMOVE BURRS AND SHARP EDGES		NUMBER	REV
		H08-0004	G

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCE ON DIMENSIONS

FRACTIONS ± 1/64
DECIMALS ± .005
ANGLES ± -

MACHINED FINISH

DO NOT SCALE DRAWING
REMOVE BURRS AND SHARP EDGES

REVISIONS

02/18/97 P. LARSEN

APPROVED FOR DIFFERENT APPLICATIONS.

TO SET UP THE SERIES 965 WATLOW CONTROLLER

PROCEED AS FOLLOWS:

Setup Menu:

To enter Setup Menu, hold the Up & Down (▲/▼) keys simultaneously for three (3) seconds and proceed as follows:

FUNCTION	FUNCTION SETTING	FUNCTION DESCRIPTION
LOC	0	User lock out
In	1	Thermocouple type
C-F	F	Degrees C or F
rL	32	Low range
rH	25	High range
RAI	0	Output
RSC	0	Hysteresis (not used)
012(EJ-0014)	0	Output 2 (not used)
**012(EJ-0084)	0	Process Alarm
**RSA	25	Hysteresis Alarm
**LAT	OFF	Non latching alarm
rP	100	Temp (not used)
PL	100	Power limiting(not used)
ASP	bor	Display

Auto tune menu:

To calibrate the auto tuning feature set temperature set point to (SEE CHART) degrees and proceed as follows:

PRI	* DEFAULT (25 F) Proportional band
rAI	* DEFAULT (0.000) Reset
RAI	* DEFAULT (0.000) Rate
CLJ	1
**ALO	32
**AHI	0
CAL	0
AUL	3

While unit is auto-tuning the lower display alternately flashes the set point and the AT prompt.

When the tuning is complete the display stops flashing(Approx. 3 min.).

Now hold the UP & Down(▲/▼) buttons simultaneously for three (3) seconds. LOC will appear in lower (green) display.

Set LOC to three (3). This will prevent operator access to Setup Menu.

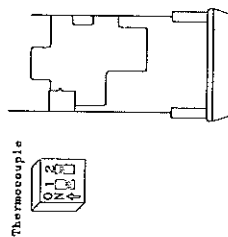
Only set point value is adjustable.

The display will return to the set point value after one (1) minute without key strokes.

* NOTE: DEFAULT indicates operator to accept the displayed value as is Do Not Change.

** Found in setup menu for EJ-0084 w/alarm option only.

How to Set the Input Type DIP Switch



MODIFICATIONS TO STANDARD SET-UP MENU DRAG SEAL HEAT CONTROL SETTINGS			
FUNCTION	FUNCTION SETTING	DESCRIPTION	FUNCTION
GREEN DISPLAY	RED DISPLAY	400	HIGH RANGE
rH	400	AUTO TUNE CALIBRATION TEMPERATURE 400 DEGREES	ALARM HIGH
**AHI	400		
HOT AIR SIDE SEALER CONTROL SETTINGS			
FUNCTION	FUNCTION SETTING	DESCRIPTION	FUNCTION
GREEN DISPLAY	RED DISPLAY	400	HIGH RANGE
rH	400	AUTO TUNE CALIBRATION TEMPERATURE 400 DEGREES	ALARM HIGH
**AHI	400		
BAND SIDE SEALER CONTROL SETTINGS			
FUNCTION	FUNCTION SETTING	DESCRIPTION	FUNCTION
GREEN DISPLAY	RED DISPLAY	400	HIGH RANGE
rH	400	AUTO TUNE CALIBRATION TEMPERATURE 400 DEGREES	ALARM HIGH
**AHI	400		
HOT KNIFE BOTTOM HEAT			
FUNCTION	FUNCTION SETTING	DESCRIPTION	FUNCTION
GREEN DISPLAY	RED DISPLAY	400	HIGH RANGE
rH	400	AUTO TUNE CALIBRATION TEMPERATURE 400 DEGREES	ALARM HIGH
**AHI	400		
HOT KNIFE TOP HEAT			
FUNCTION	FUNCTION SETTING	DESCRIPTION	FUNCTION
GREEN DISPLAY	RED DISPLAY	400	HIGH RANGE
rH	400	AUTO TUNE CALIBRATION TEMPERATURE 400 DEGREES	ALARM HIGH
**AHI	400		

EJ-0014	STANDARD CONTROL	965A-3C10-CORC	RELAY & SLC150
EJ-0084	CONTROL W/ALARM	965A-3C10-CORC	SLC500
SHANKLIN	DESCRIPTION	WATLOW	USED ON
PART NUMBER	PART NUMBER		
SHANKLIN CORPORATION			
WESTFORD ROAD			
AYER, MASSACHUSETTS			
DRAWN	TITLE		
LA ROCQUE	WATLOW CONTROLLER SET-UP		
DESIGNED	FOR		
TEMPERATURE CONTROL			
APPROVED	SCALE	DATE	NUMBER
	NONE	7/23/96	SPB-0024
			REV

REVISIONS	
2/2/95	F. KING
ADDED HOT AIR FITTING.	
ECN 96-259	DAL 7/23/96
BOTTOM & TOP HEAT.	
DRAWN BY CAD, ADDED H.K.	
2/21/97	F. KING
ADDED SIDE SEAL	
UNLESS OTHERWISE SPECIFIED	
DIMENSIONS ARE IN INCHES	
TOLERANCE ON DIMENSIONS	
FRACTIONS	± 1/64
DECIMALS	± .005
ANGLES	±
MACHINED FINISH	
DO NOT SCALE DRAWING	
REMOVE BURRS AND SHARP EDGES	

PROCEED AS FOLLOWS:-

To enter Setup Menu, hold the Up & Down(Δ / ∇) keys simultaneously for three (3) seconds and proceed as follows:

To enter Setup Menu, hold the Up & Down ($\Delta \nabla$) keys simultaneously for about 5 seconds.

Auto tune menu:

To calibrate the auto tuning feature set temperature set point to (SEE CHART) degrees and proceed as follows:

While unit is auto-tuning the

the point and the prompt.

When the tuning is complete the display stops flashing/Approx. 3 min

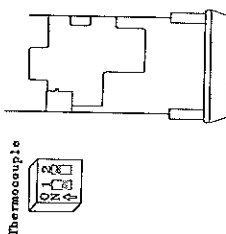
Now hold the UP & Down (∇) buttons simultaneously for three (3) seconds. LOC will appear in lower (green) display. Select LOC to three (3). This will prevent operator access to Setup Menus. The set point value is adjustable.

The display will return to the set point value after one (1) minute without key strokes.

- NOTE: DEFAULT indicators operator to accept the displayed value as is
Do Not Change.

*** Found in setup menu for EJ-0084 w/alarm option only.

How to Set the Input Type DIP Switch



Control Chassis
Bottom View

MODIFICATIONS TO STANDARD SET-UP MENU DRAG SEAL HEAT CONTROL SETTINGS

FUNCTION	FUNCTION SETTING	FUNCTION DESCRIPTION
GREEN DISPLAY	RED DISPLAY	
TH	600	HIGH RANGE
	AUTO TUNE CALIBRATION	TEMPERATURE 450 DEGREES
***AH	600	ALARM HIGH

HOT AIR SIDE SEALER CONTROL SETTINGS

FUNCTION	FUNCTION SETTING	FUNCTION DESCRIPTION
GREEN DISPLAY	RED DISPLAY	
rh	850	HIGH RANGE
AUTO TUNE	CALLERATION TEMPERATURE	700 DEGREES
**AB1	850	ARM HIGH

BAND SIDE SEALER CONTROL SETTINGS

FUNCTION	FUNCTION SETTING	FUNCTION DESCRIPTION
GREEN DISPLAY	RED DISPLAY	
PH	400	400
ATUNE	CALIBRATION TEMPERATURE	300 DEGREES
AAHI	400	ALARM HIGH

HOT KNIFE BOTTOM HEAT

FUNCTION	FUNCTION SETTING	FUNCTION DESCRIPTION
GREEN DISPLAY	RED DISPLAY	
PH	250	HIGH RANGE
	AUTO TUNE CALIBRATION	TEMPERATURE 200 DEGREES
••AH1	250	

HOT KNIFE TOP HEAT

FUNCTION	FUNCTION SETTING	FUNCTION DESCRIPTION
GREEN DISPLAY	RED DISPLAY	
PH	400	HIGH RANGE
AUTO TUNE CALIBRATION	TEMPERATURE 300 DEGREES	
**AHI	400	MEMORY VIEW

EJ-0014	STANDARD CONTROL	365A-3C10-00RC	RELAY & SLC150
EJ-0084	CONTROL V/ALARM	365A-3C00-00RC	SLC500

SHANKLIN PART NUMBER	DESCRIPTION	WATLOW PART NUMBER	USED ON
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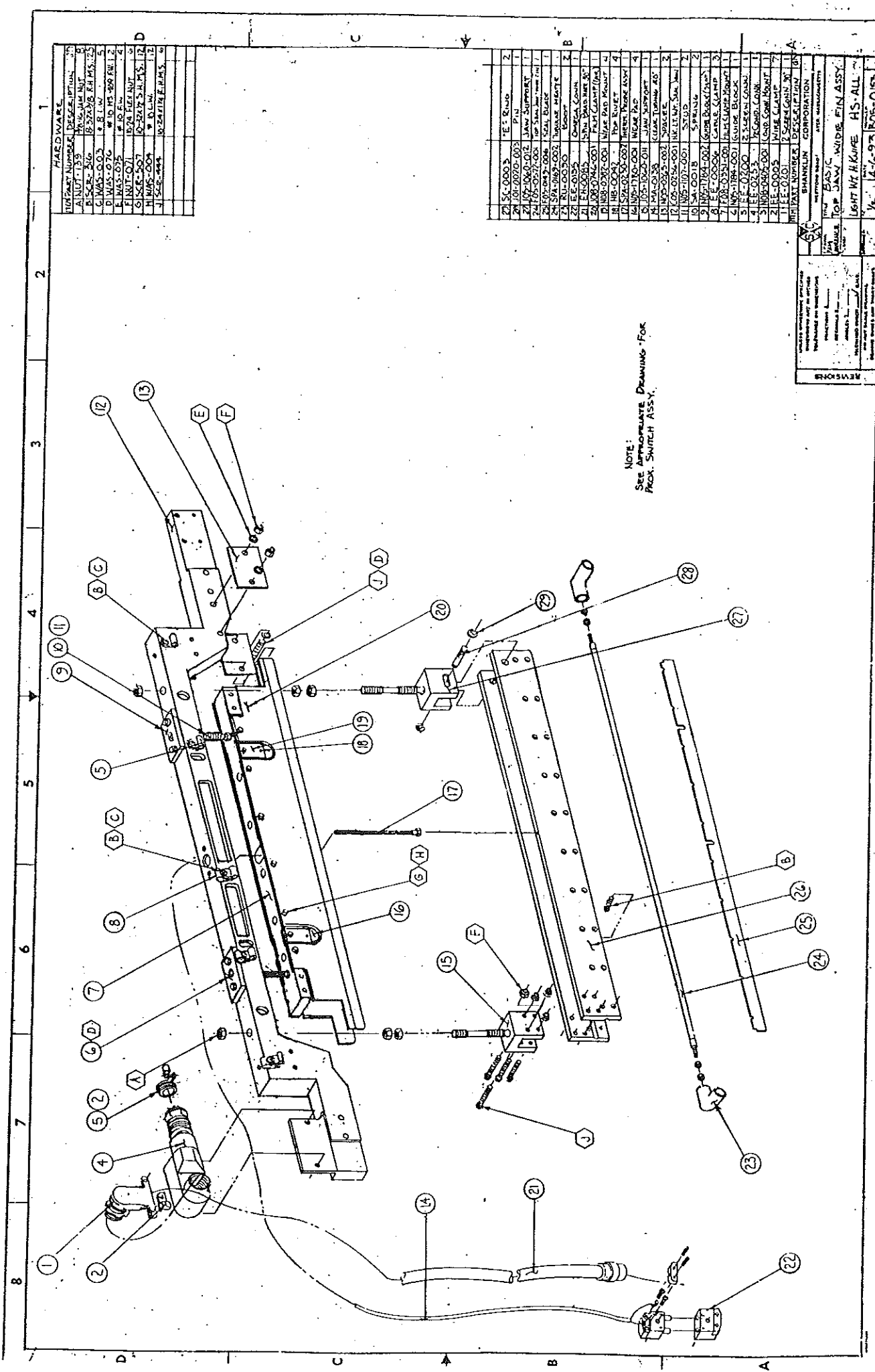


SHANKLIN CORPORATION
WESTFORD ROAD
AYER, MASSACHUSETTS

DRAWN	TITLE
LA ROCQUE	WATLOW CONTROLLER SET-UP
DESIGNED	FOR

APPROVED	SCALE NONE	DATE 7/23/96	NUMBER SPB-0024	REV 1
----------	---------------	-----------------	--------------------	----------

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON DIMENSIONS FRACTIONS ± 1/64 DECIMALS ± .005 ANGLES ± - MACHINED FINISH	DO NOT SCALE DRAWING REMOVE BURRS AND SHARP EDGES
REVISIONS	
1	DO BAYD SIDE SEAL 2/31/97 P. KINGSD
2	ADD BAYD M.K. 2/23/96
3	ADD BAYD M.K. & TOP HEAT 2/23/96
4	ADD HOT AIR KIR FILLING. 2/3/95



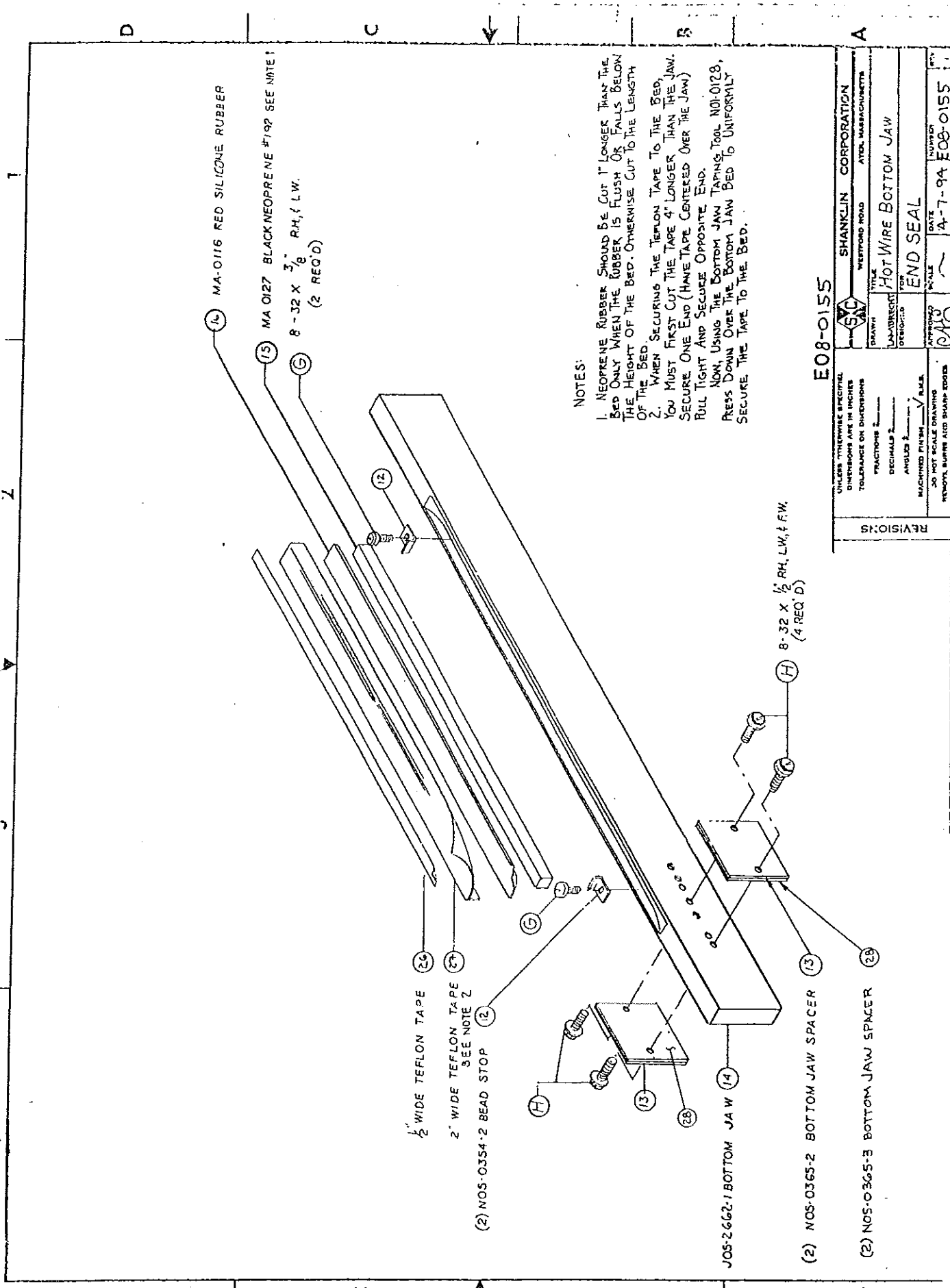
NOTE:
SEE APPROPRIATE DRAWINGS FOR
PROX. SWITCH ASSY.

HARDWARE	
PART NUMBER	DESCRIPTION
A NUT-139	1/2" X 1/4" NUT
B SCREW-206	1/2" X 1/4" R.H. MS.
C WAS-003	1/2" R.H. W.
D WAS-076	1/2" X 1/4" R.H. W.
E WAS-075	1/2" X 1/4" R.H. W.
F NUT-001	1/2" X 1/4" NUT
G WAS-007	1/2" X 1/4" R.H. W.
H WAS-007	1/2" X 1/4" R.H. W.
I WAS-007	1/2" X 1/4" R.H. W.
J WAS-007	1/2" X 1/4" R.H. W.

HARDWARE	
PART NUMBER	DESCRIPTION
1 SC-0003	1/2" X 1/4" NUT
2 SC-0003	1/2" X 1/4" NUT
3 SC-0003	1/2" X 1/4" NUT
4 SC-0003	1/2" X 1/4" NUT
5 SC-0003	1/2" X 1/4" NUT
6 SC-0003	1/2" X 1/4" NUT
7 SC-0003	1/2" X 1/4" NUT
8 SC-0003	1/2" X 1/4" NUT
9 SC-0003	1/2" X 1/4" NUT
10 SC-0003	1/2" X 1/4" NUT
11 SC-0003	1/2" X 1/4" NUT
12 SC-0003	1/2" X 1/4" NUT
13 SC-0003	1/2" X 1/4" NUT
14 SC-0003	1/2" X 1/4" NUT
15 SC-0003	1/2" X 1/4" NUT
16 SC-0003	1/2" X 1/4" NUT
17 SC-0003	1/2" X 1/4" NUT
18 SC-0003	1/2" X 1/4" NUT
19 SC-0003	1/2" X 1/4" NUT
20 SC-0003	1/2" X 1/4" NUT
21 SC-0003	1/2" X 1/4" NUT
22 SC-0003	1/2" X 1/4" NUT
23 SC-0003	1/2" X 1/4" NUT
24 SC-0003	1/2" X 1/4" NUT
25 SC-0003	1/2" X 1/4" NUT
26 SC-0003	1/2" X 1/4" NUT
27 SC-0003	1/2" X 1/4" NUT
28 SC-0003	1/2" X 1/4" NUT

REVISED	DATE	BY	DESCRIPTION
1	1-1-63	WAS	TOP SAW WIDE FIN ASSY
2	1-1-63	WAS	TOP SAW WIDE FIN ASSY
3	1-1-63	WAS	TOP SAW WIDE FIN ASSY
4	1-1-63	WAS	TOP SAW WIDE FIN ASSY
5	1-1-63	WAS	TOP SAW WIDE FIN ASSY
6	1-1-63	WAS	TOP SAW WIDE FIN ASSY
7	1-1-63	WAS	TOP SAW WIDE FIN ASSY
8	1-1-63	WAS	TOP SAW WIDE FIN ASSY
9	1-1-63	WAS	TOP SAW WIDE FIN ASSY
10	1-1-63	WAS	TOP SAW WIDE FIN ASSY
11	1-1-63	WAS	TOP SAW WIDE FIN ASSY
12	1-1-63	WAS	TOP SAW WIDE FIN ASSY
13	1-1-63	WAS	TOP SAW WIDE FIN ASSY
14	1-1-63	WAS	TOP SAW WIDE FIN ASSY
15	1-1-63	WAS	TOP SAW WIDE FIN ASSY
16	1-1-63	WAS	TOP SAW WIDE FIN ASSY
17	1-1-63	WAS	TOP SAW WIDE FIN ASSY
18	1-1-63	WAS	TOP SAW WIDE FIN ASSY
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24	1-1-63	WAS	TOP SAW WIDE FIN ASSY
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26	1-1-63	WAS	TOP SAW WIDE FIN ASSY
27	1-1-63	WAS	TOP SAW WIDE FIN ASSY
28	1-1-63	WAS	TOP SAW WIDE FIN ASSY

13 P-93 SUB-ASSY DRAWING



NOTES:

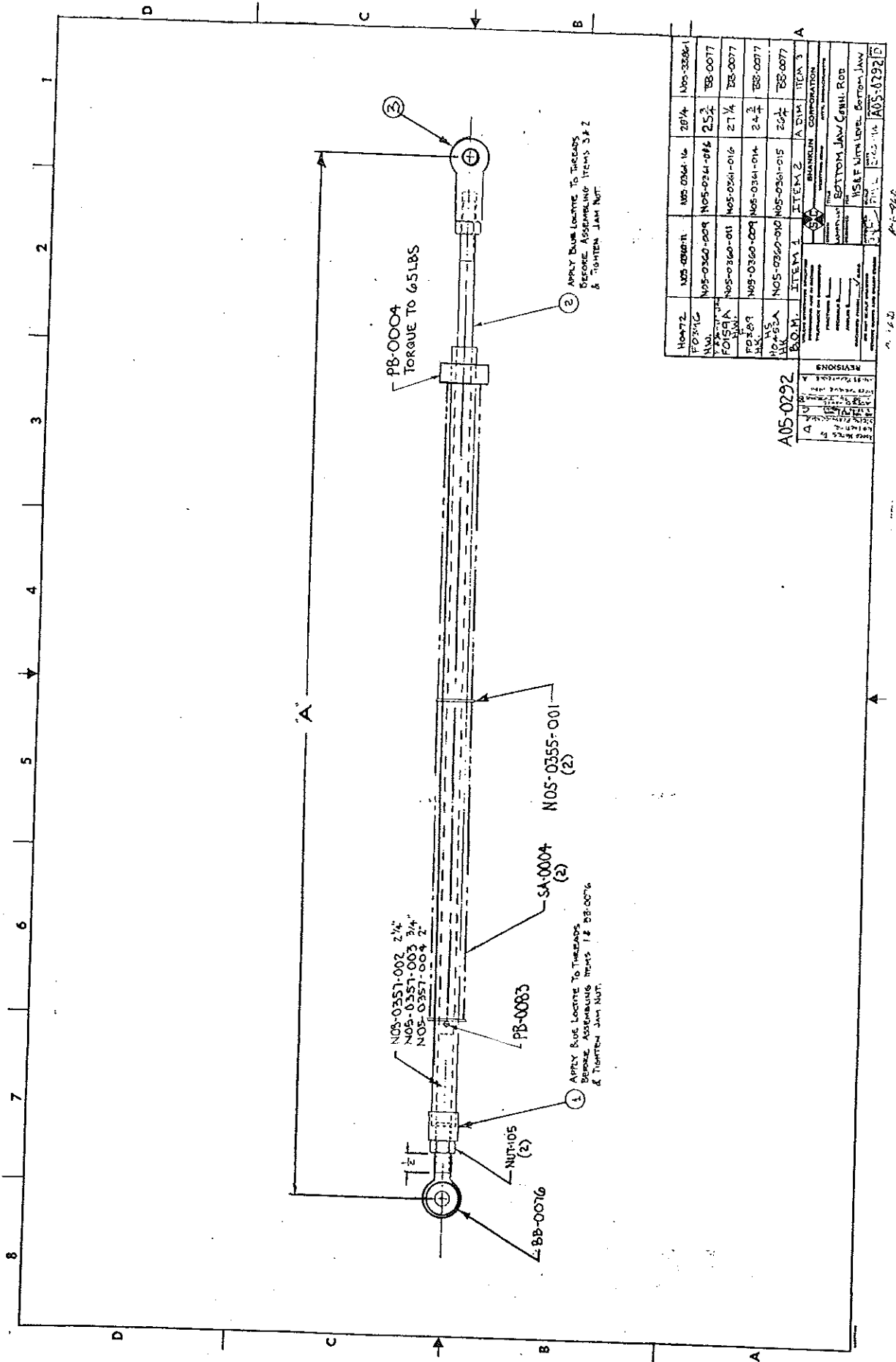
1. NEOPRENE RUBBER SHOULD BE CUT 1" LONGER THAN THE BED ONLY WHEN THE RUBBER IS FLUSH OR FALLS BELOW THE HEIGHT OF THE BED. OTHERWISE CUT TO THE LENGTH OF THE BED.
 2. WHEN SECURING THE TEFLON TAPE TO THE BED, YOU MUST FIRST CUT THE TAPE 4" LONGER THAN THE JAW. SECURE ONE END (HAVE TAPE CENTERED OVER THE JAW) ROLL TIGHT AND SECURE OPPOSITE END.
- NOW, USING THE BOTTOM JAW TAPING TOOL NO:0128, PRESS DOWN OVER THE BOTTOM JAW BED TO UNIFORMLY SECURE THE TAPE TO THE BED.

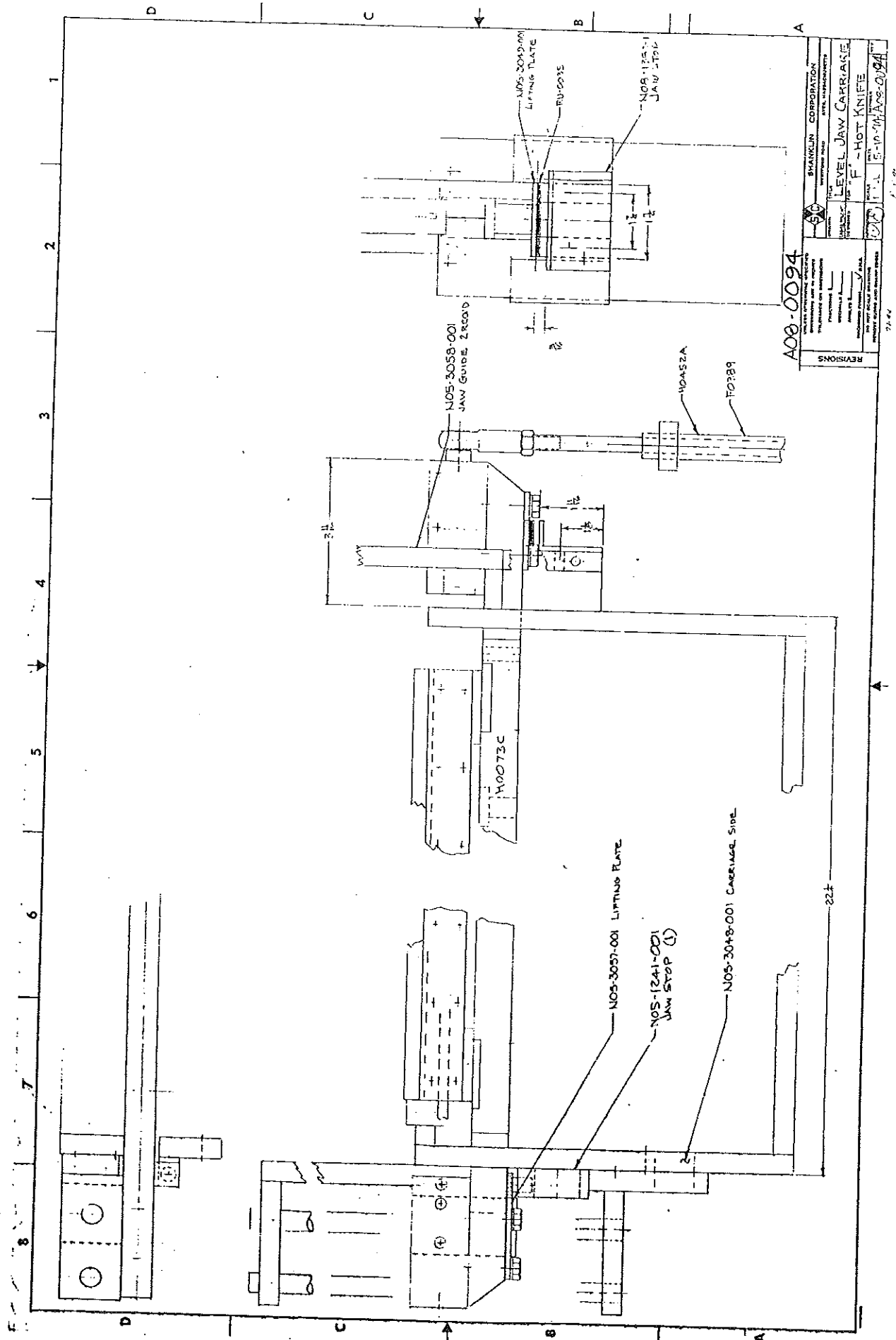
E08-0155

SHANKLIN CORPORATION WESTFORD ROAD AYER, MASSACHUSETTS	
DATE A-7-94	NUMBER E08-0155
TITLE Hot Wire Bottom Jaw	
END SEAL	
DESIGNED BY JAN-1988	APPROVED BY JAN-1988
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON DIMENSIONS FRACTIONS 2 DECIMALS 2 ANGLES 1/2	
MACHINED FINISH ☒ ALL DO NOT SCALE DRAWING REMOVE BURRS AND SHARP EDGES	

REVISIONS

- (2) NOS-0365-2 BOTTOM JAW SPACER
- (2) NOS-0365-3 BOTTOM JAW SPACER





SHANKLIN CORPORATION

F-/HS-

F-/HS- SERIES AUTOMATIC WRAPPER
SIDE SEALER

05-20-96

=====

ADJUSTING THE DIVERGING BELT SIDE SEALER WITH FIXED BOTTOM JAW

GENERAL

NOTE:

These instructions are ONLY for machines equipped with
Diverging Belt Side Sealers with Fixed Bottom Jaw

This section contains the following four procedures for the
diverging belt side sealer. There is also a troubleshooting
section that follows the procedures. The four procedures are:

- Adjusting seal wire alignment and clearance
- Adjusting the seal wire heat
- Changing seal wires
- Replacing ceramic beads

Before attempting to adjust the Side Sealer, read and understand
the instructions found in this section. Copies of the following
drawings should be available.

REFERENCE DRAWINGS:

B05-0203 • "Diverging Belt Side Sealer Fixed
Bottom Jaw Assembly"
E05-0038 • "Tracking Roll Assembly"
E05-0196 • "Top Plate Assembly"
E05-0197 • "Top Jaw Assembly"
E05-0253 • "Fixed Bottom Jaw Assembly"
G05-0069 • "Seal Wire Alignment"
H05-0164 • "Idler Pulley Mounting Assembly-Top"

WARNING!

**DISCONNECT THE POWER FROM THE MACHINE BEFORE
MAKING ANY ADJUSTMENTS TO THE SIDE SEALER.**

PROCEDURE FOR ADJUSTING THE WIRE ALIGNMENT AND CLEARANCE (using drawing #G05-0069)

The top and bottom seal wires must be positioned directly over each
other and should be gapped to a distance of .010 as a starting
point (future fine tuning of the gap may be required). Proceed as
follows:

- a) Remove the top and bottom belt guides.

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SIDE SEALER

05-20-96

- =====
- b) Remove the top and bottom outer belts, identifying each one so they may be replaced correctly. The top and bottom belt sets are matched pairs and cannot be mixed.
 - c) Remove both sets of jam nuts (*item 1*), washers, and springs from the guide pins on the top plate assembly.
 - d) Check the alignment of the top and bottom wires while pressing down on guide pins. The wires should be directly over each other. If an adjustment is needed, loosen the hex bolts (*item 4*) that secure the top plate assembly. Once loose, the top plate can move laterally in order to line up the wires. When wires are aligned, tighten the two hex bolts.
 - e) Adjust the gap between the wires with a .010 feeler gauge. Press down on the guide pins until the adjusting nuts (*item 2*) bottom out on the spacers (*item 3*). In this position, check the distance between the wires. Adjust the distance by turning the adjusting nuts. When the proper gap is achieved, replace the springs, washers, and jam nuts on the guide pins.
 - f) Replace the top and bottom belts.
 - g) Ensure that the belt tension is sufficient. The belt should have a play of about 1/4" in either direction (tested at the midpoint between the belt idler pulley (*item 7*) and the jaw).

If belt tension needs to be adjusted, loosen the four 1/4-20 hex head bolts that secure the belt idlers. Adjust the idlers to obtain the proper tension.
 - h) Replace bottom belt guide, aligning the top surfaces of both lower belts.
 - i) Replace top belt guide. Lower guide so that the top and bottom belts are able to grip film firmly enough to drive it through the sealer.
 - j) Replace all covers and guards.
 - k) Reconnect power to the machine.

=====

PROCEDURE FOR ADJUSTING THE SEAL WIRE HEAT

The heat for both the top and bottom seal wires are controlled together. Proceed as follows:

- a) Set the initial heat control settings as follows:

CONSTANT HEAT - approximately 15A on the dial.

RUNNING HEAT - approximately 25A on the dial.

CAUTION:

DO NOT turn the Running Heat control to 100% or seal wire failure and damage to the side sealer may occur.

- b) Set the air pressure to 50 PSI.
- c) Insert film, switch to manual mode, and press RESET. Run film by pressing FILM ADVANCE button. Product should NOT be on the machine while making this adjustment. Adjust the RUNNING HEAT so that a strong seal is made with minimum heat (usually a 20-30A setting)

NOTE:

**DURING OPERATION, SOME SLIGHT ADJUSTMENTS
(FINE TUNING) OF THE WIRE HEAT MAY BE NECESSARY.**

PROCEDURE FOR CHANGING SEAL WIRES

- a) Remove the top and bottom belt guides.
- b) Remove the top and bottom outer belts, identifying each one so they may be replaced correctly. The top and bottom belt sets are matched pairs and cannot be mixed.
- c) Remove the top belt guide bracket, secured with two (2) screws.
- d) Remove top jaw from support bar, secured with four (4) screws.
- e) For each of the seal wires, release tension from the wires by inserting a pin or an Allen wrench into the wire pivot.

- =====
- f) Remove both seal wires. Each seal wire is attached with two (2) terminal screws.
 - g) Inspect the notch in the brass terminal plate where the 90° bending the wire touches. File if necessary to ensure good contact.
 - h) Inspect the ceramic beads for "burn-through" damage:
 - If the ceramic bead is undamaged, proceed to the next step.
 - If the ceramic bead has been damaged, it must be replaced. Refer to the next section (*Procedure for Changing Ceramic Beads*) for instructions.
 - i) Before installing the new wires, make sure there are no kinks and rebend the 90° bend to obtain a sharp bend that will fit snugly in the notch of the brass fixed terminal plate.
 - j) Install the new seal wires. Attach the loops of the new wires onto the pins projecting from the wire pivots.
 - k) Lay the wire up the back side of the wire terminal. Pull the wire up tight and wrap around the terminal screw. Tighten the terminal screw and cut off excess seal wires.

NOTE:

**EXTREME CARE MUST BE TAKEN TO PREVENT
THE SEAL WIRES FROM KINKING!!!**

- l) Attach the braided copper wires to the wire pivots with the two remaining screws.
- m) Remove the pins from the wire pivots and check that the wires are straight and flat (the wires must lay flat on the beads).
- n) Install the top jaw to the support bar with four (4) screws.
- o) Install the top belt guide bracket with two (2) screws.
- p) Replace the top and bottom belts.

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05-20-96

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- q) Ensure that the belt tension is sufficient. The belt should have a play of about 1/4" in either direction when properly installed.

If belt tension needs to be adjusted, loosen the four 1/4-20 hex head bolts securing the belt idler pulley. Adjust the idler to obtain the proper tension.

- r) Replace bottom belt guide, aligning the top surfaces of both lower belts.
- s) Replace top belt guide. Lower the guide so that the top and bottom belts are able to grip film firmly enough to drive it through the sealer.
- t) Replace all covers and guards.
- u) Reconnect power to the machine.

NOTE:

**IF BAD SEALS OCCUR, REFER TO THE WIRE ALIGNMENT
AND CLEARANCE PROCEDURE (SECTION 27-02)**

PROCEDURE FOR CHANGING CERAMIC BEADS

(using drawing E05-0197 for Top Jaw and/or
E05-0253 for the Fixed Bottom Jaw)

This procedure is used when beads have become broken or damaged and need to be replaced. This procedure assumes that you have already performed steps a-i of the previous section (*Procedure for Changing Seal Wires*). Proceed as follows:

- a. If you are working on the top jaw assembly, go to step b. If you are working on the bottom jaw assembly, remove the left lower belt idler pulley by removing the two (2) setscrews. This will give you access to the hardware needed to remove the beads on the lower jaw. Proceed to step b.
- b. Remove the wire terminal, secured with two (2) screws.
- c. Release tension from extension spring with spring puller. This will allow the wire pivot to move freely.

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SIDE SEALER

05-20-96

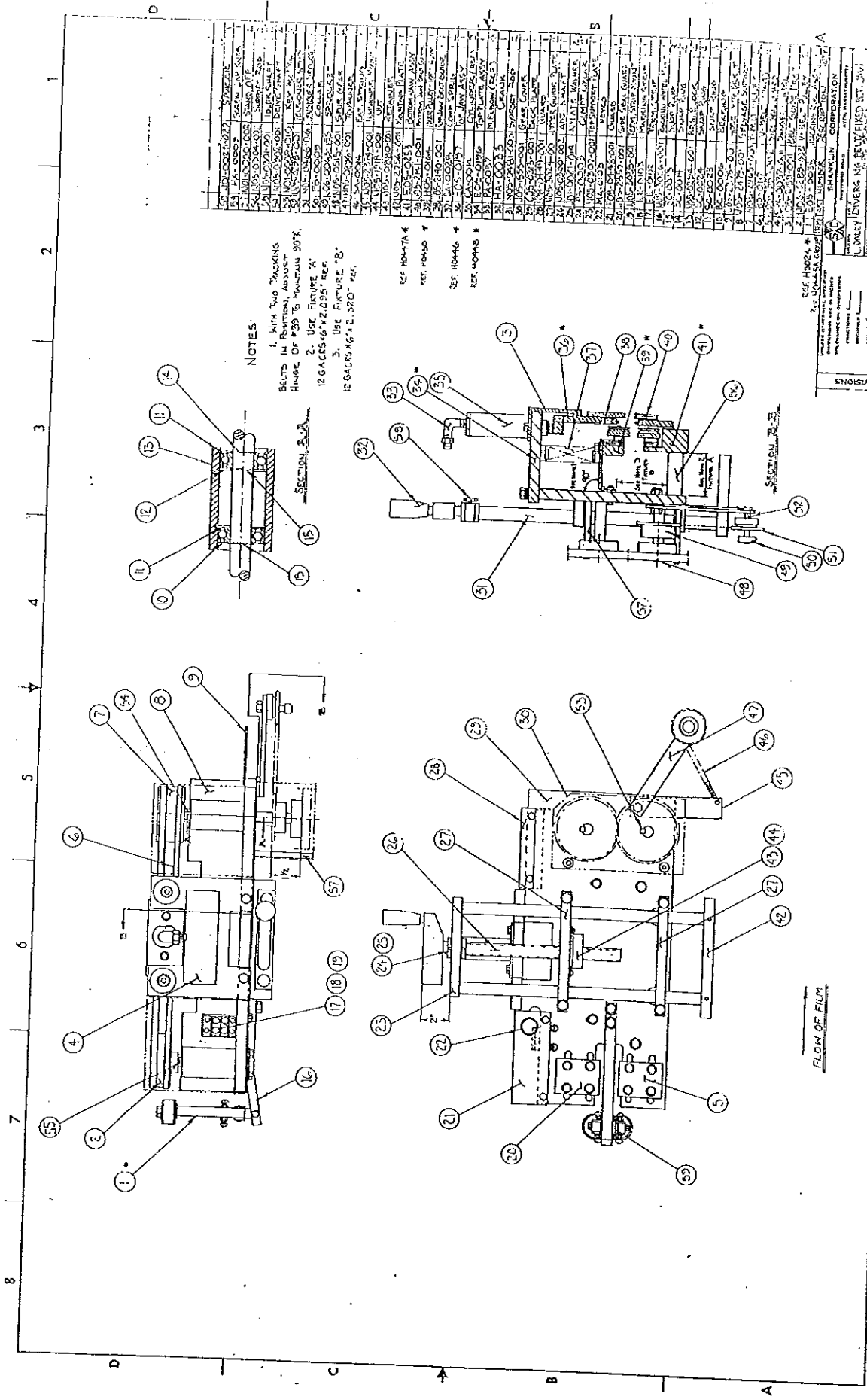
=====

- d. Remove bead stop, secured with one (1) screw.
- e. If beads are damaged, slide out of jaw assembly and replace.
Please note: Do not have a short bead at either end of the jaw as it will be inadequately supported.
- f. Check that the insulation block on the fixed terminal end is supporting the trapezoidal bead.
- g. Before installing the wire, place a straightedge across the beads to check for flatness.
- h. Install the bead stop with one (1) screw.
- i. Reconnect extension spring.
- j. Install wire terminal with two (2) screws.
- k. (*bottom jaw only*) Replace the lower belt idler pulley with two (2) setscrews. Ensure proper alignment of pulley.
- l. Return to step *j* of the previous section (*Procedure for Changing Seal Wires*) to finish the installation of the remaining hardware.

=====

TROUBLESHOOTING HINTS

- If balls of film are building up on the wire or observed on the seals, a slight change in the wire gap may be necessary. Follow the procedure (in the previous section) for adjusting and aligning the seal wires to a .010 gap. After this is done, the gap may be fine tuned while the machine is running. Back off the lock nuts for the top adjusting nuts (be sure to keep the adjusting nuts from turning). Now, with the machine running, gradually turn both adjusting nuts the same amount. A 15° turn (ccw) will close the wire gap .002-.003". Observe and test the seal after each slight adjustment. Retighten the locking nuts (without moving the adjusting nuts) when seals are satisfactory.
- Check that the "sheerface" belt guide is adjusted so that the inner and outer V-belts are level.
- Check to see that the film is held securely between the V-belts. Adjust the upper "sheerface" plate to provide sufficient pressure between the V-belts to prevent film slippage.
- Check the film feed from the unwind. Dirty or worn rubber drive rollers will cause loss of traction, putting excess tension on the film. This can cause poor side seals.
- Film tracking wheels should not be angled more than 5° past parallel as this can cause wrinkling and creasing in the film entering the side sealer. This could cause pin holes to form in the seal.
- Always run at the lowest heat settings possible. High heat settings will cause film buildup on the seal wires, requiring additional heat to seal.
- Set the machine speed to obtain minimum starting and stopping. A continuous flow will produce more uniform seals.
- Observe the film as it enters the side sealer; it should be smooth and wrinkle free. If any wrinkles or stress lines exist, they may cause poor seals and/or pin holes.
- Check the height of the side sealer. The centerline of the V-belts should match the centerline of the inverting head.
- Check any infeed guides that touch the film and adjust to eliminate stress lines.
- Check alignment of the adjustable inverting head. The top plate must line up with the bottom plate.
- Adjust film roll location of the inverting head to obtain a smooth flow of film over the head.



NOTES

1. WITH TWO TRACKING BELTS IN POSITION, ADJUST HINGE OF #39 TO MAINTAIN 90°.
2. USE FEATURE "A" 12 GAGES X 6" X 2.000" REF.
3. USE FEATURE "B" 12 GAGES X 6" X 2.500" REF.

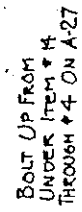
SECTION A-A

SECTION B-B

FLON OF FILM

55	10-0008-0007	STAKE	1
54	1A-0000	SCREW AND NUT	1
53	10-0008-0008	SCREW OF	1
52	10-0008-0009	SCREW OF	1
51	10-0008-0010	SCREW OF	1
50	10-0008-0011	SCREW OF	1
49	10-0008-0012	SCREW OF	1
48	10-0008-0013	SCREW OF	1
47	10-0008-0014	SCREW OF	1
46	10-0008-0015	SCREW OF	1
45	10-0008-0016	SCREW OF	1
44	10-0008-0017	SCREW OF	1
43	10-0008-0018	SCREW OF	1
42	10-0008-0019	SCREW OF	1
41	10-0008-0020	SCREW OF	1
40	10-0008-0021	SCREW OF	1
39	10-0008-0022	SCREW OF	1
38	10-0008-0023	SCREW OF	1
37	10-0008-0024	SCREW OF	1
36	10-0008-0025	SCREW OF	1
35	10-0008-0026	SCREW OF	1
34	10-0008-0027	SCREW OF	1
33	10-0008-0028	SCREW OF	1
32	10-0008-0029	SCREW OF	1
31	10-0008-0030	SCREW OF	1
30	10-0008-0031	SCREW OF	1
29	10-0008-0032	SCREW OF	1
28	10-0008-0033	SCREW OF	1
27	10-0008-0034	SCREW OF	1
26	10-0008-0035	SCREW OF	1
25	10-0008-0036	SCREW OF	1
24	10-0008-0037	SCREW OF	1
23	10-0008-0038	SCREW OF	1
22	10-0008-0039	SCREW OF	1
21	10-0008-0040	SCREW OF	1
20	10-0008-0041	SCREW OF	1
19	10-0008-0042	SCREW OF	1
18	10-0008-0043	SCREW OF	1
17	10-0008-0044	SCREW OF	1
16	10-0008-0045	SCREW OF	1
15	10-0008-0046	SCREW OF	1
14	10-0008-0047	SCREW OF	1
13	10-0008-0048	SCREW OF	1
12	10-0008-0049	SCREW OF	1
11	10-0008-0050	SCREW OF	1
10	10-0008-0051	SCREW OF	1
9	10-0008-0052	SCREW OF	1
8	10-0008-0053	SCREW OF	1
7	10-0008-0054	SCREW OF	1
6	10-0008-0055	SCREW OF	1
5	10-0008-0056	SCREW OF	1
4	10-0008-0057	SCREW OF	1
3	10-0008-0058	SCREW OF	1
2	10-0008-0059	SCREW OF	1
1	10-0008-0060	SCREW OF	1

REV. H2024
 THE HALL-SCOTT
 ENGINEERING AND CONSTRUCTION
 COMPANY
 1000 P STREET, N.W.
 WASHINGTON, D.C. 20004
 DRAWING NO. 8015-0013
 SHEET NO. 1 OF 1
 DATE 12-19-84
 DESIGNED BY
 CHECKED BY
 APPROVED BY
 REVISIONS



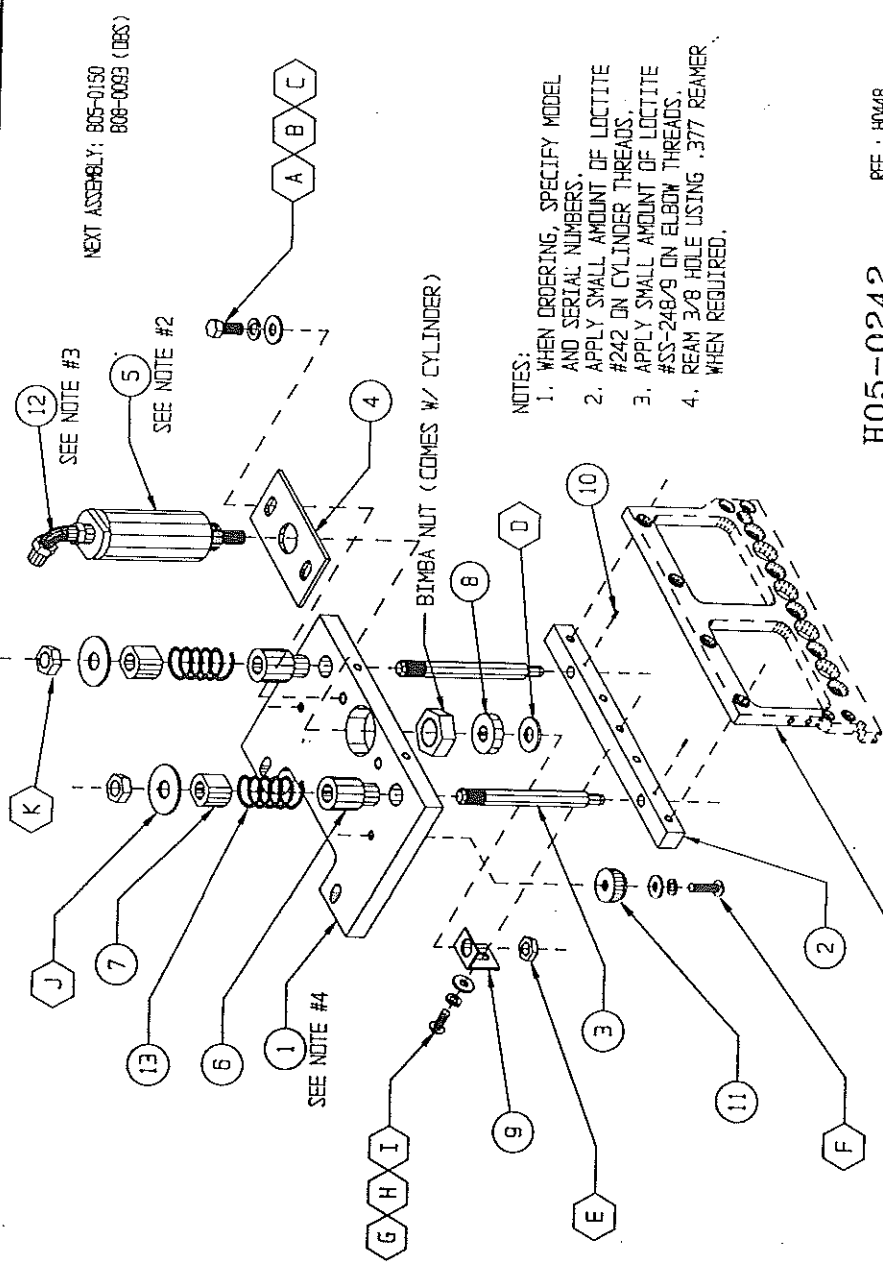
NOTES:

1. WHEN ORDERING, USE DRAWINGS NO. PLUS ITEM NO. EX. P/LC : BCS-0000-311
2. SPECIFY MODEL NO. AND S. NO. OF MACHINE WHEN ORDERING PARTS.

17	SCR-2019	SCR-2019	17	SCR-2019	6-32x1/16 S&C HW	2
16	PB-0072	PB-0072	16	PB-0072	HARDENED FL	1
15	NUT-150	NUT-150	15	NUT-150	10-32 DURA NUT	1
14	NOS-0121-001	NOS-0121-001	14	NOS-0121-001	GUIDE BOTTOM ARM	1
13	WAS-0043	WAS-0043	13	WAS-0043	1/4 LW	1
12	SCR-051	SCR-051	12	SCR-051	1/4-20x1 HHCS	1
11	WAS-0080	WAS-0080	11	WAS-0080	1/4 FW	1
10	PB-0052	PB-0052	10	PB-0052	COTTER PIN	1
9	NUT-004	NUT-004	9	NUT-004	10-32 NUT	4
8	SA-0007	SA-0007	8	SA-0007	SCREWS	2
7	SCR-329	SCR-329	7	SCR-329	10-32x1/2 RHMS	4
6	WAS-0075	WAS-0075	6	WAS-0075	#10 FW	1
5	SCR-336A	SCR-336A	5	SCR-336A	10-32x2 1/4 RHMS	1
4	NOS-0291-001	NOS-0291-001	4	NOS-0291-001	GUIDE TOP ARM	1
3	NOS-0461-001	NOS-0461-001	3	NOS-0461-001	ROLLER	2
2	NOS-053-001	NOS-053-001	2	NOS-053-001	BEARING	4
1	SCR-1607	SCR-1607	1	SCR-1607	1/4-20x1 1/4 BHMS	2
ITEMS PART NUMBERS			ITEMS PART NUMBERS			2
ST PART NUMBERS			ST PART NUMBERS			2
DESCRIPTION			DESCRIPTION			2
SHANKLIN CORPORATION			SHANKLIN CORPORATION			2
WESTFORD ROAD			WESTFORD ROAD			2
AYER, MASSACHUSETTS			AYER, MASSACHUSETTS			2
TITLE			TITLE			2
G WELLS			G WELLS			2
DESIGNED			DESIGNED			2
SCALE			SCALE			2
DATE			DATE			2
DRAWN			DRAWN			2
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APPROVED			APPROVED			2
BY			BY			2
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SCALE			SCALE			2
TITLE			TITLE			2
DRAWN			DRAWN			2
CHECKED			CHECKED			2
APPROVED			APPROVED</			

HARDWARE			
ITEM	PART #	DESCRIPTION	QTY
A	SP-048	1/4-20 X 5/8 HI. SST	2
B	WAS-080	1/4" FLAT WASHER SST	2
C	WAS-005	1/4" LOCK WASHER SST	2
D	WAS-084	5/16 F.V. SST	1
E	NUT-135	5/16 - 24 THEN D8A-NUT SST	1
F	SP-331	10-32 X 3/4 R.H.M.S. SST	2
G	SP-329	10-32 X 1/2 R.H.M.S. SST	1
H	WAS-075	#10 F.V. SST	3
I	WAS-004	#10 L.V. SST	3
J	WAS-114	3/8 F.V.	2
K	NUT-139	3/8-16 JAW NUT SST	2

ITEM	PART #	DESCRIPTION	QTY
13	SA-0031	COMPRESSION SPRING	2
12	PA-0037	ELBOW	1
11	NOS-155B-002	SPRING SPACER	2
10	PG-0135	LOCK PIN	2
9	NOS-063B-001	MOUNTING BRACKET	1
8	NOS-016B-001	BUMPER	1
7	NOS-0520-001	SPRING GUIDE	2
6	NOS-0306-01	GUIDE BUSHING	2
5	CA-0014	CYLINDER	1
4	NOS-0029-001	CYLINDER BRACKET	1
3	NOS-0277-001	GUIDE PIN	2
2	NOS-0278-002	SUPPORT BAR	1
1	NOS-2478-001	CYL. SUPPORT PLATE (NOTE #4)	1

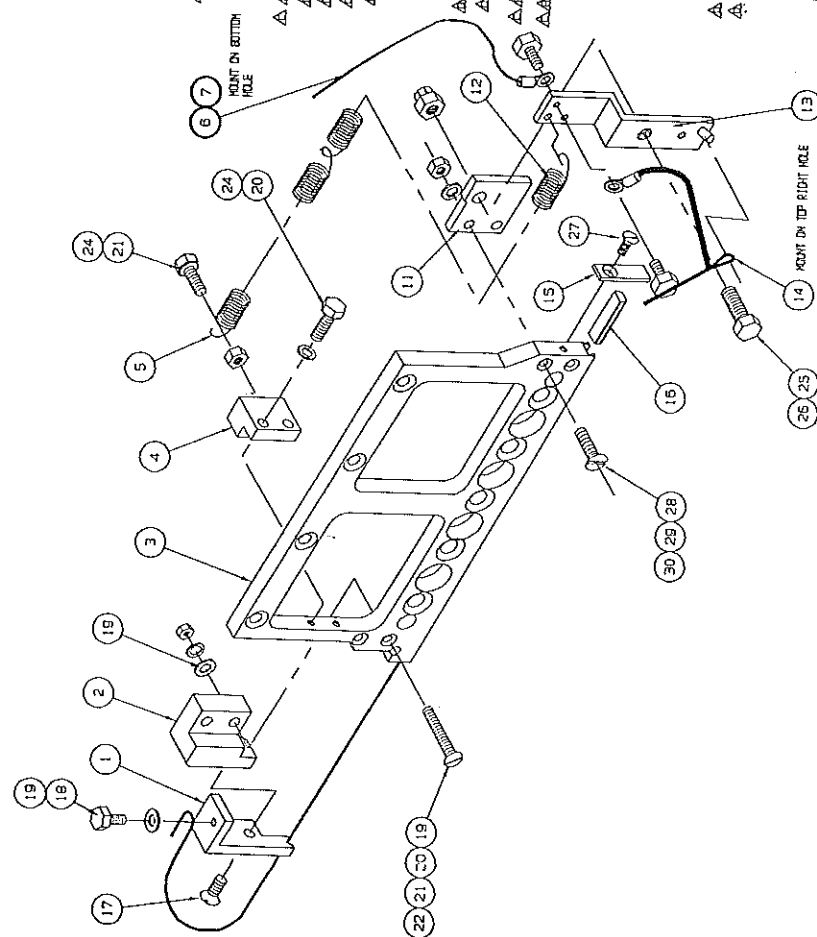


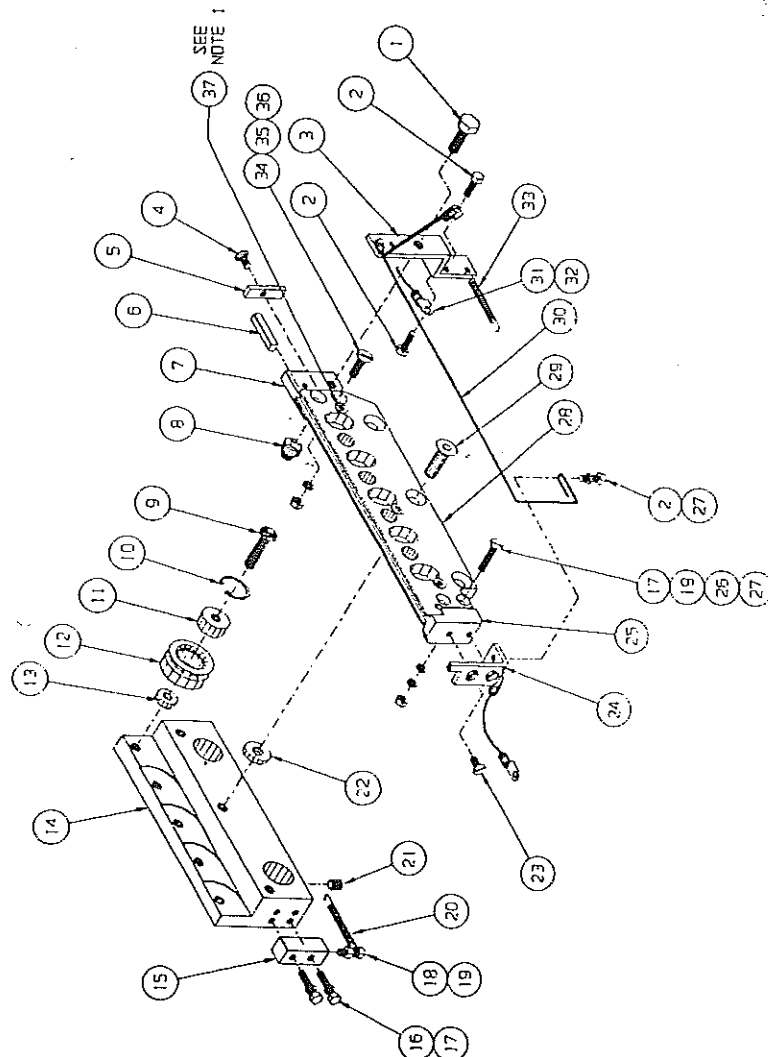
H05-0242 REF.: H0448

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON DIMENSIONS FRACTIONS $\pm 1/64$ DECIMALS $\pm .005$ ANGLES $\pm$ — MACHINED FINISH		DO NOT SCALE DRAWING REMOVE BURRS AND SHARP EDGES
SHANKLIN CORPORATION WESTFORD ROAD AYER, MASSACHUSETTS		TITLE TOP PLATE ASSEMBLY FOR DIVERGING BELT SIDE SEALER
DRAWN WALTER MISZEWICZ DESIGNED	APPROVED 	SCALE NONE DATE 3-10-93 NUMBER H05-0242 REV F & HS

WS 05-0136

NEXT ASSEMBLY: B05-0150
REFERENCE: H0446

[illegible][illegible][illegible]



NOTE:
1) SECURE ITEM 37 TO ITEM 28 USING
A LIGHT AMOUNT OF RUBBER CEMENT.

ITEM	PART NO.	DESCRIPTION	QTY.
37	MA-0023	PHENOLIC WASHER	1
36	NUT-004	#10-32 HEX NUT	2
35	WAS-004	#10 LOCK WASHER	2
34	SCR-829	#10-32 X 3/4 F.H.M.S.	2
33	SA-0020	EXTENSION SPRING	1
32	EW-0005	#10 BROWN WIRE 15"	1
31	EW-0031	RING TERMINAL	1
30	JOS-0499-001	BOTTOM SIDE SEAL WIRE	1
29	SCR-1456	1/4-20 X 1 F.H.S.C.S.	3
28	FOS-0525-001	BOTTOM JAW	1
27	WAS-072	#8 FLAT WASHER	3
26	SCR-820	#8-32 X 1 F.H.M.S.	2
25	NOS-2669-001	MOUNTING BLOCK	1
24	NOS-2665-001	WIRE TERMINAL	1
23	SCR-815	#8-32 X 3/8 F.H.M.S.	2
22	NOS-1159-001	SPACER	3
21	SCR-2106	1/4-20 X 1/4 SET SCREW	2
20	SA-0021	EXTENSION SPRING	1
19	NUT-003	#8-32 HEX NUT	1
18	SCR-006	#8-32 X 1/2 H.H.C.S.	1
17	WAS-003	#8 LOCK WASHER	4
16	SCR-009	#8-32 X 3/4 H.H.C.S.	1
15	NOS-1158-001	SPRING MOUNT	1
14	JOS-2860-001	BOTTOM JAW SUPPORT	1
13	JOI-0023-042	SPACER	1
12	NOS-3016-001	TOLER "V" PULLEY	1
11	BC-0005	BEARING	5
10	SC-0056	N5000-68H INT. SNAP RING	5
9	SCR-1609	1/4-20 X 3/4 BUTTON HEAD SOCKET	5
8	NUT-158	1/4-20 DURA NUT	1
7	NOS-0922-001	PIVOT MOUNTING BRACKET	1
6	NOS-0536-001	CERAMIC JAW BEAD - FLAT TOP	8
5	NOS-0927-001	BEAD STOP	1
4	SCR-904	#6-32 X 3/8 F.H.M.S.	1
3	NOS-1157-001	WIRE PIVOT - BOTTOM JAW	1
2	SCR-007	#8-32 X 5/16 H.H.C.S.	3
1	SCR-050	1/4-20 X 7/8 H.H.C.S.	1

E05-0253

BILL OF MATERIALS

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCE ON DIMENSIONS
FRACTIONS ± 1/64
DECIMALS ± .005
ANGLES ±

DATE: 7/24/95
SCALE: 1/2

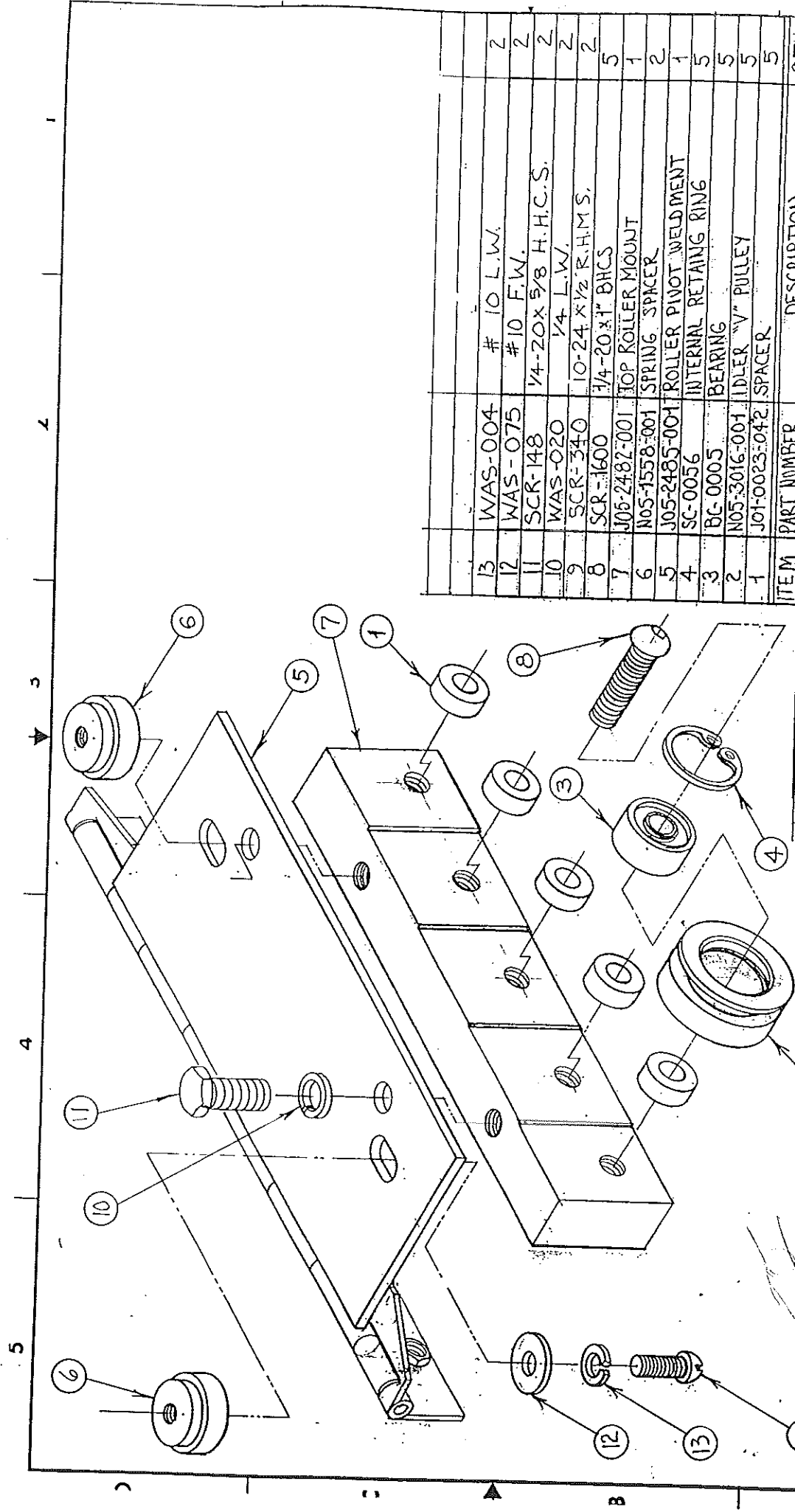
REVISIONS

SHANKLIN CORPORATION
AYER, MASSACHUSETTS

FIXED BOTTOM JAW

F & HS DIVERGING BELT SIDE SEALER

E05-0253



ITEM	PART NUMBER	DESCRIPTION	QTY
13	WAS-004	# 10 L.W.	2
12	WAS-075	# 10 F.W.	2
11	SCR-148	1/4-20 x 5/8 H.C.S.	2
10	WAS-020	1/4 L.W.	2
9	SCR-340	10-24 x 1/2 R.H.M.S.	2
8	SCR-1600	1/4-20 x 1" BHCS	5
7	J05-2482-001	TOP ROLLER MOUNT	1
6	N05-1558-001	SPRING SPACER	2
5	J05-2485-001	ROLLER PIVOT WELDMENT	1
4	SC-0056	INTERNAL RETAINING RING	5
3	BC-0005	BEARING	5
2	N05-3016-001	IDLER "V" PULLEY	5
1	J01-0023-042	SPACER	5

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCE ON DIMENSIONS

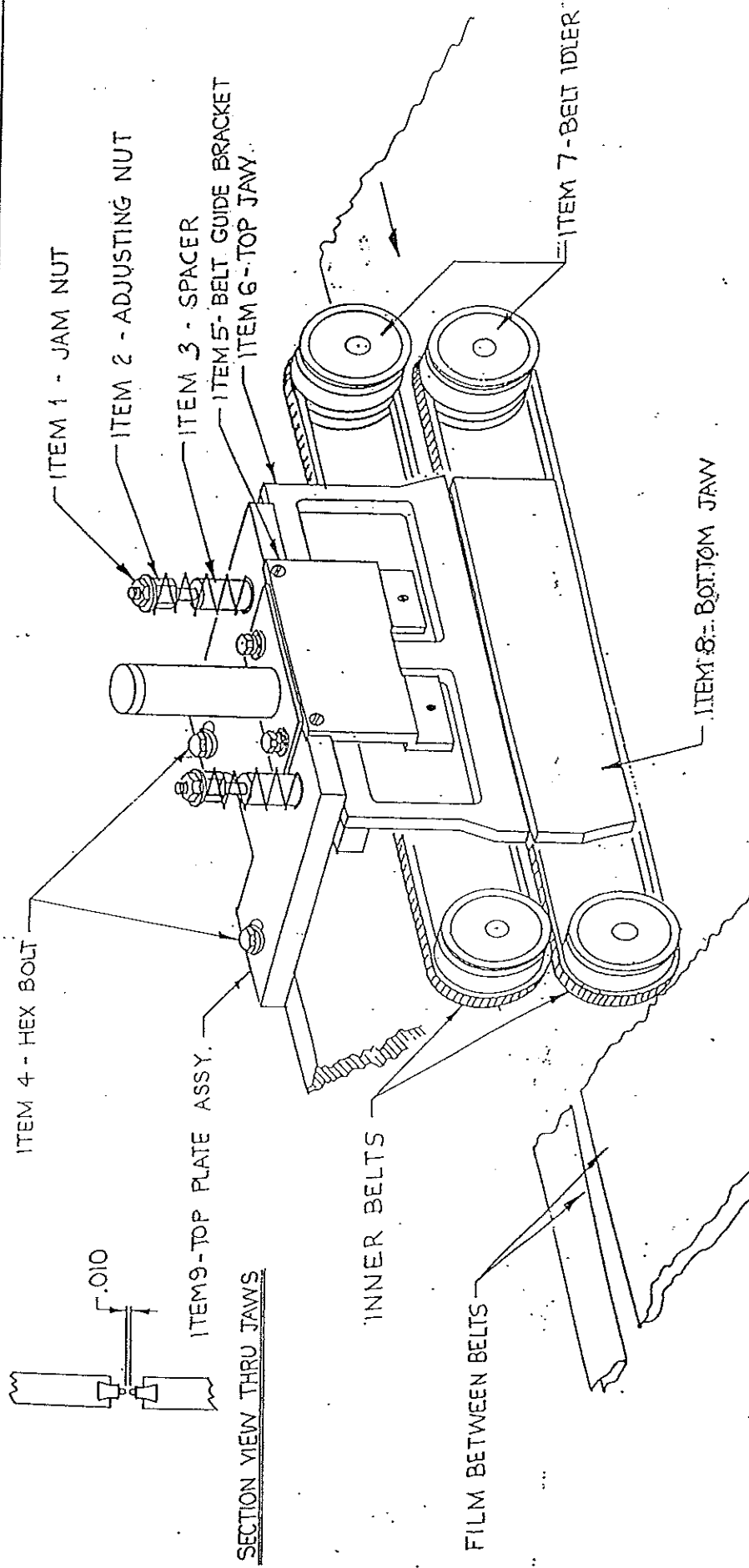
FRACTIONS ±
DECIMALS ±
ANGLES ±

MACHINED FINISH ☒ R.M.S.
DO NOT SCALE DRAWING
REMOVE BURRS AND SHARP EDGES

REVISIONS

REV ITEM #9 WAS IN ERROR
AS SCR 329 R 1/2 R.H.M.S.
12-16-94 FLAWRENCE A

SHANKLIN CORPORATION WESTFORD ROAD AYER, MASSACHUSETTS	
DRAWN FLAWRENCE DESIGNED	TITLE IDLER PULLEY MOUNTING ASSEMBLY-TOP FOR DIVERGING BELT SIDE SEALER ASSEMBLY F&HS
APPROVED 	SCALE FULL
DATE 5-18-93	NUMBER H05-0164
REV. A	QTY 5



REF. MANUAL SECTION

		SHANKLIN CORPORATION	
		WESTFORD ROAD ALEX, MASSACHUSETTS	
DRAWN <i>[Signature]</i>	DESIGNED <i>[Signature]</i>	TITLE SEAL WIRE ALIGNMENT	
		FOR F&S DIV. BELT SIDE SEALER	
APPROVED <i>[Signature]</i>	SCALE <i>[Signature]</i>	DATE 7-20-93	NUMBER G05-0069
		REV. A	

REVISIONS	
ADG 94-012	(As Section View To Show Flat Top Bead)
PLATE 3-8-94	A
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON DIMENSIONS FRACTIONS ± DECIMALS ± ANGLES ± MACHINED FINISH ☒ R.M.S. DO NOT SCALE DRAWING REMOVE BURRS AND SHARP EDGES	

Jim 02

PAGE #	TITLE	DRAWING NO.
1	FUSING & POWER DISTRIBUTION	3FF013
2	SENSORS & PLC INPUTS	3FF014
3	SAFETIES & PLC INPUTS	3FF015
4	PLC OUTPUTS	3FF016
5	MAIN DRIVE & UNKIND CONTROL	3FF017
6	HOT KNIFE & HOT WIRE END SEAL	3FF018
7	DELETED	
8	SIDE SEALER & OVERLAP SEALERS	3FF020
9	DELETED	
10	DELETED	
11	DELETED	
12	OPTIONAL EQUIPMENT	3FF024
13	DELETED	
14	DIETZ PRINT REGISTRATION (OPTIONAL)	3-S027
15	DELETED	

1: PAGES 7, 9-11, AND 16 DELETED IN REVISION A
2: PAGES 15-17 ARE RESERVED.
3: PAGES 13 AND 14 ARE OPTIONAL.

RELAYS:
K2-MAIN DRIVE MOTOR POWER
K3-JAW SAFETY 1
K4-JAW SAFETY 2
K5-NOT USED
K6-PLC READY PNEUMATIC
K7-PLC READY PNEUMATIC
K8-MAIN DRIVE CONTROL BRAKING
K9-SIDE SEAL/END SEAL HEAT ENABLE
K10-CARRIAGE TRAVEL CONTROL
K11-MAIN DRIVE MOTOR OR CLUTCH HARMONIC
K12-END SEAL/SEALER CONTROL
K13-HOT WIRE IMPULSE HEAT
K14-DIETZ PRINT REGISTRATION ENABLE
K15-HOT AIR SIDE SEAL AIR BYPASS
K16-NARROW PIG TRANSFER

SOLID STATE RELAYS:
SR1-HOT KNIFE END SEAL TOP HEAT
SR2-HOT KNIFE END SEAL BOTTOM HEAT
SR3-HOT WIRE SIDE SEAL HEAT
SR4-HOT WIRE SIDE SEAL HEAT
SR5-NOT USED
SR6-BAND SIDE SEAL HEAT
SR7-HOT AIR SIDE SEAL HEAT

SOLENOIDS:
SOL1-SIDE SEAL JAW CLOSE
SOL2-AP SEAL COOLER UP
SOL3-PRODUCT GATE OR STOP DOWN
SOL4-PACKAGE GUIDE PRODUCT STOPS
SOL5-CLOSE JAW
SOL6-CLOSE JAW
SOL7-HOLE PUNCH DUMP
SOL8-CARRIAGE RETURN
SOL9-CARRIAGE RETURN
SOL10-CARRIAGE RETURN
SOL11-NOT USED
SOL12-NOT USED
SOL13-NOT USED
SOL14-CENTERFOLDER BRAKE
SOL15-NOT USED
SOL16-NOT USED
SOL17-NOT USED
SOL18-NOT USED
SOL19-NOT USED
SOL20-NOT USED
SOL21-NOT USED
SOL22-NOT USED
SOL23-NOT USED

F1-MAIN DISCONNECT L1
F2-MAIN DISCONNECT L2
F3-CONTROL TRANSFORMER PRIMARY L1
F4-CONTROL TRANSFORMER PRIMARY L2
F5-CONTROL TRANSFORMER PRIMARY L3
F6-HOT KNIFE END SEAL L1
F7-CONTROL TRANSFORMER SECONDARY
F8-DUAL WIRE SIDESEALER L1
F9-MAIN MOTOR L1
F10-MAIN MOTOR L2
F11-SEALER/STATIC SEAL
F12-VOLT OPTION TRANSFORMER PRIMARY L1
F13-VOLT OPTION TRANSFORMER PRIMARY L2
F14-ACCUMULATING CONVEYOR L1
F15-ACCUMULATING CONVEYOR L2
F16-NOT USED
F17-BAND SEAL SIDE SEALER L1
F18-BAND SEAL SIDE SEALER L2
F19-BAND SEAL SIDE SEALER L3
F20-THERMAL LAMP SEAL
F21-NOT USED
F22-NOT USED
F23-NOT USED
F24-NOT USED
F25-HOT WIRE END SEAL L1
F26-HOT WIRE END SEAL L2
F27-HOT WIRE END SEAL L3
F28-RESERVED
F29-RESERVED
F30-RESERVED

RELAYS:
K2-MAIN DRIVE MOTOR POWER
K3-JAW SAFETY 1
K4-JAW SAFETY 2
K5-NOT USED
K6-PLC READY PNEUMATIC
K7-PLC READY PNEUMATIC
K8-MAIN DRIVE CONTROL BRAKING
K9-SIDE SEAL/END SEAL HEAT ENABLE
K10-CARRIAGE TRAVEL CONTROL
K11-MAIN DRIVE MOTOR OR CLUTCH HARMONIC
K12-END SEAL/SEALER CONTROL
K13-HOT WIRE IMPULSE HEAT
K14-DIETZ PRINT REGISTRATION ENABLE
K15-HOT AIR SIDE SEAL AIR BYPASS
K16-NARROW PIG TRANSFER

SOLENOIDS:
SOL1-SIDE SEAL JAW CLOSE
SOL2-AP SEAL COOLER UP
SOL3-PRODUCT GATE OR STOP DOWN
SOL4-PACKAGE GUIDE PRODUCT STOPS
SOL5-CLOSE JAW
SOL6-CLOSE JAW
SOL7-HOLE PUNCH DUMP
SOL8-CARRIAGE RETURN
SOL9-CARRIAGE RETURN
SOL10-CARRIAGE RETURN
SOL11-NOT USED
SOL12-NOT USED
SOL13-NOT USED
SOL14-CENTERFOLDER BRAKE
SOL15-NOT USED
SOL16-NOT USED
SOL17-NOT USED
SOL18-NOT USED
SOL19-NOT USED
SOL20-NOT USED
SOL21-NOT USED
SOL22-NOT USED
SOL23-NOT USED

LIGHTS:
L1-POWER ON
L2-READY TO RUN
L3-FAULT
L4-STOP
L5-DA HEAT LAMP

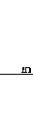
NOTE: WIRE NUMBER USAGE:
A: LAST USED 47
B: 100-199 FOR AC VOLTAGE 115V AND BELOW
C: 200-299 FOR 24VDC FOR INPUTS
D: 300-399 FOR 24VDC FOR OUTPUTS
E: LAST USED 354

SUPERSEDES DWG. 2FF005-A DATED 9/9/94

SHANKLIN CORPORATION
RESISTOR ROAD
ALLEN, MASSACHUSETTS

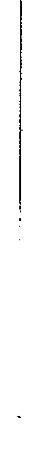
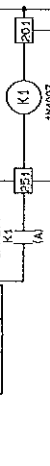
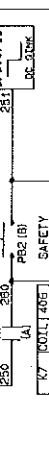
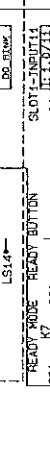
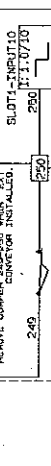
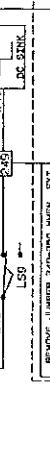
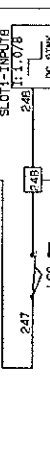
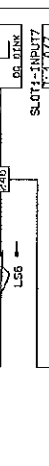
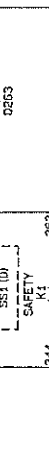
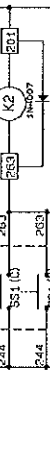
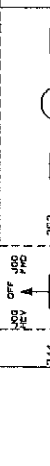
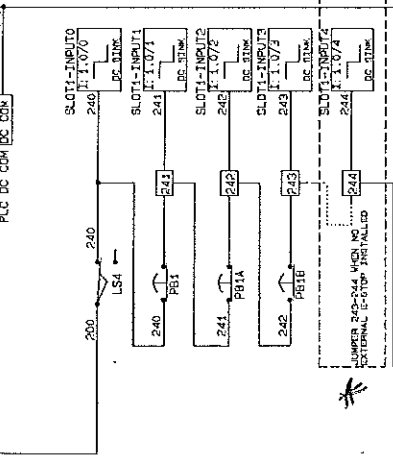
REVISIONS

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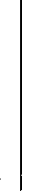
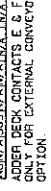
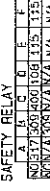
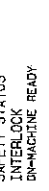
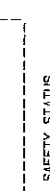
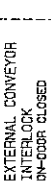
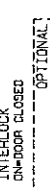
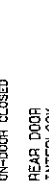
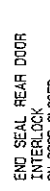
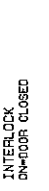
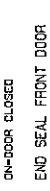
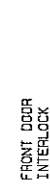
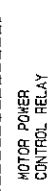
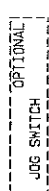
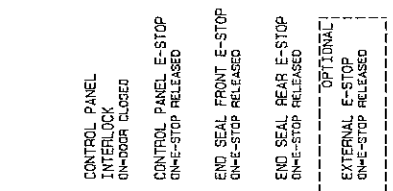
124 VDC REGULATED COMMON TO LINE 117

PLC DC COM DC COM



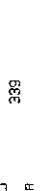
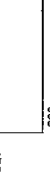
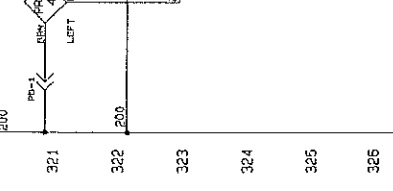
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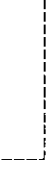
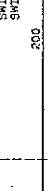
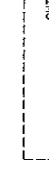
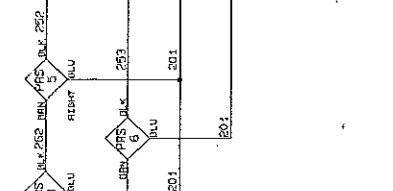
124 VDC REGULATED COMMON TO LINE 117

PLC DC COM DC COM



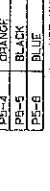
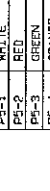
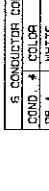
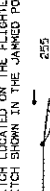
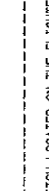
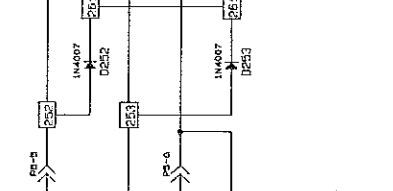
124 VDC REGULATED COMMON TO LINE 117

PLC DC COM DC COM



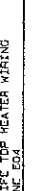
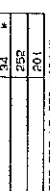
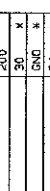
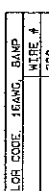
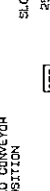
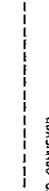
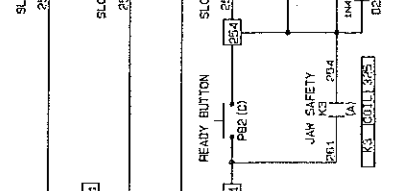
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PLC DC COM DC COM



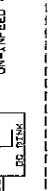
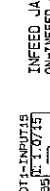
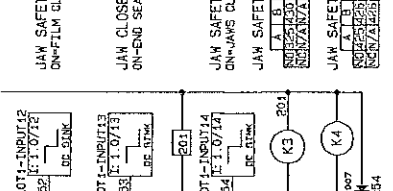
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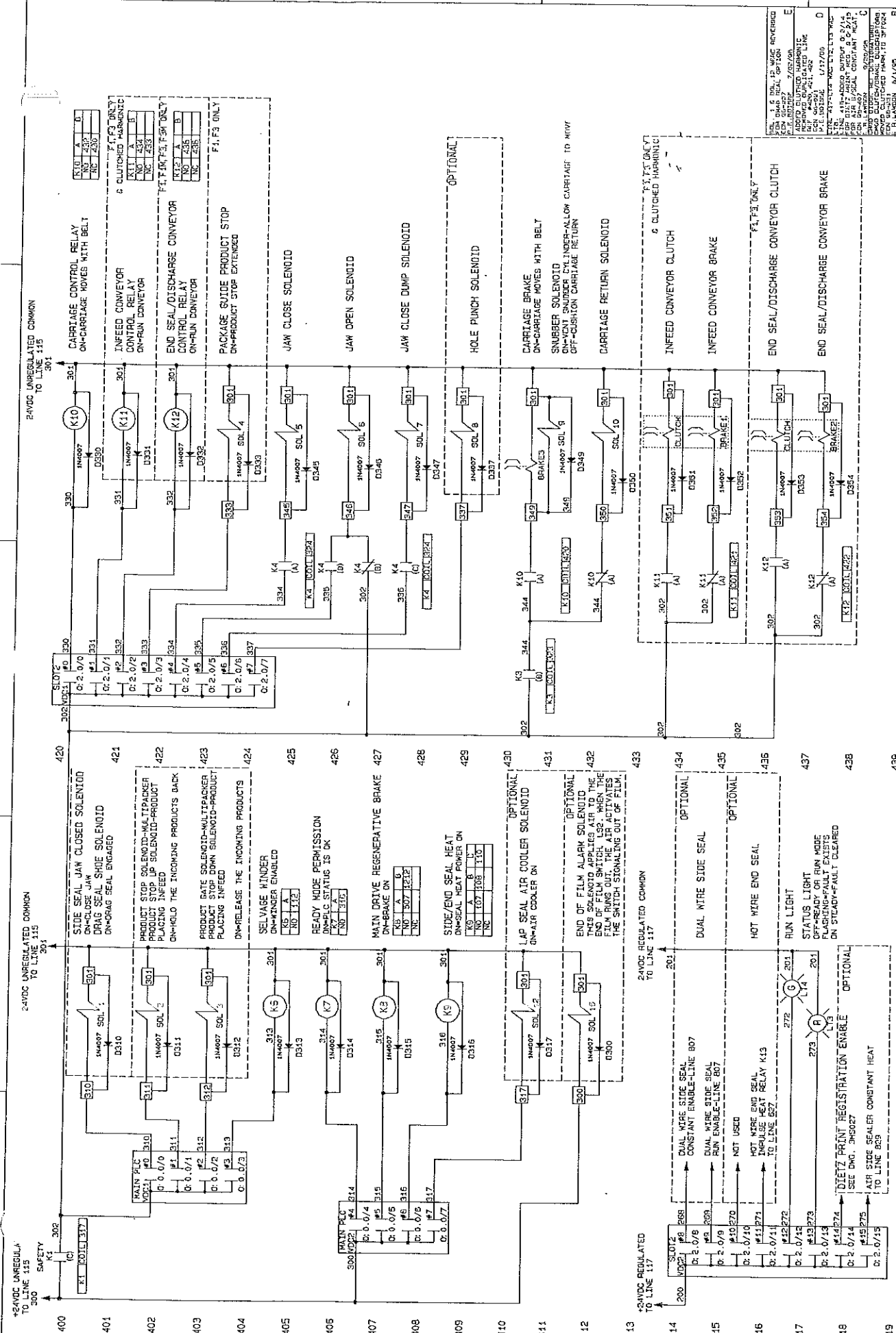
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124 VDC REGULATED COMMON TO LINE 117

PLC DC COM DC COM





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100	01/14/94

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SHANKLIN CORPORATION

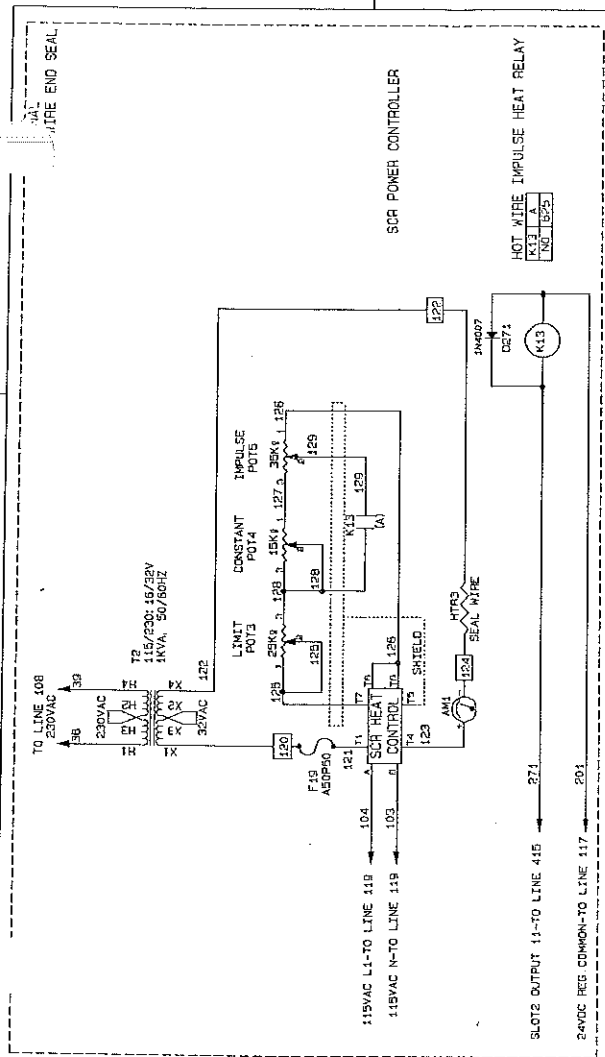
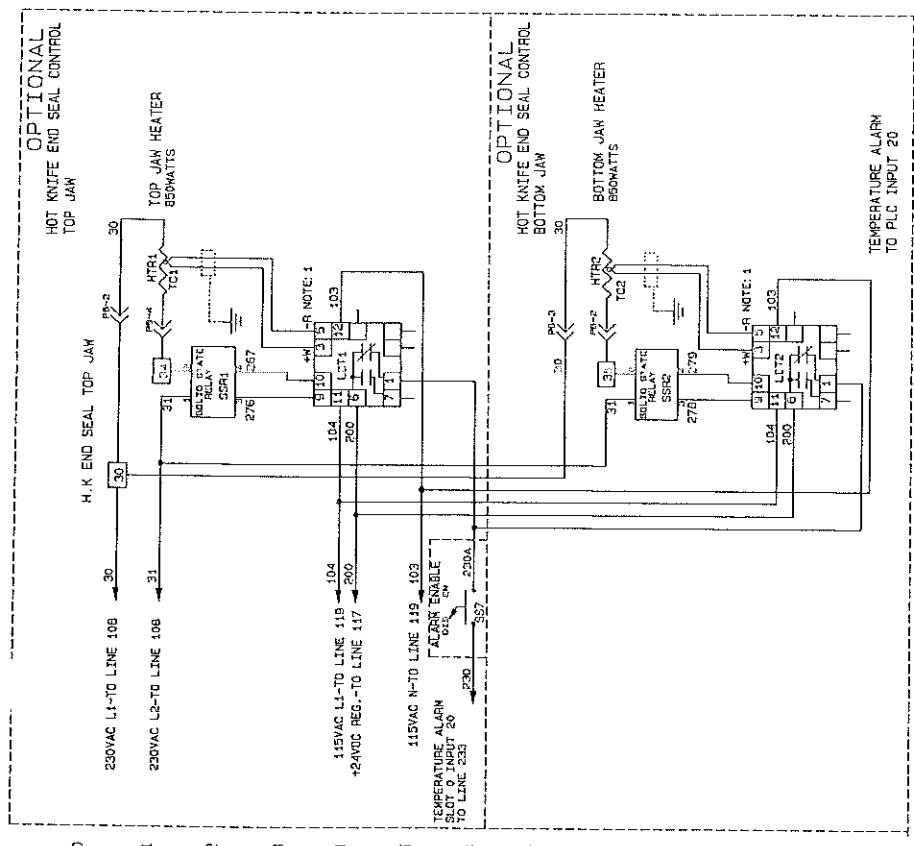
WESTPORT, MA 01983

DATE: 01/14/94

FOR: F MACHINES

APPROVED: 3FF016

REV: E



SCR POWER CONTROLLER

HOT WIRE IMPULSE HEAT RELAY

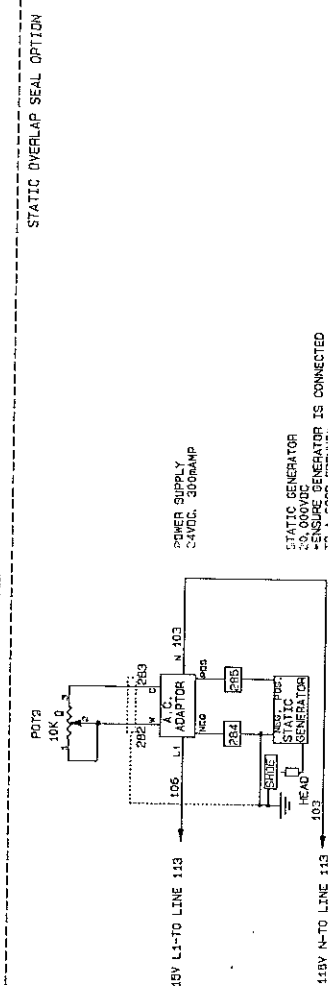
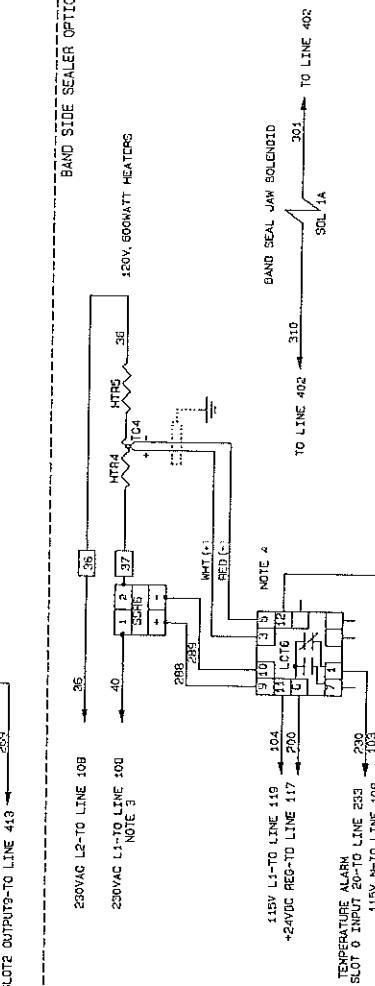
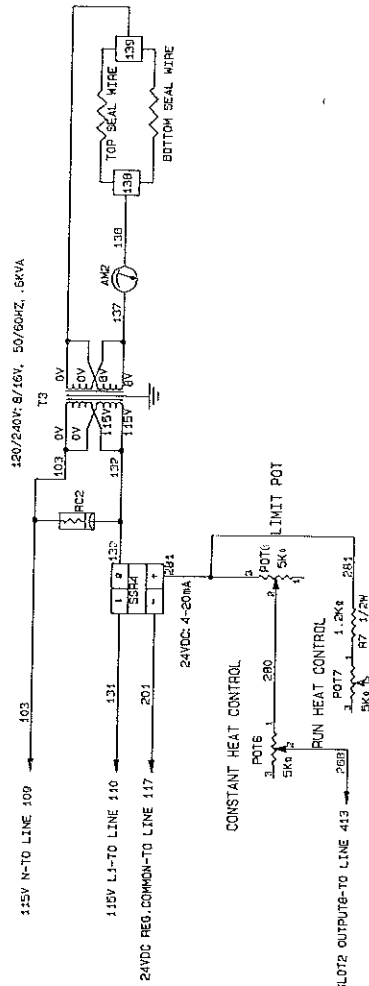
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PS-1	WHITE									
PS-2	RED									
PS-3	GREEN									
PS-4	ORANGE									
PS-5	BLACK									
PS-6	BLUE									

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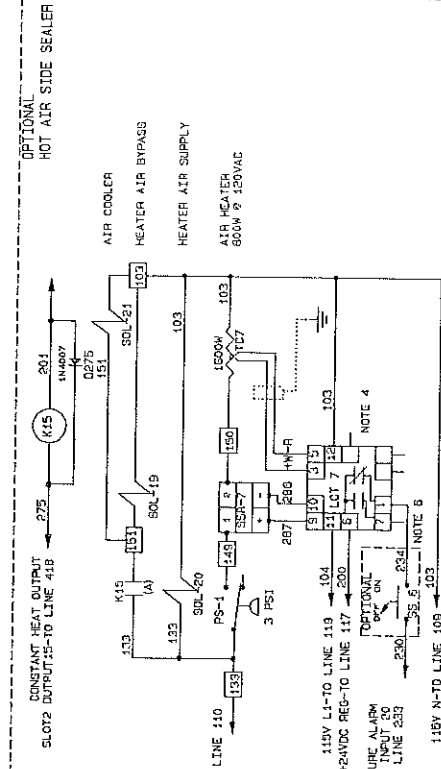
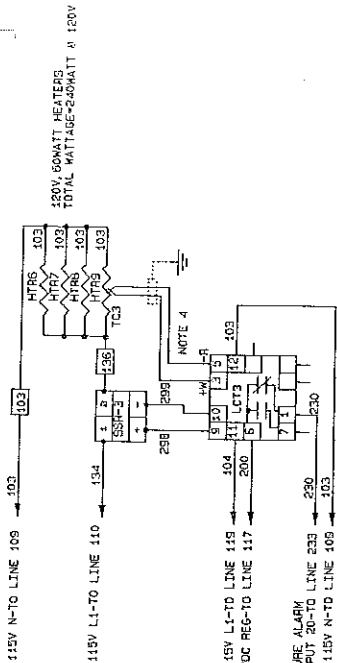
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3	01/14/94	MURRAY DUNN	FOR F MACHINES
4	01/14/94	MURRAY DUNN	FOR F MACHINES
5	01/14/94	MURRAY DUNN	FOR F MACHINES
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19	01/14/94	MURRAY DUNN	FOR F MACHINES
20	01/14/94	MURRAY DUNN	FOR F MACHINES

NOTES
1. FOR CONTROLLER INTERNAL SETTING SEE DWR 9FD-0024

DUAL WIRE SIDE SEAL



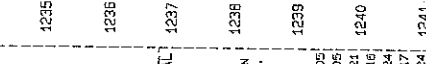
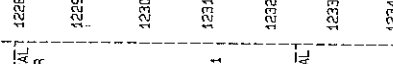
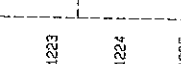
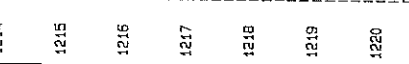
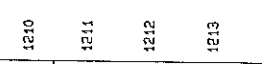
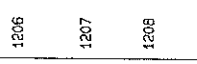
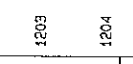
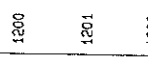
THERMAL OVERLAP SEAL OP

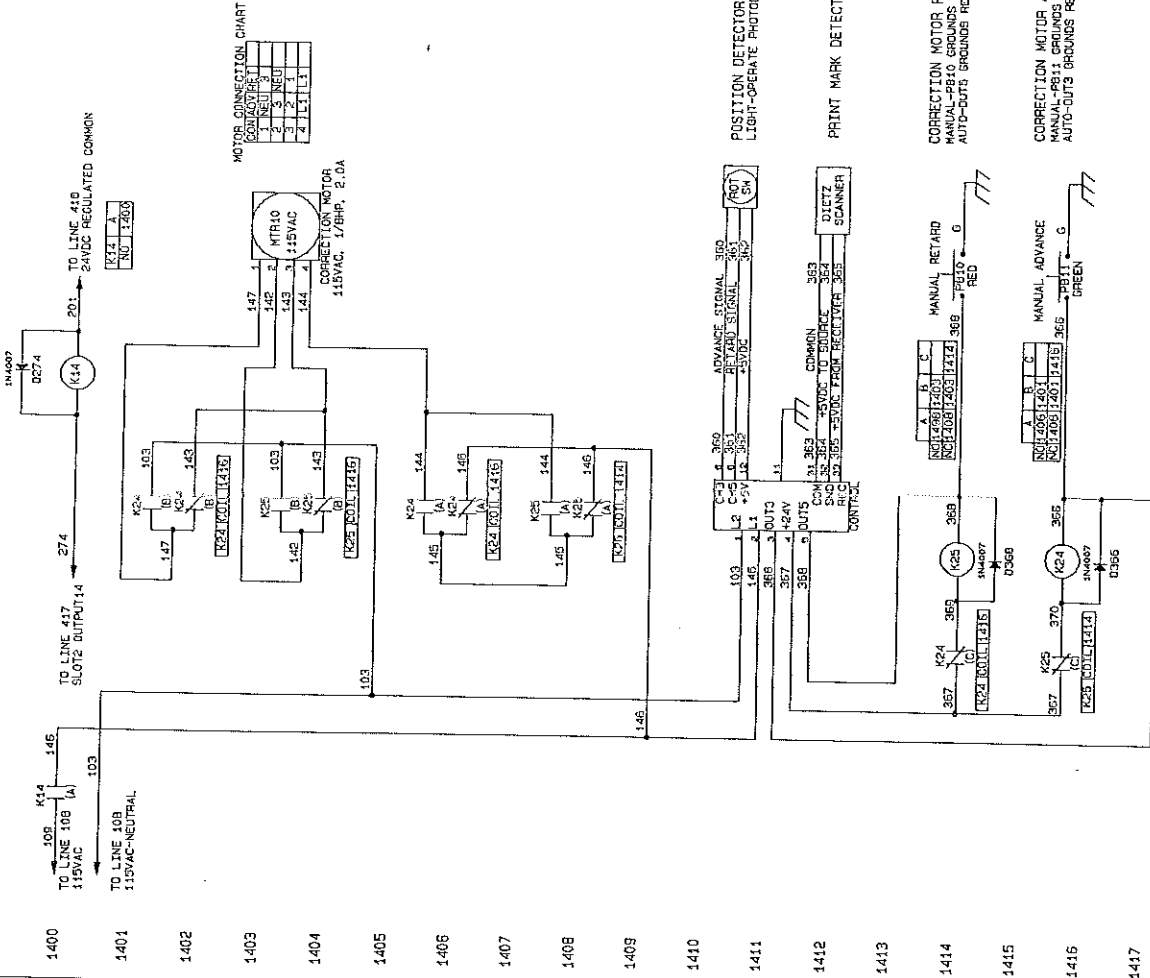


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2	01/14/94	E. R. LAMSON	REVISION
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4	01/14/94	E. R. LAMSON	REVISION
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8	01/14/94	E. R. LAMSON	REVISION
9	01/14/94	E. R. LAMSON	REVISION
10	01/14/94	E. R. LAMSON	REVISION

REVISIONS	DATE	BY	REASON
1	01/14/94	E. R. LAMSON	ORIGINAL
2	01/14/94	E. R. LAMSON	REVISION
3	01/14/94	E. R. LAMSON	REVISION
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8	01/14/94	E. R. LAMSON	REVISION
9	01/14/94	E. R. LAMSON	REVISION
10	01/14/94	E. R. LAMSON	REVISION

- NOTES
1. DELETED ON REV. D.
 2. DELETED ON REV. D.
 3. INSTALL TWO OPTIONAL K103 FUSES (F17 AND F18) FOR BAND SIDE SEALER.
 4. FOR CONTROLLER INTERNAL SETTINGS SEE DNG. SPB-0024.
 5. DELETED ON REV. D.
 6. SWITCH 9 IS USED WHEN MORE THAN ONE SIDESSEAL OPT IS AVAILABLE.

[illegible]



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LINE 1400-1418 OF THE DRAWING
AND 1400-1418 OF THE DRAWING
AND 1400-1418 OF THE DRAWING
AND 1400-1418 OF THE DRAWING

LINE NUMBERS REFERENCE DRAWINGS
34S013 AND 34S016 FOR F MACHINES.
34S013 AND 34S016 FOR HS MACHINES.
SUPERCEDES DNG. 200004 REV. 8 DATED 5/22/90

REV	DATE	DESCRIPTION OF CHANGE	BY	CHKD
1	05/11/95	34S013 AND 34S016 FOR F MACHINES.	34S013	34S016
2	05/11/95	34S013 AND 34S016 FOR HS MACHINES.	34S013	34S016

SHANKLIN CORPORATION
WESTFORD ROAD
AVENUE MASSACHUSETTS

DRAWN: ED CROWN
CHECKED: ED CROWN
APPROVED: ED CROWN

TITLE: DIETZ PRINT REGISTRATION SCHEMATIC
FOR: F and HS MACHINES
DRAWING NUMBER: 34S027
REV: A

SECTION 8. SCHEMATICS/BLEUPRINTS

This section contains the schematic diagrams and blueprints for your F-5 "Form-Fill-Seal" Automatic Wrapper. Refer to Section 1.5 for details about the configuration of your particular machine.

The logic diagram has also been included. Note that it may be contained in a separate envelope that shipped with this manual.